I. GENERALIDADES:

Ubicación:

Provincia: Alajuela
Cantón Orotina
Distrito: Hacienda Vieja

Descripción:

El puente es una estructura de 156 m de tres claros (2 claros de 48m entre apoyos en los extremos y un claro central de 60m entre apoyos). La superestructura está conformada por dos vigas principales de acero armadas a partir de placas con un peralte de 3m, y 3 vigas secundarias de sección W roladas en caliente apoyadas sobre los diafragamas. Los diafragmas del puente son cerchas de acero ubicadas a cada 8.0m. La subestructura es de concreto colado en sitio y está compuesta por pilas de dos columnas rectangulares y huecas.
Los bastiones y pilas están cimentados mediante pilotes.

Documentos de referencia:

Especificaciones para el Diseño de Puentes LRFD, ed.8, AASHTO 2017.
Requisitos del Reglamento para Concreto Estructural y Comentarios ACI 318-14.
Lineamientos para el Diseño Sismorresistente de puentes, marzo 2013.
Código Sísmico de Costa Rica, CSCR-2010
Planos constructivos, puente sobre quebrada Salitral, IMSA 1994

1. CARGAS DE DISEÑO

Cargas Permanentes:

Las correspondientes al peso de los elementos y demás dispositivos. ***AASHTO 3.5.1***

Concreto colado en sitio	=	2.40	ton/m^3
Concreto prefabricado	=	2.50	ton/m^3
Asfalto	=	2.20	ton/m^3
Baranda concreto	=	0.32	ton/m
Baranda peatonal	=	0.04	ton/m

Las correspondiente al empuje de suelos ***AASHTO 3.5.2***

Carga Peatonal: = 0.40 ton/m^2 ***AASHTO 3.6.1.6***

CARLOS EDUARDO FERNANDEZ CHAVES (FIRMA)

Firmado digitalmente por CARLOS EDUARDO FERNANDEZ CHAVES (FIRMA)
Fecha: 2022.05.24 08:16:05 -06'00'

Carga Vehicular:

La carga vehicular HL-93 ***AASHTO 3.6.1.2***

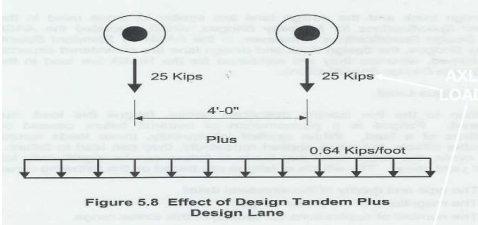


Figure 5.8 Effect of Design Tandem Plus Design Lane

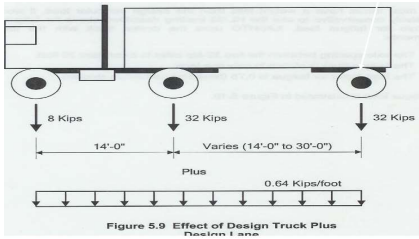


Figure 5.9 Effect of Design Truck Plus

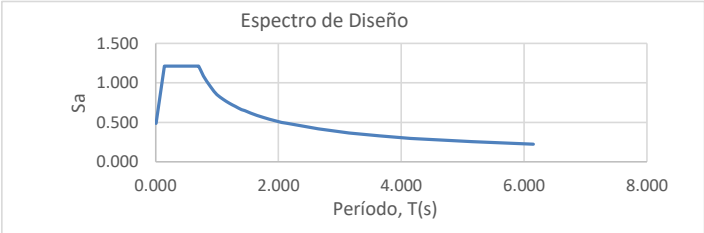
Carga de Sismo

Tipo de Sitio de Cimentación	=	S2	***Lineamientos 2.3***
Zona Sísmica	=	III	***Lineamientos 2.1***
Coeficiente Sísmico Espectral C_a	=	0.404	***Lineamientos 2.4***
Coeficiente Sísmico Espectral C_v	=	0.566	***Lineamientos 2.4***
Periodo de Control T_{sfc}	=	0.700	***Lineamientos 2.4***
Periodo de Control T_{afc}	=	0.140	***Lineamientos 2.4***
Factor de Importancia Operacional (Crítico)	=	1.25	***Lineamientos 3.2***
Factor de modificación de la respuesta			***Lineamientos 3.4***

R_{pilas} = 1.50 $R_{conexiones}$ = 0.80

$R_{bastiones}$ = 1.50

Espectro de diseño



Carga de Viento

Para la combinación de carga Strenght III

Velocidad básica (T_R=50años)	=	125 km/h	***Borrador lineamientos viento CR***
Coeficiente de recurrencia (T_R = 700años)	=	1.60	***Borrador lineamientos viento CR***
Cd	=	1.3	
G	=	1	
Z	=	46 m	
Kz (Catergoría de exposición C)	=	1.4	
Presión de diseño	=	224 kg/m2	**AASHTO 3.8.1.2.1**

Para la combinación de carga Strenght V

Velocidad de diseño	=	128	km/h	
Cd	=	1.3		
G	=	1		
Z	=	46	m	
Kz (Catergoría de exposición C)	=	1.4		**AASHTO 3.8.1.2.1**
Presión de diseño	=	147	kg/m2	**AASHTO 3.8.1.2.1**

Para la combinación de carga Service I

Velocidad de diseño	=	112	km/h	
Cd	=	1.3		
G	=	1		
Z	=	46	m	
Kz (Catergoría de exposición C)	=	1.4		
Presión de diseño	=	113	kg/m2	**AASHTO 3.8.1.2.1**

*Por demanda lateral rige la carga de sismo, por lo que se desprecian las combinaciones de carga de viento

Modificadores de Carga **AASHTO 1.3.2**

Factor debido a ductilidad (η_D)	=	0.95	*Subestructura está detallada por ductilidad
Factor debido a redundancia (η_R)	=	1.00	*Redundancia convensional
Factor debido a clasificación operacional (η_R)	=	1.05	*Nivel operativo crítico
Factor modificador de carga (η_i)	=	1.00	

2. PROPIEDADES DE LOS MATERIALES

2.1 Concreto

Viga Cabezal (VC-1)						
	Resistencia a los 28 días	f'_c	=	280	kg/cm^2	
	Módulo de elasticidad	E_c	=	278419.866	kg/cm^2	***AASHTO 5.4.2.4***
Pilas						
	Resistencia a los 28 días	f'_c	=	280	kg/cm^2	
	Módulo de elasticidad	E_c	=	2.784E+05	kg/cm^2	***AASHTO 5.4.2.4***
Fundaciones						
	Resistencia a los 28 días	f'_c	=	250	kg/cm^2	
	Módulo de elasticidad	E_c	=	2.682E+05	kg/cm^2	***AASHTO 5.4.2.4***
Losa						
	Resistencia a los 28 días	f'_c	=	350	kg/cm^2	
	Módulo de elasticidad	E_c	=	299695.708	kg/cm^2	***AASHTO 5.4.2.4***
Bastion						
	Resistencia a los 28 días	f'_c	=	280	kg/cm^2	
	Módulo de elasticidad	E_c	=	2.784E+05	kg/cm^2	***AASHTO 5.4.2.4***

2.2 Acero de Refuerzo

ASTM A-615	Grado 40	f_y	=	2800	kg/cm^2
ASTM A-615	Grado 60	f_y	=	4200	kg/cm^2

2.2 Acero de Presfuerzo

Grado 270		f_{pu}	=	18900	kg/cm^2
		E_{sp}	=	1898287.87	kg/cm^2

2.3 Acero Estructural

ASTM A-709	Grado 50	f_y	=	3500	kg/cm^2
		f_b	=	1890	kg/cm^2
		f_u	=	4920	kg/cm^3
		E_s	=	2.030E+06	kg/cm^2
		G_s	=	7.816E+05	kg/cm^2

2.4 Studs

f_u	=	4218	kg/cm^2
f_y	=	3515	kg/cm2

2.5 Pernos

ASTM A-325	Tipo 3	f_y	=	3500	kg/cm^2
		f_{ub}	=	8437	kg/cm2
		f_b	=	1890	kg/cm^2
		E_s	=	2.030E+06	kg/cm^2

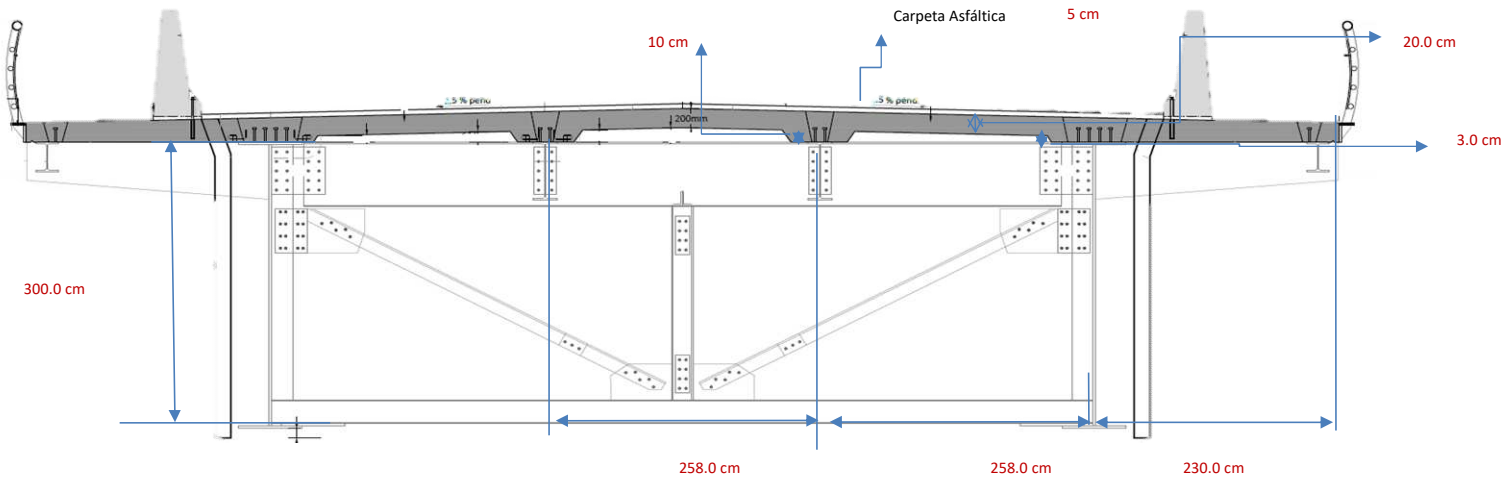
2.4. Suelo de Cimentación

Tipo de suelo	Rigidez horizontal Kh (supuesto) (ton/m3)
Toba muy alterada	10780
Fragmentos de lava basaltica	3135
Arcilla arenosa	4833
Relleno detrás de bastión	3673

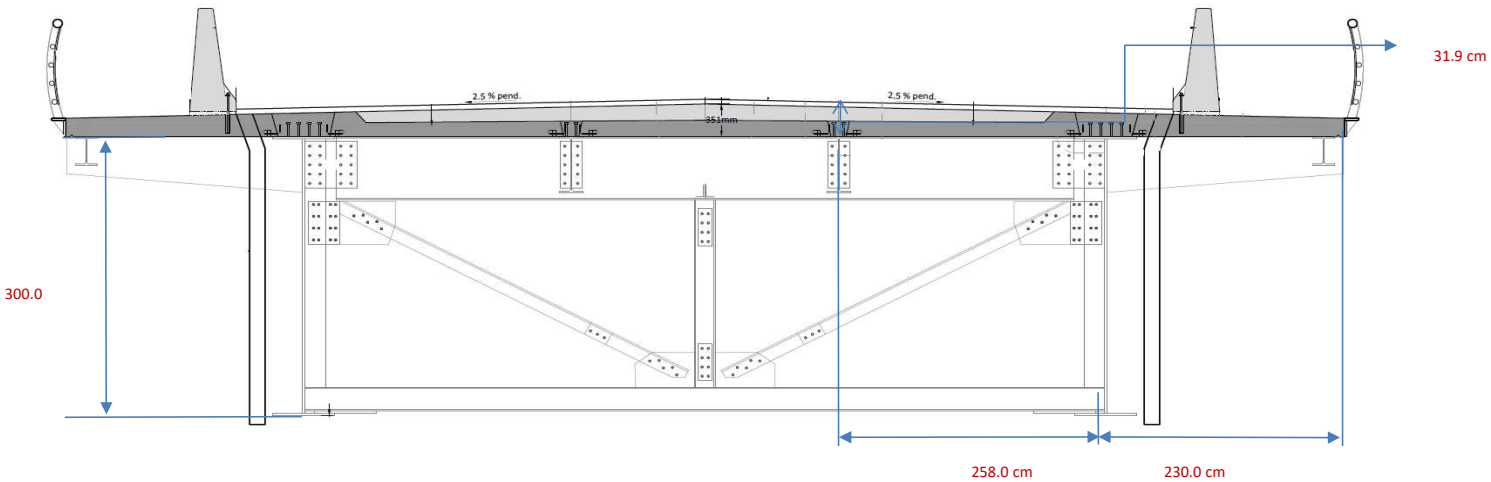
II. DISEÑO DE LA SUPERESTRUCTURA

1.GEOMETRÍA

En la siguientes figuras se muestra la geometría de los elementos de la superestructura del puente sobre el río Salitral.

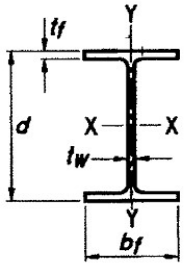


En la siguientes figuras se muestra la geometría de los elementos de la superestructura del puente sobre el río Salitral.



A continuación se muestran las dimensiones generales y propiedadesgeométricas de la vigas exteriores

		unid.	TRAMO1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5	
Seccion Simple	d	cm	300.00	300.00	300.00	300.00	300.00	2
	tw	cm	2.54	2.54	2.54	1.91	1.27	3
	bf_{inf}	cm	60.00	60.00	60.00	60.00	60.00	4
	tf_{inf}	cm	5.08	3.81	2.54	2.54	2.54	5
	bf_{sup}	cm	60.00	60.00	60.00	60.00	60.00	6
	tf_{sup}	cm	5.08	3.81	2.54	2.54	2.54	7
	A	cm^2	1345.8	1199.8	1053.9	866.6	679.3	8
	y	cm	150.0	150.0	150.0	150.0	150.0	9
	Ix	cm^4	18410527.0	15318407.0	12172093.0	10814701.0	9457310.0	10
	Iy	cm^4	183275.8	137559.3	91842.7	91609.9	91490.3	11
	Sy_{top}	cm^3	6109.2	4585.3	3061.4	3053.7	3049.7	12
	Sy_{bot}	cm^3	6109.2	4585.3	3061.4	3053.7	3049.7	13
	Sx_{top}	cm^3	122736.8	102122.7	81147.3	72098.0	63048.7	14
	Sx_{bot}	cm^3	122736.8	102122.7	81147.3	72098.0	63048.7	15
Seccion Compuesta, M+ (cargas de largo plazo)	A	cm^2	1832.5	1553.2	1407.2	1220.0	1032.7	16
	y	cm	193.5	187.1	190.9	197.2	205.8	17
	I	cm^4	28028819.9	22582322.3	19214514.3	17495281.5	15644812.1	18
	S_{conc}	cm^3	209090.8	166145.6	145484.0	139082.8	133455.0	19
	$S_{topflan}$	cm^3	263179.0	199987.2	176161.9	170203.4	166029.5	20
	$S_{botflan}$	cm^3	144852.5	120708.7	100638.0	88714.2	76030.2	21
Seccion Compuesta, M+ (cargas de corto plazo)	A	cm^2	2806.0	2259.9	2113.9	1926.6	1739.4	22
	y	cm	235.2	226.5	231.7	239.7	249.3	23
	I	cm^4	37287124.7	30306771.4	26248390.0	23518260.9	20492531.1	24
	S_{conc}	cm^3	403868.6	313919.4	287608.2	282266.1	278190.4	25
	$S_{topflan}$	cm^3	575641.7	412095.1	384510.6	389895.1	404481.7	26
	$S_{botflan}$	cm^3	158516.8	133830.2	113268.7	98123.4	82188.3	27
Seccion Compuesta, M- (concreto no efectivo en tensión)	A	cm^2	1379.8	1226.8	1080.8	893.5	706.3	28
	y	cm	154.1	153.6	154.1	154.9	156.2	29
	I	cm^4	19344317.4	16018625.1	12870191.9	11509066.5	10145962.3	30
	$S_{topflan}$	cm^3	132615.8	109399.4	88188.1	79323.9	70562.3	31
	$S_{botflan}$	cm^3	125504.4	104303.7	83540.3	74294.9	64949.7	32



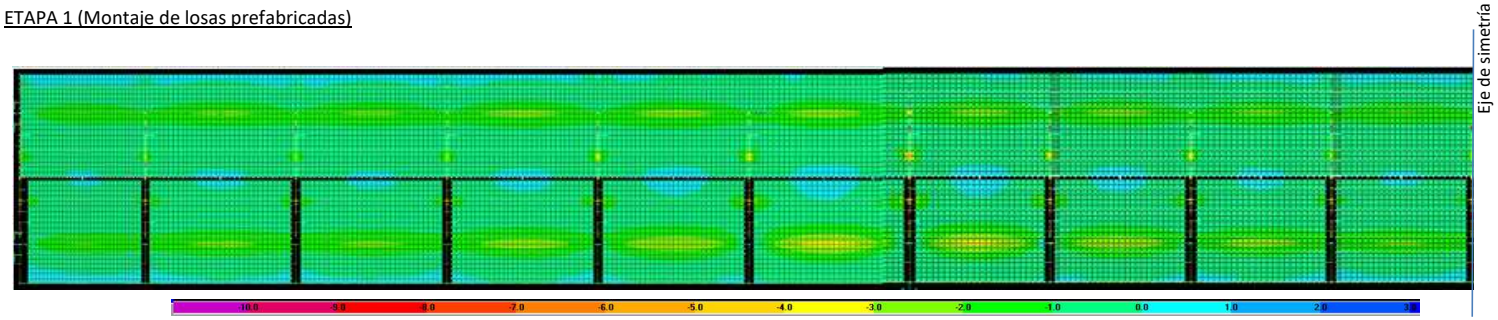
2. Diseño de Losa

2.1 Calculo de Demanda

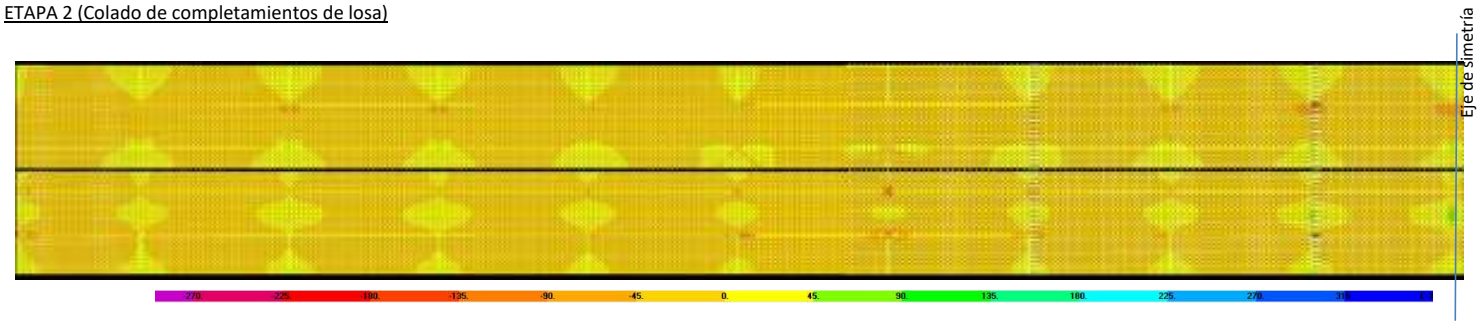
$t_{losa\ pref}$	20	cm	$t_{losa\ pref}$	31.9	cm
$t_{losa\ c.s.}$	0	cm	$t_{losa\ c.s.}$	0	cm
$t_{carpeta\ asf.}$	5	cm	$t_{carpeta\ asf.}$	5	cm
w_{DC}	0.50	ton/m^2	w_{DC}	0.80	ton/m^2
w_{DW}	0.11	ton/m^2	w_{DW}	0.11	ton/m^2
s_{losa}	774	cm	s_{losa}	774	cm

Momento debido a peso de la losa

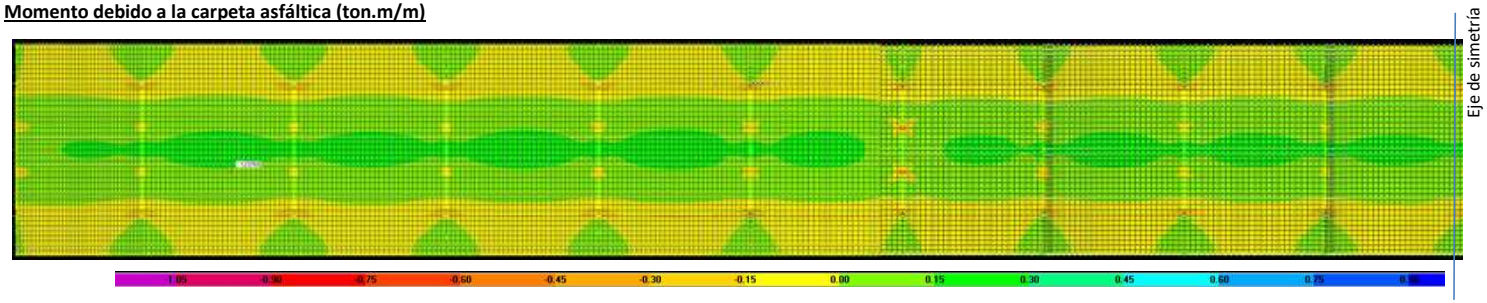
ETAPA 1 (Montaje de losas prefabricadas)



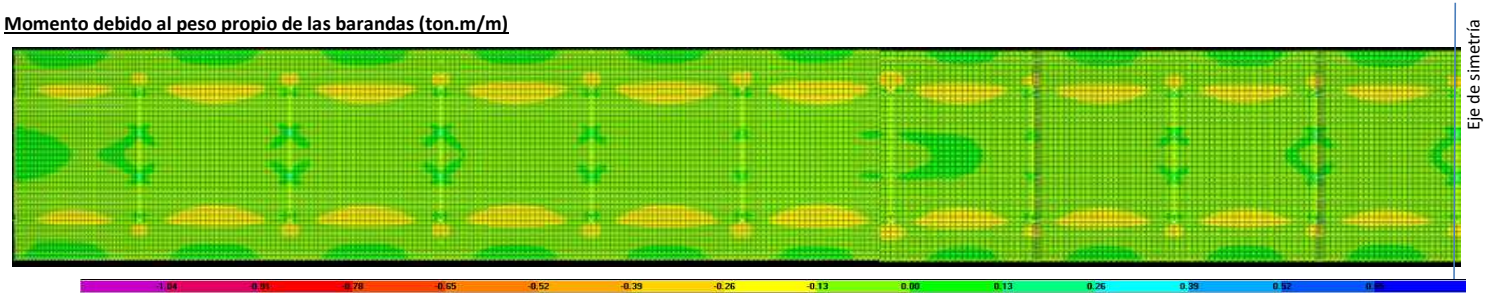
ETAPA 2 (Colado de completamientos de losa)



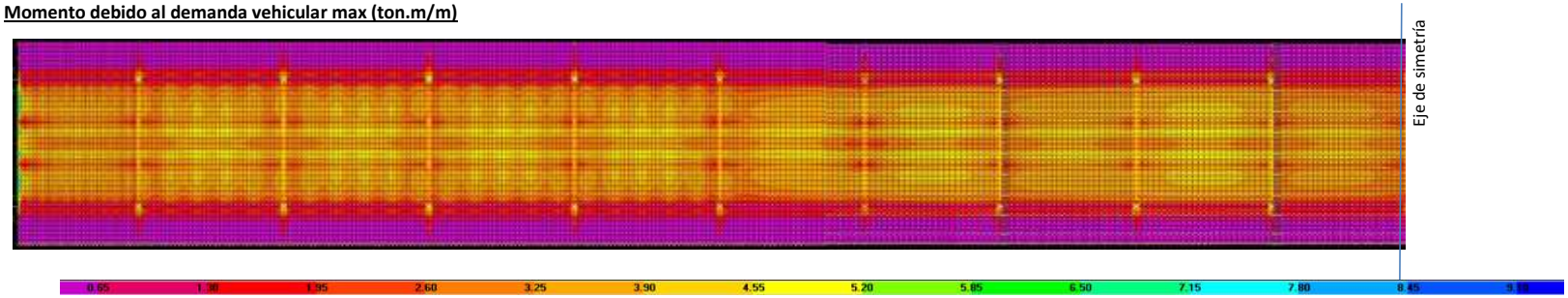
Momento debido a la carpeta asfáltica (ton.m/m)



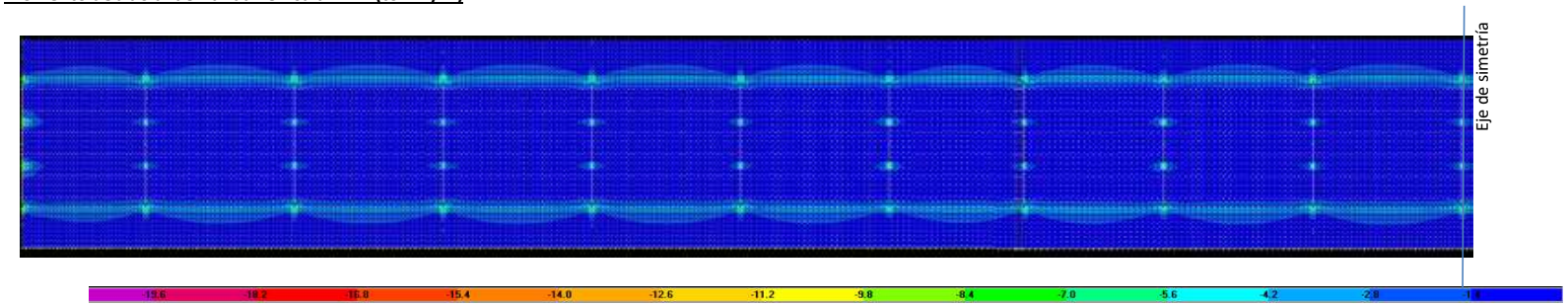
Momento debido al peso propio de las barandas (ton.m/m)



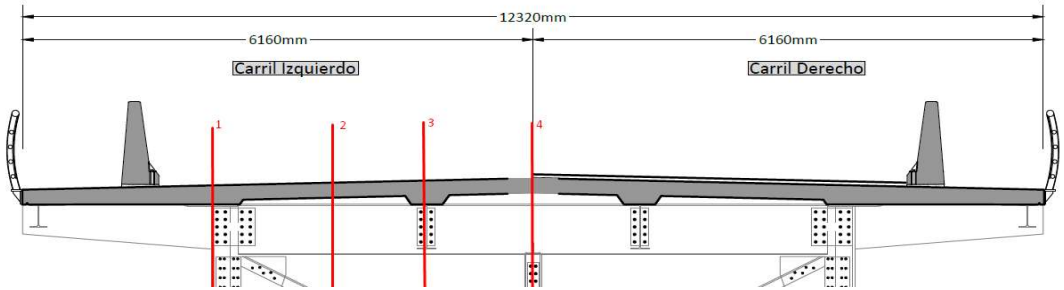
Momento debido al demanda vehicular max (ton.m/m)



Momento debido al demanda vehicular min (ton.m/m)



Resumen de demandas



Resumen de demandas losas prefabricadas

Ubicación	1	2	3	4	
Mlosa E1 (zona cercana a pilas1)	-4.22	-1.64	-0.15	0	ton.m/m
Mlosa E1 (zona cercana a pilas2)	-4.22	-1.64	-0.15	0	ton.m/m
Mlosa E1 (centro de claros 1)	-2.35	-0.56	-0.3	0	ton.m/m
Mlosa E1 (centro de claros 2)	-2.28	-0.55	-0.32	0	ton.m/m
Mlosa E1 (centro de claros 3)	-2.34	-0.57	-0.32	0	ton.m/m
Mlosa E2 (zona cercana a pilas1)	0	0	0	0	ton.m/m
Mlosa E2 (zona cercana a pilas2)	0	0	0	0	ton.m/m
Mlosa E2 (centro de claros 1)	0	0	0	0	ton.m/m
Mlosa E2 (centro de claros 2)	0	0	0	0	ton.m/m
Mlosa E2 (centro de claros 3)	0	0	0	0	ton.m/m
Mbaranda (zona cercana a pilas1)	-0.23	-0.098	-0.02	-0.004	ton.m/m
Mbaranda (zona cercana a pilas2)	-0.23	-0.07	0	0	ton.m/m
Mbaranda (centro de claros 1)	-0.21	-0.12	-0.02	-0.015	ton.m/m
Mbaranda (centro de claros 2)	-0.2	-0.08	-0.03	0	ton.m/m
Mbaranda (centro de claros 3)	-0.2133	-0.098	-0.021	-0.015	ton.m/m
Mcarpeta (zona cercana a pilas1)	-0.166	0.028	0.127	0.2	ton.m/m
Mcarpeta (zona cercana a pilas2)	-0.166	0.028	0.127	0.2	ton.m/m
Mcarpeta (centro de claros 1)	-0.158	0.07	0.132	0.208	ton.m/m
Mcarpeta (centro de claros 2)	-0.13	0.095	0.11	0.188	ton.m/m
Mcarpeta (centro de claros 3)	-0.14	0.11	0.123	0.2	ton.m/m

Ubicación	1	2	3	4	
Mll+imp max (zona cercana a pilas1)	0.44	4	4.23	3.56	ton.m/m
Mll+imp max (zona cercana a pilas2)	0.44	4	4	3.53	ton.m/m
Mll+imp max (centro de claros 1)	1.79	4.18	5.1	3.82	ton.m/m
Mll+imp max (centro de claros 2)	0.47	3.3	3.48	3.6	ton.m/m
Mll+imp max (centro de claros 3)	0.59	4.24	5.17	3.82	ton.m/m
Mll+imp min (zona cercana a pilas1)	-3.83	-0.83	-0.48	-0.11	ton.m/m
Mll+imp min (zona cercana a pilas2)	-3.93	-0.81	-0.55	-0.15	ton.m/m
Mll+imp min (centro de claros 1)	-3.49	-0.83	-0.51	-0.14	ton.m/m
Mll+imp min (centro de claros 2)	-3.48	-0.8	-0.55	-0.12	ton.m/m
Mll+imp min (centro de claros 3)	-3.48	-0.64	-0.52	-0.15	ton.m/m

Resumen de demandas últimas

	Factores de carga		
	DC	DW	LL
Strenght I	1.25	1.5	1.75
Service I	1.00	1.0	1.00

	1		2		3		4		
	max	min	max	min	max	min	max	min	
Stenght I (zona cercana a pilas1)	-5.0	-12.5	4.9	-3.6	7.4	-0.9	6.5	0.1	ton.m/m
Stenght I (zona cercana a pilas2)	-5.0	-12.7	4.9	-3.5	7.0	-1.0	6.5	0.0	ton.m/m
Stenght I (centro de claros 1)	-0.3	-9.5	6.6	-2.2	8.7	-1.1	7.0	0.0	ton.m/m
Stenght I (centro de claros 2)	-2.5	-9.4	5.1	-2.0	5.8	-1.2	6.6	0.1	ton.m/m
Stenght I (centro de claros 3)	-2.4	-9.5	6.8	-1.8	8.8	-1.2	7.0	0.0	ton.m/m
Service I (zona cercana a pilas1)	-4.2	-8.4	2.3	-2.5	4.2	-0.5	3.8	0.1	ton.m/m
Service I (zona cercana a pilas2)	-4.2	-8.5	2.3	-2.5	4.0	-0.6	3.7	0.1	ton.m/m
Service I (centro de claros 1)	-0.9	-6.2	3.6	-1.4	4.9	-0.7	4.0	0.1	ton.m/m
Service I (centro de claros 2)	-2.1	-6.1	2.8	-1.3	3.2	-0.8	3.8	0.1	ton.m/m
Service I (centro de claros 3)	-2.1	-6.2	3.7	-1.2	5.0	-0.7	4.0	0.0	ton.m/m

2.2 Calculo de Espesor mínimo

$t_{losamin}$	17.78	cm	Ok	***AASHTO 9.7.1.1***

2.2 Calculo de Refuerzo por Momentos Negativos, losas prefabricadas espesor 20cm

M_u^-	=	9.54	ton-m/m
Mr	=	3.01	ton-m/m

AASHTO 5.6.3.3

Acero Colocado

corridas	# 5	@ 20 cm	Ok						
bastones	# 4	@ 20 cm			As_{coloc}	=	16.2	cm^2/m	Ok
Recubrimiento	=	2.50	cm	***AASHTO 5.10.1***	As_{min1}	=	5.71	cm^2/m	***AASHTO 9.7.2.5***
Espesor de desgaste	=	0.00	cm	***AASHTO 2.5.2.4***	As_{min2}	=	1.54	cm^2/m	***AASHTO 5.10.6***
d	=	16.71	cm		Espaciamiento máx	=	30.0	cm	***AASHTO 5.10.3.2***
b	=	100	cm						
ϕ	=	0.90							
β_1	=	0.85							
$(\phi M_n)^+$	=	9.55	ton-m/m						
$\phi M_n/M_u$	=	1.00		Ok					

2.3 Calculo de Refuerzo por Momentos Positivos, losas prefabricadas espesor 20cm

M_u	=	8.81	ton-m/m
Mr	=	3.01	ton-m/m

AASHTO 5.6.3.3

Acero Colocado

corridas	# 5	@ 20 cm	Ok						
bastones	# 4	@ 20 cm			As_{coloc}	=	16.2	cm^2/m	Ok
Recubrimiento	=	2.50	cm	***AASHTO 5.10.1***	As_{min1}	=	5.71	cm^2/m	***AASHTO 9.7.2.5***
d	=	16.71	cm		As_{min2}	=	1.54	cm^2/m	***AASHTO 5.10.6***
b	=	100	cm		Espaciamiento máx	=	30.0	cm	***AASHTO 5.10.3.2***
ϕ	=	0.90							
β_1	=	0.85							
$(\phi M_n)^+$	=	9.5466	ton-m/m						
$\phi M_n/M_u$	=	1.08		Ok					

2.4 Calculo de Refuerzo por Momentos Negativos, losas prefabricadas espesor 30cm

M_u^-	=	12.69	ton-m/m	
Mr	=	3.01	ton-m/m	***AASHTO 5.6.3.3***

Acero Colocado

corridas		# 5	@ 20 cm	Ok
bastones		# 4	@ 20 cm	
Recubrimiento	=	2.50	cm	***AASHTO 5.10.1***
Espesor de desgaste	=	0.00	cm	***AASHTO 2.5.2.4***
d	=	28.61	cm	
b	=	100	cm	
ϕ	=	0.90		
β_1	=	0.85		
$(\phi M_n)^+$	=	16.85	ton-m/m	
$\phi M_n/M_u$	=	1.33		Ok

As_{coloc}	=	16.2	cm^2/m	Ok
As_{min1}	=	5.71	cm^2/m	***AASHTO 9.7.2.5***
As_{min2}	=	1.54	cm^2/m	***AASHTO 5.10.6***
Espaciamiento máx	=	30.0	cm	***AASHTO 5.10.3.2***

2.5 Calculo de Refuerzo por Momentos Positivos, losas prefabricadas espesor 30cm

M_u	=	7.38	ton-m/m	
Mr	=	3.01	ton-m/m	***AASHTO 5.6.3.3***

Acero Colocado

corridas		# 5	@ 20 cm	Ok
bastones		# 0	@ 20 cm	
Recubrimiento	=	2.50	cm	***AASHTO 5.10.1***
d	=	28.61	cm	
b	=	100	cm	
ϕ	=	0.90		
β_1	=	0.85		
$(\phi M_n)^+$	=	10.273	ton-m/m	
$\phi M_n/M_u$	=	1.4		Ok

As_{coloc}	=	9.9	cm^2/m	Ok
As_{min1}	=	5.71	cm^2/m	***AASHTO 9.7.2.5***
As_{min2}	=	1.54	cm^2/m	***AASHTO 5.10.6***
Espaciamiento máx	=	30.0	cm	***AASHTO 5.10.3.2***

2.4 Calculo de Refuerzo longitudinal inferior

LOSA 20cm				LOSA 30cm				
% de acero transversal		67%		% de acero transversal		67%		***AASHTO 9.7.3.2***
Área de acero longitudinal min		10.87	cm²	Área de acero longitudinal min		6.63	cm²	
As_{min}		1.09	cm^2	As_{min}		1.41	cm^2	***AASHTO 5.10.6***
s_{max}		45.00	cm	s_{max}		45.00	cm	***AASHTO 5.10.6***
Usado	# 5	@ 20.0 cm		Usado	# 5	@ 20.0 cm		
	# 4	@ 20.0 cm			# 0	@ 20.0 cm		
As_{coloc}	16.2	cm^2/m	OK	As_{coloc}	9.9	cm^2/m	OK	

2.5 Control de agrietamiento mediente postension longitudinal

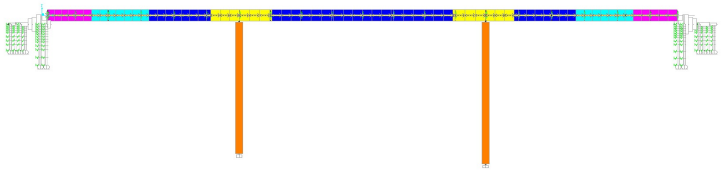
Acero de postensión requerido

bf	=	100	cm	$f_{15\%ruptura}$	=	5.63	kg/cm^2
tc	=	20	cm	Δf_{pT}	=	0.15	
Ag	=	2000	cm^2	P_{pe}	=	11.3	ton
$\bar{Y}_{presf.}$	=	10.00	cm	P_{pi}	=	13	ton
Torones	=	0.60	in	torones requeridos por metro	=	1.00	
Aps	=	1.40	cm^2				

3. DISEÑO DE VIGAS PRINCIPALES

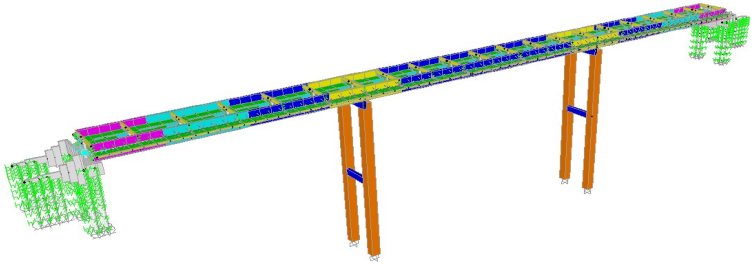
3.1 Modelaje Estructural

Se construyó un modelo de la estructura del puente en el programa SAP 2000, a partir del cual se estimaron las demandas en los elementos. Se modelaron los bastiones con pilotes, suponiendo las rigidices del suelo con base la descripcion geotecnica de los planos.



Vista Lateral

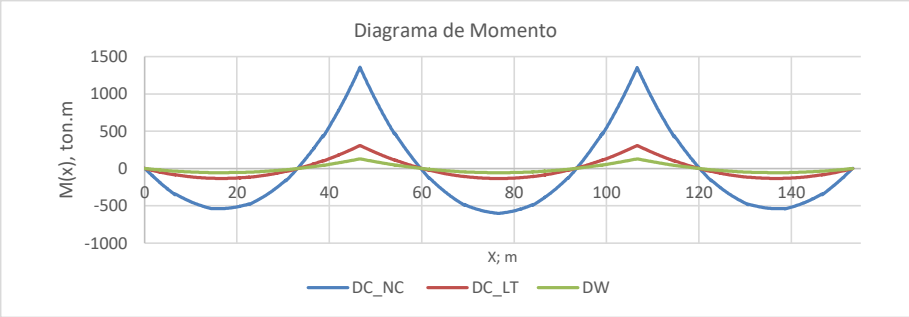
Vista Transversal

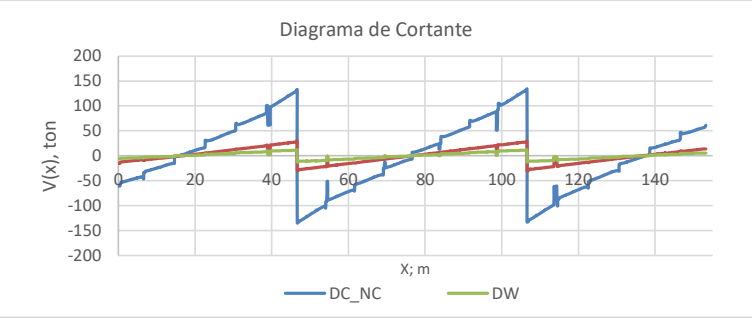


Vista 3D

3.3 Estimación de demandas (Vigas Exteriores)

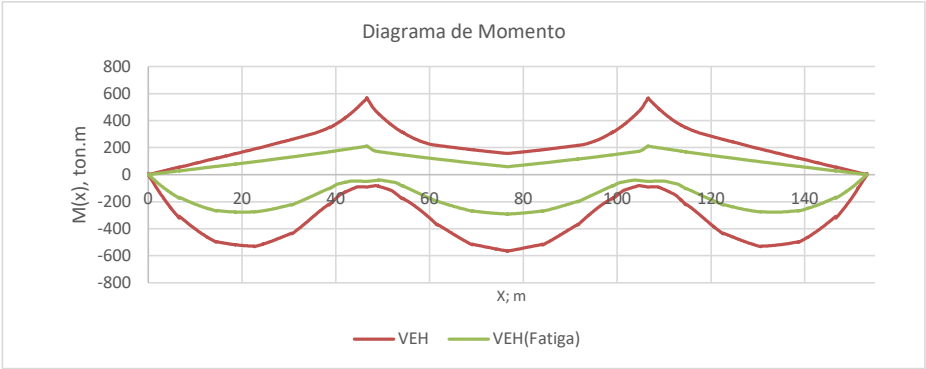
3.3.1 Cargas Permantes

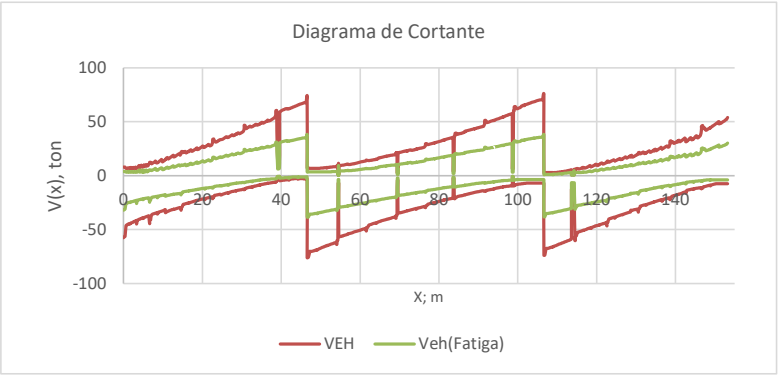




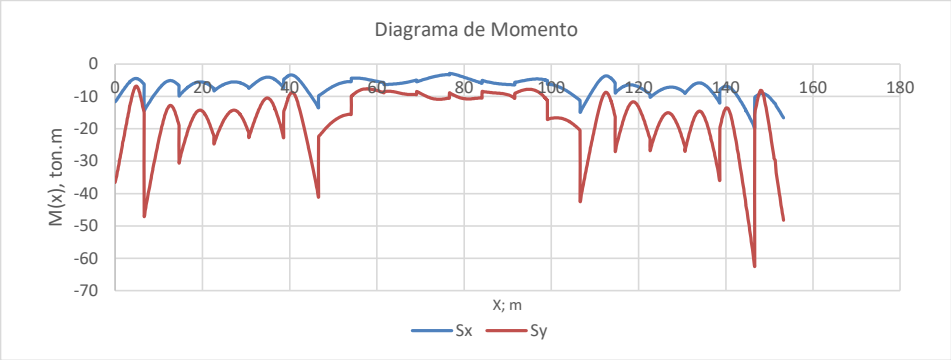
3.3.3 Carga Vehicular (LL+IM)

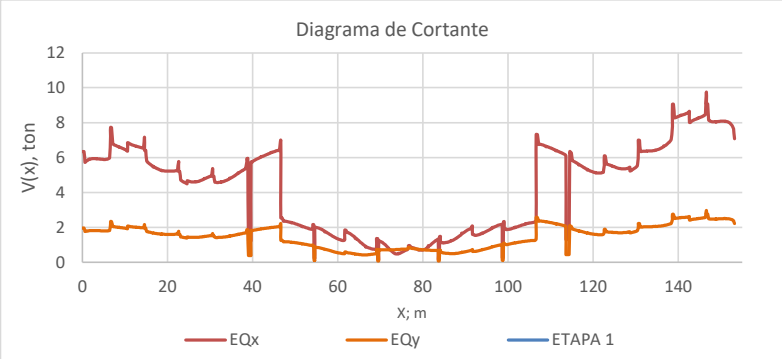
F_{IM} = 1.33 $F_{IM(FATIGA)}$ = 1.15 ***AASHTO 3.6.2.1***





3.3.4 Carga de Sismo

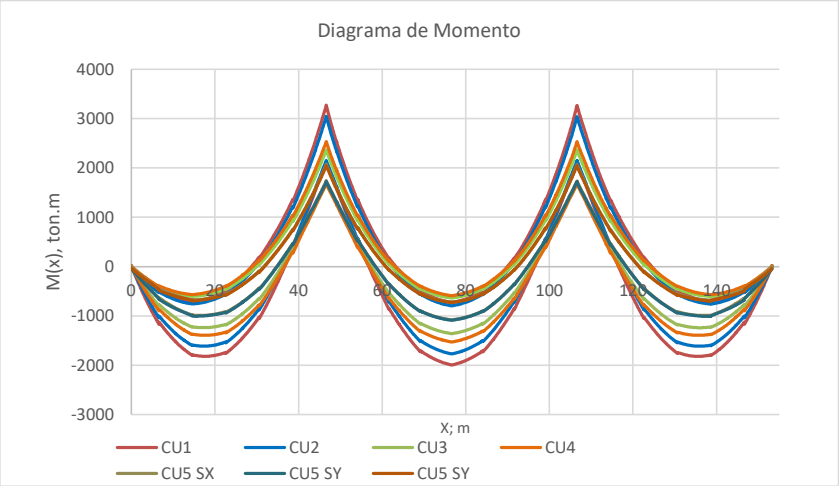


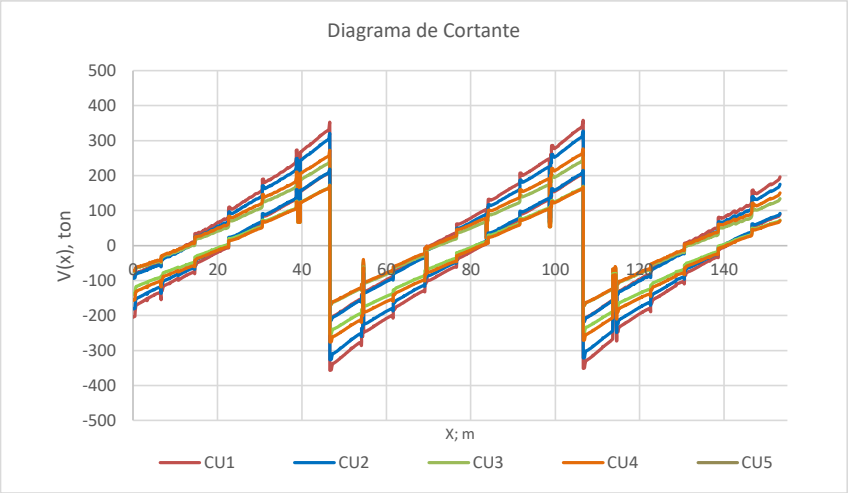


3.3.5 Demandas Últimas

AASHTO 3.4.1

	Factores de carga			
	DC	DW	LL+IM	EQ
CU1 (Strenght I)	1.25	1.5	1.75	0.00
CU2 (Strenght II)	1.25	1.5	1.35	0.00
CU3 (Service I)	1.00	1.0	1.00	0.00
CU4 (Service II)	1.00	1.0	1.30	0.00
CU5 (Extreme Event I)	1.00	1.0	0.50	1.00
CU6 (Fatigue I)	0.00	0.0	1.75	0.00
CU7 (Fatigue II)	0.00	0.0	0.80	0.00





3.4 Diseño por Flexión

3.4.1 Limites de proporcionalidad de las secciones

AASHTO 6.10.2

	TRAMO1		TRAMO 2		TRAMO 3		TRAMO 4		TRAMO 5	
D/tw:Alma Sin rigidizadores Long.	114.1102	OK	115.11	OK	116.11	OK	154.81	X	232.2	X
D/tw:Alma con rigidizadores long.		OK		OK		OK		OK		OK
bf_{bot}	60.00	OK	60.00	OK	60.00	OK	60.00	OK	60.00	OK
tf_{bot}	5.08	OK	3.81	OK	2.54	X	2.54	OK	2.54	OK
$bf/2tf_{(bot)}$	5.9	OK	7.9	OK	11.8	OK	11.8	OK	11.8	OK
bf_{top}	60.00	OK	60.00	OK	60.00	OK	60.00	OK	60.00	OK
tf_{top}	5.08	OK	3.81	OK	2.54	X	2.54	OK	2.54	OK
$bf/2tf_{(top)}$	5.9	OK	7.9	OK	11.8	OK	11.8	OK	11.8	OK
Iy_{bot}/Iy_{top}	1	OK	1	OK	1	OK	1	OK	1	OK
Iy_{top}/Iy_{bot}	1	OK	1	OK	1	OK	1	OK	1	OK

3.4.2 Estado Límite de Servicio

AASHTO 6.10.4

Deformación Elástica

AASHTO 6.10.4.1

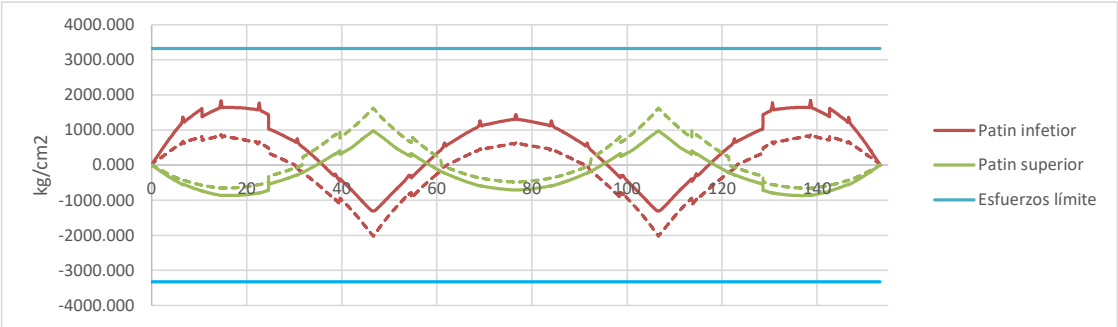
	Extremos		Central		
Longitud entre apoyos	48		60		m
Deflexion por carga vehicular	4.22	OK	5.63	OK	cm

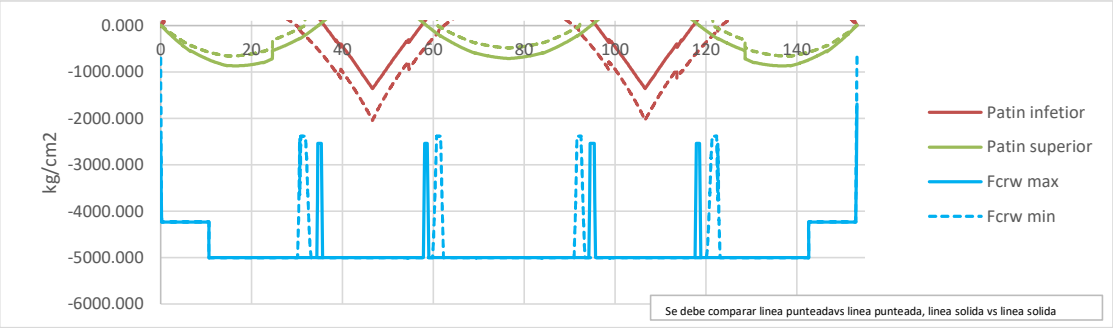
AASHTO 2.5.2.6.2

Deformaciones Permanentes

AASHTO 6.10.4.2

Sección compuesta?	=	Si
Viga continua?	=	Si
Construcción apuntalada	=	No
Concreto es efectivo a tensión	=	Si
Se detallan rigidizadores longitudinales	=	Si
Se cumple AASHTO 6.10.1.7	=	Si





3.4.3 Momento Positivo

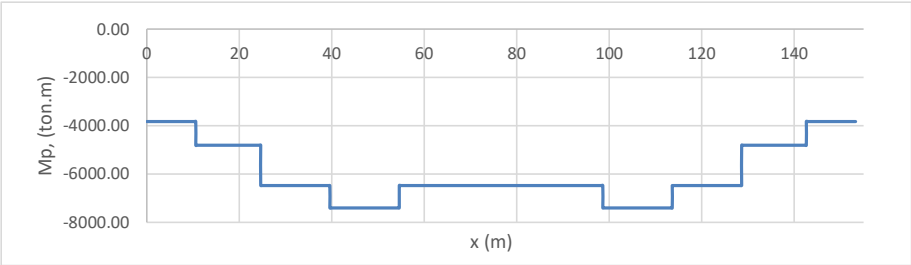
Revisión de sección compacta ***AASHTO 6.10.6.2.2***

	TRAMO 1		TRAMO 2		TRAMO 3		TRAMO 4		TRAMO 5		
Esfuerzo de fluencia de los patines	3500	OK	3500	OK	3500	OK	3500	OK	3500	OK	kg/cm2
Límite de esbeltez del alma ($2D_{cp}/t_w$)	2.812	OK	20.5	OK	21.5	OK	2.5	OK	0	OK	
Requisito de ductilidad (Dp)	38.65	OK	59.86	OK	59.86	OK	34.88	OK	31.60	OK	

AASHTO 6.10.7.3

Cálculo de Momento Plástico ***AASHTO D.6.1***

	TRAMO 1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5	
Dt	**327.6**	**323.0**	**323.0**	**323.0**	**323.0**	cm
Y	**291.3**	**270.1**	**270.1**	**295.1**	**298.4**	cm
D_p	**38.7**	**59.9**	**59.9**	**34.9**	**31.6**	cm
D_{cp}	**3.6**	**26.1**	**27.3**	**2.3**	**0.0**	cm
M_p	**7403.6**	**6468.4**	**5718.4**	**4804.8**	**3817.5**	ton.m



Cálculo de Momento de Fluencia ***AASHTO D.6.2***

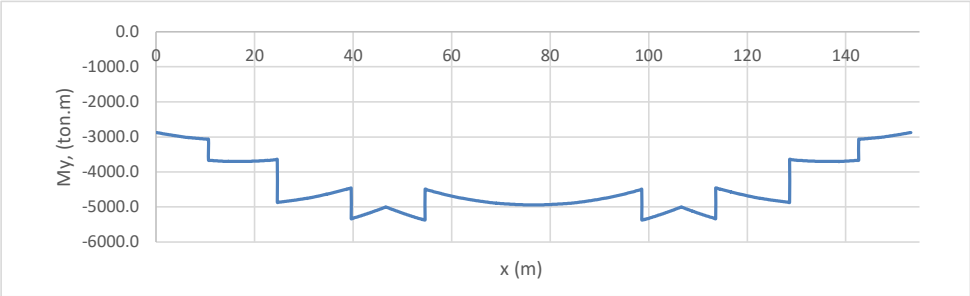
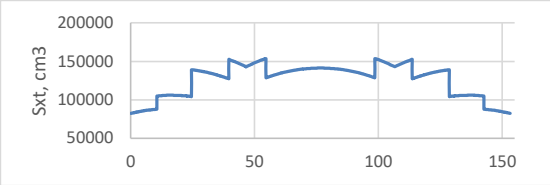
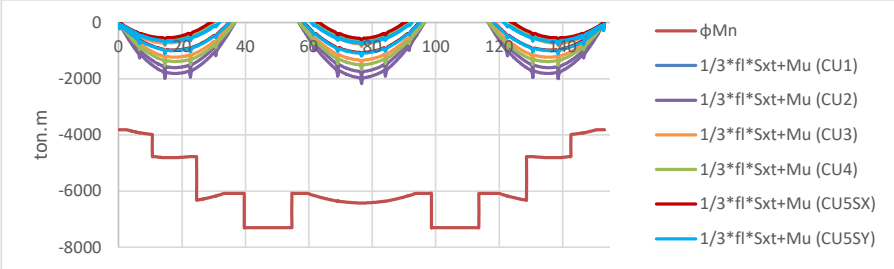


Grafico Demanda/Capacidad para momento positivo ***AASHTO 6.10.7.1.2***

Factor hibrido	Rh	=	1.0	***AASHTO 6.10.1.10.1***
Factor de resistencia por Flexion	ϕf	=	1.0	***AASHTO 6.5.4.2***
Modulo de seccion elastico		=		





3.4.4 Momento Negativo

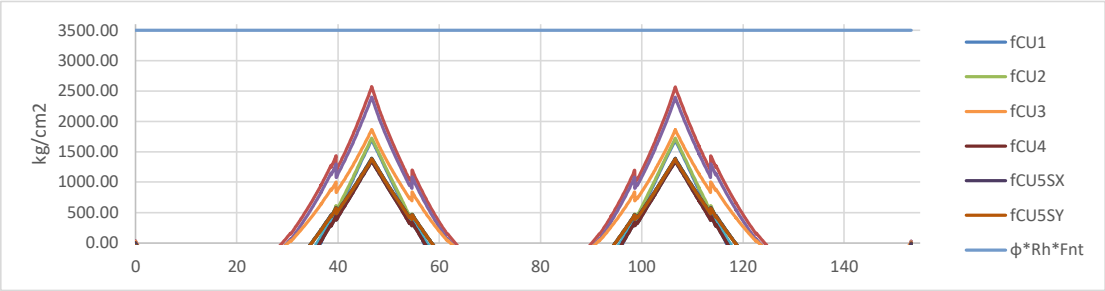
Revisión de sección compacta ***AASHTO 6.10.6.2.3***

	TRAMO 1		TRAMO 2		TRAMO 3		TRAMO 4		TRAMO 5		
Esfuerzo de fluencia de los patines	3500	OK	3500	OK	3500	OK	3500	OK	3500	OK	kg/cm2
Límite de esbeltez del alma (2Dc/tw)	117.4	OK	117.927	OK	119.31	OK	160.0	X	242.0	X	
Razón de Inercias (I_{yc}/I_{yt})	1.0	OK	1.0	OK	1.0	OK	1.0	OK	1.0	OK	

Patines en tensión

Factor de resistencia por Flexion	ϕf =	1.0	
Patines arriostrados continuamente	=	Si	**AASHTO 6.10.8.1.3**
Factor hibrido	Rh =	1.0	***AASHTO 6.10.1.10.1***

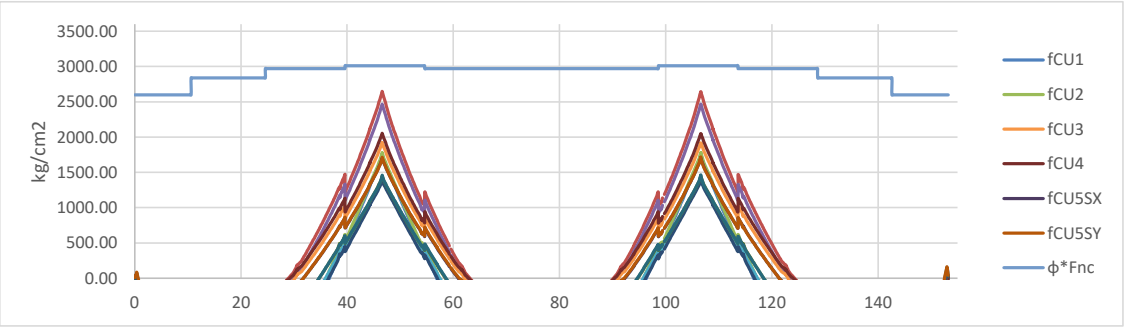
Grafico demanda capacidad



Patines en compresión **AASHTO 6.10.8.1.1**

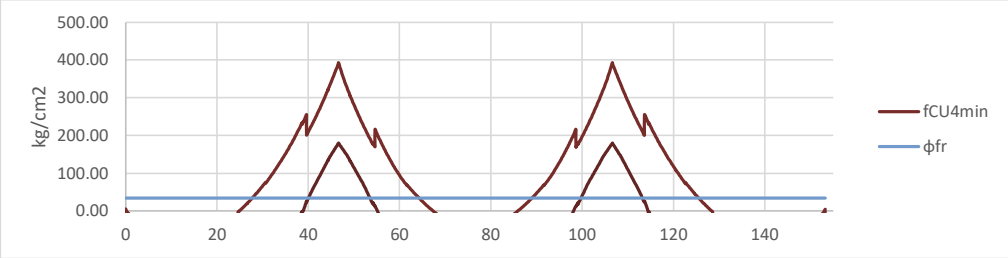
		TRAMO 1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5		
	Rb	1.00	1.00	1.00	0.96	0.86		**AASHTO 6.10.1.10.2**
	Rh	1.0	1.0	1.0	1.0	1.0		***AASHTO 6.10.1.10.1***
	Fyc	3500	3500	3500	3500	3500	kgf/cm2	
	Fyw	3500	3500	3500	3500	3500	kgf/cm2	
	Fyr	2450	2450	2450	2450	2450	kg/cm2	
Pandeo Local del patín a compresión	λf	5.91	7.87	11.81	11.81	11.81		***AASHTO 6.10.8.2.2***
	λrf	16.12	16.12	16.12	16.12	16.12		
	λpf	9.15	9.15	9.15	9.15	9.15		
	Fnc	3500.0	3500.00	3099.25	2984.89	2676.91	kgf/cm2	
Pandeo Lateral Torsional	rt	14.57	13.89	12.76	13.55	14.50	cm	
	Lb	800.00	800.00	800.00	800.00	800.00	cm	
	Lp	350.79	334.54	307.37	326.24	349.21	cm	
	Lr	1317.18	1256.18	1154.14	1224.99	1311.24	cm	
	Fcr	6641.66	6040.78	5099.18	5532.52	5684.99	kg/cm2	
	Cb	1.00	1.00	1.00	1.00	1.00		
	Fnc	3011.92	2969.72	2889.13	2837.78	2598.08	kg/cm2	

Grafico demanda capacidad



Revisión de Refuerzo mínimo en flexión Negativa ***AASHTO 6.10.1.7***

Módulo de ruptura	fr =	37.6	kg/cm2
	ϕ =	0.9	
Esfuerzo límite en tensión del concreto	ϕ*fr =	33.8	kg/cm2



Acero de refuerzo longitudinal mínimo en las zonas donde fCU4 es mayor a ϕfr (LOSA 20cm)	=	20 cm2/m	*2/3 deben colocarse en el lecho
Acero de refuerzo longitudinal mínimo en las zonas donde fCU4 es mayor a ϕfr (LOSA 30cm)	=	30 cm2/m	superior

Acero de refuerzo longitudinal colocado

LOSA 20cm					LOSA 30cm				
Malla superior	=	# 5	@ 20 cm		Malla superior	=	# 5	@ 20 cm	
		# 4	@ 20 cm	OK			# 6	@ 20 cm	OK
Malla inferior	=	# 5	@ 20 cm		Malla inferior	=	# 5	@ 20 cm	
		# 4	@ 20 cm				# 0	@ 20 cm	
Area de acero Total	=	32.5	cm2/m	OK	Area de acero Total	=	34.0	cm2/m	OK

3.5 Diseño Conectores de Cortante

AASHTO 6.10.10

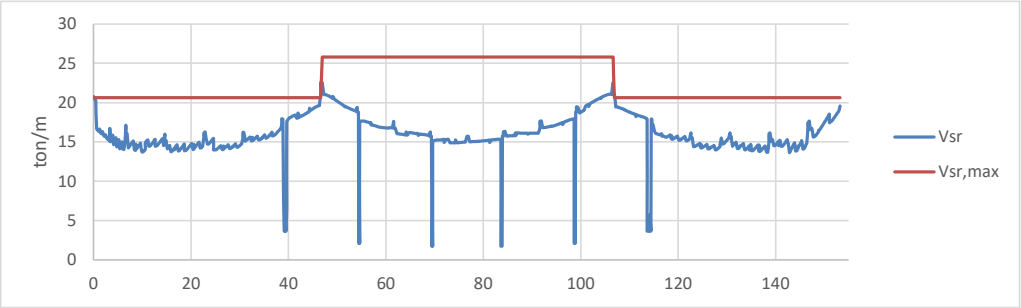
	Distribucion de studs colocados									
Estacion inicial	0	24.5	46.7	76.700	106.7	130.2				
Estacion final	24.5	46.7	76.7	106.7	130.2	154.7				
Diametro studs	2.2	2.2	2.2	2.2	2.2	2.2			cm	
Cant.max.studs x linea	7	7	7	7	7	7				
Cant.studs x linea	4	4	4	4	4	4				OK
pitch $_{max}$	121.92	121.92	121.92	121.92	121.92	121.92			cm	
pitch $_{min}$	13.2	13.2	13.2	13.2	13.2	13.2				
pitch	40	40	32	32	40	40			cm	OK
losa con metaldeck?	No	No	No	No	No	No				
altura min studs	15	15	15	15	15	15			cm	
altura de sutds	15.24	15.24	15.24	15.24	15.24	15.24			cm	OK
h/d	6.93	6.93	6.93	6.93	6.93	6.93				OK

Fatiga

AASHTO 6.10.10.2

	TRAMO1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5	
A (viga de acero)	1345.79	1199.85	1053.90	866.62	679.35	
y (viga de acero)	150.00	150.00	150.00	150.00	150.00	
y (momento positivo)	235.23	226.46	231.74	239.68	249.34	
I (momento positivo)	37287124.69	30306771.42	26248389.96	23518260.88	20492531.15	
y (momento negativo)	235.23	226.46	231.74	239.68	249.34	
I (momento negativo)	37287124.69	30306771.42	26248389.96	23518260.88	20492531.15	
Q (momento positivo)	114695.42	91736.39	86140.88	77719.18	67483.97	cm3
Q (momento negativo)	114695.42	91736.39	86140.88	77719.18	67483.97	cm3

	Distribucion de studs								
Estacion inicial	0	24.5	46.7	76.7	106.7	130.2			
Estacion final	24.5	46.7	76.7	106.7	130.2	154.7			
Zr	2.06	2.06	2.06	2.06	2.06	2.06			ton
Vsrmax	20.631	20.631	25.788	25.788	20.631	20.631			ton/m



Resistencia ***AASHTO 6.10.10.4***

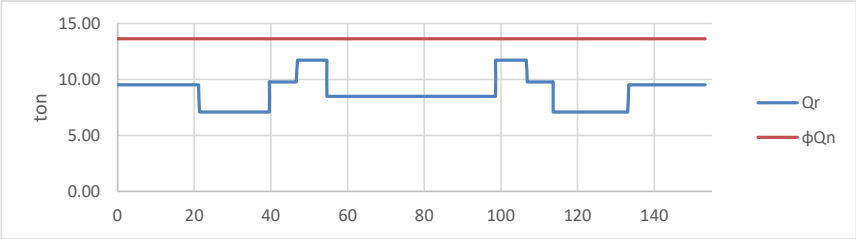
Factor de resistencia ϕsc = 0.85

	TRAMO1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5	
P1p	2942	2136	2136	2136	2136	ton
P2p	4710	4199	3689	3033	2378	ton
Pp	2942	2136	2136	2136	2136	ton
Fp	0	0	0	0	0	ton
P1n	4710	4199	3689	3033	2378	ton
P2n	1558	1131	1131	1131	1131	ton
Pn	1558	1131	1131	1131	1131	ton
Pt	4500	3267	3267	3267	3267	ton
Ft	0	0	0	0	0	ton
$P_{al\ extremo\ del\ elemento}$	2942	2136	2136	2136	2136	ton
$P_{al\ apoyo\ intermedio\ (M-)}$	4500	3267	3267	3267	3267	ton

	Primer Luz		Segunda luz		Tercera luz	
	max	min	max	min	max	min
inicio de tramo	0		46.7		106.7	
ubicacion momento veh max positivo	21.34		76.7		133.36	
final del tramo	46.7		106.7		154.7	

Cantidad de studs tramo azul	224
Cantidad de studs tramo rojo	460
Cantidad de studs tramo naranja	384

*considera del momento positivo maximo al apoyo



3.6 Diseño por Cortante

AASHTO 6.10.6.3/AASHTO 6.10.9/6.1

Factor de resistencia $\phi v = 1.0$

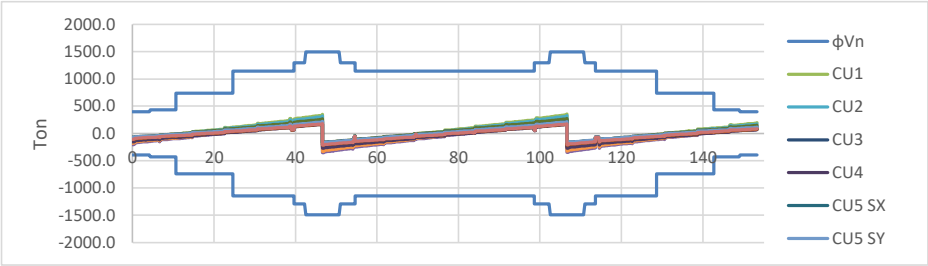
	Paneles intermedios					
	TRAMO1	**TRAMO 2**	**TRAMO 3**	**TRAMO 4**	**TRAMO 5**	
D/tw	114.11	115.11	116.11	154.81	232.22	
do paneles internos	223	266	250	266	223	cm
Rigidizadores Longitudinales?	No	No	No	No	No	
Alma rigidizada?	Si	Si	Si	Si	Si	
sidera el alma rigidizada para la capacidad?	No	No	No	Si	Si	
Vp	1494.47	1507.57	1520.67	1140.50	760.33	ton
k	13.42	11.04	11.96	11.15	13.75	
C	0.87	0.76	0.80	0.42	0.23	
Vn	1294.19	1143.88	1221.60	737.38	429.21	ton

*Cumple con ser menor a 1.5D al tener rigidizadores long.

*Se desprecia el aporte de los rigidizadores longitudinales pues no cumplen con la inercia mínima requerida según AASHTO 6.10.11.3.2

*Casos que no consideran rígidizada es debido a que no cumplen con la inercia mínima requerida según AASHTO 6.10.11.1.3

	Paneles en zona de apoyo					
	TRAMO1				**TRAMO 5**	
D/tw	114.11				232.22	
do paneles internos	130				130	cm
Alma rigidizada?	Si				Si	
Vp	1494.47				760.33	ton
k	29.85				30.73	
C	1.00				0.52	
Vn	1494.47				394.58	ton



Rigidizadores Transversales Intermedios *AASHTO 6.10.11.1*

	TRAMO1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5	
Rigidizadores a ambos lados de la viga?	Si	Si	Si	Si	Si	
bt	16 **OK**	16 **OK**	16 **OK**	16 **OK**	16 **OK**	cm
tp	1.27	1.27	1.27	1.27	1.27	cm
Fcr	3500	3500	3500	3500	3500	kg/cm^2
esarrollar postbuckling tension field action?	Si	No	No	No	Si	
Se considera Tension Field Action?	No	No	No	No	No	
b	223.3	266.0	250.0	266.0	223.0	cm
J	2.21	1.02	1.48	1.07	2.37	
ρ_t	1.00	1.00	1.00	1.00	1.00	
I_{t1}	8090.8	4448.1	6059.6	1973.5	1083.8	cm^4
I_{t2}	12630.8	13079.4	13539.9	13539.9	13539.9	cm^4
I_3	752.3	637.1	683.8	538.1	493.6	
I_{min}	8090.8	4448.1	6059.6	1973.5	1083.8	
I_t	✗ 3467.9	✗ 3467.9	✗ 3467.9	✓ 3467.9	✓ 3467.9	cm^4

AASHTO 6.10.11.1.2

AASHTO 6.10.11.1.3

Rigidizadores en zona de apoyo *AASHTO 6.10.11.1*

Rigidizadores a ambos lados de la viga? Si

Pu en pilas = 705 ton

Pu en bastiones = 204 ton

	En pilas					
	TRAMO1					
bf	23.73 **X**					cm
tp	1.27					cm
Cantidad	3					
separación	20					cm
Ancho del alma	85.72					cm
h	289.84					cm
Ag	398.55					cm2
I	33941.18					
rs	9.23					cm
Pe	4580.72					ton
resistencia axial ϕPn	1105.20					ton
Bearing ϕRsbn	911.35					ton
K	5.16					cm
N	60.00					cm
web local yielding **ϕRn**	762.72					ton
web crippling **ϕRn**	745.77					ton

AASHTO 6.10.11.2.2

AASHTO Apéndice D6, al no cumplir con AASHTO 6.10.11.2.2

Seccion utilizada en los apoyos de las pilas		=	TRAMO1		
	ϕPn	=	1105.20		OK
	ϕRsbn	=	911.35		OK
web local yielding	ϕRn	=	762.72	ton	OK
web crippling	ϕRn	=	745.77	ton	OK

	En bastiones											
									TRAMO 5			
bf									20	OK	cm	*AASHTO 6.10.11.2.2*
tp									1.905		cm	
Cantidad									1			
separación									0		cm	
Ancho del alma									22.86		cm	
h									294.92		cm	
Ag									105.23		cm2	
I									10160.00			
rs									9.83		cm	
Pe									1324.37		ton	
resistencia axial ϕPn									295.06		ton	
Bearing ϕRsbn									384.05		ton	
K									2.62			
N									46.00			
web local yielding ϕRn									233.57		ton	
web crippling ϕRn									89.41		ton	*AASHTO Apéndice D6, al no cumplir con AASHTO 6.10.11.2.2*

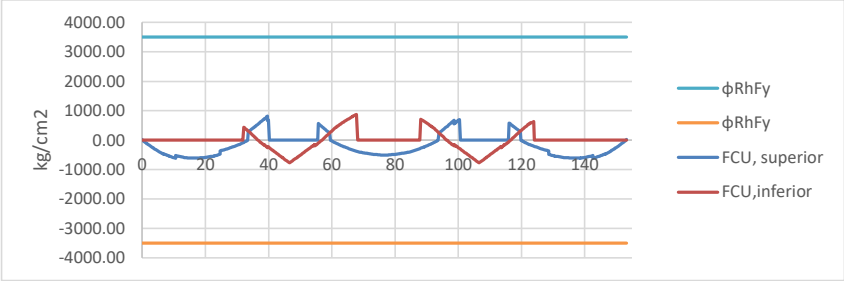
Seccion utilizada en los apoyos de los bastiones		=	TRAMO 5			
	ϕPn	=	295.06	ton	OK	
	ϕRsbn	=	384.05	ton	OK	
web local yielding*	ϕRn	=	-	ton	OK	*No se revisan ya que cumple con
web crippling*	ϕRn	=	-	ton	OK	AASHTO 6.10.11.2.2

Rigidizadores longitudinales ***AASHTO 6.10.11.3***

	TRAMO1		TRAMO 2		TRAMO 3		TRAMO 4		TRAMO 5		
bl	13.0	OK	13.00	OK	13.00	OK	13.00	OK	13.00	OK	cm
ts	1.59		1.59		1.59		1.59		1.59		cm
bef	45.72		45.72		45.72		34.29		22.86		cm
Y	2.44		2.44		2.44		2.74		3.60		cm
I	✗ 1412.89		✗ 1412.89		✗ 1412.89		✗ 1182.92		✗ 909.66		cm4
Imin	6150.36		8894.75		7706.39		3715.61		750.41		cm4
Imax	6513.37		7690.44		7165.60		7624.20		6391.72		
Ag	136.80		136.80		136.80		85.99		49.70		cm2
r	✓ 3.21		✓ 3.21		✓ 3.21		✓ 3.71		✓ 4.28		cm3
rmin	2.35		2.79		2.63		2.79		2.34		
β	1.00		1.00		1.00		1.00		1.00		

OK

	Distribucion de rigidizador									
Estacion inicial	0	32	40	55.5	68	88	100.5	116	124	m
Estacion final	32	40	55.5	68	88	100.5	116	124	156	m
ubicacion superior	60	60	0	60	60	60	0	60	60	cm
ubicación inferior	0	60	60	60	0	60	60	60	0	cm



4. Apoyos de Vigas en Bastiones

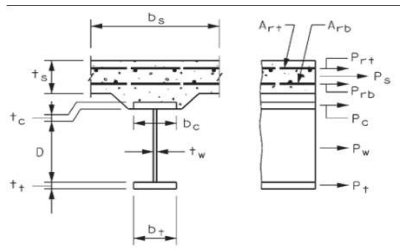
Las demandas verticales y transevesales se deben transmitir mediante apoyos tipo Vasoflón VU (con desplazamiento longitudinal) y retenedores oleaodinámicos OT, o similares, los cuales deben ser diseñados por el proveedor con la capacidad para los siguientes demandas:

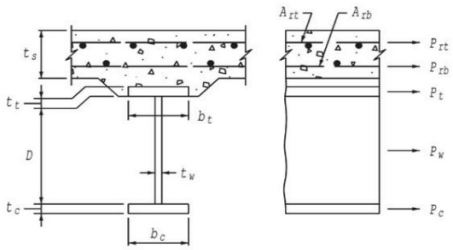
	DC	DW	LL+IMP	SX	SY
Axial (ton)	85.984	7.07	60.886	1.04875	17.05
Transversal (ton)	-0.6077	0.882	-7.05	16.4963	613.19
Longitudinal (ton)	0	0	0	599.75	4608.8
Movimiento long (mm)	-0.005	0.0036	0.036	0	0
Rotación (rad)	0.01232	0.00035	0.003	3.8E-05	0.0004

* Debe diseñarse los apoyos para que tengan una capacidad de movimiento longitudinal de 100mm para que sea compatible con la junta de expansión

VIGA PRINCIPAL (SALITRAL)

		Momento Plastico Flexión Positiva					Momento Plástico Flexión Negativa				
		TRAMO 1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5	TRAMO 1	TRAMO 2	TRAMO 3	TRAMO 4	TRAMO 5
	Dt	327.6	323.0	323.0	323.0	323.0	327.6	323.0	323.0	323.0	323.0
	Y	291.35	270.14	270.14	295.12	298.40	158.04	156.36	156.36	158.48	162.72
Patín Inferior en tensión	*dbt (cm)*	*5.08*	*3.81*	*2.54*	*2.54*	*2.54*	5.1	3.8	2.5	2.5	2.5
	Ybt (cm)	*2.54*	*1.91*	*1.27*	*1.27*	*1.27*	2.5	1.9	1.3	1.3	1.3
	Pbt (ton)	1066.8	800.1	533.4	533.4	533.4	-1066.8	-800.1	-533.4	-533.4	-533.4
Patín Inferior en compresión	*dbc (cm)*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	0.0	0.0	0.0	0.0	0.0
	Ybc (cm)	5.08	3.81	2.54	2.54	2.54	5.1	3.8	2.5	2.5	2.5
	Pbc (ton)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alma en tensión	*dwt (cm)*	*286.3*	*266.3*	*267.6*	*292.6*	*294.9*	153.0	152.5	153.8	155.9	160.2
	Ywt (cm)	*148.2*	*137.0*	*136.3*	*148.8*	*150.0*	81.6	80.1	79.4	80.5	82.6
	Pwt (ton)	2544.9	2367.7	2378.9	1950.8	1310.9	-1359.8	-1356.2	-1367.5	-1039.7	-712.0
Alma en compresión	*dwc (cm)*	*3.6*	*26.1*	*27.3*	*2.3*	*0.0*	136.9	139.8	141.1	139.0	134.7
	Ywc (cm)	*293.1*	*283.2*	*283.8*	*296.3*	*297.5*	226.5	226.3	226.9	228.0	230.1
	Pwc (ton)	-31.8	-231.6	-242.9	-15.6	0.0	1216.8	1243.1	1254.4	926.7	598.9
Patín Superior en tensión	*dtt (cm)*	*0.00*	*0.00*	*0.00*	*0.00*	*0.94*	0.0	0.0	0.0	0.0	0.0
	Ytt (cm)	*294.9*	*296.2*	*297.5*	*297.5*	*297.9*	294.9	296.2	297.5	297.5	297.5
	Ptt (ton)	0.0	0.0	0.0	0.0	198.3	0.0	0.0	0.0	0.0	0.0
Patín Superior en compresión	*dtc (cm)*	*5.08*	*3.81*	*2.54*	*2.54*	*1.60*	5.1	3.8	2.5	2.5	2.5
	Ytc (cm)	297.46	298.1	298.7	298.73	299.2021	297.5	298.1	298.7	298.7	298.7
	Ptc (ton)	-1066.8	-800.1	-533.4	-533.4	-335.1	1066.8	800.1	533.4	533.4	533.4
Concreto en compresión	β1	0.65	0.65	0.65	0.65	0.65					
	a (cm)	*23.5*	*34.4*	*34.4*	*18.1*	*16.0*					
	ds (cm)	*23.5*	*20.0*	*20.0*	*18.1*	*16.0*					
	Ys (cm)	*315.8*	*313.0*	*313.0*	*313.9*	*315.0*					
	Ps (ton)	-2513.2	-2136.1	-2136.1	-1935.2	-1707.5					
Acero long. cama inferior	*Arb (cm2)*						9.9	13.5	13.5	13.5	13.5
	Yrb (cm)						304.9	307.9	307.9	307.9	307.9
	Prb (ton)						41.6	56.5	56.5	56.5	56.5
Acero long. cama superior	*Art*						24.1	13.5	13.5	13.5	13.5
	Yrt (cm)						322.7	318.1	318.1	318.1	318.1
	Prt (ton)						101.4	56.5	56.5	56.5	56.5
	Suma de fuerzas	0.009	-0.005	0.004	-0.002	0.003	-0.0002	-0.0039	-0.0039	-0.0084	-0.0217
	Dcp	3.6	26.1	27.3	2.3	0.0	153.0	152.5	153.8	155.9	160.2
	M_p (ton.m)	7403.6	6468.4	5718.4	4804.8	3817.5	-5247.0	-4450.4	-3700.4	-3216.0	-2730.3
	Dt *(cm)*	330.00	330.00	330.00	330.00	330.00					
	Dp *(cm)*	38.65	59.86	59.86	34.88	31.60	169.51	166.64	166.64	164.52	160.28





VIGA PRINCIPAL (SALITRAL)

Ubicación	Sección	Sección No Compuesta							Sección Compuesta Momento Positivo															
		SNC_{top} (cm3)	SNC_{bot} (cm3)	Fy_{ftop} (kg/cm2)	Fy_{fboy} (kg/cm2)	My_{top} (ton.m)	My_{bot} (ton.m)	My (ton.m)	SNC_{top} (cm3)	SST_{top} (cm3)	SLT_{top} (cm3)	$MD1_{top}$ (ton.m)	$MD2_{top}$ (ton.m)	MAD_{top} (ton.m)	My_{top} (ton.m)	SNC_{bot} (cm3)	SST_{bot} (cm3)	SLT_{bot} (cm3)	$MD1_{bot}$ (ton.m)	$MD2_{bot}$ (ton.m)	MAD_{bot} (ton.m)	My_{bot} (ton.m)	My (ton.m)
0	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	6.0	2.0	14113.7	14121.7	63048.73	82188.31	76030.24	5.978338	1.958488	2866.7	2874.6	**-2874.6**
0.20703	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-9.8	-3.8	14229.0	14215.4	63048.73	82188.31	76030.24	-9.81195	-3.77274	2893.5	2879.9	**-2879.9**
0.20703	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-9.8	-3.8	14229.0	14215.4	63048.73	82188.31	76030.24	-9.81195	-3.77274	2893.5	2879.9	**-2879.9**
0.41406	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-25.6	-9.5	14344.1	14309.0	63048.73	82188.31	76030.24	-25.5737	-9.50394	2920.2	2885.1	**-2885.1**
0.41406	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-25.6	-9.5	14344.1	14309.0	63048.73	82188.31	76030.24	-25.5737	-9.50394	2920.2	2885.1	**-2885.1**
0.62109	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-40.5	-15.4	14454.1	14398.2	63048.73	82188.31	76030.24	-40.497	-15.3734	2946.0	2890.1	**-2890.1**
0.62109	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-40.5	-15.4	14454.1	14398.2	63048.73	82188.31	76030.24	-40.497	-15.3734	2946.0	2890.1	**-2890.1**
0.82813	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-56.2	-21.4	14569.8	14492.2	63048.73	82188.31	76030.24	-56.2284	-21.4457	2973.1	2895.4	**-2895.4**
0.82813	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-56.2	-21.4	14569.8	14492.2	63048.73	82188.31	76030.24	-56.2284	-21.4457	2973.1	2895.4	**-2895.4**
1.03516	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-71.8	-27.4	14684.5	14585.3	63048.73	82188.31	76030.24	-71.8311	-27.4452	2999.9	2900.6	**-2900.6**
1.03516	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-71.8	-27.4	14684.5	14585.3	63048.73	82188.31	76030.24	-71.8311	-27.4452	2999.9	2900.6	**-2900.6**
1.24219	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-87.3	-33.4	14798.2	14677.5	63048.73	82188.31	76030.24	-87.2985	-33.3755	3026.5	2905.8	**-2905.8**
1.24219	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-87.3	-33.4	14798.2	14677.5	63048.73	82188.31	76030.24	-87.2985	-33.3755	3026.5	2905.8	**-2905.8**
1.44922	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-102.6	-39.2	14910.9	14769.0	63048.73	82188.31	76030.24	-102.628	-39.2374	3052.8	2910.9	**-2910.9**
1.44922	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-102.6	-39.2	14910.9	14769.0	63048.73	82188.31	76030.24	-102.628	-39.2374	3052.8	2910.9	**-2910.9**
1.65625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-117.8	-45.0	15022.4	14859.6	63048.73	82188.31	76030.24	-117.818	-45.0309	3078.9	2916.0	**-2916.0**
1.65625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-119.6	-46.3	15037.0	14871.1	63048.73	82188.31	76030.24	-119.599	-46.3221	3082.6	2916.6	**-2916.6**
1.86328	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-132.9	-50.8	15132.9	14949.3	63048.73	82188.31	76030.24	-132.866	-50.7557	3104.7	2921.0	**-2921.0**
1.86328	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-132.9	-50.8	15132.9	14949.3	63048.73	82188.31	76030.24	-132.866	-50.7557	3104.7	2921.0	**-2921.0**
2.07031	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-147.8	-56.4	15242.3	15038.1	63048.73	82188.31	76030.24	-147.769	-56.4113	3130.2	2926.0	**-2926.0**
2.07031	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-147.8	-56.4	15242.3	15038.1	63048.73	82188.31	76030.24	-147.769	-56.4113	3130.2	2926.0	**-2926.0**
2.27734	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-162.5	-62.0	15350.6	15126.0	63048.73	82188.31	76030.24	-162.525	-61.9972	3155.5	2930.9	**-2930.9**
2.27734	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-162.5	-62.0	15350.6	15126.0	63048.73	82188.31	76030.24	-162.525	-61.9972	3155.5	2930.9	**-2930.9**
2.48438	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-177.1	-67.5	15457.7	15213.1	63048.73	82188.31	76030.24	-177.132	-67.5133	3180.5	2935.8	**-2935.8**
2.48438	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-177.1	-67.5	15457.7	15213.1	63048.73	82188.31	76030.24	-177.132	-67.5133	3180.5	2935.8	**-2935.8**
2.69141	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-191.6	-73.0	15563.7	15299.2	63048.73	82188.31	76030.24	-191.589	-72.9592	3205.2	2940.7	**-2940.7**
2.69141	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-191.6	-73.0	15563.7	15299.2	63048.73	82188.31	76030.24	-191.589	-72.9592	3205.2	2940.7	**-2940.7**
2.89844	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-205.9	-78.3	15668.6	15384.4	63048.73	82188.31	76030.24	-205.895	-78.3347	3229.7	2945.4	**-2945.4**
2.89844	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-205.9	-78.3	15668.6	15384.4	63048.73	82188.31	76030.24	-205.895	-78.3347	3229.7	2945.4	**-2945.4**
3.10547	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-220.0	-83.6	15772.3	15468.6	63048.73	82188.31	76030.24	-220.049	-83.6399	3253.9	2950.2	**-2950.2**
3.10547	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-220.0	-83.6	15772.3	15468.6	63048.73	82188.31	76030.24	-220.049	-83.6399	3253.9	2950.2	**-2950.2**
3.3125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-234.1	-88.9	15874.9	15552.0	63048.73	82188.31	76030.24	-234.052	-88.8747	3277.8	2954.8	**-2954.8**
3.3125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-235.6	-90.0	15887.8	15562.1	63048.73	82188.31	76030.24	-235.616	-90.0402	3281.1	2955.4	**-2955.4**
3.51953	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-247.9	-94.0	15976.4	15634.4	63048.73	82188.31	76030.24	-247.905	-94.0392	3301.4	2959.5	**-2959.5**
3.51953	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-247.9	-94.0	15976.4	15634.4	63048.73	82188.31	76030.24	-247.905	-94.0392	3301.4	2959.5	**-2959.5**
3.72656	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-261.6	-99.1	16076.7	15715.9	63048.73	82188.31	76030.24	-261.607	-99.1336	3324.8	2964.0	**-2964.0**
3.72656	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-261.6	-99.1	16076.7	15715.9	63048.73	82188.31	76030.24	-261.607	-99.1336	3324.8	2964.0	**-2964.0**
3.93359	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-275.2	-104.2	16175.9	15796.6	63048.73	82188.31	76030.24	-275.162	-104.158	3347.9	2968.6	**-2968.6**
3.93359	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-275.2	-104.2	16175.9	15796.6	63048.73	82188.31	76030.24	-275.162	-104.158	3347.9	2968.6	**-2968.6**
4.14063	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-288.6	-109.1	16274.0	15876.3	63048.73	82188.31	76030.24	-288.57	-109.114	3370.7	2973.0	**-2973.0**
4.14063	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-288.6	-109.1	16274.0	15876.3	63048.73	82188.31	76030.24	-288.57	-109.114	3370.7	2973.0	**-2973.0**
4.34766	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-301.8	-114.0	16371.0	15955.1	63048.73	82188.31	76030.24	-301.835	-114	3393.3	2977.5	**-2977.5**
4.34766	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-301.8	-114.0	16371.0	15955.1	63048.73	82188.31	76030.24	-301.835	-114	3393.3	2977.5	**-2977.5**
4.55469	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-315.0	-118.8	16466.9	16033.1	63048.73	82188.31	76030.24	-314.96	-118.818	3415.6	2981.8	**-2981.8**
4.55469	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-315.0	-118.8	16466.9	16033.1	63048.73	82188.31	76030.24	-314.96	-118.818	3415.6	2981.8	**-2981.8**
4.76172	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-327.9	-123.6	16561.8	16110.3	63048.73	82188.31	76030.24	-327.948	-123.568	3437.7	2986.2	**-2986.2**
4.76172	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-327.9	-123.6	16561.8	16110.3	63048.73	82188.31	76030.24	-327.948	-123.568	3437.7	2986.2	**-2986.2**
4.96875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-340.8	-128.3	16655.7	16186.6	63048.73	82188.31	76030.24	-340.805	-128.251	3459.5	2990.4	**-2990.4**
4.96875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-342.2	-129.3	16667.0	16195.5	63048.73	82188.31	76030.24	-342.167	-129.293	3462.4	2990.9	**-2990.9**
5.17578	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-353.5	-132.9	16748.6	16262.2	63048.73	82188.31	76030.24	-353.536	-132.868	3481.1	2994.7	**-2994.7**
5.17578	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-353.5	-132.9	16748.6	16262.2	63048.73	82188.31	76030.24	-353.536	-132.868	3481.1	2994.7	**-2994.7**
5.38281	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-366.1	-137.4	16840.6	16337.0	63048.73	82188.31	76030.24	-366.145	-137.418	3502.4	2998.9	**-2998.9**
5.38281	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-366.1	-137.4	16840.6	16337.0	63048.73	82188.31	76030.24	-366.145	-137.418	3502.4	2998.9	**-2998.9**
5.58984	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-378.6	-141.9	16931.7	16411.1	63048.73	82188.31	76030.24	-378.641	-141.904	3523.6	3003.0	**-3003.0**
5.58984	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-378.6	-141.9	16931.7	16411.1	63048.73	82188.31	76030.24	-378.641	-141.904	3523.6	3003.0	**-3003.0**
5.79688	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-391.0	-146.3	17021.9	16484.6	63048.73	82188.31	76030.24	-391.03	-146.325	3544.5	3007.1	**-3007.1**
5.79688	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-391.0	-146.3	17021.9	16484.6	63048.73	82188.31	76030.24	-391.03	-146.325	3544.5	3007.1	**-3007.1**
6.00391	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-403.3	-150.7	17111.4	16557.4	63048.73	82188.31	76030.24	-403.323	-150.682	3565.2	3011.2	**-3011.2**
6.00391	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-403.3	-150.7	17111.4	16557.4	63048.73	82188.31	76030.24	-403.323	-150.682	3565.2	3011.2	**-3011.2**

6.21094	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-415.5	-155.0	17200.2	16629.7	63048.73	82188.31	76030.24	-415.535	-154.978	3585.8	3015.3	**-3015.3**
6.21094	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-415.5	-155.0	17200.2	16629.7	63048.73	82188.31	76030.24	-415.535	-154.978	3585.8	3015.3	**-3015.3**
6.41797	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-427.7	-159.2	17288.5	16701.6	63048.73	82188.31	76030.24	-427.68	-159.215	3606.2	3019.3	**-3019.3**
6.41797	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-427.7	-159.2	17288.5	16701.6	63048.73	82188.31	76030.24	-427.68	-159.215	3606.2	3019.3	**-3019.3**
6.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-440.4	-163.8	17381.1	16776.9	63048.73	82188.31	76030.24	-440.374	-163.8	3627.7	3023.5	**-3023.5**
6.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-425.7	-158.2	17273.5	16689.6	63048.73	82188.31	76030.24	-425.724	-158.233	3602.6	3018.6	**-3018.6**
6.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-436.4	-162.3	17351.8	16753.1	63048.73	82188.31	76030.24	-436.373	-162.318	3620.9	3022.2	**-3022.2**
6.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-436.4	-162.3	17351.8	16753.1	63048.73	82188.31	76030.24	-436.373	-162.318	3620.9	3022.2	**-3022.2**
7.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-446.5	-166.5	17426.6	16813.7	63048.73	82188.31	76030.24	-446.452	-166.472	3638.5	3025.6	**-3025.6**
7.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-446.5	-166.5	17426.6	16813.7	63048.73	82188.31	76030.24	-446.452	-166.472	3638.5	3025.6	**-3025.6**
7.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-456.9	-170.6	17503.9	16876.3	63048.73	82188.31	76030.24	-456.917	-170.644	3656.7	3029.1	**-3029.1**
7.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-456.9	-170.6	17503.9	16876.3	63048.73	82188.31	76030.24	-456.917	-170.644	3656.7	3029.1	**-3029.1**
7.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-467.2	-174.7	17580.1	16938.1	63048.73	82188.31	76030.24	-467.248	-174.718	3674.5	3032.6	**-3032.6**
7.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-467.2	-174.7	17580.1	16938.1	63048.73	82188.31	76030.24	-467.248	-174.718	3674.5	3032.6	**-3032.6**
7.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-477.4	-178.7	17655.1	16998.9	63048.73	82188.31	76030.24	-477.424	-178.694	3692.1	3036.0	**-3036.0**
7.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-477.4	-178.7	17655.1	16998.9	63048.73	82188.31	76030.24	-477.424	-178.694	3692.1	3036.0	**-3036.0**
8.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-487.4	-182.6	17728.7	17058.7	63048.73	82188.31	76030.24	-487.43	-182.574	3709.4	3039.3	**-3039.3**
8.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-487.4	-182.6	17728.7	17058.7	63048.73	82188.31	76030.24	-487.43	-182.574	3709.4	3039.3	**-3039.3**
8.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-497.3	-186.4	17801.0	17117.3	63048.73	82188.31	76030.24	-497.256	-186.358	3726.2	3042.6	**-3042.6**
8.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-497.3	-186.4	17801.0	17117.3	63048.73	82188.31	76030.24	-497.256	-186.358	3726.2	3042.6	**-3042.6**
8.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-506.9	-190.0	17871.7	17174.8	63048.73	82188.31	76030.24	-506.89	-190.044	3742.8	3045.9	**-3045.9**
8.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-507.7	-190.6	17878.5	17180.1	63048.73	82188.31	76030.24	-507.716	-190.645	3744.5	3046.2	**-3046.2**
8.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-516.3	-193.6	17941.0	17231.1	63048.73	82188.31	76030.24	-516.326	-193.632	3759.0	3049.0	**-3049.0**
8.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-516.3	-193.6	17941.0	17231.1	63048.73	82188.31	76030.24	-516.326	-193.632	3759.0	3049.0	**-3049.0**
9.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-525.6	-197.1	18008.7	17286.0	63048.73	82188.31	76030.24	-525.555	-197.121	3774.8	3052.1	**-3052.1**
9.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-525.6	-197.1	18008.7	17286.0	63048.73	82188.31	76030.24	-525.555	-197.121	3774.8	3052.1	**-3052.1**
9.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-534.6	-200.5	18074.8	17339.8	63048.73	82188.31	76030.24	-534.573	-200.511	3790.2	3055.1	**-3055.1**
9.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-534.6	-200.5	18074.8	17339.8	63048.73	82188.31	76030.24	-534.573	-200.511	3790.2	3055.1	**-3055.1**
9.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-543.4	-203.8	18139.3	17392.1	63048.73	82188.31	76030.24	-543.373	-203.8	3805.2	3058.0	**-3058.0**
9.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-543.4	-203.8	18139.3	17392.1	63048.73	82188.31	76030.24	-543.373	-203.8	3805.2	3058.0	**-3058.0**
9.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-552.0	-207.0	18202.1	17443.2	63048.73	82188.31	76030.24	-551.954	-206.988	3819.9	3060.9	**-3060.9**
9.875	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-552.0	-207.0	18202.1	17443.2	63048.73	82188.31	76030.24	-551.954	-206.988	3819.9	3060.9	**-3060.9**
10.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-560.3	-210.1	18263.2	17492.9	63048.73	82188.31	76030.24	-560.31	-210.074	3834.1	3063.7	**-3063.7**
10.125	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-560.3	-210.1	18263.2	17492.9	63048.73	82188.31	76030.24	-560.31	-210.074	3834.1	3063.7	**-3063.7**
10.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-568.4	-213.1	18322.7	17541.2	63048.73	82188.31	76030.24	-568.44	-213.056	3847.9	3066.4	**-3066.4**
10.375	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-568.4	-213.1	18322.7	17541.2	63048.73	82188.31	76030.24	-568.44	-213.056	3847.9	3066.4	**-3066.4**
10.625	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-576.3	-215.9	18380.3	17588.1	63048.73	82188.31	76030.24	-576.336	-215.93	3861.3	3069.0	**-3069.0**
10.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-576.9	-216.3	17261.4	16468.2	72098.01	98123.37	88714.15	-576.851	-216.337	4458.7	3665.5	**-3665.5**
10.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-584.2	-218.8	17306.6	16503.7	72098.01	98123.37	88714.15	-584.157	-218.827	4471.4	3668.4	**-3668.4**
10.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-584.2	-218.8	17306.6	16503.7	72098.01	98123.37	88714.15	-584.157	-218.827	4471.4	3668.4	**-3668.4**
11.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-591.6	-221.5	17353.2	16540.0	72098.01	98123.37	88714.15	-591.619	-221.526	4484.5	3671.4	**-3671.4**
11.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-591.6	-221.5	17353.2	16540.0	72098.01	98123.37	88714.15	-591.619	-221.526	4484.5	3671.4	**-3671.4**
11.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-598.8	-224.1	17398.1	16575.2	72098.01	98123.37	88714.15	-598.832	-224.112	4497.2	3674.2	**-3674.2**
11.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-598.8	-224.1	17398.1	16575.2	72098.01	98123.37	88714.15	-598.832	-224.112	4497.2	3674.2	**-3674.2**
11.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-605.8	-226.6	17441.5	16609.1	72098.01	98123.37	88714.15	-605.803	-226.59	4509.4	3677.0	**-3677.0**
11.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-605.8	-226.6	17441.5	16609.1	72098.01	98123.37	88714.15	-605.803	-226.59	4509.4	3677.0	**-3677.0**
11.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-612.5	-229.0	17483.4	16641.8	72098.01	98123.37	88714.15	-612.54	-228.964	4521.2	3679.7	**-3679.7**
11.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-612.5	-229.0	17483.4	16641.8	72098.01	98123.37	88714.15	-612.54	-228.964	4521.2	3679.7	**-3679.7**
12.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-619.0	-231.2	17523.7	16673.5	72098.01	98123.37	88714.15	-619.048	-231.233	4532.6	3682.3	**-3682.3**
12.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-619.0	-231.2	17523.7	16673.5	72098.01	98123.37	88714.15	-619.048	-231.233	4532.6	3682.3	**-3682.3**
12.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-625.3	-233.4	17562.7	16704.0	72098.01	98123.37	88714.15	-625.335	-233.401	4543.5	3684.8	**-3684.8**
12.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-625.3	-233.4	17562.7	16704.0	72098.01	98123.37	88714.15	-625.335	-233.401	4543.5	3684.8	**-3684.8**
12.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-631.4	-235.5	17600.3	16733.4	72098.01	98123.37	88714.15	-631.408	-235.467	4554.1	3687.2	**-3687.2**
12.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-631.7	-235.7	17602.2	16734.8	72098.01	98123.37	88714.15	-631.663	-235.702	4554.7	3687.3	**-3687.3**
12.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-637.3	-237.4	17636.5	16761.8	72098.01	98123.37	88714.15	-637.276	-237.434	4564.2	3689.5	**-3689.5**
12.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-637.3	-237.4	17636.5	16761.8	72098.01	98123.37	88714.15	-637.276	-237.434	4564.2	3689.5	**-3689.5**
13.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-643.0	-239.3	17671.5	16789.2	72098.01	98123.37	88714.15	-642.951	-239.303	4574.0	3691.8	**-3691.8**
13.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-643.0	-239.3	17671.5	16789.2	72098.01	98123.37	88714.15	-642.951	-239.303	4574.0	3691.8	**-3691.8**
13.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-648.4	-241.1	17705.3	16815.7	72098.01	98123.37	88714.15	-648.446	-241.074	4583.5	3694.0	**-3694.0**
13.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-648.4	-241.1	17705.3	16815.7	72098.01	98123.37	88714.15	-648.446	-241.074	4583.5	3694.0	**-3694.0**
13.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-653.8	-242.7	17737.9	16841.4	72098.01	98123.37	88714.15	-653.776	-242.748	4592.6	3696.1	**-3696.1**
13.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-653.8	-242.7	17737.9	16841.4	72098.01	98123.37	88714.15	-653.776	-242.748	4592.6	3696.1	**-3696.1**
13.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-659.0	-244.3	17769.6	16866.3	72098.01	98123.37	88714.15	-658.961	-244.326	4601.4	3698.1	**-3698.1**
13.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-659.0	-244.3	17769.6	16866.3	72098.01	98123.37	88714.15	-658.961	-244.326	4601.4	3698.1	**-3698.1**

14.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-664.0	-245.8	17800.4	16890.6	72098.01	98123.37	88714.15	-664.032	-245.808	4609.9	3700.1	**-3700.1**
14.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-664.0	-245.8	17800.4	16890.6	72098.01	98123.37	88714.15	-664.032	-245.808	4609.9	3700.1	**-3700.1**
14.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-669.0	-247.2	17830.7	16914.4	72098.01	98123.37	88714.15	-669.041	-247.19	4618.3	3702.0	**-3702.0**
14.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-669.0	-247.2	17830.7	16914.4	72098.01	98123.37	88714.15	-669.041	-247.19	4618.3	3702.0	**-3702.0**
14.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-674.0	-248.5	17860.5	16938.0	72098.01	98123.37	88714.15	-673.997	-248.512	4626.5	3704.0	**-3704.0**
14.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-671.6	-248.0	17846.2	16926.6	72098.01	98123.37	88714.15	-671.587	-247.958	4622.6	3703.0	**-3703.0**
14.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.2	-248.6	17850.6	16929.9	72098.01	98123.37	88714.15	-672.151	-248.551	4624.0	3703.3	**-3703.3**
14.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.2	-248.6	17850.6	16929.9	72098.01	98123.37	88714.15	-672.151	-248.551	4624.0	3703.3	**-3703.3**
15.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.4	-249.0	17853.3	16931.8	72098.01	98123.37	88714.15	-672.445	-249.047	4625.0	3703.5	**-3703.5**
15.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.4	-249.0	17853.3	16931.8	72098.01	98123.37	88714.15	-672.445	-249.047	4625.0	3703.5	**-3703.5**
15.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.8	-249.4	17855.9	16933.7	72098.01	98123.37	88714.15	-672.758	-249.447	4625.8	3703.6	**-3703.6**
15.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.8	-249.4	17855.9	16933.7	72098.01	98123.37	88714.15	-672.758	-249.447	4625.8	3703.6	**-3703.6**
15.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.0	-249.8	17857.7	16935.0	72098.01	98123.37	88714.15	-672.955	-249.751	4626.4	3703.7	**-3703.7**
15.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.0	-249.8	17857.7	16935.0	72098.01	98123.37	88714.15	-672.955	-249.751	4626.4	3703.7	**-3703.7**
15.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.0	-250.0	17858.4	16935.5	72098.01	98123.37	88714.15	-673.007	-249.958	4626.7	3703.8	**-3703.8**
15.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.0	-250.0	17858.4	16935.5	72098.01	98123.37	88714.15	-673.007	-249.958	4626.7	3703.8	**-3703.8**
16.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.9	-250.1	17858.1	16935.1	72098.01	98123.37	88714.15	-672.893	-250.07	4626.7	3703.7	**-3703.7**
16.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.9	-250.1	17858.1	16935.1	72098.01	98123.37	88714.15	-672.893	-250.07	4626.7	3703.7	**-3703.7**
16.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.6	-250.1	17856.5	16933.8	72098.01	98123.37	88714.15	-672.6	-250.085	4626.3	3703.6	**-3703.6**
16.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.6	-250.1	17856.5	16933.8	72098.01	98123.37	88714.15	-672.6	-250.085	4626.3	3703.6	**-3703.6**
16.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.1	-250.0	17853.7	16931.6	72098.01	98123.37	88714.15	-672.113	-250.003	4625.6	3703.4	**-3703.4**
16.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.1	-250.0	17853.8	16931.7	72098.01	98123.37	88714.15	-672.146	-249.987	4625.6	3703.5	**-3703.5**
16.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-671.4	-249.8	17849.6	16928.3	72098.01	98123.37	88714.15	-671.424	-249.823	4624.4	3703.2	**-3703.2**
16.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-671.4	-249.8	17849.6	16928.3	72098.01	98123.37	88714.15	-671.424	-249.823	4624.4	3703.2	**-3703.2**
17.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-670.5	-249.5	17844.1	16924.0	72098.01	98123.37	88714.15	-670.523	-249.543	4622.9	3702.8	**-3702.8**
17.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-670.5	-249.5	17844.1	16924.0	72098.01	98123.37	88714.15	-670.523	-249.543	4622.9	3702.8	**-3702.8**
17.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-669.4	-249.2	17837.1	16918.6	72098.01	98123.37	88714.15	-669.402	-249.164	4620.9	3702.4	**-3702.4**
17.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-669.4	-249.2	17837.1	16918.6	72098.01	98123.37	88714.15	-669.402	-249.164	4620.9	3702.4	**-3702.4**
17.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-668.1	-248.7	17828.8	16912.0	72098.01	98123.37	88714.15	-668.056	-248.685	4618.6	3701.8	**-3701.8**
17.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-668.1	-248.7	17828.8	16912.0	72098.01	98123.37	88714.15	-668.056	-248.685	4618.6	3701.8	**-3701.8**
17.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-666.5	-248.1	17818.9	16904.3	72098.01	98123.37	88714.15	-666.481	-248.103	4615.8	3701.2	**-3701.2**
17.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-666.5	-248.1	17818.9	16904.3	72098.01	98123.37	88714.15	-666.481	-248.103	4615.8	3701.2	**-3701.2**
18.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-664.7	-247.4	17807.5	16895.5	72098.01	98123.37	88714.15	-664.672	-247.42	4612.6	3700.5	**-3700.5**
18.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-664.7	-247.4	17807.5	16895.5	72098.01	98123.37	88714.15	-664.672	-247.42	4612.6	3700.5	**-3700.5**
18.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-662.6	-246.6	17794.7	16885.4	72098.01	98123.37	88714.15	-662.626	-246.634	4608.9	3699.7	**-3699.7**
18.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-662.6	-246.6	17794.7	16885.4	72098.01	98123.37	88714.15	-662.626	-246.634	4608.9	3699.7	**-3699.7**
18.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-660.3	-245.7	17780.3	16874.2	72098.01	98123.37	88714.15	-660.343	-245.745	4604.8	3698.7	**-3698.7**
18.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-660.2	-245.6	17779.3	16873.5	72098.01	98123.37	88714.15	-660.213	-245.635	4604.5	3698.7	**-3698.7**
18.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-657.8	-244.8	17764.4	16861.8	72098.01	98123.37	88714.15	-657.822	-244.754	4600.3	3697.7	**-3697.7**
18.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-657.8	-244.8	17764.4	16861.8	72098.01	98123.37	88714.15	-657.822	-244.754	4600.3	3697.7	**-3697.7**
19.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-655.1	-243.7	17747.0	16848.2	72098.01	98123.37	88714.15	-655.062	-243.66	4595.3	3696.6	**-3696.6**
19.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-655.1	-243.7	17747.0	16848.2	72098.01	98123.37	88714.15	-655.062	-243.66	4595.3	3696.6	**-3696.6**
19.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-652.1	-242.5	17728.0	16833.5	72098.01	98123.37	88714.15	-652.066	-242.463	4589.9	3695.4	**-3695.4**
19.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-652.1	-242.5	17728.0	16833.5	72098.01	98123.37	88714.15	-652.066	-242.463	4589.9	3695.4	**-3695.4**
19.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-648.8	-241.2	17707.6	16817.6	72098.01	98123.37	88714.15	-648.836	-241.164	4584.1	3694.1	**-3694.1**
19.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-648.8	-241.2	17707.6	16817.6	72098.01	98123.37	88714.15	-648.836	-241.164	4584.1	3694.1	**-3694.1**
19.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-645.4	-239.8	17685.7	16800.5	72098.01	98123.37	88714.15	-645.374	-239.764	4577.8	3692.7	**-3692.7**
19.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-645.4	-239.8	17685.7	16800.5	72098.01	98123.37	88714.15	-645.374	-239.764	4577.8	3692.7	**-3692.7**
20.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-641.7	-238.3	17662.3	16782.3	72098.01	98123.37	88714.15	-641.686	-238.263	4571.2	3691.2	**-3691.2**
20.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-641.7	-238.3	17662.3	16782.3	72098.01	98123.37	88714.15	-641.686	-238.263	4571.2	3691.2	**-3691.2**
20.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-637.8	-236.7	17637.5	16763.0	72098.01	98123.37	88714.15	-637.777	-236.662	4564.1	3689.6	**-3689.6**
20.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-637.8	-236.7	17637.5	16763.0	72098.01	98123.37	88714.15	-637.777	-236.662	4564.1	3689.6	**-3689.6**
20.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-633.7	-235.0	17611.3	16742.7	72098.01	98123.37	88714.15	-633.654	-234.963	4556.6	3688.0	**-3688.0**
20.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-633.4	-234.8	17609.2	16741.1	72098.01	98123.37	88714.15	-633.36	-234.758	4556.0	3687.8	**-3687.8**
20.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-629.3	-233.2	17583.7	16721.3	72098.01	98123.37	88714.15	-629.325	-233.165	4548.7	3686.2	**-3686.2**
20.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-629.3	-233.2	17583.7	16721.3	72098.01	98123.37	88714.15	-629.325	-233.165	4548.7	3686.2	**-3686.2**
21.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-624.8	-231.3	17554.9	16698.9	72098.01	98123.37	88714.15	-624.802	-231.271	4540.5	3684.4	**-3684.4**
21.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-624.8	-231.3	17554.9	16698.9	72098.01	98123.37	88714.15	-624.802	-231.271	4540.5	3684.4	**-3684.4**
21.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-620.1	-229.3	17524.9	16675.6	72098.01	98123.37	88714.15	-620.094	-229.281	4531.8	3682.5	**-3682.5**
21.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-620.1	-229.3	17524.9	16675.6	72098.01	98123.37	88714.15	-620.094	-229.281	4531.8	3682.5	**-3682.5**
21.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-615.2	-227.2	17493.8	16651.4	72098.01	98123.37	88714.15	-615.218	-227.195	4522.9	3680.5	**-3680.5**
21.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-615.2	-227.2	17493.8	16651.4	72098.01	98123.37	88714.15	-615.218	-227.195	4522.9	3680.5	**-3680.5**
21.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-610.2	-225.0	17461.6	16626.4	72098.01	98123.37	88714.15	-610.191	-225.015	4513.7	3678.4	**-3678.4**
21.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-610.2	-225.0	17461.6	16626.4	72098.01	98123.37	88714.15	-610.191	-225.015	4513.7	3678.4	**-3678.4**

22.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-605.0	-222.7	17428.5	16600.8	72098.01	98123.37	88714.15	-605.042	-222.738	4504.1	3676.3	**-3676.3**
22.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-605.0	-222.7	17428.5	16600.8	72098.01	98123.37	88714.15	-605.042	-222.738	4504.1	3676.3	**-3676.3**
22.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-599.8	-220.4	17394.9	16574.7	72098.01	98123.37	88714.15	-599.826	-220.36	4494.4	3674.2	**-3674.2**
22.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-599.8	-220.4	17394.9	16574.7	72098.01	98123.37	88714.15	-599.826	-220.36	4494.4	3674.2	**-3674.2**
22.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-594.3	-217.7	17358.9	16546.9	72098.01	98123.37	88714.15	-594.291	-217.722	4483.9	3671.9	**-3671.9**
22.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-603.5	-221.7	17417.8	16592.6	72098.01	98123.37	88714.15	-603.499	-221.693	4500.9	3675.7	**-3675.7**
22.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-593.9	-218.7	17359.0	16546.4	72098.01	98123.37	88714.15	-593.899	-218.685	4484.5	3671.9	**-3671.9**
22.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-593.9	-218.7	17359.0	16546.4	72098.01	98123.37	88714.15	-593.899	-218.685	4484.5	3671.9	**-3671.9**
23.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-584.3	-215.5	17300.0	16500.2	72098.01	98123.37	88714.15	-584.328	-215.544	4468.0	3668.1	**-3668.1**
23.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-584.3	-215.5	17300.0	16500.2	72098.01	98123.37	88714.15	-584.328	-215.544	4468.0	3668.1	**-3668.1**
23.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-574.5	-212.2	17239.4	16452.7	72098.01	98123.37	88714.15	-574.532	-212.217	4451.0	3664.2	**-3664.2**
23.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-574.5	-212.2	17239.4	16452.7	72098.01	98123.37	88714.15	-574.532	-212.217	4451.0	3664.2	**-3664.2**
23.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-564.6	-208.8	17178.1	16404.6	72098.01	98123.37	88714.15	-564.628	-208.798	4433.7	3660.3	**-3660.3**
23.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-564.6	-208.8	17178.1	16404.6	72098.01	98123.37	88714.15	-564.628	-208.798	4433.7	3660.3	**-3660.3**
23.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-554.6	-205.3	17115.7	16355.8	72098.01	98123.37	88714.15	-554.584	-205.287	4416.2	3656.3	**-3656.3**
23.875	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-554.6	-205.3	17115.7	16355.8	72098.01	98123.37	88714.15	-554.584	-205.287	4416.2	3656.3	**-3656.3**
24.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-544.4	-201.7	17052.3	16306.2	72098.01	98123.37	88714.15	-544.381	-201.687	4398.3	3652.2	**-3652.2**
24.125	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-544.4	-201.7	17052.3	16306.2	72098.01	98123.37	88714.15	-544.381	-201.687	4398.3	3652.2	**-3652.2**
24.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-534.0	-198.0	16987.7	16255.7	72098.01	98123.37	88714.15	-534.01	-198.002	4380.1	3648.1	**-3648.1**
24.375	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-534.0	-198.0	16987.7	16255.7	72098.01	98123.37	88714.15	-534.01	-198.002	4380.1	3648.1	**-3648.1**
24.625	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-523.5	-194.2	16922.2	16204.4	72098.01	98123.37	88714.15	-523.473	-194.243	4361.6	3643.9	**-3643.9**
24.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-523.0	-193.9	16933.4	16216.5	102122.7	133830.2	120708.7	-523.04	-193.855	5584.4	4867.5	**-4867.5**
24.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-512.6	-190.3	16884.1	16181.1	102122.7	133830.2	120708.7	-512.626	-190.302	5566.8	4863.9	**-4863.9**
24.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-512.6	-190.3	16884.1	16181.1	102122.7	133830.2	120708.7	-512.626	-190.302	5566.8	4863.9	**-4863.9**
25.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-501.6	-186.3	16831.2	16143.4	102122.7	133830.2	120708.7	-501.578	-186.296	5547.9	4860.0	**-4860.0**
25.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-501.6	-186.3	16831.2	16143.4	102122.7	133830.2	120708.7	-501.578	-186.296	5547.9	4860.0	**-4860.0**
25.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-490.3	-182.2	16777.2	16104.7	102122.7	133830.2	120708.7	-490.278	-182.185	5528.5	4856.1	**-4856.1**
25.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-490.3	-182.2	16777.2	16104.7	102122.7	133830.2	120708.7	-490.278	-182.185	5528.5	4856.1	**-4856.1**
25.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-478.7	-178.0	16721.8	16065.1	102122.7	133830.2	120708.7	-478.721	-177.968	5508.7	4852.0	**-4852.0**
25.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-478.7	-178.0	16721.8	16065.1	102122.7	133830.2	120708.7	-478.721	-177.968	5508.7	4852.0	**-4852.0**
25.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-466.9	-173.6	16665.2	16024.7	102122.7	133830.2	120708.7	-466.903	-173.645	5488.4	4847.9	**-4847.9**
25.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-466.9	-173.6	16665.2	16024.7	102122.7	133830.2	120708.7	-466.903	-173.645	5488.4	4847.9	**-4847.9**
26.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-454.8	-169.2	16607.4	15983.3	102122.7	133830.2	120708.7	-454.821	-169.216	5467.7	4843.7	**-4843.7**
26.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-454.8	-169.2	16607.4	15983.3	102122.7	133830.2	120708.7	-454.821	-169.216	5467.7	4843.7	**-4843.7**
26.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-442.5	-164.7	16548.2	15941.0	102122.7	133830.2	120708.7	-442.471	-164.681	5446.5	4839.3	**-4839.3**
26.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-442.5	-164.7	16548.2	15941.0	102122.7	133830.2	120708.7	-442.471	-164.681	5446.5	4839.3	**-4839.3**
26.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-429.9	-160.0	16487.7	15897.8	102122.7	133830.2	120708.7	-429.851	-160.039	5424.8	4834.9	**-4834.9**
26.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-429.3	-159.6	16484.7	15895.8	102122.7	133830.2	120708.7	-429.327	-159.615	5423.7	4834.7	**-4834.7**
26.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-417.0	-155.3	16425.9	15853.6	102122.7	133830.2	120708.7	-416.962	-155.291	5402.7	4830.4	**-4830.4**
26.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-417.0	-155.3	16425.9	15853.6	102122.7	133830.2	120708.7	-416.962	-155.291	5402.7	4830.4	**-4830.4**
27.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-403.8	-150.4	16362.8	15808.5	102122.7	133830.2	120708.7	-403.803	-150.437	5380.0	4825.8	**-4825.8**
27.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-403.8	-150.4	16362.8	15808.5	102122.7	133830.2	120708.7	-403.803	-150.437	5380.0	4825.8	**-4825.8**
27.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-390.4	-145.5	16298.4	15762.5	102122.7	133830.2	120708.7	-390.374	-145.478	5356.9	4821.1	**-4821.1**
27.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-390.4	-145.5	16298.4	15762.5	102122.7	133830.2	120708.7	-390.374	-145.478	5356.9	4821.1	**-4821.1**
27.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-376.7	-140.4	16232.7	15715.6	102122.7	133830.2	120708.7	-376.678	-140.413	5333.4	4816.3	**-4816.3**
27.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-376.7	-140.4	16232.7	15715.6	102122.7	133830.2	120708.7	-376.678	-140.413	5333.4	4816.3	**-4816.3**
27.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-362.7	-135.2	16165.7	15667.7	102122.7	133830.2	120708.7	-362.716	-135.244	5309.3	4811.4	**-4811.4**
27.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-362.7	-135.2	16165.7	15667.7	102122.7	133830.2	120708.7	-362.716	-135.244	5309.3	4811.4	**-4811.4**
28.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-348.5	-130.0	16097.4	15619.0	102122.7	133830.2	120708.7	-348.492	-129.972	5284.9	4806.4	**-4806.4**
28.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-348.5	-130.0	16097.4	15619.0	102122.7	133830.2	120708.7	-348.492	-129.972	5284.9	4806.4	**-4806.4**
28.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-334.0	-124.6	16027.9	15569.3	102122.7	133830.2	120708.7	-334.01	-124.597	5259.9	4801.3	**-4801.3**
28.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-334.0	-124.6	16027.9	15569.3	102122.7	133830.2	120708.7	-334.01	-124.597	5259.9	4801.3	**-4801.3**
28.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-319.3	-119.1	15957.2	15518.8	102122.7	133830.2	120708.7	-319.277	-119.12	5234.5	4796.1	**-4796.1**
28.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-318.6	-118.6	15953.5	15516.2	102122.7	133830.2	120708.7	-318.616	-118.62	5233.1	4795.9	**-4795.9**
28.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-304.3	-113.5	15885.2	15467.4	102122.7	133830.2	120708.7	-304.298	-113.542	5208.7	4790.9	**-4790.9**
28.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-304.3	-113.5	15885.2	15467.4	102122.7	133830.2	120708.7	-304.298	-113.542	5208.7	4790.9	**-4790.9**
29.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-289.1	-107.9	15812.1	15415.2	102122.7	133830.2	120708.7	-289.08	-107.866	5182.5	4785.5	**-4785.5**
29.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-289.1	-107.9	15812.1	15415.2	102122.7	133830.2	120708.7	-289.08	-107.866	5182.5	4785.5	**-4785.5**
29.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-273.6	-102.1	15737.9	15362.2	102122.7	133830.2	120708.7	-273.634	-102.092	5155.8	4780.1	**-4780.1**
29.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-273.6	-102.1	15737.9	15362.2	102122.7	133830.2	120708.7	-273.634	-102.092	5155.8	4780.1	**-4780.1**
29.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-258.0	-96.2	15662.6	15308.4	102122.7	133830.2	120708.7	-257.968	-96.2214	5128.8	4774.6	**-4774.6**
29.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-258.0	-96.2	15662.6	15308.4	102122.7	133830.2	120708.7	-257.968	-96.2214	5128.8	4774.6	**-4774.6**
29.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-242.1	-90.3	15586.2	15253.9	102122.7	133830.2	120708.7	-242.093	-90.2549	5101.4	4769.0	**-4769.0**
29.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-242.1	-90.3	15586.2	15253.9	102122.7	133830.2	120708.7	-242.093	-90.2549	5101.4	4769.0	**-4769.0**

30.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-226.0	-84.2	15508.9	15198.7	102122.7	133830.2	120708.7	-226.027	-84.1923	5073.6	4763.4	**-4763.4**
30.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-226.0	-84.2	15508.9	15198.7	102122.7	133830.2	120708.7	-226.027	-84.1923	5073.6	4763.4	**-4763.4**
30.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-209.8	-78.0	15430.9	15143.0	102122.7	133830.2	120708.7	-209.832	-78.0293	5045.6	4757.7	**-4757.7**
30.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-209.8	-78.0	15430.9	15143.0	102122.7	133830.2	120708.7	-209.832	-78.0293	5045.6	4757.7	**-4757.7**
30.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-193.3	-71.5	15350.5	15085.7	102122.7	133830.2	120708.7	-193.257	-71.4733	5016.6	4751.8	**-4751.8**
30.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-205.2	-76.7	15409.5	15127.6	102122.7	133830.2	120708.7	-205.23	-76.6641	5038.0	4756.1	**-4756.1**
30.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-185.0	-69.9	15314.1	15059.1	102122.7	133830.2	120708.7	-185.041	-69.9278	5004.1	4749.1	**-4749.1**
30.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-185.0	-69.9	15314.1	15059.1	102122.7	133830.2	120708.7	-185.041	-69.9278	5004.1	4749.1	**-4749.1**
31.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-165.2	-63.0	15220.0	14991.7	102122.7	133830.2	120708.7	-165.228	-63.0415	4970.5	4742.2	**-4742.2**
31.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-165.2	-63.0	15220.0	14991.7	102122.7	133830.2	120708.7	-165.228	-63.0415	4970.5	4742.2	**-4742.2**
31.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-144.9	-55.9	15123.4	14922.6	102122.7	133830.2	120708.7	-144.939	-55.9102	4936.0	4735.1	**-4735.1**
31.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-144.9	-55.9	15123.4	14922.6	102122.7	133830.2	120708.7	-144.939	-55.9102	4936.0	4735.1	**-4735.1**
31.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-124.5	-48.7	15026.0	14852.8	102122.7	133830.2	120708.7	-124.477	-48.6862	4901.2	4728.0	**-4728.0**
31.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-124.5	-48.7	15026.0	14852.8	102122.7	133830.2	120708.7	-124.477	-48.6862	4901.2	4728.0	**-4728.0**
31.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-103.8	-41.4	14927.5	14782.3	102122.7	133830.2	120708.7	-103.815	-41.3682	4866.0	4720.8	**-4720.8**
31.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-103.8	-41.4	14927.5	14782.3	102122.7	133830.2	120708.7	-103.815	-41.3682	4866.0	4720.8	**-4720.8**
32.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-82.9	-34.0	14828.0	14711.1	102122.7	133830.2	120708.7	-82.9406	-33.9547	4830.4	4713.5	**-4713.5**
32.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-82.9	-34.0	14828.0	14711.1	102122.7	133830.2	120708.7	-82.9406	-33.9547	4830.4	4713.5	**-4713.5**
32.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-61.8	-26.4	14727.4	14639.1	102122.7	133830.2	120708.7	-61.8403	-26.4445	4794.4	4706.1	**-4706.1**
32.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-61.8	-26.4	14727.4	14639.1	102122.7	133830.2	120708.7	-61.8403	-26.4445	4794.4	4706.1	**-4706.1**
32.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-40.5	-18.8	14625.6	14566.2	102122.7	133830.2	120708.7	-40.5042	-18.836	4758.0	4698.7	**-4698.7**
32.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-39.6	-18.1	14620.7	14562.9	102122.7	133830.2	120708.7	-39.6382	-18.1441	4756.1	4698.3	**-4698.3**
32.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-18.9	-11.1	14522.6	14492.6	102122.7	133830.2	120708.7	-18.9233	-11.128	4721.2	4691.1	**-4691.1**
32.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-18.9	-11.1	14522.6	14492.6	102122.7	133830.2	120708.7	-18.9233	-11.128	4721.2	4691.1	**-4691.1**
33.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	2.9	-3.3	14418.4	14418.0	102122.7	133830.2	120708.7	2.910488	-3.31921	4683.9	4683.5	**-4683.5**
33.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	2.9	-3.3	14418.4	14418.0	102122.7	133830.2	120708.7	2.910488	-3.31921	4683.9	4683.5	**-4683.5**
33.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	25.0	4.6	14313.0	14342.6	102122.7	133830.2	120708.7	25.00393	4.591525	4646.2	4675.8	**-4675.8**
33.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	25.0	4.6	14313.0	14342.6	102122.7	133830.2	120708.7	25.00393	4.591525	4646.2	4675.8	**-4675.8**
33.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	47.4	12.6	14206.2	14266.2	102122.7	133830.2	120708.7	47.36286	12.60516	4608.0	4668.0	**-4668.0**
33.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	47.4	12.6	14206.2	14266.2	102122.7	133830.2	120708.7	47.36286	12.60516	4608.0	4668.0	**-4668.0**
33.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	70.0	20.7	14098.2	14188.9	102122.7	133830.2	120708.7	69.99204	20.72254	4569.4	4660.1	**-4660.1**
33.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	70.0	20.7	14098.2	14188.9	102122.7	133830.2	120708.7	69.99204	20.72254	4569.4	4660.1	**-4660.1**
34.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	92.9	28.9	13988.8	14110.7	102122.7	133830.2	120708.7	92.8954	28.9443	4530.2	4652.1	**-4652.1**
34.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	92.9	28.9	13988.8	14110.7	102122.7	133830.2	120708.7	92.8954	28.9443	4530.2	4652.1	**-4652.1**
34.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	116.1	37.3	13878.1	14031.5	102122.7	133830.2	120708.7	116.0759	37.27099	4490.6	4644.0	**-4644.0**
34.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	116.1	37.3	13878.1	14031.5	102122.7	133830.2	120708.7	116.0759	37.27099	4490.6	4644.0	**-4644.0**
34.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	139.5	45.7	13766.1	13951.3	102122.7	133830.2	120708.7	139.5359	45.70297	4450.5	4635.8	**-4635.8**
34.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	140.5	46.5	13760.4	13947.5	102122.7	133830.2	120708.7	140.5424	46.46961	4448.4	4635.4	**-4635.4**
34.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	163.3	54.2	13652.7	13870.2	102122.7	133830.2	120708.7	163.2769	54.24048	4409.9	4627.5	**-4627.5**
34.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	163.3	54.2	13652.7	13870.2	102122.7	133830.2	120708.7	163.2769	54.24048	4409.9	4627.5	**-4627.5**
35.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	187.3	62.9	13537.9	13788.1	102122.7	133830.2	120708.7	187.2997	62.88357	4368.9	4619.1	**-4619.1**
35.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	187.3	62.9	13537.9	13788.1	102122.7	133830.2	120708.7	187.2997	62.88357	4368.9	4619.1	**-4619.1**
35.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	211.6	71.6	13421.8	13705.1	102122.7	133830.2	120708.7	211.6043	71.63217	4327.3	4610.6	**-4610.6**
35.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	211.6	71.6	13421.8	13705.1	102122.7	133830.2	120708.7	211.6043	71.63217	4327.3	4610.6	**-4610.6**
35.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	236.2	80.5	13304.4	13621.1	102122.7	133830.2	120708.7	236.1904	80.48603	4285.3	4602.0	**-4602.0**
35.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	236.2	80.5	13304.4	13621.1	102122.7	133830.2	120708.7	236.1904	80.48603	4285.3	4602.0	**-4602.0**
35.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	261.1	89.4	13185.6	13536.1	102122.7	133830.2	120708.7	261.0565	89.44474	4242.8	4593.3	**-4593.3**
35.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	261.1	89.4	13185.6	13536.1	102122.7	133830.2	120708.7	261.0565	89.44474	4242.8	4593.3	**-4593.3**
36.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	286.2	98.5	13065.4	13450.1	102122.7	133830.2	120708.7	286.2009	98.50771	4199.8	4584.5	**-4584.5**
36.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	286.2	98.5	13065.4	13450.1	102122.7	133830.2	120708.7	286.2009	98.50771	4199.8	4584.5	**-4584.5**
36.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	311.6	107.7	12944.0	13363.3	102122.7	133830.2	120708.7	311.6208	107.6741	4156.3	4575.6	**-4575.6**
36.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	311.6	107.7	12944.0	13363.3	102122.7	133830.2	120708.7	311.6208	107.6741	4156.3	4575.6	**-4575.6**
36.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	337.3	116.9	12821.2	13275.5	102122.7	133830.2	120708.7	337.3133	116.943	4112.4	4566.6	**-4566.6**
36.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	338.5	117.8	12814.8	13271.1	102122.7	133830.2	120708.7	338.4677	117.785	4109.9	4566.2	**-4566.2**
36.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	363.3	126.3	12697.1	13186.7	102122.7	133830.2	120708.7	363.2745	126.3129	4067.9	4557.5	**-4557.5**
36.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	363.3	126.3	12697.1	13186.7	102122.7	133830.2	120708.7	363.2745	126.3129	4067.9	4557.5	**-4557.5**
37.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	389.5	135.8	12571.8	13097.1	102122.7	133830.2	120708.7	389.5005	135.7824	4023.1	4548.4	**-4548.4**
37.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	389.5	135.8	12571.8	13097.1	102122.7	133830.2	120708.7	389.5005	135.7824	4023.1	4548.4	**-4548.4**
37.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	416.0	145.3	12445.2	13006.5	102122.7	133830.2	120708.7	415.9876	145.3494	3977.8	4539.1	**-4539.1**
37.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	416.0	145.3	12445.2	13006.5	102122.7	133830.2	120708.7	415.9876	145.3494	3977.8	4539.1	**-4539.1**
37.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	442.7	155.0	12317.4	12915.1	102122.7	133830.2	120708.7	442.7329	155.0119	3932.0	4529.7	**-4529.7**
37.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	442.7	155.0	12317.4	12915.1	102122.7	133830.2	120708.7	442.7329	155.0119	3932.0	4529.7	**-4529.7**
37.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	469.7	164.8	12188.3	12822.8	102122.7	133830.2	120708.7	469.7355	164.7676	3885.8	4520.3	**-4520.3**
37.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	469.7	164.8	12188.3	12822.8	102122.7	133830.2	120708.7	469.7355	164.7676	3885.8	4520.3	**-4520.3**

38.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	497.0	174.6	12058.0	12729.6	102122.7	133830.2	120708.7	496.9954	174.6152	3839.2	4510.8	**-4510.8**
38.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	497.0	174.6	12058.0	12729.6	102122.7	133830.2	120708.7	496.9954	174.6152	3839.2	4510.8	**-4510.8**
38.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	524.5	184.6	11926.7	12635.7	102122.7	133830.2	120708.7	524.4536	184.5525	3792.2	4501.2	**-4501.2**
38.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	524.5	184.6	11926.7	12635.7	102122.7	133830.2	120708.7	524.4536	184.5525	3792.2	4501.2	**-4501.2**
38.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	552.4	195.0	11792.5	12539.9	102122.7	133830.2	120708.7	552.3872	194.9813	3744.0	4491.4	**-4491.4**
38.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	529.6	187.4	11900.1	12617.1	102122.7	133830.2	120708.7	529.6013	187.3996	3782.3	4499.3	**-4499.3**
38.75	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	545.3	192.6	11826.0	12563.9	102122.7	133830.2	120708.7	545.3249	192.571	3755.9	4493.8	**-4493.8**
38.75	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	545.3	192.6	11826.0	12563.9	102122.7	133830.2	120708.7	545.3249	192.571	3755.9	4493.8	**-4493.8**
38.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	561.1	197.7	11751.8	12510.6	102122.7	133830.2	120708.7	561.0669	197.7424	3729.6	4488.4	**-4488.4**
38.875	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	561.1	197.7	11751.8	12510.6	102122.7	133830.2	120708.7	561.0669	197.7424	3729.6	4488.4	**-4488.4**
39	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	572.7	200.6	11698.8	12472.1	102122.7	133830.2	120708.7	572.7396	200.614	3711.1	4484.4	**-4484.4**
39	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	572.7	200.6	11698.8	12472.1	102122.7	133830.2	120708.7	572.7396	200.614	3711.1	4484.4	**-4484.4**
39.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	590.2	207.5	11614.1	12411.8	102122.7	133830.2	120708.7	590.2046	207.4838	3680.6	4478.3	**-4478.3**
39.125	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	590.2	207.5	11614.1	12411.8	102122.7	133830.2	120708.7	590.2046	207.4838	3680.6	4478.3	**-4478.3**
39.25	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	604.1	211.7	11549.6	12365.3	102122.7	133830.2	120708.7	604.0592	211.6726	3657.8	4473.5	**-4473.5**
39.25	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	604.1	211.7	11549.6	12365.3	102122.7	133830.2	120708.7	604.0592	211.6726	3657.8	4473.5	**-4473.5**
39.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	621.7	218.6	11464.4	12304.6	102122.7	133830.2	120708.7	621.6655	218.5645	3627.1	4467.3	**-4467.3**
39.375	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	621.7	218.6	11464.4	12304.6	102122.7	133830.2	120708.7	621.6655	218.5645	3627.1	4467.3	**-4467.3**
39.5	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	635.7	222.8	11399.2	12257.6	102122.7	133830.2	120708.7	635.661	222.7968	3604.0	4462.5	**-4462.5**
39.5	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	635.7	222.8	11399.2	12257.6	102122.7	133830.2	120708.7	635.661	222.7968	3604.0	4462.5	**-4462.5**
39.625	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	653.5	229.8	11312.6	12196.0	102122.7	133830.2	120708.7	653.5276	229.7902	3572.9	4456.2	**-4456.2**
39.625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	656.3	231.8	16562.1	17450.3	122736.8	158516.8	144852.5	656.342	231.8129	4446.7	5334.9	**-5334.9**
39.91667	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	692.2	243.8	16367.9	17303.8	122736.8	158516.8	144852.5	692.1928	243.7682	4387.3	5323.3	**-5323.3**
39.91667	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	692.2	243.8	16367.9	17303.8	122736.8	158516.8	144852.5	692.1928	243.7682	4387.3	5323.3	**-5323.3**
40.20833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	729.8	256.8	16162.7	17149.4	122736.8	158516.8	144852.5	729.8475	256.8138	4324.4	5311.1	**-5311.1**
40.20833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	729.8	256.8	16162.7	17149.4	122736.8	158516.8	144852.5	729.8475	256.8138	4324.4	5311.1	**-5311.1**
40.5	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	768.0	270.0	15954.8	16992.9	122736.8	158516.8	144852.5	768.0127	270.0153	4260.7	5298.7	**-5298.7**
40.5	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	768.0	270.0	15954.8	16992.9	122736.8	158516.8	144852.5	768.0127	270.0153	4260.7	5298.7	**-5298.7**
40.79167	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	806.7	283.4	15744.3	16834.3	122736.8	158516.8	144852.5	806.6819	283.3594	4196.2	5286.2	**-5286.2**
40.79167	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	806.7	283.4	15744.3	16834.3	122736.8	158516.8	144852.5	806.6819	283.3594	4196.2	5286.2	**-5286.2**
41.08333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	845.9	296.8	15531.0	16673.8	122736.8	158516.8	144852.5	845.8635	296.844	4130.8	5273.5	**-5273.5**
41.08333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	845.9	296.8	15531.0	16673.8	122736.8	158516.8	144852.5	845.8635	296.844	4130.8	5273.5	**-5273.5**
41.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	885.6	310.5	15315.0	16511.1	122736.8	158516.8	144852.5	885.5681	310.4689	4064.6	5260.6	**-5260.6**
41.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	885.6	310.5	15315.0	16511.1	122736.8	158516.8	144852.5	885.5681	310.4689	4064.6	5260.6	**-5260.6**
41.66667	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	925.8	324.2	15096.2	16346.2	122736.8	158516.8	144852.5	925.8056	324.2347	3997.6	5247.6	**-5247.6**
41.66667	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	925.8	324.2	15096.2	16346.2	122736.8	158516.8	144852.5	925.8056	324.2347	3997.6	5247.6	**-5247.6**
41.95833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	966.6	338.1	14874.5	16179.3	122736.8	158516.8	144852.5	966.5845	338.1419	3929.7	5234.4	**-5234.4**
41.95833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	968.0	339.1	14865.7	16172.8	122736.8	158516.8	144852.5	968.0206	339.0924	3926.8	5233.9	**-5233.9**
42.25	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1007.9	352.2	14650.0	16010.1	122736.8	158516.8	144852.5	1007.912	352.191	3860.9	5221.0	**-5221.0**
42.25	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1007.9	352.2	14650.0	16010.1	122736.8	158516.8	144852.5	1007.912	352.191	3860.9	5221.0	**-5221.0**
42.54166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1049.8	366.4	14422.5	15838.7	122736.8	158516.8	144852.5	1049.793	366.3821	3791.3	5207.5	**-5207.5**
42.54166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1049.8	366.4	14422.5	15838.7	122736.8	158516.8	144852.5	1049.793	366.3821	3791.3	5207.5	**-5207.5**
42.83333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1092.2	380.7	14192.1	15665.1	122736.8	158516.8	144852.5	1092.23	380.7151	3720.8	5193.8	**-5193.8**
42.83333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1092.2	380.7	14192.1	15665.1	122736.8	158516.8	144852.5	1092.23	380.7151	3720.8	5193.8	**-5193.8**
43.125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1135.2	395.2	13958.8	15489.2	122736.8	158516.8	144852.5	1135.227	395.1896	3649.5	5179.9	**-5179.9**
43.125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1135.2	395.2	13958.8	15489.2	122736.8	158516.8	144852.5	1135.227	395.1896	3649.5	5179.9	**-5179.9**
43.41666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1178.8	409.8	13722.6	15311.1	122736.8	158516.8	144852.5	1178.783	409.8049	3577.2	5165.8	**-5165.8**
43.41666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1178.8	409.8	13722.6	15311.1	122736.8	158516.8	144852.5	1178.783	409.8049	3577.2	5165.8	**-5165.8**
43.70833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1222.9	424.6	13483.4	15130.9	122736.8	158516.8	144852.5	1222.896	424.5599	3504.1	5151.5	**-5151.5**
43.70833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1222.9	424.6	13483.4	15130.9	122736.8	158516.8	144852.5	1222.896	424.5599	3504.1	5151.5	**-5151.5**
44	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1267.6	439.5	13241.3	14948.3	122736.8	158516.8	144852.5	1267.564	439.453	3430.1	5137.1	**-5137.1**
44	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1267.6	439.5	13241.3	14948.3	122736.8	158516.8	144852.5	1267.564	439.453	3430.1	5137.1	**-5137.1**
44.29166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1312.8	454.5	12996.4	14763.6	122736.8	158516.8	144852.5	1312.782	454.4821	3355.3	5122.5	**-5122.5**
44.29166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1314.5	455.5	12986.3	14756.2	122736.8	158516.8	144852.5	1314.459	455.5086	3352.0	5121.9	**-5121.9**
44.58333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1358.5	469.6	12748.6	14576.8	122736.8	158516.8	144852.5	1358.544	469.6442	3279.6	5107.7	**-5107.7**
44.58333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1358.5	469.6	12748.6	14576.8	122736.8	158516.8	144852.5	1358.544	469.6442	3279.6	5107.7	**-5107.7**
44.87499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1404.8	484.9	12498.0	14387.8	122736.8	158516.8	144852.5	1404.843	484.935	3203.0	5092.8	**-5092.8**
44.87499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1404.8	484.9	12498.0	14387.8	122736.8	158516.8	144852.5	1404.843	484.935	3203.0	5092.8	**-5092.8**
45.16666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1451.7	500.3	12244.7	14196.7	122736.8	158516.8	144852.5	1451.671	500.3483	3125.7	5077.7	**-5077.7**
45.16666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1451.7	500.3	12244.7	14196.7	122736.8	158516.8	144852.5	1451.671	500.3483	3125.7	5077.7	**-5077.7**
45.45833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1499.0	515.9	11988.6	14003.5	122736.8	158516.8	144852.5	1499.022	515.8748	3047.5	5062.4	**-5062.4**
45.45833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1499.0	515.9	11988.6	14003.5	122736.8	158516.8	144852.5	1499.022	515.8748	3047.5	5062.4	**-5062.4**
45.74999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1546.9	531.5	11729.9	13808.3	122736.8	158516.8	144852.5	1546.895	531.4992	2968.6	5047.0	**-5047.0**
45.74999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1546.9	531.5	11729.9	13808.3	122736.8	158516.8	144852.5	1546.895	531.4992	2968.6	5047.0	**-5047.0**

46.04166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1595.3	547.2	11468.6	13611.1	122736.8	158516.8	144852.5	1595.297	547.1841	2888.9	5031.4	**-5031.4**
46.04166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1595.3	547.2	11468.6	13611.1	122736.8	158516.8	144852.5	1595.297	547.1841	2888.9	5031.4	**-5031.4**
46.33333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1644.1	562.8	11205.6	13412.5	122736.8	158516.8	144852.5	1644.085	562.8039	2808.8	5015.7	**-5015.7**
46.33333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1644.1	562.8	11205.6	13412.5	122736.8	158516.8	144852.5	1644.085	562.8039	2808.8	5015.7	**-5015.7**
46.62499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1693.4	579.6	10937.9	13210.8	122736.8	158516.8	144852.5	1693.354	579.5506	2726.9	4999.8	**-4999.8**
46.62499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1695.5	580.3	10926.1	13201.9	122736.8	158516.8	144852.5	1695.532	580.3058	2723.2	4999.1	**-4999.1**
46.93749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1643.1	563.0	11209.9	13416.0	122736.8	158516.8	144852.5	1643.068	563.023	2809.9	5016.0	**-5016.0**
46.93749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1643.1	563.0	11209.9	13416.0	122736.8	158516.8	144852.5	1643.068	563.023	2809.9	5016.0	**-5016.0**
47.24999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1590.9	546.8	11490.1	13627.8	122736.8	158516.8	144852.5	1590.916	546.7501	2895.1	5032.7	**-5032.7**
47.24999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1590.9	546.8	11490.1	13627.8	122736.8	158516.8	144852.5	1590.916	546.7501	2895.1	5032.7	**-5032.7**
47.56249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1538.4	530.0	11773.0	13841.4	122736.8	158516.8	144852.5	1538.424	529.9527	2981.2	5049.6	**-5049.6**
47.56249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1538.4	530.0	11773.0	13841.4	122736.8	158516.8	144852.5	1538.424	529.9527	2981.2	5049.6	**-5049.6**
47.87499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1486.5	513.2	12052.9	14052.7	122736.8	158516.8	144852.5	1486.545	513.2369	3066.5	5066.3	**-5066.3**
47.87499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1486.5	513.2	12052.9	14052.7	122736.8	158516.8	144852.5	1486.545	513.2369	3066.5	5066.3	**-5066.3**
48.18749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1435.3	496.6	12329.7	14261.6	122736.8	158516.8	144852.5	1435.266	496.6377	3150.9	5082.8	**-5082.8**
48.18749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1435.3	496.6	12329.7	14261.6	122736.8	158516.8	144852.5	1435.266	496.6377	3150.9	5082.8	**-5082.8**
48.49999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1384.6	480.2	12603.4	14468.2	122736.8	158516.8	144852.5	1384.592	480.1715	3234.4	5099.2	**-5099.2**
48.49999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1384.6	480.2	12603.4	14468.2	122736.8	158516.8	144852.5	1384.592	480.1715	3234.4	5099.2	**-5099.2**
48.81249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1334.5	463.8	12873.9	14672.3	122736.8	158516.8	144852.5	1334.529	463.8482	3316.9	5115.3	**-5115.3**
48.81249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1334.5	463.8	12873.9	14672.3	122736.8	158516.8	144852.5	1334.529	463.8482	3316.9	5115.3	**-5115.3**
49.12499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1285.1	447.7	13141.2	14873.9	122736.8	158516.8	144852.5	1285.084	447.6743	3398.5	5131.2	**-5131.2**
49.12499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1283.5	446.7	13150.5	14880.8	122736.8	158516.8	144852.5	1283.537	446.713	3401.5	5131.8	**-5131.8**
49.43749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1236.3	431.7	13405.2	15073.1	122736.8	158516.8	144852.5	1236.265	431.6543	3479.1	5147.0	**-5147.0**
49.43749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1236.3	431.7	13405.2	15073.1	122736.8	158516.8	144852.5	1236.265	431.6543	3479.1	5147.0	**-5147.0**
49.74999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1188.1	415.8	13665.9	15269.7	122736.8	158516.8	144852.5	1188.078	415.7911	3558.6	5162.5	**-5162.5**
49.74999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1188.1	415.8	13665.9	15269.7	122736.8	158516.8	144852.5	1188.078	415.7911	3558.6	5162.5	**-5162.5**
50.06249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1140.5	400.1	13923.3	15463.9	122736.8	158516.8	144852.5	1140.525	400.0867	3637.3	5177.9	**-5177.9**
50.06249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1140.5	400.1	13923.3	15463.9	122736.8	158516.8	144852.5	1140.525	400.0867	3637.3	5177.9	**-5177.9**
50.37499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1093.6	384.5	14177.3	15655.4	122736.8	158516.8	144852.5	1093.606	384.5425	3714.9	5193.0	**-5193.0**
50.37499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1093.6	384.5	14177.3	15655.4	122736.8	158516.8	144852.5	1093.606	384.5425	3714.9	5193.0	**-5193.0**
50.68749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1047.3	369.2	14428.0	15844.5	122736.8	158516.8	144852.5	1047.322	369.1593	3791.5	5208.0	**-5208.0**
50.68749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1047.3	369.2	14428.0	15844.5	122736.8	158516.8	144852.5	1047.322	369.1593	3791.5	5208.0	**-5208.0**
50.99999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1001.7	353.9	14675.4	16031.0	122736.8	158516.8	144852.5	1001.666	353.9373	3867.1	5222.7	**-5222.7**
50.99999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1001.7	353.9	14675.4	16031.0	122736.8	158516.8	144852.5	1001.666	353.9373	3867.1	5222.7	**-5222.7**
51.31249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	956.6	338.9	14919.6	16215.1	122736.8	158516.8	144852.5	956.6331	338.8765	3941.7	5237.2	**-5237.2**
51.31249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	956.6	338.9	14919.6	16215.1	122736.8	158516.8	144852.5	956.6331	338.8765	3941.7	5237.2	**-5237.2**
51.62499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	912.2	324.0	15160.5	16396.7	122736.8	158516.8	144852.5	912.2134	323.9762	4015.4	5251.6	**-5251.6**
51.62499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	910.9	323.1	15168.6	16402.6	122736.8	158516.8	144852.5	910.9039	323.0911	4018.1	5252.1	**-5252.1**
51.93749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	868.4	309.2	15398.3	16575.9	122736.8	158516.8	144852.5	868.3948	309.2352	4088.1	5265.8	**-5265.8**
51.93749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	868.4	309.2	15398.3	16575.9	122736.8	158516.8	144852.5	868.3948	309.2352	4088.1	5265.8	**-5265.8**
52.24999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	825.2	294.7	15632.9	16752.7	122736.8	158516.8	144852.5	825.1623	294.652	4159.9	5279.7	**-5279.7**
52.24999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	825.2	294.7	15632.9	16752.7	122736.8	158516.8	144852.5	825.1623	294.652	4159.9	5279.7	**-5279.7**
52.56249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	782.5	280.2	15864.6	16927.3	122736.8	158516.8	144852.5	782.4982	280.2241	4230.8	5293.5	**-5293.5**
52.56249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	782.5	280.2	15864.6	16927.3	122736.8	158516.8	144852.5	782.4982	280.2241	4230.8	5293.5	**-5293.5**
52.87499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	740.4	265.9	16093.3	17099.7	122736.8	158516.8	144852.5	740.3828	265.9488	4300.8	5307.2	**-5307.2**
52.87499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	740.4	265.9	16093.3	17099.7	122736.8	158516.8	144852.5	740.3828	265.9488	4300.8	5307.2	**-5307.2**
53.18749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	698.8	251.8	16319.3	17269.9	122736.8	158516.8	144852.5	698.795	251.8225	4370.0	5320.6	**-5320.6**
53.18749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	698.8	251.8	16319.3	17269.9	122736.8	158516.8	144852.5	698.795	251.8225	4370.0	5320.6	**-5320.6**
53.49999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	657.7	237.8	16542.5	17438.1	122736.8	158516.8	144852.5	657.7108	237.8411	4438.4	5333.9	**-5333.9**
53.49999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	657.7	237.8	16542.5	17438.1	122736.8	158516.8	144852.5	657.7108	237.8411	4438.4	5333.9	**-5333.9**
53.81249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	617.0	224.0	16763.6	17604.7	122736.8	158516.8	144852.5	617.0203	224.0084	4506.1	5347.1	**-5347.1**
53.81249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	617.0	224.0	16763.6	17604.7	122736.8	158516.8	144852.5	617.0203	224.0084	4506.1	5347.1	**-5347.1**
54.12499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	575.4	210.0	16989.3	17774.8	122736.8	158516.8	144852.5	575.4176	210.0462	4575.1	5360.5	**-5360.5**
54.12499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	595.4	216.7	16881.2	17693.3	122736.8	158516.8	144852.5	595.3517	216.7188	4542.0	5354.1	**-5354.1**
54.18749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	588.2	214.2	16920.5	17722.8	122736.8	158516.8	144852.5	588.1581	214.2002	4554.1	5356.4	**-5356.4**
54.18749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	588.2	214.2	16920.5	17722.8	122736.8	158516.8	144852.5	588.1581	214.2002	4554.1	5356.4	**-5356.4**
54.24999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	581.0	211.7	16959.7	17752.3	122736.8	158516.8	144852.5	580.9698	211.6816	4566.1	5358.8	**-5358.8**
54.24999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	581.0	211.7	16959.7	17752.3	122736.8	158516.8	144852.5	580.9698	211.6816	4566.1	5358.8	**-5358.8**
54.31249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	573.8	209.2	16998.9	17781.8	122736.8	158516.8	144852.5	573.7865	209.163	4578.1	5361.1	**-5361.1**
54.31249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	573.8	209.2	16998.9	17781.8	122736.8	158516.8	144852.5	573.7865	209.163	4578.1	5361.1	**-5361.1**
54.37499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	566.6	206.6	17038.1	17811.3	122736.8	158516.8	144852.5	566.6085	206.6444	4590.2	5363.4	**-5363.4**
54.37499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	566.6	206.6	17038.1	17811.3	122736.8	158516.8	144852.5	566.6085	206.6444	4590.2	5363.4	**-5363.4**
54.43749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	561.3	205.3	17065.7	17832.3	122736.8	158516.8	144852.5	561.3482	205.2811	4598.5	5365.1	**-5365.1**
54.43749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	561.3	205.3	17065.7	17832.3	122736.8	158516.8	144852.5	561.3482	205.2811	4598.5	5365.1	**-5365.1**

54.49999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	553.1	202.0	17111.4	17866.5	122736.8	158516.8	144852.5	553.1431	201.9787	4612.7	5367.8	**-5367.8**
54.49999	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	553.1	202.0	17111.4	17866.5	122736.8	158516.8	144852.5	553.1431	201.9787	4612.7	5367.8	**-5367.8**
54.56249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	546.7	200.0	17145.9	17892.6	122736.8	158516.8	144852.5	546.7191	199.9736	4623.2	5369.8	**-5369.8**
54.56249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	546.7	200.0	17145.9	17892.6	122736.8	158516.8	144852.5	546.7191	199.9736	4623.2	5369.8	**-5369.8**
54.62499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	538.5	196.7	17191.7	17926.9	122736.8	158516.8	144852.5	538.4984	196.6877	4637.4	5372.6	**-5372.6**
54.62499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	536.7	195.4	11854.7	12586.9	102122.7	133830.2	120708.7	536.7356	195.4282	3764.0	4496.2	**-4496.2**
54.91666	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	504.6	184.5	12007.0	12696.1	102122.7	133830.2	120708.7	504.5771	184.5236	3818.2	4507.3	**-4507.3**
54.91666	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	504.6	184.5	12007.0	12696.1	102122.7	133830.2	120708.7	504.5771	184.5236	3818.2	4507.3	**-4507.3**
55.20832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	471.5	172.9	12164.4	12808.8	102122.7	133830.2	120708.7	471.5215	172.8809	3874.5	4518.9	**-4518.9**
55.20832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	471.5	172.9	12164.4	12808.8	102122.7	133830.2	120708.7	471.5215	172.8809	3874.5	4518.9	**-4518.9**
55.49999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	438.8	161.4	12320.2	12920.3	102122.7	133830.2	120708.7	438.792	161.3542	3930.1	4530.3	**-4530.3**
55.49999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	438.8	161.4	12320.2	12920.3	102122.7	133830.2	120708.7	438.792	161.3542	3930.1	4530.3	**-4530.3**
55.79166	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	406.4	150.0	12474.3	13030.7	102122.7	133830.2	120708.7	406.4107	149.9575	3985.2	4541.6	**-4541.6**
55.79166	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	406.4	150.0	12474.3	13030.7	102122.7	133830.2	120708.7	406.4107	149.9575	3985.2	4541.6	**-4541.6**
56.08332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	374.4	138.7	12626.8	13139.9	102122.7	133830.2	120708.7	374.3871	138.6959	4039.7	4552.7	**-4552.7**
56.08332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	374.4	138.7	12626.8	13139.9	102122.7	133830.2	120708.7	374.3871	138.6959	4039.7	4552.7	**-4552.7**
56.37499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	342.7	127.6	12777.4	13247.7	102122.7	133830.2	120708.7	342.728	127.5724	4093.5	4563.8	**-4563.8**
56.37499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	342.7	127.6	12777.4	13247.7	102122.7	133830.2	120708.7	342.728	127.5724	4093.5	4563.8	**-4563.8**
56.66666	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	311.4	116.6	12926.3	13354.4	102122.7	133830.2	120708.7	311.4394	116.5892	4146.7	4574.7	**-4574.7**
56.66666	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	311.4	116.6	12926.3	13354.4	102122.7	133830.2	120708.7	311.4394	116.5892	4146.7	4574.7	**-4574.7**
56.95832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	280.5	105.7	13073.4	13459.7	102122.7	133830.2	120708.7	280.5258	105.7476	4199.2	4585.5	**-4585.5**
56.95832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	279.5	105.0	13078.9	13463.5	102122.7	133830.2	120708.7	279.5339	105.0158	4201.3	4585.9	**-4585.9**
57.24999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	250.0	95.0	13218.7	13563.7	102122.7	133830.2	120708.7	249.9903	95.04855	4251.1	4596.1	**-4596.1**
57.24999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	250.0	95.0	13218.7	13563.7	102122.7	133830.2	120708.7	249.9903	95.04855	4251.1	4596.1	**-4596.1**
57.54165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	219.8	84.5	13362.1	13666.5	102122.7	133830.2	120708.7	219.8347	84.49266	4302.3	4606.6	**-4606.6**
57.54165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	219.8	84.5	13362.1	13666.5	102122.7	133830.2	120708.7	219.8347	84.49266	4302.3	4606.6	**-4606.6**
57.83332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	190.1	74.1	13503.7	13767.9	102122.7	133830.2	120708.7	190.0593	74.08009	4352.9	4617.0	**-4617.0**
57.83332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	190.1	74.1	13503.7	13767.9	102122.7	133830.2	120708.7	190.0593	74.08009	4352.9	4617.0	**-4617.0**
58.12499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	160.7	63.8	13643.5	13868.0	102122.7	133830.2	120708.7	160.6633	63.81074	4402.8	4627.2	**-4627.2**
58.12499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	160.7	63.8	13643.5	13868.0	102122.7	133830.2	120708.7	160.6633	63.81074	4402.8	4627.2	**-4627.2**
58.41665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	131.6	53.7	13781.5	13966.8	102122.7	133830.2	120708.7	131.6441	53.68416	4452.0	4637.3	**-4637.3**
58.41665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	131.6	53.7	13781.5	13966.8	102122.7	133830.2	120708.7	131.6441	53.68416	4452.0	4637.3	**-4637.3**
58.70832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	103.0	43.7	13917.7	14064.4	102122.7	133830.2	120708.7	102.9978	43.69965	4500.6	4647.3	**-4647.3**
58.70832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	103.0	43.7	13917.7	14064.4	102122.7	133830.2	120708.7	102.9978	43.69965	4500.6	4647.3	**-4647.3**
58.99999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	74.7	33.9	14052.1	14160.6	102122.7	133830.2	120708.7	74.71885	33.85617	4548.6	4657.2	**-4657.2**
58.99999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	74.7	33.9	14052.1	14160.6	102122.7	133830.2	120708.7	74.71885	33.85617	4548.6	4657.2	**-4657.2**
59.29165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	46.8	24.2	14184.7	14255.7	102122.7	133830.2	120708.7	46.80005	24.15241	4595.9	4666.9	**-4666.9**
59.29165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	46.8	24.2	14184.7	14255.7	102122.7	133830.2	120708.7	46.80005	24.15241	4595.9	4666.9	**-4666.9**
59.58332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	19.2	14.6	14315.7	14349.5	102122.7	133830.2	120708.7	19.23229	14.58675	4642.7	4676.5	**-4676.5**
59.58332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	19.2	14.6	14315.7	14349.5	102122.7	133830.2	120708.7	19.23229	14.58675	4642.7	4676.5	**-4676.5**
59.87498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-8.0	5.2	14445.0	14442.1	102122.7	133830.2	120708.7	-7.99531	5.157318	4688.8	4686.0	**-4686.0**
59.87498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-8.0	5.2	14445.0	14442.1	102122.7	133830.2	120708.7	-7.99531	5.157318	4688.8	4686.0	**-4686.0**
60.16665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-34.9	-4.1	14572.7	14533.6	102122.7	133830.2	120708.7	-34.8954	-4.13799	4734.4	4695.3	**-4695.3**
60.16665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-34.9	-4.1	14572.7	14533.6	102122.7	133830.2	120708.7	-34.8954	-4.13799	4734.4	4695.3	**-4695.3**
60.45832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-61.5	-13.3	14698.8	14624.1	102122.7	133830.2	120708.7	-61.4825	-13.3014	4779.4	4704.6	**-4704.6**
60.45832	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-61.5	-13.3	14698.8	14624.1	102122.7	133830.2	120708.7	-61.4825	-13.3014	4779.4	4704.6	**-4704.6**
60.74998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-87.8	-22.3	14823.5	14713.4	102122.7	133830.2	120708.7	-87.7727	-22.3353	4823.8	4713.7	**-4713.7**
60.74998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-87.8	-22.3	14823.5	14713.4	102122.7	133830.2	120708.7	-87.7727	-22.3353	4823.8	4713.7	**-4713.7**
61.04165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-113.8	-31.2	14946.9	14801.8	102122.7	133830.2	120708.7	-113.789	-31.2418	4867.8	4722.8	**-4722.8**
61.04165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-113.8	-31.2	14946.9	14801.8	102122.7	133830.2	120708.7	-113.789	-31.2418	4867.8	4722.8	**-4722.8**
61.33332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-139.6	-40.0	15069.1	14889.5	102122.7	133830.2	120708.7	-139.597	-40.0225	4911.4	4731.8	**-4731.8**
61.33332	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-139.6	-40.0	15069.1	14889.5	102122.7	133830.2	120708.7	-139.597	-40.0225	4911.4	4731.8	**-4731.8**
61.62498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-165.8	-48.9	15193.1	14978.4	102122.7	133830.2	120708.7	-165.799	-48.9048	4955.6	4740.9	**-4740.9**
61.62498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-156.9	-45.3	15149.6	14947.5	102122.7	133830.2	120708.7	-156.863	-45.2751	4939.8	4737.7	**-4737.7**
61.93748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-179.7	-53.6	15259.0	15025.7	102122.7	133830.2	120708.7	-179.724	-53.5695	4979.0	4745.7	**-4745.7**
61.93748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-179.7	-53.6	15259.0	15025.7	102122.7	133830.2	120708.7	-179.724	-53.5695	4979.0	4745.7	**-4745.7**
62.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-202.2	-61.7	15366.5	15102.5	102122.7	133830.2	120708.7	-202.208	-61.7203	5017.5	4753.5	**-4753.5**
62.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-202.2	-61.7	15366.5	15102.5	102122.7	133830.2	120708.7	-202.208	-61.7203	5017.5	4753.5	**-4753.5**
62.56248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-224.7	-69.8	15474.1	15179.6	102122.7	133830.2	120708.7	-224.745	-69.8275	5056.0	4761.4	**-4761.4**
62.56248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-224.7	-69.8	15474.1	15179.6	102122.7	133830.2	120708.7	-224.745	-69.8275	5056.0	4761.4	**-4761.4**
62.87498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-246.9	-77.8	15580.1	15255.4	102122.7	133830.2	120708.7	-246.946	-77.7861	5093.9	4769.2	**-4769.2**
62.87498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-246.9	-77.8	15580.1	15255.4	102122.7	133830.2	120708.7	-246.946	-77.7861	5093.9	4769.2	**-4769.2**
63.18748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-268.8	-85.6	15684.4	15330.0	102122.7	133830.2	120708.7	-268.794	-85.5948	5131.2	4776.8	**-4776.8**
63.18748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-268.8	-85.6	15684.4	15330.0	102122.7	133830.2	120708.7	-268.794	-85.5948	5131.2	4776.8	**-4776.8**

63.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-290.3	-93.3	15786.8	15403.3	102122.7	133830.2	120708.7	-290.274	-93.2513	5167.8	4784.3	**-4784.3**
63.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-290.3	-93.3	15786.8	15403.3	102122.7	133830.2	120708.7	-290.274	-93.2513	5167.8	4784.3	**-4784.3**
63.81248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-311.4	-100.8	15887.4	15475.3	102122.7	133830.2	120708.7	-311.373	-100.753	5203.8	4791.7	**-4791.7**
63.81248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-311.4	-100.8	15887.4	15475.3	102122.7	133830.2	120708.7	-311.373	-100.753	5203.8	4791.7	**-4791.7**
64.12498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-332.1	-108.1	15986.1	15545.9	102122.7	133830.2	120708.7	-332.079	-108.099	5239.1	4798.9	**-4798.9**
64.12498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-332.6	-108.5	15989.3	15548.1	102122.7	133830.2	120708.7	-332.642	-108.533	5240.3	4799.1	**-4799.1**
64.43748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-352.4	-115.3	16082.9	15615.2	102122.7	133830.2	120708.7	-352.383	-115.286	5273.7	4806.0	**-4806.0**
64.43748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-352.4	-115.3	16082.9	15615.2	102122.7	133830.2	120708.7	-352.383	-115.286	5273.7	4806.0	**-4806.0**
64.74998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-372.3	-122.3	16177.6	15683.0	102122.7	133830.2	120708.7	-372.278	-122.314	5307.5	4812.9	**-4812.9**
64.74998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-372.3	-122.3	16177.6	15683.0	102122.7	133830.2	120708.7	-372.278	-122.314	5307.5	4812.9	**-4812.9**
65.06248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-391.8	-129.2	16270.4	15749.4	102122.7	133830.2	120708.7	-391.76	-129.18	5340.7	4819.7	**-4819.7**
65.06248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-391.8	-129.2	16270.4	15749.4	102122.7	133830.2	120708.7	-391.76	-129.18	5340.7	4819.7	**-4819.7**
65.37498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-410.8	-135.9	16361.1	15814.4	102122.7	133830.2	120708.7	-410.827	-135.885	5373.1	4826.4	**-4826.4**
65.37498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-410.8	-135.9	16361.1	15814.4	102122.7	133830.2	120708.7	-410.827	-135.885	5373.1	4826.4	**-4826.4**
65.68748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-429.5	-142.4	16449.9	15878.0	102122.7	133830.2	120708.7	-429.478	-142.429	5404.8	4832.9	**-4832.9**
65.68748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-429.5	-142.4	16449.9	15878.0	102122.7	133830.2	120708.7	-429.478	-142.429	5404.8	4832.9	**-4832.9**
65.99998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-447.7	-148.8	16536.6	15940.1	102122.7	133830.2	120708.7	-447.717	-148.81	5435.8	4839.2	**-4839.2**
65.99998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-447.7	-148.8	16536.6	15940.1	102122.7	133830.2	120708.7	-447.717	-148.81	5435.8	4839.2	**-4839.2**
66.31248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-465.5	-155.0	16621.4	16000.8	102122.7	133830.2	120708.7	-465.548	-155.031	5466.0	4845.5	**-4845.5**
66.31248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-465.5	-155.0	16621.4	16000.8	102122.7	133830.2	120708.7	-465.548	-155.031	5466.0	4845.5	**-4845.5**
66.62498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-483.0	-161.1	16704.2	16060.2	102122.7	133830.2	120708.7	-482.98	-161.093	5495.6	4851.5	**-4851.5**
66.62498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-483.4	-161.4	16706.7	16061.8	102122.7	133830.2	120708.7	-483.403	-161.45	5496.5	4851.7	**-4851.7**
66.93748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-500.0	-167.0	16785.2	16118.2	102122.7	133830.2	120708.7	-500.022	-166.995	5524.5	4857.5	**-4857.5**
66.93748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-500.0	-167.0	16785.2	16118.2	102122.7	133830.2	120708.7	-500.022	-166.995	5524.5	4857.5	**-4857.5**
67.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-516.7	-172.7	16864.3	16174.8	102122.7	133830.2	120708.7	-516.689	-172.741	5552.7	4863.3	**-4863.3**
67.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-516.7	-172.7	16864.3	16174.8	102122.7	133830.2	120708.7	-516.689	-172.741	5552.7	4863.3	**-4863.3**
67.56248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-533.0	-178.3	16941.6	16230.3	102122.7	133830.2	120708.7	-532.996	-178.332	5580.3	4868.9	**-4868.9**
67.56248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-533.0	-178.3	16941.6	16230.3	102122.7	133830.2	120708.7	-532.996	-178.332	5580.3	4868.9	**-4868.9**
67.87498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-549.0	-183.8	17017.2	16284.5	102122.7	133830.2	120708.7	-548.964	-183.769	5607.2	4874.5	**-4874.5**
67.87498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-549.0	-183.8	17017.2	16284.5	102122.7	133830.2	120708.7	-548.964	-183.769	5607.2	4874.5	**-4874.5**
68.18748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-564.6	-189.1	17091.3	16337.6	102122.7	133830.2	120708.7	-564.618	-189.055	5633.6	4879.9	**-4879.9**
68.18748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-564.6	-189.1	17091.3	16337.6	102122.7	133830.2	120708.7	-564.618	-189.055	5633.6	4879.9	**-4879.9**
68.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-580.0	-194.2	17163.9	16389.7	102122.7	133830.2	120708.7	-579.995	-194.189	5659.4	4885.2	**-4885.2**
68.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-580.0	-194.2	17163.9	16389.7	102122.7	133830.2	120708.7	-579.995	-194.189	5659.4	4885.2	**-4885.2**
68.81248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-595.2	-199.2	17235.4	16441.1	102122.7	133830.2	120708.7	-595.174	-199.167	5684.8	4890.5	**-4890.5**
68.81248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-595.2	-199.2	17235.4	16441.1	102122.7	133830.2	120708.7	-595.174	-199.167	5684.8	4890.5	**-4890.5**
69.12498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-610.4	-204.1	17306.9	16492.5	102122.7	133830.2	120708.7	-610.393	-204.056	5710.2	4895.8	**-4895.8**
69.12498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-602.1	-201.0	17267.3	16464.2	102122.7	133830.2	120708.7	-602.12	-201.04	5696.0	4892.9	**-4892.9**
69.18748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-604.1	-201.8	17277.0	16471.0	102122.7	133830.2	120708.7	-604.112	-201.821	5699.5	4893.6	**-4893.6**
69.18748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-604.1	-201.8	17277.0	16471.0	102122.7	133830.2	120708.7	-604.112	-201.821	5699.5	4893.6	**-4893.6**
69.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-606.1	-202.6	17286.6	16477.9	102122.7	133830.2	120708.7	-606.099	-202.602	5703.0	4894.3	**-4894.3**
69.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-606.1	-202.6	17286.6	16477.9	102122.7	133830.2	120708.7	-606.099	-202.602	5703.0	4894.3	**-4894.3**
69.31248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-608.1	-203.4	17296.2	16484.7	102122.7	133830.2	120708.7	-608.082	-203.383	5706.4	4895.0	**-4895.0**
69.31248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-608.1	-203.4	17296.2	16484.7	102122.7	133830.2	120708.7	-608.082	-203.383	5706.4	4895.0	**-4895.0**
69.37498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-610.1	-204.2	17305.8	16491.6	102122.7	133830.2	120708.7	-610.06	-204.164	5709.9	4895.7	**-4895.7**
69.37498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-610.1	-204.2	17305.8	16491.6	102122.7	133830.2	120708.7	-610.06	-204.164	5709.9	4895.7	**-4895.7**
69.43748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-611.4	-204.6	17312.2	16496.2	102122.7	133830.2	120708.7	-611.438	-204.581	5712.2	4896.1	**-4896.1**
69.43748	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-611.4	-204.6	17312.2	16496.2	102122.7	133830.2	120708.7	-611.438	-204.581	5712.2	4896.1	**-4896.1**
69.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-613.7	-205.6	17323.2	16504.0	102122.7	133830.2	120708.7	-613.662	-205.576	5716.2	4896.9	**-4896.9**
69.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-613.7	-205.6	17323.2	16504.0	102122.7	133830.2	120708.7	-613.662	-205.576	5716.2	4896.9	**-4896.9**
69.56248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-615.4	-206.2	17331.4	16509.9	102122.7	133830.2	120708.7	-615.38	-206.176	5719.1	4897.5	**-4897.5**
69.56248	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-615.4	-206.2	17331.4	16509.9	102122.7	133830.2	120708.7	-615.38	-206.176	5719.1	4897.5	**-4897.5**
69.62498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-617.6	-207.2	17342.4	16517.6	102122.7	133830.2	120708.7	-617.599	-207.152	5723.1	4898.3	**-4898.3**
69.62498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-618.1	-207.5	17345.1	16519.5	102122.7	133830.2	120708.7	-618.086	-207.517	5724.1	4898.5	**-4898.5**
69.91665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-626.7	-210.7	17386.2	16548.9	102122.7	133830.2	120708.7	-626.653	-210.7	5738.9	4901.5	**-4901.5**
69.91665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-626.7	-210.7	17386.2	16548.9	102122.7	133830.2	120708.7	-626.653	-210.7	5738.9	4901.5	**-4901.5**
70.20831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-635.4	-214.0	17428.3	16578.9	102122.7	133830.2	120708.7	-635.373	-214.023	5754.0	4904.6	**-4904.6**
70.20831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-635.4	-214.0	17428.3	16578.9	102122.7	133830.2	120708.7	-635.373	-214.023	5754.0	4904.6	**-4904.6**
70.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-643.9	-217.2	17469.1	16608.0	102122.7	133830.2	120708.7	-643.862	-217.227	5768.7	4907.6	**-4907.6**
70.49998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-643.9	-217.2	17469.1	16608.0	102122.7	133830.2	120708.7	-643.862	-217.227	5768.7	4907.6	**-4907.6**
70.79165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-652.1	-220.3	17508.7	16636.3	102122.7	133830.2	120708.7	-652.091	-220.307	5782.9	4910.5	**-4910.5**
70.79165	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-652.1	-220.3	17508.7	16636.3	102122.7	133830.2	120708.7	-652.091	-220.307	5782.9	4910.5	**-4910.5**
71.08331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-660.0	-223.3	17546.8	16663.5	102122.7	133830.2	120708.7	-660.039	-223.258	5796.6	4913.3	**-4913.3**
71.08331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-660.0	-223.3	17546.8	16663.5	102122.7	133830.2	120708.7	-660.039	-223.258	5796.6	4913.3	**-4913.3**

71.37498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-667.7	-226.1	17583.5	16689.7	102122.7	133830.2	120708.7	-667.691	-226.078	5809.7	4915.9	**-4915.9**
71.37498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-667.7	-226.1	17583.5	16689.7	102122.7	133830.2	120708.7	-667.691	-226.078	5809.7	4915.9	**-4915.9**
71.66665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-675.0	-228.8	17618.7	16714.9	102122.7	133830.2	120708.7	-675.034	-228.766	5822.3	4918.5	**-4918.5**
71.66665	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-675.0	-228.8	17618.7	16714.9	102122.7	133830.2	120708.7	-675.034	-228.766	5822.3	4918.5	**-4918.5**
71.95831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-682.1	-231.3	17652.3	16738.9	102122.7	133830.2	120708.7	-682.058	-231.319	5834.3	4921.0	**-4921.0**
71.95831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-682.3	-231.5	17653.5	16739.8	102122.7	133830.2	120708.7	-682.279	-231.488	5834.8	4921.1	**-4921.1**
72.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-688.8	-233.7	17684.3	16761.8	102122.7	133830.2	120708.7	-688.757	-233.737	5845.8	4923.3	**-4923.3**
72.24998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-688.8	-233.7	17684.3	16761.8	102122.7	133830.2	120708.7	-688.757	-233.737	5845.8	4923.3	**-4923.3**
72.54164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-695.1	-236.0	17714.7	16783.6	102122.7	133830.2	120708.7	-695.125	-236.017	5856.7	4925.5	**-4925.5**
72.54164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-695.1	-236.0	17714.7	16783.6	102122.7	133830.2	120708.7	-695.125	-236.017	5856.7	4925.5	**-4925.5**
72.83331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-701.2	-238.2	17743.5	16804.1	102122.7	133830.2	120708.7	-701.159	-238.16	5867.0	4927.6	**-4927.6**
72.83331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-701.2	-238.2	17743.5	16804.1	102122.7	133830.2	120708.7	-701.159	-238.16	5867.0	4927.6	**-4927.6**
73.12498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-706.9	-240.2	17770.6	16823.6	102122.7	133830.2	120708.7	-706.858	-240.166	5876.7	4929.6	**-4929.6**
73.12498	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-706.9	-240.2	17770.6	16823.6	102122.7	133830.2	120708.7	-706.858	-240.166	5876.7	4929.6	**-4929.6**
73.41664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-712.2	-242.0	17796.1	16841.8	102122.7	133830.2	120708.7	-712.223	-242.033	5885.8	4931.5	**-4931.5**
73.41664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-712.2	-242.0	17796.1	16841.8	102122.7	133830.2	120708.7	-712.223	-242.033	5885.8	4931.5	**-4931.5**
73.70831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-717.3	-243.8	17820.0	16859.0	102122.7	133830.2	120708.7	-717.257	-243.763	5894.3	4933.3	**-4933.3**
73.70831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-717.3	-243.8	17820.0	16859.0	102122.7	133830.2	120708.7	-717.257	-243.763	5894.3	4933.3	**-4933.3**
73.99998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-722.0	-245.4	17842.3	16874.9	102122.7	133830.2	120708.7	-721.966	-245.357	5902.2	4934.9	**-4934.9**
73.99998	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-722.0	-245.4	17842.3	16874.9	102122.7	133830.2	120708.7	-721.966	-245.357	5902.2	4934.9	**-4934.9**
74.29164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-726.4	-246.8	17863.0	16889.8	102122.7	133830.2	120708.7	-726.357	-246.814	5909.6	4936.4	**-4936.4**
74.29164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-726.4	-246.9	17863.5	16890.2	102122.7	133830.2	120708.7	-726.447	-246.909	5909.8	4936.4	**-4936.4**
74.58331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-730.4	-248.1	17882.2	16903.6	102122.7	133830.2	120708.7	-730.44	-248.138	5916.4	4937.8	**-4937.8**
74.58331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-730.4	-248.1	17882.2	16903.6	102122.7	133830.2	120708.7	-730.44	-248.138	5916.4	4937.8	**-4937.8**
74.87497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-734.2	-249.3	17899.9	16916.4	102122.7	133830.2	120708.7	-734.227	-249.328	5922.7	4939.1	**-4939.1**
74.87497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-734.2	-249.3	17899.9	16916.4	102122.7	133830.2	120708.7	-734.227	-249.328	5922.7	4939.1	**-4939.1**
75.16664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-737.7	-250.4	17916.2	16928.1	102122.7	133830.2	120708.7	-737.733	-250.387	5928.5	4940.3	**-4940.3**
75.16664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-737.7	-250.4	17916.2	16928.1	102122.7	133830.2	120708.7	-737.733	-250.387	5928.5	4940.3	**-4940.3**
75.45831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-741.0	-251.3	17931.3	16939.0	102122.7	133830.2	120708.7	-740.979	-251.315	5933.7	4941.4	**-4941.4**
75.45831	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-741.0	-251.3	17931.3	16939.0	102122.7	133830.2	120708.7	-740.979	-251.315	5933.7	4941.4	**-4941.4**
75.74997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-744.0	-252.1	17945.0	16948.9	102122.7	133830.2	120708.7	-743.987	-252.113	5938.6	4942.5	**-4942.5**
75.74997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-744.0	-252.1	17945.0	16948.9	102122.7	133830.2	120708.7	-743.987	-252.113	5938.6	4942.5	**-4942.5**
76.04164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-746.8	-252.8	17957.7	16958.2	102122.7	133830.2	120708.7	-746.793	-252.781	5943.0	4943.4	**-4943.4**
76.04164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-746.8	-252.8	17957.7	16958.2	102122.7	133830.2	120708.7	-746.793	-252.781	5943.0	4943.4	**-4943.4**
76.33331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-749.5	-253.3	17969.6	16966.9	102122.7	133830.2	120708.7	-749.467	-253.317	5947.1	4944.3	**-4944.3**
76.33331	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-749.5	-253.3	17969.6	16966.9	102122.7	133830.2	120708.7	-749.467	-253.317	5947.1	4944.3	**-4944.3**
76.62497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-751.9	-253.7	17980.4	16974.7	102122.7	133830.2	120708.7	-751.938	-253.684	5950.7	4945.1	**-4945.1**
76.62497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-751.9	-253.7	17980.3	16974.7	102122.7	133830.2	120708.7	-751.931	-253.683	5950.7	4945.1	**-4945.1**
76.91664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-749.5	-253.3	17969.9	16967.0	102122.7	133830.2	120708.7	-749.516	-253.338	5947.2	4944.3	**-4944.3**
76.91664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-749.5	-253.3	17969.9	16967.0	102122.7	133830.2	120708.7	-749.516	-253.338	5947.2	4944.3	**-4944.3**
77.2083	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-746.8	-252.8	17958.0	16958.4	102122.7	133830.2	120708.7	-746.844	-252.827	5943.1	4943.4	**-4943.4**
77.2083	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-746.8	-252.8	17958.0	16958.4	102122.7	133830.2	120708.7	-746.844	-252.827	5943.1	4943.4	**-4943.4**
77.49997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-744.1	-252.2	17945.5	16949.2	102122.7	133830.2	120708.7	-744.061	-252.17	5938.7	4942.5	**-4942.5**
77.49997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-744.1	-252.2	17945.5	16949.2	102122.7	133830.2	120708.7	-744.061	-252.17	5938.7	4942.5	**-4942.5**
77.79164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-741.1	-251.4	17931.8	16939.3	102122.7	133830.2	120708.7	-741.08	-251.383	5933.9	4941.5	**-4941.5**
77.79164	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-741.1	-251.4	17931.8	16939.3	102122.7	133830.2	120708.7	-741.08	-251.383	5933.9	4941.5	**-4941.5**
78.0833	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-737.9	-250.5	17916.9	16928.6	102122.7	133830.2	120708.7	-737.863	-250.467	5928.7	4940.4	**-4940.4**
78.0833	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-737.9	-250.5	17916.9	16928.6	102122.7	133830.2	120708.7	-737.863	-250.467	5928.7	4940.4	**-4940.4**
78.37497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-734.4	-249.4	17900.7	16916.9	102122.7	133830.2	120708.7	-734.386	-249.42	5923.0	4939.2	**-4939.2**
78.37497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-734.4	-249.4	17900.7	16916.9	102122.7	133830.2	120708.7	-734.386	-249.42	5923.0	4939.2	**-4939.2**
78.66664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-730.6	-248.2	17883.2	16904.3	102122.7	133830.2	120708.7	-730.631	-248.241	5916.8	4937.9	**-4937.9**
78.66664	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-730.6	-248.2	17883.2	16904.3	102122.7	133830.2	120708.7	-730.631	-248.241	5916.8	4937.9	**-4937.9**
78.9583	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-726.6	-246.9	17864.1	16890.6	102122.7	133830.2	120708.7	-726.58	-246.93	5910.0	4936.5	**-4936.5**
78.9583	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-726.5	-246.8	17863.6	16890.2	102122.7	133830.2	120708.7	-726.49	-246.836	5909.8	4936.5	**-4936.5**
79.24997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-722.2	-245.5	17843.6	16875.8	102122.7	133830.2	120708.7	-722.222	-245.484	5902.7	4935.0	**-4935.0**
79.24997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-722.2	-245.5	17843.6	16875.8	102122.7	133830.2	120708.7	-722.222	-245.484	5902.7	4935.0	**-4935.0**
79.54163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-717.5	-243.9	17821.4	16860.0	102122.7	133830.2	120708.7	-717.546	-243.903	5894.8	4933.4	**-4933.4**
79.54163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-717.5	-243.9	17821.4	16860.0	102122.7	133830.2	120708.7	-717.546	-243.903	5894.8	4933.4	**-4933.4**
79.8333	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-712.5	-242.2	17797.7	16843.0	102122.7	133830.2	120708.7	-712.546	-242.185	5886.3	4931.6	**-4931.6**
79.8333	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-712.5	-242.2	17797.7	16843.0	102122.7	133830.2	120708.7	-712.546	-242.185	5886.3	4931.6	**-4931.6**
80.12497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-707.2	-240.3	17772.4	16824.8	102122.7	133830.2	120708.7	-707.214	-240.33	5877.3	4929.8	**-4929.8**
80.12497	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-707.2	-240.3	17772.4	16824.8	102122.7	133830.2	120708.7	-707.214	-240.33	5877.3	4929.8	**-4929.8**
80.41663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-701.5	-238.3	17745.4	16805.5	102122.7	133830.2	120708.7	-701.55	-238.336	5867.7	4927.8	**-4927.8**
80.41663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-701.5	-238.3	17745.4	16805.5	102122.7	133830.2	120708.7	-701.55	-238.336	5867.7	4927.8	**-4927.8**

80.7083	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-695.5	-236.2	17716.8	16785.0	102122.7	133830.2	120708.7	-695.55	-236.206	5857.4	4925.7	**-4925.7**
80.7083	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-695.5	-236.2	17716.8	16785.0	102122.7	133830.2	120708.7	-695.55	-236.206	5857.4	4925.7	**-4925.7**
80.99997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-689.2	-233.9	17686.6	16763.4	102122.7	133830.2	120708.7	-689.216	-233.937	5846.6	4923.5	**-4923.5**
80.99997	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-689.2	-233.9	17686.6	16763.4	102122.7	133830.2	120708.7	-689.216	-233.937	5846.6	4923.5	**-4923.5**
81.29163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-682.6	-231.5	17654.7	16740.6	102122.7	133830.2	120708.7	-682.552	-231.532	5835.2	4921.1	**-4921.1**
81.29163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-682.3	-231.4	17653.5	16739.8	102122.7	133830.2	120708.7	-682.331	-231.363	5834.8	4921.1	**-4921.1**
81.5833	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-675.6	-229.0	17621.3	16716.7	102122.7	133830.2	120708.7	-675.561	-228.991	5823.3	4918.7	**-4918.7**
81.5833	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-675.6	-229.0	17621.3	16716.7	102122.7	133830.2	120708.7	-675.561	-228.991	5823.3	4918.7	**-4918.7**
81.87496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-668.3	-226.3	17586.3	16691.7	102122.7	133830.2	120708.7	-668.25	-226.315	5810.7	4916.1	**-4916.1**
81.87496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-668.3	-226.3	17586.3	16691.7	102122.7	133830.2	120708.7	-668.25	-226.315	5810.7	4916.1	**-4916.1**
82.16663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-660.6	-223.5	17549.7	16665.6	102122.7	133830.2	120708.7	-660.631	-223.506	5797.6	4913.5	**-4913.5**
82.16663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-660.6	-223.5	17549.7	16665.6	102122.7	133830.2	120708.7	-660.631	-223.506	5797.6	4913.5	**-4913.5**
82.4583	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-652.7	-220.6	17511.7	16638.4	102122.7	133830.2	120708.7	-652.714	-220.566	5784.0	4910.7	**-4910.7**
82.4583	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-652.7	-220.6	17511.7	16638.4	102122.7	133830.2	120708.7	-652.714	-220.566	5784.0	4910.7	**-4910.7**
82.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-644.5	-217.5	17472.3	16610.3	102122.7	133830.2	120708.7	-644.515	-217.498	5769.8	4907.8	**-4907.8**
82.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-644.5	-217.5	17472.3	16610.3	102122.7	133830.2	120708.7	-644.515	-217.498	5769.8	4907.8	**-4907.8**
83.04163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-636.1	-214.3	17431.6	16581.2	102122.7	133830.2	120708.7	-636.055	-214.305	5755.2	4904.8	**-4904.8**
83.04163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-636.1	-214.3	17431.6	16581.2	102122.7	133830.2	120708.7	-636.055	-214.305	5755.2	4904.8	**-4904.8**
83.3333	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-627.4	-211.0	17389.7	16551.3	102122.7	133830.2	120708.7	-627.362	-210.993	5740.1	4901.8	**-4901.8**
83.3333	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-627.4	-211.0	17389.7	16551.3	102122.7	133830.2	120708.7	-627.362	-210.993	5740.1	4901.8	**-4901.8**
83.62496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-618.5	-207.6	17346.9	16520.8	102122.7	133830.2	120708.7	-618.5	-207.583	5724.7	4898.7	**-4898.7**
83.62496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-618.0	-207.2	17344.2	16519.0	102122.7	133830.2	120708.7	-618.012	-207.218	5723.7	4898.5	**-4898.5**
83.68746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-617.0	-207.1	17339.9	16515.7	102122.7	133830.2	120708.7	-616.981	-207.136	5722.3	4898.1	**-4898.1**
83.68746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-617.0	-207.1	17339.9	16515.7	102122.7	133830.2	120708.7	-616.981	-207.136	5722.3	4898.1	**-4898.1**
83.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-614.8	-206.2	17328.9	16508.0	102122.7	133830.2	120708.7	-614.761	-206.16	5718.3	4897.3	**-4897.3**
83.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-614.8	-206.2	17328.9	16508.0	102122.7	133830.2	120708.7	-614.761	-206.16	5718.3	4897.3	**-4897.3**
83.81246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-613.0	-205.6	17320.7	16502.1	102122.7	133830.2	120708.7	-613.043	-205.56	5715.3	4896.7	**-4896.7**
83.81246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-613.0	-205.6	17320.7	16502.1	102122.7	133830.2	120708.7	-613.043	-205.56	5715.3	4896.7	**-4896.7**
83.87496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-610.8	-204.6	17309.7	16494.3	102122.7	133830.2	120708.7	-610.818	-204.565	5711.3	4895.9	**-4895.9**
83.87496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-610.8	-204.6	17309.7	16494.3	102122.7	133830.2	120708.7	-610.818	-204.565	5711.3	4895.9	**-4895.9**
83.93746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-608.5	-203.5	17298.1	16486.1	102122.7	133830.2	120708.7	-608.515	-203.452	5707.1	4895.1	**-4895.1**
83.93746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-608.5	-203.5	17298.1	16486.1	102122.7	133830.2	120708.7	-608.515	-203.452	5707.1	4895.1	**-4895.1**
83.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-606.5	-202.7	17288.5	16479.3	102122.7	133830.2	120708.7	-606.536	-202.672	5703.6	4894.4	**-4894.4**
83.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-606.5	-202.7	17288.5	16479.3	102122.7	133830.2	120708.7	-606.536	-202.672	5703.6	4894.4	**-4894.4**
84.06246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-604.6	-201.9	17278.9	16472.4	102122.7	133830.2	120708.7	-604.552	-201.892	5700.2	4893.7	**-4893.7**
84.06246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-604.6	-201.9	17278.9	16472.4	102122.7	133830.2	120708.7	-604.552	-201.892	5700.2	4893.7	**-4893.7**
84.12496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-602.6	-201.1	17269.3	16465.6	102122.7	133830.2	120708.7	-602.564	-201.111	5696.7	4893.0	**-4893.0**
84.12496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-610.8	-204.1	17308.8	16493.9	102122.7	133830.2	120708.7	-610.826	-204.126	5710.9	4895.9	**-4895.9**
84.43746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-595.8	-199.5	17238.7	16443.4	102122.7	133830.2	120708.7	-595.827	-199.47	5686.0	4890.7	**-4890.7**
84.43746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-595.8	-199.5	17238.7	16443.4	102122.7	133830.2	120708.7	-595.827	-199.47	5686.0	4890.7	**-4890.7**
84.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-580.8	-194.6	17168.0	16392.6	102122.7	133830.2	120708.7	-580.81	-194.566	5660.9	4885.5	**-4885.5**
84.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-580.8	-194.6	17168.0	16392.6	102122.7	133830.2	120708.7	-580.81	-194.566	5660.9	4885.5	**-4885.5**
85.06246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-565.5	-189.4	17095.5	16340.6	102122.7	133830.2	120708.7	-565.461	-189.444	5635.1	4880.2	**-4880.2**
85.06246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-565.5	-189.4	17095.5	16340.6	102122.7	133830.2	120708.7	-565.461	-189.444	5635.1	4880.2	**-4880.2**
85.37496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-549.8	-184.2	17021.6	16287.6	102122.7	133830.2	120708.7	-549.836	-184.171	5608.8	4874.8	**-4874.8**
85.37496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-549.8	-184.2	17021.6	16287.6	102122.7	133830.2	120708.7	-549.836	-184.171	5608.8	4874.8	**-4874.8**
85.68746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-533.9	-178.7	16946.1	16233.4	102122.7	133830.2	120708.7	-533.899	-178.746	5581.9	4869.3	**-4869.3**
85.68746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-533.9	-178.7	16946.1	16233.4	102122.7	133830.2	120708.7	-533.899	-178.746	5581.9	4869.3	**-4869.3**
85.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-517.6	-173.2	16868.9	16178.1	102122.7	133830.2	120708.7	-517.624	-173.167	5554.4	4863.6	**-4863.6**
85.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-517.6	-173.2	16868.9	16178.1	102122.7	133830.2	120708.7	-517.624	-173.167	5554.4	4863.6	**-4863.6**
86.31246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-501.0	-167.4	16790.0	16121.6	102122.7	133830.2	120708.7	-500.991	-167.434	5526.2	4857.8	**-4857.8**
86.31246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-501.0	-167.4	16790.0	16121.6	102122.7	133830.2	120708.7	-500.991	-167.434	5526.2	4857.8	**-4857.8**
86.62496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-484.0	-161.5	16709.2	16063.7	102122.7	133830.2	120708.7	-483.984	-161.544	5497.4	4851.9	**-4851.9**
86.62496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-483.6	-161.2	16706.8	16062.0	102122.7	133830.2	120708.7	-483.561	-161.187	5496.5	4851.7	**-4851.7**
86.93746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-466.6	-155.5	16626.6	16004.5	102122.7	133830.2	120708.7	-466.588	-155.495	5467.9	4845.8	**-4845.8**
86.93746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-466.6	-155.5	16626.6	16004.5	102122.7	133830.2	120708.7	-466.588	-155.495	5467.9	4845.8	**-4845.8**
87.24996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-448.8	-149.3	16542.0	15943.9	102122.7	133830.2	120708.7	-448.792	-149.286	5437.7	4839.6	**-4839.6**
87.24996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-448.8	-149.3	16542.0	15943.9	102122.7	133830.2	120708.7	-448.792	-149.286	5437.7	4839.6	**-4839.6**
87.56246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-430.6	-142.9	16455.4	15881.9	102122.7	133830.2	120708.7	-430.589	-142.917	5406.8	4833.3	**-4833.3**
87.56246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-430.6	-142.9	16455.4	15881.9	102122.7	133830.2	120708.7	-430.589	-142.917	5406.8	4833.3	**-4833.3**
87.87496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-412.0	-136.4	16366.8	15818.4	102122.7	133830.2	120708.7	-411.975	-136.387	5375.2	4826.8	**-4826.8**
87.87496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-412.0	-136.4	16366.8	15818.4	102122.7	133830.2	120708.7	-411.975	-136.387	5375.2	4826.8	**-4826.8**
88.18746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-392.9	-129.7	16276.2	15753.6	102122.7	133830.2	120708.7	-392.945	-129.694	5342.8	4820.2	**-4820.2**
88.18746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-392.9	-129.7	16276.2	15753.6	102122.7	133830.2	120708.7	-392.945	-129.694	5342.8	4820.2	**-4820.2**

88.49996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-373.5	-122.8	16183.6	15687.3	102122.7	133830.2	120708.7	-373.5	-122.84	5309.7	4813.4	**-4813.4**
88.49996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-373.5	-122.8	16183.6	15687.3	102122.7	133830.2	120708.7	-373.5	-122.84	5309.7	4813.4	**-4813.4**
88.81246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-353.6	-115.8	16089.0	15619.6	102122.7	133830.2	120708.7	-353.641	-115.826	5275.9	4806.4	**-4806.4**
88.81246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-353.6	-115.8	16089.0	15619.6	102122.7	133830.2	120708.7	-353.641	-115.826	5275.9	4806.4	**-4806.4**
89.12496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-333.4	-108.7	15992.5	15550.4	102122.7	133830.2	120708.7	-333.373	-108.651	5241.4	4799.4	**-4799.4**
89.12496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-332.8	-108.2	15989.3	15548.3	102122.7	133830.2	120708.7	-332.81	-108.217	5240.2	4799.2	**-4799.2**
89.43746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-312.7	-101.3	15894.0	15479.9	102122.7	133830.2	120708.7	-312.703	-101.318	5206.2	4792.2	**-4792.2**
89.43746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-312.7	-101.3	15894.0	15479.9	102122.7	133830.2	120708.7	-312.703	-101.318	5206.2	4792.2	**-4792.2**
89.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-291.6	-93.8	15793.5	15408.1	102122.7	133830.2	120708.7	-291.639	-93.8278	5170.3	4784.8	**-4784.8**
89.74996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-291.6	-93.8	15793.5	15408.1	102122.7	133830.2	120708.7	-291.639	-93.8278	5170.3	4784.8	**-4784.8**
90.06246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-270.2	-86.2	15691.2	15334.9	102122.7	133830.2	120708.7	-270.193	-86.1834	5133.7	4777.3	**-4777.3**
90.06246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-270.2	-86.2	15691.2	15334.9	102122.7	133830.2	120708.7	-270.193	-86.1834	5133.7	4777.3	**-4777.3**
90.37496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-248.4	-78.4	15587.1	15260.4	102122.7	133830.2	120708.7	-248.379	-78.3868	5096.5	4769.7	**-4769.7**
90.37496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-248.4	-78.4	15587.1	15260.4	102122.7	133830.2	120708.7	-248.379	-78.3868	5096.5	4769.7	**-4769.7**
90.68746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-226.2	-70.4	15481.3	15184.7	102122.7	133830.2	120708.7	-226.21	-70.4402	5058.6	4761.9	**-4761.9**
90.68746	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-226.2	-70.4	15481.3	15184.7	102122.7	133830.2	120708.7	-226.21	-70.4402	5058.6	4761.9	**-4761.9**
90.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-203.7	-62.3	15373.8	15107.8	102122.7	133830.2	120708.7	-203.703	-62.3446	5020.1	4754.1	**-4754.1**
90.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-203.7	-62.3	15373.8	15107.8	102122.7	133830.2	120708.7	-203.703	-62.3446	5020.1	4754.1	**-4754.1**
91.31246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-180.9	-54.1	15264.9	15029.9	102122.7	133830.2	120708.7	-180.93	-54.0965	4981.1	4746.1	**-4746.1**
91.31246	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-180.9	-54.1	15264.9	15029.9	102122.7	133830.2	120708.7	-180.93	-54.0965	4981.1	4746.1	**-4746.1**
91.62496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-157.7	-45.4	15153.5	14950.3	102122.7	133830.2	120708.7	-157.746	-45.4172	4941.1	4738.0	**-4738.0**
91.62496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-166.7	-49.0	15197.0	14981.2	102122.7	133830.2	120708.7	-166.669	-49.0456	4956.9	4741.1	**-4741.1**
91.91663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-140.9	-40.6	15075.5	14894.0	102122.7	133830.2	120708.7	-140.89	-40.6076	4913.7	4732.2	**-4732.2**
91.91663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-140.9	-40.6	15075.5	14894.0	102122.7	133830.2	120708.7	-140.89	-40.6076	4913.7	4732.2	**-4732.2**
92.20829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-115.5	-32.0	14955.1	14807.7	102122.7	133830.2	120708.7	-115.454	-31.9889	4870.8	4723.4	**-4723.4**
92.20829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-115.5	-32.0	14955.1	14807.7	102122.7	133830.2	120708.7	-115.454	-31.9889	4870.8	4723.4	**-4723.4**
92.49996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-89.5	-23.1	14831.9	14719.4	102122.7	133830.2	120708.7	-89.4642	-23.0938	4826.9	4714.3	**-4714.3**
92.49996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-89.5	-23.1	14831.9	14719.4	102122.7	133830.2	120708.7	-89.4642	-23.0938	4826.9	4714.3	**-4714.3**
92.79163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-63.2	-14.1	14707.4	14630.1	102122.7	133830.2	120708.7	-63.2034	-14.0715	4782.5	4705.2	**-4705.2**
92.79163	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-63.2	-14.1	14707.4	14630.1	102122.7	133830.2	120708.7	-63.2034	-14.0715	4782.5	4705.2	**-4705.2**
93.08329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-36.6	-4.9	14581.3	14539.8	102122.7	133830.2	120708.7	-36.6473	-4.91971	4737.5	4696.0	**-4696.0**
93.08329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-36.6	-4.9	14581.3	14539.8	102122.7	133830.2	120708.7	-36.6473	-4.91971	4737.5	4696.0	**-4696.0**
93.37496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-9.8	4.4	14453.8	14448.4	102122.7	133830.2	120708.7	-9.77933	4.363785	4692.0	4686.6	**-4686.6**
93.37496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-9.8	4.4	14453.8	14448.4	102122.7	133830.2	120708.7	-9.77933	4.363785	4692.0	4686.6	**-4686.6**
93.66663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	17.4	13.8	14324.7	14355.9	102122.7	133830.2	120708.7	17.41514	13.78123	4646.0	4677.2	**-4677.2**
93.66663	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	17.4	13.8	14324.7	14355.9	102122.7	133830.2	120708.7	17.41514	13.78123	4646.0	4677.2	**-4677.2**
93.95829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	44.9	23.3	14193.9	14262.1	102122.7	133830.2	120708.7	44.94894	23.33476	4599.3	4667.6	**-4667.6**
93.95829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	45.8	24.0	14189.1	14258.9	102122.7	133830.2	120708.7	45.7928	23.98915	4597.5	4667.2	**-4667.2**
94.24996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	72.8	33.0	14061.4	14167.2	102122.7	133830.2	120708.7	72.83309	33.02629	4552.0	4657.9	**-4657.9**
94.24996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	72.8	33.0	14061.4	14167.2	102122.7	133830.2	120708.7	72.83309	33.02629	4552.0	4657.9	**-4657.9**
94.54162	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	101.1	42.9	13927.1	14071.1	102122.7	133830.2	120708.7	101.0767	42.85742	4504.1	4648.0	**-4648.0**
94.54162	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	101.1	42.9	13927.1	14071.1	102122.7	133830.2	120708.7	101.0767	42.85742	4504.1	4648.0	**-4648.0**
94.83329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	129.7	52.8	13791.1	13973.7	102122.7	133830.2	120708.7	129.6873	52.82951	4455.5	4638.0	**-4638.0**
94.83329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	129.7	52.8	13791.1	13973.7	102122.7	133830.2	120708.7	129.6873	52.82951	4455.5	4638.0	**-4638.0**
95.12496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	158.7	62.9	13653.3	13875.0	102122.7	133830.2	120708.7	158.6705	62.94359	4406.3	4628.0	**-4628.0**
95.12496	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	158.7	62.9	13653.3	13875.0	102122.7	133830.2	120708.7	158.6705	62.94359	4406.3	4628.0	**-4628.0**
95.41662	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	188.0	73.2	13513.7	13775.0	102122.7	133830.2	120708.7	188.0302	73.2004	4356.5	4617.7	**-4617.7**
95.41662	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	188.0	73.2	13513.7	13775.0	102122.7	133830.2	120708.7	188.0302	73.2004	4356.5	4617.7	**-4617.7**
95.70829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	217.8	83.6	13372.3	13673.7	102122.7	133830.2	120708.7	217.7691	83.60041	4306.0	4607.4	**-4607.4**
95.70829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	217.8	83.6	13372.3	13673.7	102122.7	133830.2	120708.7	217.7691	83.60041	4306.0	4607.4	**-4607.4**
95.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	247.9	94.1	13229.0	13571.1	102122.7	133830.2	120708.7	247.8882	94.14374	4254.8	4596.9	**-4596.9**
95.99996	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	247.9	94.1	13229.0	13571.1	102122.7	133830.2	120708.7	247.8882	94.14374	4254.8	4596.9	**-4596.9**
96.29162	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	278.4	104.8	13083.9	13467.2	102122.7	133830.2	120708.7	278.3872	104.8302	4203.0	4586.2	**-4586.2**
96.29162	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	279.4	105.6	13078.4	13463.4	102122.7	133830.2	120708.7	279.3792	105.5618	4200.9	4585.8	**-4585.8**
96.58329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	309.3	115.7	12937.0	13362.0	102122.7	133830.2	120708.7	309.2645	115.6594	4150.5	4575.5	**-4575.5**
96.58329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	309.3	115.7	12937.0	13362.0	102122.7	133830.2	120708.7	309.2645	115.6594	4150.5	4575.5	**-4575.5**
96.87495	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	340.5	126.6	12788.3	13255.5	102122.7	133830.2	120708.7	340.5169	126.6302	4097.4	4564.6	**-4564.6**
96.87495	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	340.5	126.6	12788.3	13255.5	102122.7	133830.2	120708.7	340.5169	126.6302	4097.4	4564.6	**-4564.6**
97.16662	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	372.1	137.7	12637.8	13147.7	102122.7	133830.2	120708.7	372.1401	137.7414	4043.7	4553.5	**-4553.5**
97.16662	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	372.1	137.7	12637.8	13147.7	102122.7	133830.2	120708.7	372.1401	137.7414	4043.7	4553.5	**-4553.5**
97.45829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	404.1	149.0	12485.5	13038.7	102122.7	133830.2	120708.7	404.1283	148.9909	3989.3	4542.4	**-4542.4**
97.45829	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	404.1	149.0	12485.5	13038.7	102122.7	133830.2	120708.7	404.1283	148.9909	3989.3	4542.4	**-4542.4**
97.74995	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	436.5	160.4	12331.6	12928.4	102122.7	133830.2	120708.7	436.4746	160.3757	3934.3	4531.1	**-4531.1**
97.74995	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	436.5	160.4	12331.6	12928.4	102122.7	133830.2	120708.7	436.4746	160.3757	3934.3	4531.1	**-4531.1**

98.04162	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	469.2	171.9	12175.9	12817.0	102122.7	133830.2	120708.7	469.17	171.891	3878.6	4519.7	**-4519.7**
98.04162	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	469.2	171.9	12175.9	12817.0	102122.7	133830.2	120708.7	469.17	171.891	3878.6	4519.7	**-4519.7**
98.33329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	502.2	183.5	12018.7	12704.4	102122.7	133830.2	120708.7	502.1902	183.5206	3822.5	4508.2	**-4508.2**
98.33329	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	502.2	183.5	12018.7	12704.4	102122.7	133830.2	120708.7	502.1902	183.5206	3822.5	4508.2	**-4508.2**
98.62495	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	535.4	195.2	11860.4	12591.0	102122.7	133830.2	120708.7	535.4462	195.2201	3765.9	4496.6	**-4496.6**
98.62495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	537.2	196.5	17198.2	17931.9	122736.8	158516.8	144852.5	537.2088	196.4793	4639.3	5372.9	**-5372.9**
98.68745	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	541.2	196.8	17178.7	17916.7	122736.8	158516.8	144852.5	541.2225	196.7572	4633.8	5371.8	**-5371.8**
98.68745	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	541.2	196.8	17178.7	17916.7	122736.8	158516.8	144852.5	541.2225	196.7572	4633.8	5371.8	**-5371.8**
98.74995	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	549.4	200.0	17133.0	17882.5	122736.8	158516.8	144852.5	549.4442	200.0423	4619.6	5369.0	**-5369.0**
98.74995	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	549.4	200.0	17133.0	17882.5	122736.8	158516.8	144852.5	549.4442	200.0423	4619.6	5369.0	**-5369.0**
98.81245	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	555.9	202.0	17098.5	17856.4	122736.8	158516.8	144852.5	555.8673	202.0483	4609.1	5367.0	**-5367.0**
98.81245	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	555.9	202.0	17098.5	17856.4	122736.8	158516.8	144852.5	555.8673	202.0483	4609.1	5367.0	**-5367.0**
98.87495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	564.1	205.3	17052.8	17822.2	122736.8	158516.8	144852.5	564.0735	205.3499	4594.9	5364.3	**-5364.3**
98.87495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	564.1	205.3	17052.8	17822.2	122736.8	158516.8	144852.5	564.0735	205.3499	4594.9	5364.3	**-5364.3**
98.93745	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	572.5	209.0	17005.5	17786.9	122736.8	158516.8	144852.5	572.477	208.9515	4580.1	5361.5	**-5361.5**
98.93745	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	572.5	209.0	17005.5	17786.9	122736.8	158516.8	144852.5	572.477	208.9515	4580.1	5361.5	**-5361.5**
98.99995	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	579.7	211.5	16966.3	17757.4	122736.8	158516.8	144852.5	579.6562	211.4695	4568.0	5359.2	**-5359.2**
98.99995	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	579.7	211.5	16966.3	17757.4	122736.8	158516.8	144852.5	579.6562	211.4695	4568.0	5359.2	**-5359.2**
99.06245	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	586.8	214.0	16927.1	17727.9	122736.8	158516.8	144852.5	586.8406	213.9876	4556.0	5356.8	**-5356.8**
99.06245	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	586.8	214.0	16927.1	17727.9	122736.8	158516.8	144852.5	586.8406	213.9876	4556.0	5356.8	**-5356.8**
99.12495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	594.0	216.5	16887.9	17698.4	122736.8	158516.8	144852.5	594.0302	216.5056	4544.0	5354.5	**-5354.5**
99.12495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	574.1	209.8	16995.9	17779.9	122736.8	158516.8	144852.5	574.1041	209.8347	4577.0	5360.9	**-5360.9**
99.43745	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	615.1	223.1	16774.6	17612.8	122736.8	158516.8	144852.5	615.0887	223.1386	4509.5	5347.7	**-5347.7**
99.43745	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	615.1	223.1	16774.6	17612.8	122736.8	158516.8	144852.5	615.0887	223.1386	4509.5	5347.7	**-5347.7**
99.62495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	638.5	231.6	16646.4	17516.5	122736.8	158516.8	144852.5	638.4779	231.5936	4470.0	5340.1	**-5340.1**
99.62495	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	638.5	231.6	16646.4	17516.5	122736.8	158516.8	144852.5	638.4779	231.5936	4470.0	5340.1	**-5340.1**
99.74995	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	655.2	236.8	16556.6	17448.6	122736.8	158516.8	144852.5	655.1966	236.7935	4442.8	5334.7	**-5334.7**
99.74995	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	655.2	236.8	16556.6	17448.6	122736.8	158516.8	144852.5	655.1966	236.7935	4442.8	5334.7	**-5334.7**
100.0625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	696.2	250.8	16333.6	17280.6	122736.8	158516.8	144852.5	696.2456	250.763	4374.5	5321.5	**-5321.5**
100.0625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	696.2	250.8	16333.6	17280.6	122736.8	158516.8	144852.5	696.2456	250.763	4374.5	5321.5	**-5321.5**
100.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	737.8	264.9	16107.8	17110.5	122736.8	158516.8	144852.5	737.7931	264.8773	4305.4	5308.0	**-5308.0**
100.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	737.8	264.9	16107.8	17110.5	122736.8	158516.8	144852.5	737.7931	264.8773	4305.4	5308.0	**-5308.0**
100.6875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	779.9	279.1	15879.3	16938.3	122736.8	158516.8	144852.5	779.866	279.1407	4235.4	5294.4	**-5294.4**
100.6875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	779.9	279.1	15879.3	16938.3	122736.8	158516.8	144852.5	779.866	279.1407	4235.4	5294.4	**-5294.4**
101	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	822.5	293.6	15647.9	16763.9	122736.8	158516.8	144852.5	822.4861	293.5563	4164.6	5280.6	**-5280.6**
101	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	822.5	293.6	15647.9	16763.9	122736.8	158516.8	144852.5	822.4861	293.5563	4164.6	5280.6	**-5280.6**
101.3125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	865.7	308.1	15413.5	16587.3	122736.8	158516.8	144852.5	865.6734	308.1272	4092.9	5266.7	**-5266.7**
101.3125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	865.7	308.1	15413.5	16587.3	122736.8	158516.8	144852.5	865.6734	308.1272	4092.9	5266.7	**-5266.7**
101.625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	909.4	322.9	15175.9	16408.2	122736.8	158516.8	144852.5	909.4457	322.8557	4020.2	5252.5	**-5252.5**
101.625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	910.8	323.7	15167.9	16402.4	122736.8	158516.8	144852.5	910.7548	323.7406	4017.6	5252.0	**-5252.0**
101.9375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	953.8	337.7	14935.3	16226.8	122736.8	158516.8	144852.5	953.8183	337.7435	3946.6	5238.2	**-5238.2**
101.9375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	953.8	337.7	14935.3	16226.8	122736.8	158516.8	144852.5	953.8183	337.7435	3946.6	5238.2	**-5238.2**
102.25	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	998.8	352.8	14691.4	16043.0	122736.8	158516.8	144852.5	998.8034	352.7917	3872.0	5223.6	**-5223.6**
102.25	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	998.8	352.8	14691.4	16043.0	122736.8	158516.8	144852.5	998.8034	352.7917	3872.0	5223.6	**-5223.6**
102.5625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1044.4	368.0	14444.2	15856.6	122736.8	158516.8	144852.5	1044.411	368.001	3796.5	5208.9	**-5208.9**
102.5625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1044.4	368.0	14444.2	15856.6	122736.8	158516.8	144852.5	1044.411	368.001	3796.5	5208.9	**-5208.9**
102.875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1090.6	383.4	14193.7	15667.8	122736.8	158516.8	144852.5	1090.647	383.3716	3720.0	5194.0	**-5194.0**
102.875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1090.6	383.4	14193.7	15667.8	122736.8	158516.8	144852.5	1090.647	383.3716	3720.0	5194.0	**-5194.0**
103.1875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1137.5	398.9	13940.0	15476.4	122736.8	158516.8	144852.5	1137.516	398.9032	3642.4	5178.9	**-5178.9**
103.1875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1137.5	398.9	13940.0	15476.4	122736.8	158516.8	144852.5	1137.516	398.9032	3642.4	5178.9	**-5178.9**
103.5	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1185.0	414.6	13682.8	15282.4	122736.8	158516.8	144852.5	1185.02	414.595	3563.9	5163.5	**-5163.5**
103.5	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1185.0	414.6	13682.8	15282.4	122736.8	158516.8	144852.5	1185.02	414.595	3563.9	5163.5	**-5163.5**
103.8125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1233.2	430.4	13422.4	15086.0	122736.8	158516.8	144852.5	1233.159	430.4458	3484.4	5148.0	**-5148.0**
103.8125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1233.2	430.4	13422.4	15086.0	122736.8	158516.8	144852.5	1233.159	430.4458	3484.4	5148.0	**-5148.0**
104.125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1281.9	446.5	13158.6	14887.0	122736.8	158516.8	144852.5	1281.928	446.4536	3403.9	5132.3	**-5132.3**
104.125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1283.5	447.4	13149.3	14880.2	122736.8	158516.8	144852.5	1283.475	447.4147	3400.8	5131.7	**-5131.7**
104.4375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1331.3	462.6	12891.6	14685.6	122736.8	158516.8	144852.5	1331.325	462.6153	3322.4	5116.3	**-5116.3**
104.4375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1331.3	462.6	12891.6	14685.6	122736.8	158516.8	144852.5	1331.325	462.6153	3322.4	5116.3	**-5116.3**
104.75	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1381.3	478.9	12621.4	14481.6	122736.8	158516.8	144852.5	1381.34	478.9269	3240.0	5100.2	**-5100.2**
104.75	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1381.3	478.9	12621.4	14481.6	122736.8	158516.8	144852.5	1381.34	478.9269	3240.0	5100.2	**-5100.2**
105.0625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1432.0	495.4	12347.9	14275.3	122736.8	158516.8	144852.5	1431.966	495.3818	3156.6	5083.9	**-5083.9**
105.0625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1432.0	495.4	12347.9	14275.3	122736.8	158516.8	144852.5	1431.966	495.3818	3156.6	5083.9	**-5083.9**
105.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1483.2	512.0	12071.4	14066.5	122736.8	158516.8	144852.5	1483.197	511.9705	3072.2	5067.4	**-5067.4**
105.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1483.2	512.0	12071.4	14066.5	122736.8	158516.8	144852.5	1483.197	511.9705	3072.2	5067.4	**-5067.4**

105.6875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1535.0	528.7	11791.7	13855.4	122736.8	158516.8	144852.5	1535.031	528.6773	2987.0	5050.7	**-5050.7**
105.6875	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1535.0	528.7	11791.7	13855.4	122736.8	158516.8	144852.5	1535.031	528.6773	2987.0	5050.7	**-5050.7**
106	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1587.5	545.5	11509.0	13642.0	122736.8	158516.8	144852.5	1587.481	545.4645	2900.9	5033.9	**-5033.9**
106	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1587.5	545.5	11509.0	13642.0	122736.8	158516.8	144852.5	1587.481	545.4645	2900.9	5033.9	**-5033.9**
106.3125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1640.4	562.2	11224.2	13426.8	122736.8	158516.8	144852.5	1640.41	562.1998	2814.2	5016.8	**-5016.8**
106.3125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1640.4	562.2	11224.2	13426.8	122736.8	158516.8	144852.5	1640.41	562.1998	2814.2	5016.8	**-5016.8**
106.625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1693.8	580.0	10934.9	13208.7	122736.8	158516.8	144852.5	1693.767	580.0222	2725.8	4999.6	**-4999.6**
106.625	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1691.6	579.3	10946.8	13217.6	122736.8	158516.8	144852.5	1691.603	579.268	2729.4	5000.3	**-5000.3**
106.9166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1643.3	563.1	11208.7	13415.1	122736.8	158516.8	144852.5	1643.304	563.0782	2809.5	5015.9	**-5015.9**
106.9166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1643.3	563.1	11208.7	13415.1	122736.8	158516.8	144852.5	1643.304	563.0782	2809.5	5015.9	**-5015.9**
107.2083	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1595.4	548.0	11466.4	13609.8	122736.8	158516.8	144852.5	1595.398	547.9752	2887.9	5031.3	**-5031.3**
107.2083	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1595.4	548.0	11466.4	13609.8	122736.8	158516.8	144852.5	1595.398	547.9752	2887.9	5031.3	**-5031.3**
107.5	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1547.0	532.3	11727.8	13807.1	122736.8	158516.8	144852.5	1546.983	532.2863	2967.6	5046.9	**-5046.9**
107.5	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1547.0	532.3	11727.8	13807.1	122736.8	158516.8	144852.5	1546.983	532.2863	2967.6	5046.9	**-5046.9**
107.7916	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1499.1	516.7	11986.6	14002.3	122736.8	158516.8	144852.5	1499.092	516.658	3046.6	5062.3	**-5062.3**
107.7916	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1499.1	516.7	11986.6	14002.3	122736.8	158516.8	144852.5	1499.092	516.658	3046.6	5062.3	**-5062.3**
108.0833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1451.7	501.1	12242.7	14195.6	122736.8	158516.8	144852.5	1451.721	501.1261	3124.8	5077.6	**-5077.6**
108.0833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1451.7	501.1	12242.7	14195.6	122736.8	158516.8	144852.5	1451.721	501.1261	3124.8	5077.6	**-5077.6**
108.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1404.9	485.7	12496.2	14386.8	122736.8	158516.8	144852.5	1404.872	485.7066	3202.1	5092.7	**-5092.7**
108.375	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1404.9	485.7	12496.2	14386.8	122736.8	158516.8	144852.5	1404.872	485.7066	3202.1	5092.7	**-5092.7**
108.6666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1358.6	470.4	12746.9	14575.8	122736.8	158516.8	144852.5	1358.552	470.409	3278.7	5107.7	**-5107.7**
108.6666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1358.6	470.4	12746.9	14575.8	122736.8	158516.8	144852.5	1358.552	470.409	3278.7	5107.7	**-5107.7**
108.9583	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1312.8	455.2	12994.8	14762.8	122736.8	158516.8	144852.5	1312.768	455.2398	3354.4	5122.4	**-5122.4**
108.9583	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1311.1	454.2	13004.9	14770.2	122736.8	158516.8	144852.5	1311.093	454.2135	3357.7	5123.0	**-5123.0**
109.25	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1267.5	440.2	13239.9	14947.6	122736.8	158516.8	144852.5	1267.527	440.2033	3429.3	5137.1	**-5137.1**
109.25	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1267.5	440.2	13239.9	14947.6	122736.8	158516.8	144852.5	1267.527	440.2033	3429.3	5137.1	**-5137.1**
109.5416	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1222.8	425.3	13482.1	15130.2	122736.8	158516.8	144852.5	1222.836	425.3026	3503.4	5151.5	**-5151.5**
109.5416	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1222.8	425.3	13482.1	15130.2	122736.8	158516.8	144852.5	1222.836	425.3026	3503.4	5151.5	**-5151.5**
109.8333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1178.7	410.5	13721.3	15310.6	122736.8	158516.8	144852.5	1178.699	410.5399	3576.5	5165.7	**-5165.7**
109.8333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1178.7	410.5	13721.3	15310.6	122736.8	158516.8	144852.5	1178.699	410.5399	3576.5	5165.7	**-5165.7**
110.125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1135.1	395.9	13957.7	15488.8	122736.8	158516.8	144852.5	1135.12	395.9168	3648.8	5179.8	**-5179.8**
110.125	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1135.1	395.9	13957.7	15488.8	122736.8	158516.8	144852.5	1135.12	395.9168	3648.8	5179.8	**-5179.8**
110.4166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1092.1	381.4	14191.2	15664.7	122736.8	158516.8	144852.5	1092.1	381.4344	3720.2	5193.7	**-5193.7**
110.4166	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1092.1	381.4	14191.2	15664.7	122736.8	158516.8	144852.5	1092.1	381.4344	3720.2	5193.7	**-5193.7**
110.7083	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1049.6	367.1	14421.7	15838.4	122736.8	158516.8	144852.5	1049.639	367.0935	3790.7	5207.5	**-5207.5**
110.7083	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1049.6	367.1	14421.7	15838.4	122736.8	158516.8	144852.5	1049.639	367.0935	3790.7	5207.5	**-5207.5**
111	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1007.7	352.9	14649.3	16009.9	122736.8	158516.8	144852.5	1007.735	352.8945	3860.4	5221.0	**-5221.0**
111	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	1007.7	352.9	14649.3	16009.9	122736.8	158516.8	144852.5	1007.735	352.8945	3860.4	5221.0	**-5221.0**
111.2916	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	966.4	338.8	14873.9	16179.2	122736.8	158516.8	144852.5	966.385	338.8376	3929.2	5234.4	**-5234.4**
111.2916	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	965.0	337.9	14882.7	16185.6	122736.8	158516.8	144852.5	964.9504	337.8872	3932.1	5234.9	**-5234.9**
111.5833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	925.6	324.9	15095.7	16346.2	122736.8	158516.8	144852.5	925.5834	324.9224	3997.1	5247.6	**-5247.6**
111.5833	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	925.6	324.9	15095.7	16346.2	122736.8	158516.8	144852.5	925.5834	324.9224	3997.1	5247.6	**-5247.6**
111.8749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	885.3	311.1	15314.7	16511.2	122736.8	158516.8	144852.5	885.3238	311.1488	4064.2	5260.6	**-5260.6**
111.8749	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	885.3	311.1	15314.7	16511.2	122736.8	158516.8	144852.5	885.3238	311.1488	4064.2	5260.6	**-5260.6**
112.1666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	845.6	297.5	15530.8	16673.9	122736.8	158516.8	144852.5	845.5977	297.516	4130.4	5273.5	**-5273.5**
112.1666	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	845.6	297.5	15530.8	16673.9	122736.8	158516.8	144852.5	845.5977	297.516	4130.4	5273.5	**-5273.5**
112.4583	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	806.4	284.0	15744.2	16834.6	122736.8	158516.8	144852.5	806.3951	284.0237	4195.8	5286.2	**-5286.2**
112.4583	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	806.4	284.0	15744.2	16834.6	122736.8	158516.8	144852.5	806.3951	284.0237	4195.8	5286.2	**-5286.2**
112.7499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	767.7	270.7	15954.9	16993.2	122736.8	158516.8	144852.5	767.7056	270.6717	4260.4	5298.8	**-5298.8**
112.7499	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	767.7	270.7	15954.9	16993.2	122736.8	158516.8	144852.5	767.7056	270.6717	4260.4	5298.8	**-5298.8**
113.0416	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	729.5	257.5	16162.8	17149.8	122736.8	158516.8	144852.5	729.5203	257.462	4324.1	5311.1	**-5311.1**
113.0416	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	729.5	257.5	16162.8	17149.8	122736.8	158516.8	144852.5	729.5203	257.462	4324.1	5311.1	**-5311.1**
113.3333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	691.8	244.4	16368.1	17304.3	122736.8	158516.8	144852.5	691.8481	244.4096	4387.1	5323.3	**-5323.3**
113.3333	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	691.8	244.4	16368.1	17304.3	122736.8	158516.8	144852.5	691.8481	244.4096	4387.1	5323.3	**-5323.3**
113.6249	VA-01 TRAMO1	122736.8	122736.8	3500	3500	4295.8	4295.8	**4295.8**	122736.8	575641.7	263179.0	654.8	231.6	16570.1	17456.4	122736.8	158516.8	144852.5	654.7587	231.572	4449.0	5335.4	**-5335.4**
113.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	651.9	229.5	11319.5	12201.0	102122.7	133830.2	120708.7	651.9474	229.5495	3575.2	4456.7	**-4456.7**
113.7499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	642.3	228.5	11360.8	12231.5	102122.7	133830.2	120708.7	642.2741	228.4578	3589.1	4459.8	**-4459.8**
113.7499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	642.3	228.5	11360.8	12231.5	102122.7	133830.2	120708.7	642.2741	228.4578	3589.1	4459.8	**-4459.8**
113.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	624.4	221.5	11447.2	12293.1	102122.7	133830.2	120708.7	624.4308	221.4653	3620.2	4466.1	**-4466.1**
113.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	624.4	221.5	11447.2	12293.1	102122.7	133830.2	120708.7	624.4308	221.4653	3620.2	4466.1	**-4466.1**
113.9999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	610.5	217.2	11512.2	12339.9	102122.7	133830.2	120708.7	610.4891	217.2495	3643.2	4470.9	**-4470.9**
113.9999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	610.5	217.2	11512.2	12339.9	102122.7	133830.2	120708.7	610.4891	217.2495	3643.2	4470.9	**-4470.9**
114.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	592.9	210.4	11597.3	12400.6	102122.7	133830.2	120708.7	592.9059	210.3586	3673.8	4477.1	**-4477.1**
114.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	592.9	210.4	11597.3	12400.6	102122.7	133830.2	120708.7	592.9059	210.3586	3673.8	4477.1	**-4477.1**

114.2499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	579.1	206.2	11661.7	12447.0	102122.7	133830.2	120708.7	579.0862	206.1738	3696.6	4481.8	**-4481.8**
114.2499	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	579.1	206.2	11661.7	12447.0	102122.7	133830.2	120708.7	579.0862	206.1738	3696.6	4481.8	**-4481.8**
114.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	561.6	199.3	11746.2	12507.2	102122.7	133830.2	120708.7	561.6439	199.3049	3727.1	4488.0	**-4488.0**
114.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	561.6	199.3	11746.2	12507.2	102122.7	133830.2	120708.7	561.6439	199.3049	3727.1	4488.0	**-4488.0**
114.4999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	543.8	192.3	11832.8	12568.9	102122.7	133830.2	120708.7	543.7594	192.3355	3758.2	4494.3	**-4494.3**
114.4999	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	543.8	192.3	11832.8	12568.9	102122.7	133830.2	120708.7	543.7594	192.3355	3758.2	4494.3	**-4494.3**
114.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	528.0	187.2	11906.9	12622.1	102122.7	133830.2	120708.7	528.0382	187.1648	3784.6	4499.8	**-4499.8**
114.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	550.8	194.7	11799.2	12544.8	102122.7	133830.2	120708.7	550.8393	194.7458	3746.3	4491.9	**-4491.9**
114.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	523.6	185.0	11929.2	12637.8	102122.7	133830.2	120708.7	523.5881	185.0261	3792.8	4501.4	**-4501.4**
114.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	523.6	185.0	11929.2	12637.8	102122.7	133830.2	120708.7	523.5881	185.0261	3792.8	4501.4	**-4501.4**
115.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	496.7	175.3	12057.8	12729.8	102122.7	133830.2	120708.7	496.7123	175.2758	3838.8	4510.8	**-4510.8**
115.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	496.7	175.3	12057.8	12729.8	102122.7	133830.2	120708.7	496.7123	175.2758	3838.8	4510.8	**-4510.8**
115.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	469.4	165.4	12188.1	12823.0	102122.7	133830.2	120708.7	469.4464	165.4219	3885.5	4520.3	**-4520.3**
115.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	469.4	165.4	12188.1	12823.0	102122.7	133830.2	120708.7	469.4464	165.4219	3885.5	4520.3	**-4520.3**
115.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	442.4	155.7	12317.2	12915.3	102122.7	133830.2	120708.7	442.4345	155.6595	3931.7	4529.8	**-4529.8**
115.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	442.4	155.7	12317.2	12915.3	102122.7	133830.2	120708.7	442.4345	155.6595	3931.7	4529.8	**-4529.8**
115.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	415.7	146.0	12445.1	13006.8	102122.7	133830.2	120708.7	415.6792	145.99	3977.5	4539.1	**-4539.1**
115.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	415.7	146.0	12445.1	13006.8	102122.7	133830.2	120708.7	415.6792	145.99	3977.5	4539.1	**-4539.1**
116.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	389.2	136.4	12571.8	13097.4	102122.7	133830.2	120708.7	389.1816	136.4158	4022.8	4548.4	**-4548.4**
116.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	389.2	136.4	12571.8	13097.4	102122.7	133830.2	120708.7	389.1816	136.4158	4022.8	4548.4	**-4548.4**
116.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	362.9	126.9	12697.2	13187.1	102122.7	133830.2	120708.7	362.9447	126.9389	4067.7	4557.6	**-4557.6**
116.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	362.9	126.9	12697.2	13187.1	102122.7	133830.2	120708.7	362.9447	126.9389	4067.7	4557.6	**-4557.6**
116.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	337.0	117.6	12821.3	13275.8	102122.7	133830.2	120708.7	336.9722	117.5614	4112.1	4566.7	**-4566.7**
116.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	335.8	116.7	12827.7	13280.2	102122.7	133830.2	120708.7	335.8186	116.7196	4114.6	4567.1	**-4567.1**
116.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	311.3	108.3	12944.1	13363.7	102122.7	133830.2	120708.7	311.268	108.2849	4156.1	4575.6	**-4575.6**
116.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	311.3	108.3	12944.1	13363.7	102122.7	133830.2	120708.7	311.268	108.2849	4156.1	4575.6	**-4575.6**
117.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	285.8	99.1	13065.7	13450.6	102122.7	133830.2	120708.7	285.8359	99.1107	4199.6	4584.5	**-4584.5**
117.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	285.8	99.1	13065.7	13450.6	102122.7	133830.2	120708.7	285.8359	99.1107	4199.6	4584.5	**-4584.5**
117.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	260.7	90.0	13185.9	13536.6	102122.7	133830.2	120708.7	260.6792	90.03987	4242.6	4593.3	**-4593.3**
117.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	260.7	90.0	13185.9	13536.6	102122.7	133830.2	120708.7	260.6792	90.03987	4242.6	4593.3	**-4593.3**
117.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	235.8	81.1	13304.7	13621.6	102122.7	133830.2	120708.7	235.8004	81.07321	4285.2	4602.0	**-4602.0**
117.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	235.8	81.1	13304.7	13621.6	102122.7	133830.2	120708.7	235.8004	81.07321	4285.2	4602.0	**-4602.0**
117.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	211.2	72.2	13422.3	13705.7	102122.7	133830.2	120708.7	211.2016	72.21137	4327.2	4610.6	**-4610.6**
117.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	211.2	72.2	13422.3	13705.7	102122.7	133830.2	120708.7	211.2016	72.21137	4327.2	4610.6	**-4610.6**
118.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	186.9	63.5	13538.4	13788.8	102122.7	133830.2	120708.7	186.8841	63.45474	4368.8	4619.1	**-4619.1**
118.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	186.9	63.5	13538.4	13788.8	102122.7	133830.2	120708.7	186.8841	63.45474	4368.8	4619.1	**-4619.1**
118.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	162.8	54.8	13653.3	13870.9	102122.7	133830.2	120708.7	162.8484	54.80361	4409.9	4627.5	**-4627.5**
118.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	162.8	54.8	13653.3	13870.9	102122.7	133830.2	120708.7	162.8484	54.80361	4409.9	4627.5	**-4627.5**
118.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	139.1	46.3	13766.7	13952.1	102122.7	133830.2	120708.7	139.0945	46.25805	4450.5	4635.8	**-4635.8**
118.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	138.1	45.5	13772.4	13955.9	102122.7	133830.2	120708.7	138.0888	45.49155	4452.7	4636.2	**-4636.2**
118.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	115.6	37.8	13878.8	14032.3	102122.7	133830.2	120708.7	115.6217	37.81804	4490.6	4644.0	**-4644.0**
118.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	115.6	37.8	13878.8	14032.3	102122.7	133830.2	120708.7	115.6217	37.81804	4490.6	4644.0	**-4644.0**
119.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	92.4	29.5	13989.6	14111.5	102122.7	133830.2	120708.7	92.42855	29.48335	4530.2	4652.2	**-4652.2**
119.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	92.4	29.5	13989.6	14111.5	102122.7	133830.2	120708.7	92.42855	29.48335	4530.2	4652.2	**-4652.2**
119.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	69.5	21.3	14099.0	14189.8	102122.7	133830.2	120708.7	69.51276	21.2536	4569.4	4660.2	**-4660.2**
119.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	69.5	21.3	14099.0	14189.8	102122.7	133830.2	120708.7	69.51276	21.2536	4569.4	4660.2	**-4660.2**
119.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	46.9	13.1	14207.1	14267.1	102122.7	133830.2	120708.7	46.87148	13.12833	4608.1	4668.1	**-4668.1**
119.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	46.9	13.1	14207.1	14267.1	102122.7	133830.2	120708.7	46.87148	13.12833	4608.1	4668.1	**-4668.1**
119.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	24.5	5.1	14313.9	14343.5	102122.7	133830.2	120708.7	24.5008	5.10685	4646.3	4675.9	**-4675.9**
119.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	24.5	5.1	14313.9	14343.5	102122.7	133830.2	120708.7	24.5008	5.10685	4646.3	4675.9	**-4675.9**
120.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	2.4	-2.8	14419.5	14419.0	102122.7	133830.2	120708.7	2.396075	-2.81167	4684.0	4683.6	**-4683.6**
120.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	2.4	-2.8	14419.5	14419.0	102122.7	133830.2	120708.7	2.396075	-2.81167	4684.0	4683.6	**-4683.6**
120.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-19.4	-10.6	14523.7	14493.6	102122.7	133830.2	120708.7	-19.4485	-10.6282	4721.3	4691.3	**-4691.3**
120.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-19.4	-10.6	14523.7	14493.6	102122.7	133830.2	120708.7	-19.4485	-10.6282	4721.3	4691.3	**-4691.3**
120.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-41.0	-18.3	14626.7	14567.4	102122.7	133830.2	120708.7	-41.0395	-18.3438	4758.2	4698.8	**-4698.8**
120.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-41.9	-19.0	14631.7	14570.7	102122.7	133830.2	120708.7	-41.9048	-19.0356	4760.1	4699.1	**-4699.1**
120.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-62.4	-26.0	14728.6	14640.2	102122.7	133830.2	120708.7	-62.385	-25.9597	4794.6	4706.2	**-4706.2**
120.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-62.4	-26.0	14728.6	14640.2	102122.7	133830.2	120708.7	-62.385	-25.9597	4794.6	4706.2	**-4706.2**
121.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-83.5	-33.5	14829.2	14712.3	102122.7	133830.2	120708.7	-83.4939	-33.4772	4830.6	4713.6	**-4713.6**
121.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-83.5	-33.5	14829.2	14712.3	102122.7	133830.2	120708.7	-83.4939	-33.4772	4830.6	4713.6	**-4713.6**
121.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-104.4	-40.9	14928.8	14783.5	102122.7	133830.2	120708.7	-104.376	-40.8979	4866.2	4720.9	**-4720.9**
121.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-104.4	-40.9	14928.8	14783.5	102122.7	133830.2	120708.7	-104.376	-40.8979	4866.2	4720.9	**-4720.9**
121.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-125.0	-48.2	15027.3	14854.0	102122.7	133830.2	120708.7	-125.044	-48.223	4901.4	4728.1	**-4728.1**
121.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-125.0	-48.2	15027.3	14854.0	102122.7	133830.2	120708.7	-125.044	-48.223	4901.4	4728.1	**-4728.1**

121.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-145.5	-55.5	15124.8	14923.8	102122.7	133830.2	120708.7	-145.512	-55.4539	4936.2	4735.3	**-4735.3**
121.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-145.5	-55.5	15124.8	14923.8	102122.7	133830.2	120708.7	-145.512	-55.4539	4936.2	4735.3	**-4735.3**
122.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-165.8	-62.6	15221.4	14993.0	102122.7	133830.2	120708.7	-165.802	-62.5922	4970.7	4742.3	**-4742.3**
122.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-165.8	-62.6	15221.4	14993.0	102122.7	133830.2	120708.7	-165.802	-62.5922	4970.7	4742.3	**-4742.3**
122.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-186.0	-69.6	15317.3	15061.7	102122.7	133830.2	120708.7	-185.976	-69.6386	5005.0	4749.4	**-4749.4**
122.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-186.0	-69.6	15317.3	15061.7	102122.7	133830.2	120708.7	-185.976	-69.6386	5005.0	4749.4	**-4749.4**
122.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-206.6	-76.9	15415.3	15131.9	102122.7	133830.2	120708.7	-206.589	-76.8519	5040.0	4756.6	**-4756.6**
122.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-194.6	-71.7	15356.3	15090.1	102122.7	133830.2	120708.7	-194.618	-71.662	5018.6	4752.3	**-4752.3**
122.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-210.8	-77.8	15434.3	15145.7	102122.7	133830.2	120708.7	-210.81	-77.7793	5046.6	4758.0	**-4758.0**
122.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-210.8	-77.8	15434.3	15145.7	102122.7	133830.2	120708.7	-210.81	-77.7793	5046.6	4758.0	**-4758.0**
123.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-226.6	-83.8	15510.6	15200.1	102122.7	133830.2	120708.7	-226.638	-83.8259	5074.0	4763.5	**-4763.5**
123.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-226.6	-83.8	15510.6	15200.1	102122.7	133830.2	120708.7	-226.638	-83.8259	5074.0	4763.5	**-4763.5**
123.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-242.7	-89.9	15588.0	15255.4	102122.7	133830.2	120708.7	-242.705	-89.8957	5101.8	4769.2	**-4769.2**
123.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-242.7	-89.9	15588.0	15255.4	102122.7	133830.2	120708.7	-242.705	-89.8957	5101.8	4769.2	**-4769.2**
123.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-258.6	-95.9	15664.3	15309.9	102122.7	133830.2	120708.7	-258.584	-95.8693	5129.2	4774.8	**-4774.8**
123.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-258.6	-95.9	15664.3	15309.9	102122.7	133830.2	120708.7	-258.584	-95.8693	5129.2	4774.8	**-4774.8**
123.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-274.3	-101.7	15739.7	15363.7	102122.7	133830.2	120708.7	-274.257	-101.747	5156.3	4780.3	**-4780.3**
123.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-274.3	-101.7	15739.7	15363.7	102122.7	133830.2	120708.7	-274.257	-101.747	5156.3	4780.3	**-4780.3**
124.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-289.7	-107.5	15814.0	15416.7	102122.7	133830.2	120708.7	-289.711	-107.528	5182.9	4785.7	**-4785.7**
124.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-289.7	-107.5	15814.0	15416.7	102122.7	133830.2	120708.7	-289.711	-107.528	5182.9	4785.7	**-4785.7**
124.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-304.9	-113.2	15887.1	15469.0	102122.7	133830.2	120708.7	-304.936	-113.212	5209.2	4791.0	**-4791.0**
124.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-304.9	-113.2	15887.1	15469.0	102122.7	133830.2	120708.7	-304.936	-113.212	5209.2	4791.0	**-4791.0**
124.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-319.9	-118.8	15959.1	15520.4	102122.7	133830.2	120708.7	-319.924	-118.797	5235.0	4796.3	**-4796.3**
124.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-320.6	-119.3	15962.8	15522.9	102122.7	133830.2	120708.7	-320.585	-119.296	5236.4	4796.6	**-4796.6**
124.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-334.7	-124.3	16029.9	15571.0	102122.7	133830.2	120708.7	-334.667	-124.281	5260.4	4801.5	**-4801.5**
124.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-334.7	-124.3	16029.9	15571.0	102122.7	133830.2	120708.7	-334.667	-124.281	5260.4	4801.5	**-4801.5**
125.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-349.2	-129.7	16099.5	15620.7	102122.7	133830.2	120708.7	-349.159	-129.664	5285.4	4806.6	**-4806.6**
125.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-349.2	-129.7	16099.5	15620.7	102122.7	133830.2	120708.7	-349.159	-129.664	5285.4	4806.6	**-4806.6**
125.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-363.4	-134.9	16167.8	15669.5	102122.7	133830.2	120708.7	-363.394	-134.945	5309.9	4811.6	**-4811.6**
125.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-363.4	-134.9	16167.8	15669.5	102122.7	133830.2	120708.7	-363.394	-134.945	5309.9	4811.6	**-4811.6**
125.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-377.4	-140.1	16234.9	15717.4	102122.7	133830.2	120708.7	-377.367	-140.122	5333.9	4816.5	**-4816.5**
125.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-377.4	-140.1	16234.9	15717.4	102122.7	133830.2	120708.7	-377.367	-140.122	5333.9	4816.5	**-4816.5**
125.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-391.1	-145.2	16300.6	15764.4	102122.7	133830.2	120708.7	-391.075	-145.194	5357.5	4821.3	**-4821.3**
125.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-391.1	-145.2	16300.6	15764.4	102122.7	133830.2	120708.7	-391.075	-145.194	5357.5	4821.3	**-4821.3**
126.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-404.5	-150.2	16365.1	15810.4	102122.7	133830.2	120708.7	-404.516	-150.162	5380.7	4826.0	**-4826.0**
126.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-404.5	-150.2	16365.1	15810.4	102122.7	133830.2	120708.7	-404.516	-150.162	5380.7	4826.0	**-4826.0**
126.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-417.7	-155.0	16428.3	15855.5	102122.7	133830.2	120708.7	-417.687	-155.023	5403.3	4830.6	**-4830.6**
126.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-417.7	-155.0	16428.3	15855.5	102122.7	133830.2	120708.7	-417.687	-155.023	5403.3	4830.6	**-4830.6**
126.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-430.6	-159.8	16490.1	15899.8	102122.7	133830.2	120708.7	-430.588	-159.779	5425.5	4835.1	**-4835.1**
126.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-431.1	-160.2	16493.1	15901.8	102122.7	133830.2	120708.7	-431.112	-160.204	5426.6	4835.3	**-4835.3**
126.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-443.2	-164.4	16550.7	15943.0	102122.7	133830.2	120708.7	-443.218	-164.429	5447.2	4839.5	**-4839.5**
126.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-443.2	-164.4	16550.7	15943.0	102122.7	133830.2	120708.7	-443.218	-164.429	5447.2	4839.5	**-4839.5**
127.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-455.6	-169.0	16609.9	15985.4	102122.7	133830.2	120708.7	-455.58	-168.973	5468.4	4843.9	**-4843.9**
127.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-455.6	-169.0	16609.9	15985.4	102122.7	133830.2	120708.7	-455.58	-168.973	5468.4	4843.9	**-4843.9**
127.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-467.7	-173.4	16667.9	16026.8	102122.7	133830.2	120708.7	-467.674	-173.41	5489.2	4848.1	**-4848.1**
127.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-467.7	-173.4	16667.9	16026.8	102122.7	133830.2	120708.7	-467.674	-173.41	5489.2	4848.1	**-4848.1**
127.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-479.5	-177.7	16724.5	16067.3	102122.7	133830.2	120708.7	-479.503	-177.741	5509.5	4852.3	**-4852.3**
127.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-479.5	-177.7	16724.5	16067.3	102122.7	133830.2	120708.7	-479.503	-177.741	5509.5	4852.3	**-4852.3**
127.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-491.1	-182.0	16779.9	16106.9	102122.7	133830.2	120708.7	-491.071	-181.966	5529.3	4856.3	**-4856.3**
127.8749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-491.1	-182.0	16779.9	16106.9	102122.7	133830.2	120708.7	-491.071	-181.966	5529.3	4856.3	**-4856.3**
128.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-502.4	-186.1	16834.0	16145.6	102122.7	133830.2	120708.7	-502.381	-186.085	5548.7	4860.3	**-4860.3**
128.1249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-502.4	-186.1	16834.0	16145.6	102122.7	133830.2	120708.7	-502.381	-186.085	5548.7	4860.3	**-4860.3**
128.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-513.4	-190.1	16886.9	16183.4	102122.7	133830.2	120708.7	-513.44	-190.098	5567.7	4864.1	**-4864.1**
128.3749	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-513.4	-190.1	16886.9	16183.4	102122.7	133830.2	120708.7	-513.44	-190.098	5567.7	4864.1	**-4864.1**
128.6249	VA-01 TRAMO2	102122.7	102122.7	3500	3500	3574.3	3574.3	**3574.3**	102122.7	412095.1	199987.2	-524.3	-194.0	16938.6	16220.4	102122.7	133830.2	120708.7	-524.253	-194.008	5586.2	4867.9	**-4867.9**
128.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-524.7	-194.4	16929.1	16210.0	72098.01	98123.37	88714.15	-524.686	-194.395	4363.4	3644.3	**-3644.3**
128.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-534.7	-197.7	16991.0	16258.5	72098.01	98123.37	88714.15	-534.732	-197.717	4380.8	3648.3	**-3648.3**
128.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-534.7	-197.7	16991.0	16258.5	72098.01	98123.37	88714.15	-534.732	-197.717	4380.8	3648.3	**-3648.3**
129.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-545.1	-201.4	17055.6	16309.1	72098.01	98123.37	88714.15	-545.112	-201.411	4399.0	3652.4	**-3652.4**
129.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-545.1	-201.4	17055.6	16309.1	72098.01	98123.37	88714.15	-545.112	-201.411	4399.0	3652.4	**-3652.4**
129.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-555.3	-205.0	17119.1	16358.7	72098.01	98123.37	88714.15	-555.322	-205.019	4416.9	3656.5	**-3656.5**
129.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-555.3	-205.0	17119.1	16358.7	72098.01	98123.37	88714.15	-555.322	-205.019	4416.9	3656.5	**-3656.5**
129.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-565.4	-208.5	17181.5	16407.6	72098.01	98123.37	88714.15	-565.372	-208.538	4434.4	3660.5	**-3660.5**
129.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-565.4	-208.5	17181.5	16407.6	72098.01	98123.37	88714.15	-565.372	-208.538	4434.4	3660.5	**-3660.5**

129.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-575.3	-212.0	17242.9	16455.7	72098.01	98123.37	88714.15	-575.279	-211.967	4451.7	3664.5	**-3664.5**
129.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-575.3	-212.0	17242.9	16455.7	72098.01	98123.37	88714.15	-575.279	-211.967	4451.7	3664.5	**-3664.5**
130.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-585.1	-215.3	17303.5	16503.2	72098.01	98123.37	88714.15	-585.075	-215.303	4468.7	3668.3	**-3668.3**
130.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-585.1	-215.3	17303.5	16503.2	72098.01	98123.37	88714.15	-585.075	-215.303	4468.7	3668.3	**-3668.3**
130.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-594.8	-218.5	17363.6	16550.3	72098.01	98123.37	88714.15	-594.815	-218.547	4485.6	3672.2	**-3672.2**
130.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-594.8	-218.5	17363.6	16550.3	72098.01	98123.37	88714.15	-594.815	-218.547	4485.6	3672.2	**-3672.2**
130.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-604.7	-221.8	17424.5	16598.0	72098.01	98123.37	88714.15	-604.67	-221.833	4502.6	3676.1	**-3676.1**
130.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-595.4	-217.9	17365.2	16551.9	72098.01	98123.37	88714.15	-595.392	-217.862	4485.6	3672.3	**-3672.3**
130.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-600.8	-220.3	17399.7	16578.7	72098.01	98123.37	88714.15	-600.754	-220.27	4495.6	3674.5	**-3674.5**
130.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-600.8	-220.3	17399.7	16578.7	72098.01	98123.37	88714.15	-600.754	-220.27	4495.6	3674.5	**-3674.5**
131.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-605.8	-222.6	17432.1	16603.7	72098.01	98123.37	88714.15	-605.758	-222.602	4504.9	3676.6	**-3676.6**
131.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-605.8	-222.6	17432.1	16603.7	72098.01	98123.37	88714.15	-605.758	-222.602	4504.9	3676.6	**-3676.6**
131.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-610.9	-224.9	17465.2	16629.4	72098.01	98123.37	88714.15	-610.906	-224.889	4514.5	3678.7	**-3678.7**
131.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-610.9	-224.9	17465.2	16629.4	72098.01	98123.37	88714.15	-610.906	-224.889	4514.5	3678.7	**-3678.7**
131.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-615.9	-227.1	17497.4	16654.4	72098.01	98123.37	88714.15	-615.936	-227.079	4523.8	3680.7	**-3680.7**
131.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-615.9	-227.1	17497.4	16654.4	72098.01	98123.37	88714.15	-615.936	-227.079	4523.8	3680.7	**-3680.7**
131.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-620.8	-229.2	17528.6	16678.6	72098.01	98123.37	88714.15	-620.818	-229.174	4532.7	3682.7	**-3682.7**
131.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-620.8	-229.2	17528.6	16678.6	72098.01	98123.37	88714.15	-620.818	-229.174	4532.7	3682.7	**-3682.7**
132.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-625.5	-231.2	17558.7	16702.0	72098.01	98123.37	88714.15	-625.534	-231.174	4541.3	3684.6	**-3684.6**
132.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-625.5	-231.2	17558.7	16702.0	72098.01	98123.37	88714.15	-625.534	-231.174	4541.3	3684.6	**-3684.6**
132.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-630.1	-233.1	17587.6	16724.4	72098.01	98123.37	88714.15	-630.067	-233.078	4549.6	3686.5	**-3686.5**
132.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-630.1	-233.1	17587.6	16724.4	72098.01	98123.37	88714.15	-630.067	-233.078	4549.6	3686.5	**-3686.5**
132.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-634.4	-234.9	17615.2	16745.9	72098.01	98123.37	88714.15	-634.406	-234.885	4557.5	3688.2	**-3688.2**
132.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-634.7	-235.1	17617.2	16747.4	72098.01	98123.37	88714.15	-634.702	-235.09	4558.2	3688.4	**-3688.4**
132.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-638.5	-236.6	17641.4	16766.3	72098.01	98123.37	88714.15	-638.541	-236.595	4565.0	3689.9	**-3689.9**
132.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-638.5	-236.6	17641.4	16766.3	72098.01	98123.37	88714.15	-638.541	-236.595	4565.0	3689.9	**-3689.9**
133.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-642.5	-238.2	17666.3	16785.7	72098.01	98123.37	88714.15	-642.463	-238.206	4572.2	3691.5	**-3691.5**
133.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-642.5	-238.2	17666.3	16785.7	72098.01	98123.37	88714.15	-642.463	-238.206	4572.2	3691.5	**-3691.5**
133.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-646.2	-239.7	17689.8	16803.9	72098.01	98123.37	88714.15	-646.165	-239.717	4578.9	3693.0	**-3693.0**
133.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-646.2	-239.7	17689.8	16803.9	72098.01	98123.37	88714.15	-646.165	-239.717	4578.9	3693.0	**-3693.0**
133.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-649.6	-241.1	17711.9	16821.1	72098.01	98123.37	88714.15	-649.641	-241.128	4585.2	3694.4	**-3694.4**
133.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-649.6	-241.1	17711.9	16821.1	72098.01	98123.37	88714.15	-649.641	-241.128	4585.2	3694.4	**-3694.4**
133.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-652.9	-242.4	17732.4	16837.1	72098.01	98123.37	88714.15	-652.887	-242.437	4591.0	3695.7	**-3695.7**
133.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-652.9	-242.4	17732.4	16837.1	72098.01	98123.37	88714.15	-652.887	-242.437	4591.0	3695.7	**-3695.7**
134.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-655.9	-243.6	17751.5	16851.9	72098.01	98123.37	88714.15	-655.898	-243.644	4596.5	3696.9	**-3696.9**
134.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-655.9	-243.6	17751.5	16851.9	72098.01	98123.37	88714.15	-655.898	-243.644	4596.5	3696.9	**-3696.9**
134.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-658.7	-244.7	17769.0	16865.6	72098.01	98123.37	88714.15	-658.673	-244.749	4601.5	3698.0	**-3698.0**
134.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-658.7	-244.7	17769.0	16865.6	72098.01	98123.37	88714.15	-658.673	-244.749	4601.5	3698.0	**-3698.0**
134.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-661.2	-245.8	17785.0	16878.0	72098.01	98123.37	88714.15	-661.21	-245.751	4606.0	3699.1	**-3699.1**
134.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-661.3	-245.9	17786.0	16878.8	72098.01	98123.37	88714.15	-661.342	-245.862	4606.3	3699.1	**-3699.1**
134.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-663.5	-246.7	17799.5	16889.3	72098.01	98123.37	88714.15	-663.509	-246.651	4610.1	3700.0	**-3700.0**
134.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-663.5	-246.7	17799.5	16889.3	72098.01	98123.37	88714.15	-663.509	-246.651	4610.1	3700.0	**-3700.0**
135.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-665.6	-247.4	17812.5	16899.5	72098.01	98123.37	88714.15	-665.57	-247.447	4613.8	3700.8	**-3700.8**
135.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-665.6	-247.4	17812.5	16899.5	72098.01	98123.37	88714.15	-665.57	-247.447	4613.8	3700.8	**-3700.8**
135.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-667.4	-248.1	17823.9	16908.4	72098.01	98123.37	88714.15	-667.395	-248.141	4617.1	3701.5	**-3701.5**
135.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-667.4	-248.1	17823.9	16908.4	72098.01	98123.37	88714.15	-667.395	-248.141	4617.1	3701.5	**-3701.5**
135.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-669.0	-248.7	17833.9	16916.2	72098.01	98123.37	88714.15	-668.985	-248.733	4619.9	3702.2	**-3702.2**
135.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-669.0	-248.7	17833.9	16916.2	72098.01	98123.37	88714.15	-668.985	-248.733	4619.9	3702.2	**-3702.2**
135.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-670.3	-249.2	17842.4	16922.8	72098.01	98123.37	88714.15	-670.346	-249.223	4622.3	3702.7	**-3702.7**
135.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-670.3	-249.2	17842.4	16922.8	72098.01	98123.37	88714.15	-670.346	-249.223	4622.3	3702.7	**-3702.7**
136.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-671.5	-249.6	17849.4	16928.3	72098.01	98123.37	88714.15	-671.48	-249.613	4624.3	3703.2	**-3703.2**
136.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-671.5	-249.6	17849.4	16928.3	72098.01	98123.37	88714.15	-671.48	-249.613	4624.3	3703.2	**-3703.2**
136.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.4	-249.9	17855.0	16932.7	72098.01	98123.37	88714.15	-672.395	-249.902	4625.8	3703.5	**-3703.5**
136.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.4	-249.9	17855.0	16932.7	72098.01	98123.37	88714.15	-672.395	-249.902	4625.8	3703.5	**-3703.5**
136.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.1	-250.1	17859.2	16936.0	72098.01	98123.37	88714.15	-673.097	-250.092	4627.0	3703.8	**-3703.8**
136.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.1	-250.1	17859.1	16935.9	72098.01	98123.37	88714.15	-673.067	-250.108	4627.0	3703.8	**-3703.8**
136.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.6	-250.2	17862.1	16938.4	72098.01	98123.37	88714.15	-673.595	-250.185	4627.8	3704.0	**-3704.0**
136.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.6	-250.2	17862.1	16938.4	72098.01	98123.37	88714.15	-673.595	-250.185	4627.8	3704.0	**-3704.0**
137.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.9	-250.2	17863.8	16939.7	72098.01	98123.37	88714.15	-673.899	-250.18	4628.2	3704.1	**-3704.1**
137.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.9	-250.2	17863.8	16939.7	72098.01	98123.37	88714.15	-673.899	-250.18	4628.2	3704.1	**-3704.1**
137.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-674.0	-250.1	17864.2	16940.1	72098.01	98123.37	88714.15	-674.022	-250.078	4628.2	3704.1	**-3704.1**
137.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-674.0	-250.1	17864.2	16940.1	72098.01	98123.37	88714.15	-674.022	-250.078	4628.2	3704.1	**-3704.1**
137.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-674.0	-249.9	17863.5	16939.7	72098.01	98123.37	88714.15	-673.978	-249.88	4628.0	3704.1	**-3704.1**
137.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-674.0	-249.9	17863.5	16939.7	72098.01	98123.37	88714.15	-673.978	-249.88	4628.0	3704.1	**-3704.1**

137.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.8	-249.6	17861.8	16938.4	72098.01	98123.37	88714.15	-673.785	-249.587	4627.4	3704.0	**-3704.0**
137.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.8	-249.6	17861.8	16938.4	72098.01	98123.37	88714.15	-673.785	-249.587	4627.4	3704.0	**-3704.0**
138.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.5	-249.2	17859.2	16936.6	72098.01	98123.37	88714.15	-673.474	-249.197	4626.5	3703.9	**-3703.9**
138.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.5	-249.2	17859.2	16936.6	72098.01	98123.37	88714.15	-673.474	-249.197	4626.5	3703.9	**-3703.9**
138.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.1	-248.7	17856.0	16934.2	72098.01	98123.37	88714.15	-673.095	-248.706	4625.5	3703.7	**-3703.7**
138.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-673.1	-248.7	17856.0	16934.2	72098.01	98123.37	88714.15	-673.095	-248.706	4625.5	3703.7	**-3703.7**
138.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-672.5	-248.1	17851.4	16930.8	72098.01	98123.37	88714.15	-672.504	-248.053	4623.9	3703.4	**-3703.4**
138.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-675.3	-248.6	17867.5	16943.7	72098.01	98123.37	88714.15	-675.256	-248.622	4628.3	3704.4	**-3704.4**
138.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-670.4	-247.4	17838.6	16920.8	72098.01	98123.37	88714.15	-670.416	-247.41	4620.4	3702.6	**-3702.6**
138.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-670.4	-247.4	17838.6	16920.8	72098.01	98123.37	88714.15	-670.416	-247.41	4620.4	3702.6	**-3702.6**
139.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-665.5	-246.1	17808.7	16897.2	72098.01	98123.37	88714.15	-665.456	-246.081	4612.2	3700.6	**-3700.6**
139.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-665.5	-246.1	17808.7	16897.2	72098.01	98123.37	88714.15	-665.456	-246.081	4612.2	3700.6	**-3700.6**
139.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-660.4	-244.6	17777.9	16872.9	72098.01	98123.37	88714.15	-660.383	-244.609	4603.6	3698.6	**-3698.6**
139.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-660.4	-244.6	17777.9	16872.9	72098.01	98123.37	88714.15	-660.383	-244.609	4603.6	3698.6	**-3698.6**
139.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-655.2	-243.0	17746.3	16848.1	72098.01	98123.37	88714.15	-655.201	-243.04	4594.8	3696.6	**-3696.6**
139.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-655.2	-243.0	17746.3	16848.1	72098.01	98123.37	88714.15	-655.201	-243.04	4594.8	3696.6	**-3696.6**
139.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-649.9	-241.4	17713.7	16822.4	72098.01	98123.37	88714.15	-649.877	-241.375	4585.8	3694.5	**-3694.5**
139.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-649.9	-241.4	17713.7	16822.4	72098.01	98123.37	88714.15	-649.877	-241.375	4585.8	3694.5	**-3694.5**
140.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-644.4	-239.6	17680.0	16796.0	72098.01	98123.37	88714.15	-644.39	-239.613	4576.3	3692.3	**-3692.3**
140.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-644.4	-239.6	17680.0	16796.0	72098.01	98123.37	88714.15	-644.39	-239.613	4576.3	3692.3	**-3692.3**
140.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-638.7	-237.8	17645.1	16768.6	72098.01	98123.37	88714.15	-638.724	-237.754	4566.6	3690.1	**-3690.1**
140.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-638.7	-237.8	17645.1	16768.6	72098.01	98123.37	88714.15	-638.724	-237.754	4566.6	3690.1	**-3690.1**
140.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-632.9	-235.8	17608.9	16740.3	72098.01	98123.37	88714.15	-632.867	-235.797	4556.4	3687.8	**-3687.8**
140.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-632.6	-235.6	17607.0	16738.9	72098.01	98123.37	88714.15	-632.616	-235.561	4555.8	3687.7	**-3687.7**
140.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-626.8	-233.7	17571.4	16710.9	72098.01	98123.37	88714.15	-626.807	-233.74	4545.9	3685.4	**-3685.4**
140.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-626.8	-233.7	17571.4	16710.9	72098.01	98123.37	88714.15	-626.807	-233.74	4545.9	3685.4	**-3685.4**
141.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-620.5	-231.6	17532.6	16680.5	72098.01	98123.37	88714.15	-620.534	-231.582	4535.0	3682.9	**-3682.9**
141.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-620.5	-231.6	17532.6	16680.5	72098.01	98123.37	88714.15	-620.534	-231.582	4535.0	3682.9	**-3682.9**
141.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-614.0	-229.3	17492.3	16648.9	72098.01	98123.37	88714.15	-614.041	-229.323	4523.7	3680.3	**-3680.3**
141.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-614.0	-229.3	17492.3	16648.9	72098.01	98123.37	88714.15	-614.041	-229.323	4523.7	3680.3	**-3680.3**
141.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-607.3	-227.0	17450.5	16616.2	72098.01	98123.37	88714.15	-607.32	-226.96	4511.9	3677.6	**-3677.6**
141.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-607.3	-227.0	17450.5	16616.2	72098.01	98123.37	88714.15	-607.32	-226.96	4511.9	3677.6	**-3677.6**
141.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-600.4	-224.5	17407.3	16582.4	72098.01	98123.37	88714.15	-600.364	-224.491	4499.7	3674.8	**-3674.8**
141.8749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-600.4	-224.5	17407.3	16582.4	72098.01	98123.37	88714.15	-600.364	-224.491	4499.7	3674.8	**-3674.8**
142.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-593.2	-221.9	17362.5	16547.4	72098.01	98123.37	88714.15	-593.169	-221.916	4487.1	3672.0	**-3672.0**
142.1249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-593.2	-221.9	17362.5	16547.4	72098.01	98123.37	88714.15	-593.169	-221.916	4487.1	3672.0	**-3672.0**
142.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-585.7	-219.2	17316.0	16511.1	72098.01	98123.37	88714.15	-585.725	-219.228	4474.0	3669.0	**-3669.0**
142.3749	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-585.7	-219.2	17316.0	16511.1	72098.01	98123.37	88714.15	-585.725	-219.228	4474.0	3669.0	**-3669.0**
142.6249	VA-01 TRAMO4	72098.01	72098.01	3500	3500	2523.4	2523.4	**2523.4**	72098.0	389895.1	170203.4	-578.0	-216.4	17267.9	16473.5	72098.01	98123.37	88714.15	-578.014	-216.414	4460.3	3665.9	**-3665.9**
142.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-577.5	-216.0	18388.0	17594.5	63048.73	82188.31	76030.24	-577.502	-216.007	3862.9	3069.4	**-3069.4**
142.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-570.2	-213.6	18335.4	17551.6	63048.73	82188.31	76030.24	-570.217	-213.615	3850.8	3067.0	**-3067.0**
142.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-570.2	-213.6	18335.4	17551.6	63048.73	82188.31	76030.24	-570.217	-213.615	3850.8	3067.0	**-3067.0**
143.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-562.1	-210.6	18276.2	17503.5	63048.73	82188.31	76030.24	-562.113	-210.648	3837.1	3064.3	**-3064.3**
143.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-562.1	-210.6	18276.2	17503.5	63048.73	82188.31	76030.24	-562.113	-210.648	3837.1	3064.3	**-3064.3**
143.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-553.8	-207.6	18215.3	17453.9	63048.73	82188.31	76030.24	-553.781	-207.576	3822.9	3061.5	**-3061.5**
143.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-553.8	-207.6	18215.3	17453.9	63048.73	82188.31	76030.24	-553.781	-207.576	3822.9	3061.5	**-3061.5**
143.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-545.2	-204.4	18152.7	17403.0	63048.73	82188.31	76030.24	-545.225	-204.402	3808.3	3058.7	**-3058.7**
143.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-545.2	-204.4	18152.7	17403.0	63048.73	82188.31	76030.24	-545.225	-204.402	3808.3	3058.7	**-3058.7**
143.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-536.4	-201.1	18088.4	17350.8	63048.73	82188.31	76030.24	-536.448	-201.127	3793.3	3055.7	**-3055.7**
143.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-536.4	-201.1	18088.4	17350.8	63048.73	82188.31	76030.24	-536.448	-201.127	3793.3	3055.7	**-3055.7**
144.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-527.5	-197.8	18022.4	17297.2	63048.73	82188.31	76030.24	-527.453	-197.751	3777.9	3052.7	**-3052.7**
144.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-527.5	-197.8	18022.4	17297.2	63048.73	82188.31	76030.24	-527.453	-197.751	3777.9	3052.7	**-3052.7**
144.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-518.2	-194.3	17954.9	17242.4	63048.73	82188.31	76030.24	-518.244	-194.276	3762.2	3049.6	**-3049.6**
144.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-518.2	-194.3	17954.9	17242.4	63048.73	82188.31	76030.24	-518.244	-194.276	3762.2	3049.6	**-3049.6**
144.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-508.8	-190.7	17885.8	17186.2	63048.73	82188.31	76030.24	-508.829	-190.7	3746.0	3046.5	**-3046.5**
144.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-508.0	-190.1	17879.0	17180.9	63048.73	82188.31	76030.24	-508.007	-190.099	3744.3	3046.2	**-3046.2**
144.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-499.2	-187.0	17815.1	17128.9	63048.73	82188.31	76030.24	-499.212	-187.027	3729.5	3043.3	**-3043.3**
144.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-499.2	-187.0	17815.1	17128.9	63048.73	82188.31	76030.24	-499.212	-187.027	3729.5	3043.3	**-3043.3**
145.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-489.4	-183.3	17743.0	17070.4	63048.73	82188.31	76030.24	-489.402	-183.256	3712.7	3040.0	**-3040.0**
145.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-489.4	-183.3	17743.0	17070.4	63048.73	82188.31	76030.24	-489.402	-183.256	3712.7	3040.0	**-3040.0**
145.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-479.4	-179.4	17669.5	17010.7	63048.73	82188.31	76030.24	-479.409	-179.387	3695.4	3036.7	**-3036.7**
145.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-479.4	-179.4	17669.5	17010.7	63048.73	82188.31	76030.24	-479.409	-179.387	3695.4	3036.7	**-3036.7**
145.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-469.2	-175.4	17594.6	16949.9	63048.73	82188.31	76030.24	-469.242	-175.422	3677.9	3033.2	**-3033.2**
145.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-469.2	-175.4	17594.6	16949.9	63048.73	82188.31	76030.24	-469.242	-175.422	3677.9	3033.2	**-3033.2**

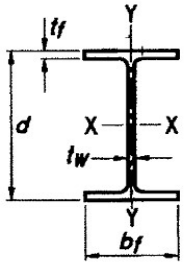
145.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-458.9	-171.4	17518.4	16888.2	63048.73	82188.31	76030.24	-458.915	-171.36	3660.1	3029.8	**-3029.8**
145.8749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-458.9	-171.4	17518.4	16888.2	63048.73	82188.31	76030.24	-458.915	-171.36	3660.1	3029.8	**-3029.8**
146.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-448.4	-167.2	17441.1	16825.5	63048.73	82188.31	76030.24	-448.445	-167.197	3641.9	3026.3	**-3026.3**
146.1249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-448.4	-167.2	17441.1	16825.5	63048.73	82188.31	76030.24	-448.445	-167.197	3641.9	3026.3	**-3026.3**
146.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-437.9	-162.9	17362.9	16762.1	63048.73	82188.31	76030.24	-437.876	-162.923	3623.5	3022.7	**-3022.7**
146.3749	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-437.9	-162.9	17362.9	16762.1	63048.73	82188.31	76030.24	-437.876	-162.923	3623.5	3022.7	**-3022.7**
146.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-426.7	-158.2	17279.7	16694.8	63048.73	82188.31	76030.24	-426.699	-158.191	3603.8	3018.9	**-3018.9**
146.6249	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-441.5	-163.8	17387.9	16782.7	63048.73	82188.31	76030.24	-441.451	-163.762	3629.1	3023.9	**-3023.9**
146.901	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-425.4	-158.5	17272.0	16688.1	63048.73	82188.31	76030.24	-425.378	-158.509	3602.4	3018.6	**-3018.6**
146.901	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-425.4	-158.5	17272.0	16688.1	63048.73	82188.31	76030.24	-425.378	-158.509	3602.4	3018.6	**-3018.6**
147.177	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-409.6	-153.0	17157.5	16594.8	63048.73	82188.31	76030.24	-409.613	-153.022	3576.0	3013.3	**-3013.3**
147.177	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-409.6	-153.0	17157.5	16594.8	63048.73	82188.31	76030.24	-409.613	-153.022	3576.0	3013.3	**-3013.3**
147.4531	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-393.2	-147.2	17038.3	16497.8	63048.73	82188.31	76030.24	-393.224	-147.247	3548.4	3007.9	**-3007.9**
147.4531	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-393.2	-147.2	17038.3	16497.8	63048.73	82188.31	76030.24	-393.224	-147.247	3548.4	3007.9	**-3007.9**
147.7291	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-376.7	-141.4	16917.7	16399.7	63048.73	82188.31	76030.24	-376.669	-141.358	3520.4	3002.4	**-3002.4**
147.7291	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-376.7	-141.4	16917.7	16399.7	63048.73	82188.31	76030.24	-376.669	-141.358	3520.4	3002.4	**-3002.4**
148.0052	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-359.9	-135.4	16795.6	16300.4	63048.73	82188.31	76030.24	-359.923	-135.353	3492.1	2996.8	**-2996.8**
148.0052	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-359.9	-135.4	16795.6	16300.4	63048.73	82188.31	76030.24	-359.923	-135.353	3492.1	2996.8	**-2996.8**
148.2812	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-343.0	-129.2	16672.0	16199.8	63048.73	82188.31	76030.24	-342.968	-129.23	3463.4	2991.2	**-2991.2**
148.2812	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-343.0	-129.2	16672.0	16199.8	63048.73	82188.31	76030.24	-342.968	-129.23	3463.4	2991.2	**-2991.2**
148.5572	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-325.8	-123.0	16546.6	16097.8	63048.73	82188.31	76030.24	-325.791	-122.99	3434.2	2985.5	**-2985.5**
148.5572	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-325.8	-123.0	16546.6	16097.8	63048.73	82188.31	76030.24	-325.791	-122.99	3434.2	2985.5	**-2985.5**
148.8333	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-308.4	-116.6	16419.4	15994.3	63048.73	82188.31	76030.24	-308.378	-116.629	3404.7	2979.7	**-2979.7**
148.8333	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-307.2	-115.7	16409.5	15986.6	63048.73	82188.31	76030.24	-307.182	-115.729	3402.1	2979.2	**-2979.2**
149.1093	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-290.7	-110.1	16290.3	15889.4	63048.73	82188.31	76030.24	-290.72	-110.148	3374.6	2973.8	**-2973.8**
149.1093	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-290.7	-110.1	16290.3	15889.4	63048.73	82188.31	76030.24	-290.72	-110.148	3374.6	2973.8	**-2973.8**
149.3854	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-272.8	-103.5	16159.3	15782.9	63048.73	82188.31	76030.24	-272.809	-103.544	3344.1	2967.8	**-2967.8**
149.3854	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-272.8	-103.5	16159.3	15782.9	63048.73	82188.31	76030.24	-272.809	-103.544	3344.1	2967.8	**-2967.8**
149.6614	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-254.6	-96.8	16026.3	15674.9	63048.73	82188.31	76030.24	-254.638	-96.8171	3313.2	2961.7	**-2961.7**
149.6614	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-254.6	-96.8	16026.3	15674.9	63048.73	82188.31	76030.24	-254.638	-96.8171	3313.2	2961.7	**-2961.7**
149.9374	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-236.2	-90.0	15891.4	15565.2	63048.73	82188.31	76030.24	-236.202	-89.9657	3281.7	2955.6	**-2955.6**
149.9374	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-236.2	-90.0	15891.4	15565.2	63048.73	82188.31	76030.24	-236.202	-89.9657	3281.7	2955.6	**-2955.6**
150.2135	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-217.5	-83.0	15754.4	15453.9	63048.73	82188.31	76030.24	-217.5	-82.9896	3249.8	2949.3	**-2949.3**
150.2135	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-217.5	-83.0	15754.4	15453.9	63048.73	82188.31	76030.24	-217.5	-82.9896	3249.8	2949.3	**-2949.3**
150.4895	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-198.5	-75.9	15615.4	15341.0	63048.73	82188.31	76030.24	-198.529	-75.8885	3217.4	2943.0	**-2943.0**
150.4895	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-198.5	-75.9	15615.4	15341.0	63048.73	82188.31	76030.24	-198.529	-75.8885	3217.4	2943.0	**-2943.0**
150.7656	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-179.3	-68.7	15474.3	15226.4	63048.73	82188.31	76030.24	-179.29	-68.6625	3184.5	2936.6	**-2936.6**
150.7656	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-179.3	-68.7	15474.3	15226.4	63048.73	82188.31	76030.24	-179.29	-68.6625	3184.5	2936.6	**-2936.6**
151.0416	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-159.8	-61.3	15331.3	15110.2	63048.73	82188.31	76030.24	-159.784	-61.312	3151.2	2930.1	**-2930.1**
151.0416	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-158.4	-60.3	15319.6	15101.0	63048.73	82188.31	76030.24	-158.35	-60.2728	3148.2	2929.5	**-2929.5**
151.3176	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-146.2	-58.3	15237.1	15032.5	63048.73	82188.31	76030.24	-146.226	-58.3301	3130.3	2925.7	**-2925.7**
151.3176	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-146.2	-58.3	15237.1	15032.5	63048.73	82188.31	76030.24	-146.226	-58.3301	3130.3	2925.7	**-2925.7**
151.5937	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-120.0	-46.2	15039.3	14873.1	63048.73	82188.31	76030.24	-119.989	-46.2405	3083.0	2916.8	**-2916.8**
151.5937	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-120.0	-46.2	15039.3	14873.1	63048.73	82188.31	76030.24	-119.989	-46.2405	3083.0	2916.8	**-2916.8**
151.8697	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-99.7	-38.5	14890.4	14752.2	63048.73	82188.31	76030.24	-99.7099	-38.5219	3048.2	2910.0	**-2910.0**
151.8697	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-99.7	-38.5	14890.4	14752.2	63048.73	82188.31	76030.24	-99.7099	-38.5219	3048.2	2910.0	**-2910.0**
152.1458	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-79.2	-30.7	14739.6	14629.7	63048.73	82188.31	76030.24	-79.1855	-30.6837	3013.0	2903.1	**-2903.1**
152.1458	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-79.2	-30.7	14739.6	14629.7	63048.73	82188.31	76030.24	-79.1855	-30.6837	3013.0	2903.1	**-2903.1**
152.4218	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-58.4	-22.7	14587.0	14505.9	63048.73	82188.31	76030.24	-58.4225	-22.728	2977.3	2896.2	**-2896.2**
152.4218	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-58.4	-22.7	14587.0	14505.9	63048.73	82188.31	76030.24	-58.4225	-22.728	2977.3	2896.2	**-2896.2**
152.6979	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-37.4	-14.7	14432.7	14380.6	63048.73	82188.31	76030.24	-37.4272	-14.6573	2941.2	2889.1	**-2889.1**
152.6979	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-37.4	-14.7	14432.7	14380.6	63048.73	82188.31	76030.24	-37.4272	-14.6573	2941.2	2889.1	**-2889.1**
152.9739	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-16.2	-6.5	14276.9	14254.2	63048.73	82188.31	76030.24	-16.2493	-6.47657	2904.8	2882.0	**-2882.0**
152.9739	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	-16.2	-6.5	14276.9	14254.2	63048.73	82188.31	76030.24	-16.2493	-6.47657	2904.8	2882.0	**-2882.0**
153.2499	VA-01 TRAMO5	63048.73	63048.73	3500	3500	2206.7	2206.7	**2206.7**	63048.7	404481.7	166029.5	5.7	1.8	14116.2	14123.6	63048.73	82188.31	76030.24	5.659738	1.786345	2867.3	2874.7	**-2874.7**

II. DISEÑO DE LA SUPERESTRUCTURA (Vigas Secundarias)

1.GEOMETRÍA

A continuación se muestran las dimensiones generales y propiedadesgeométricas de la vigas secundarias

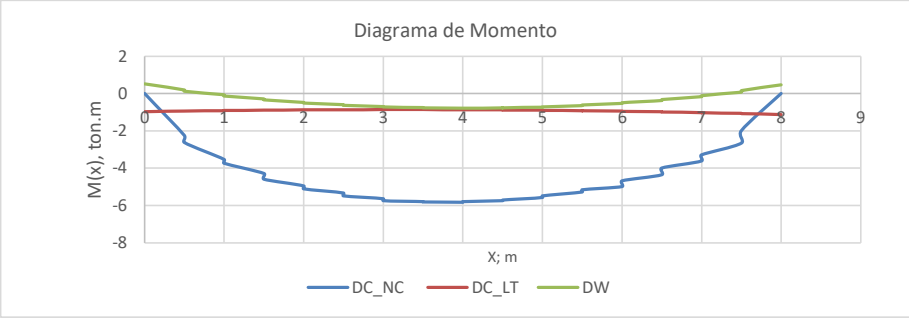
		unid.	TRAMO1					
			W24x68					1
Seccion Simple	d	cm	60.30					2
	tw	cm	1.10					3
	bf_{inf}	cm	22.80					4
	tf_{inf}	cm	1.50					5
	bf_{sup}	cm	22.80					6
	tf_{sup}	cm	1.50					7
	A	cm^2	129.7					8
	y	cm	30.15					9
	Ix	cm^4	76170.4					10
	Iy	cm^4	2930.3					11
	Sy_{top}	cm^3	257.0					12
	Sy_{bot}	cm^3	257.0					13
	Sx_{top}	cm^3	2526.4					14
	Sx_{bot}	cm^3	2526.4					15
Seccion Compuesta, M+ (cargas de largo plazo)	A	cm^2	383.6					16
	y	cm	63.3					17
	I	cm^4	300549.8					18
	S_{conc}	cm^3	11150.0					19
	$S_{topflan}$	cm^3	98704.3					20
	$S_{botflan}$	cm^3	4744.7					21
Seccion Compuesta, M+ (cargas de corto plazo)	A	cm^2	891.5					22
	y	cm	73.0					23
	I	cm^4	380304.1					24
	S_{conc}	cm^3	21987.8					25
	$S_{topflan}$	cm^3	29936.2					26
	$S_{botflan}$	cm^3	5209.4					27
Seccion Compuesta, M- (concreto no efectivo en tensión)	A	cm^2	163.7					28
	y	cm	41.0					29
	I	cm^4	150587.2					30
	$S_{topflan}$	cm^3	7810.1					31
	$S_{botflan}$	cm^3	3671.2					32

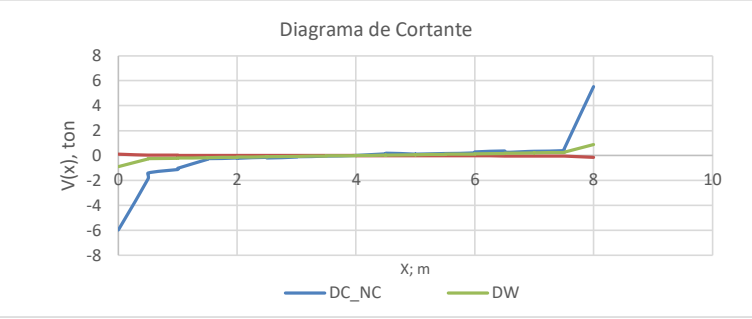


3. DISEÑO DE VIGAS Secundarias

3.3 Estimación de demandas (Vigas Exteriores)

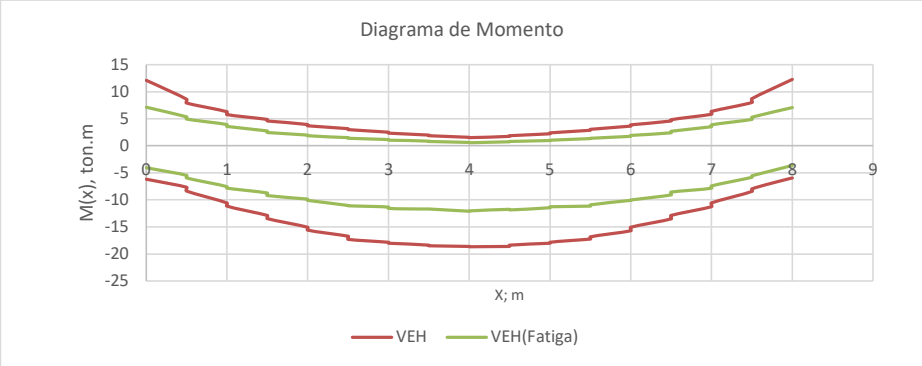
3.3.1 Cargas Permantes

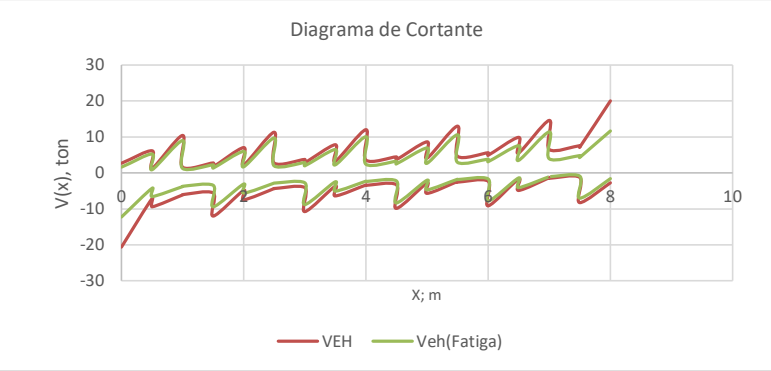




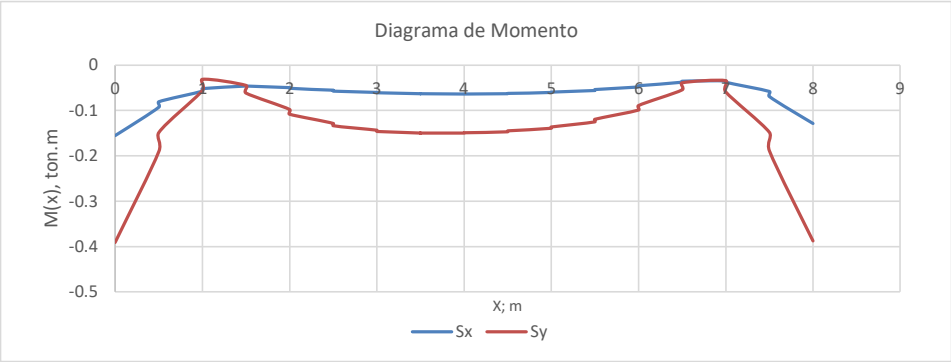
3.3.3 Carga Vehicular (LL+IM)

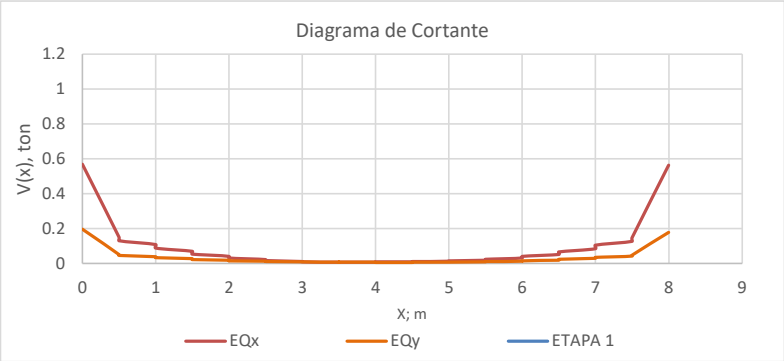
F_{IM} = 1.33 $F_{IM(FATIGA)}$ = 1.15 ***AASHTO 3.6.2.1***





3.3.4 Carga de Sismo

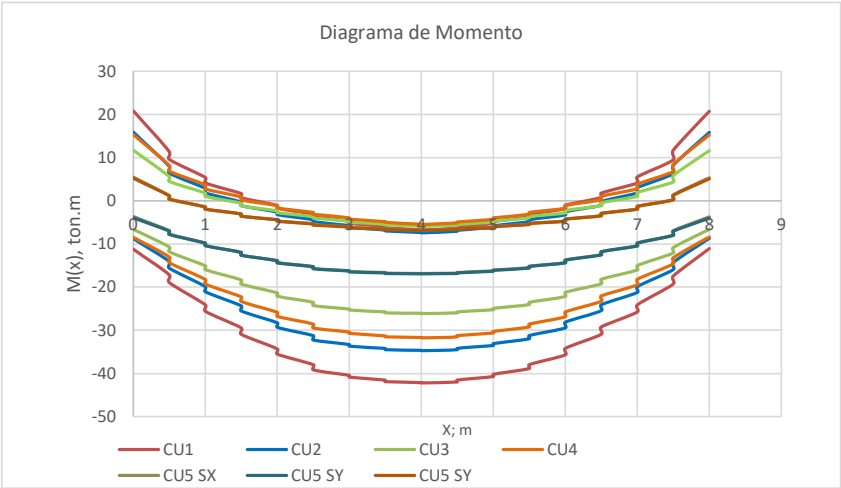


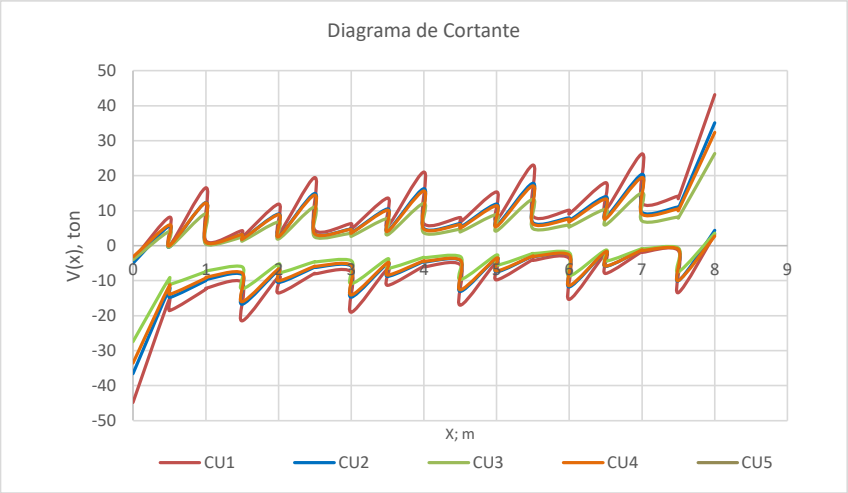


3.3.5 Demandas Últimas

AASHTO 3.4.1

	Factores de carga			
	DC	DW	LL+IM	EQ
CU1 (Strenght I)	1.25	1.5	1.75	0.00
CU2 (Strenght II)	1.25	1.5	1.35	0.00
CU3 (Service I)	1.00	1.0	1.00	0.00
CU4 (Service II)	1.00	1.0	1.30	0.00
CU5 (Extreme Event I)	1.00	1.0	0.50	1.00
CU6 (Fatigue I)	0.00	0.0	1.75	0.00
CU7 (Fatigue II)	0.00	0.0	0.80	0.00





3.4 Diseño por Flexión

3.4.1 Limites de proporcionalidad de las secciones *AASHTO 6.10.2*

	TRAMO1									
D/tw:Alma Sin rigidizadores Long.	52.09091	OK								
D/tw:Alma con rigidizadores long.		OK								
bf_{bot}	22.80	OK								
tf_{bot}	1.50	OK								
$bf/2tf_{(bot)}$	7.6	OK								
bf_{top}	22.80	OK								
tf_{top}	1.50	OK								
$bf/2tf_{(top)}$	7.6	OK								
Iy_{bot}/Iy_{top}	1	OK								
Iy_{top}/Iy_{bot}	1	OK								

3.4.2 Estado Límite de Servicio *AASHTO 6.10.4*

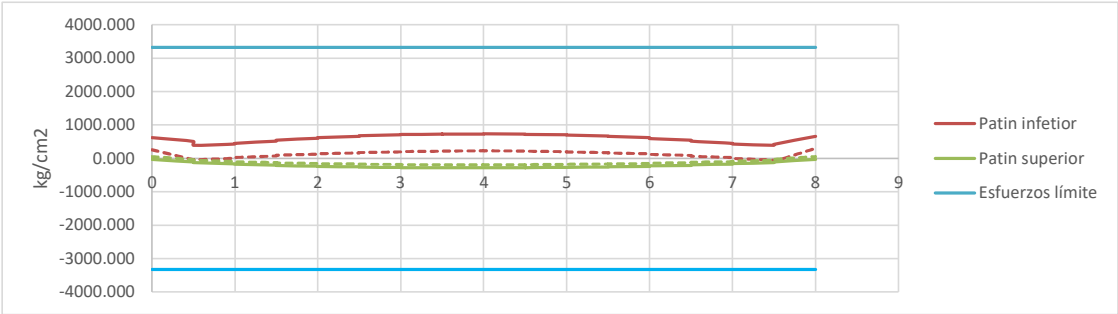
Deformación Elástica *AASHTO 6.10.4.1*

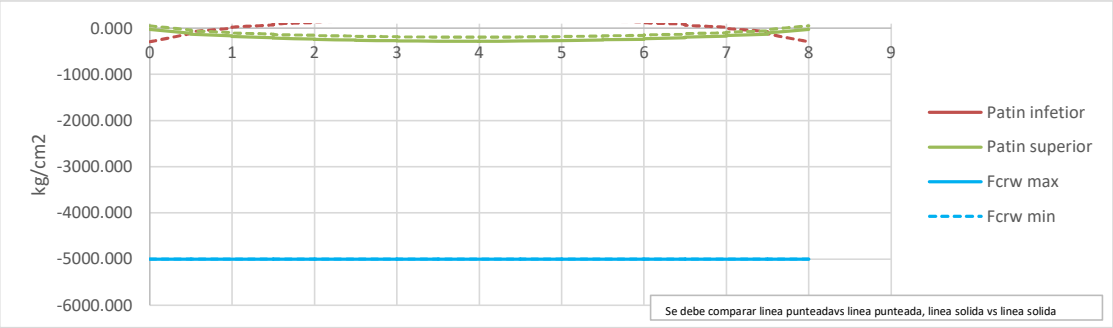
Longitud entre apoyos	8				m
Deflexion por carga vehicular	0.5	OK			cm

AASHTO 2.5.2.6.2

Deformaciones Permanentes *AASHTO 6.10.4.2*

Sección compuesta?	=	Si
Viga continua?	=	No
Construcción apuntalada	=	No
Concreto es efectivo a tensión	=	Si
Se detallan rigidizadores longitudinales	=	No
Se cumple AASHTO 6.10.1.7	=	Si





3.4.3 Momento Positivo

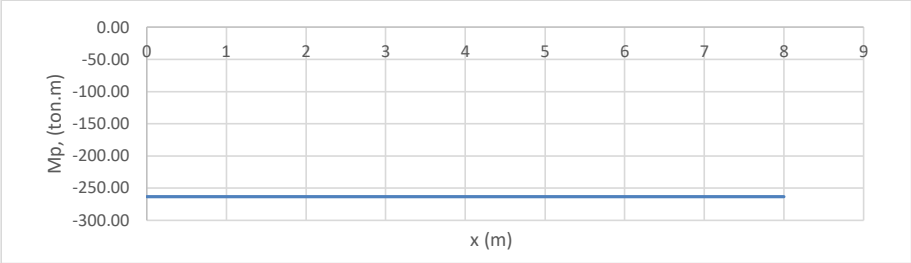
Revisión de sección compacta ***AASHTO 6.10.6.2.2***

	TRAMO 1										
Esfuerzo de fluencia de los patines	3500	OK									kg/cm2
Límite de esbeltez del alma ($2D_{cp}/t_w$)	0	OK									
Requisito de ductilidad (Dp)	9.22	OK									

AASHTO 6.10.7.3

Cálculo de Momento Plástico ***AASHTO D.6.1***

	TRAMO 1					
Dt	**90.3**					cm
Y	**81.1**					cm
D_p	**9.2**					cm
D_{cp}	**0.0**					cm
M_p	**262.9**					ton.m



Cálculo de Momento de Fluencia ***AASHTO D.6.2***

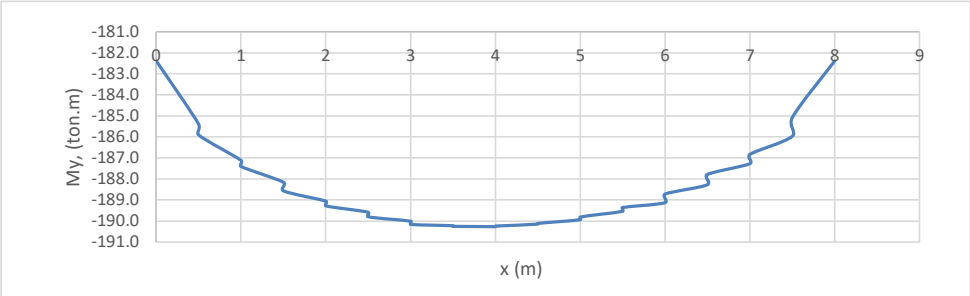
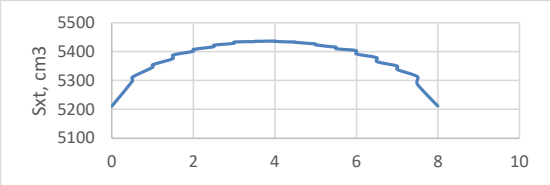
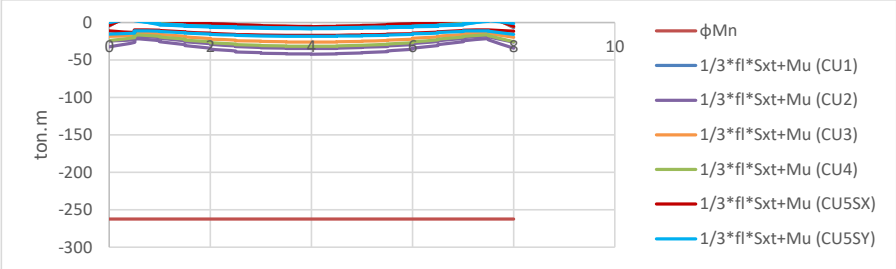


Grafico Demanda/Capacidad para momento positivo ***AASHTO 6.10.7.1.2***

Factor hibrido	Rh	=	1.0	***AASHTO 6.10.1.10.1***
Factor de resistencia por Flexion	ϕf	=	1.0	***AASHTO 6.5.4.2***
Modulo de seccion elastico		=		





3.4.4 Momento Negativo

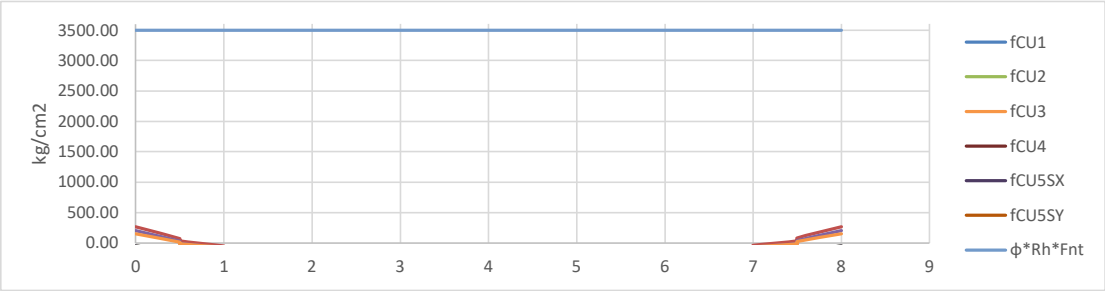
Revisión de sección compacta ***AASHTO 6.10.6.2.3***

	TRAMO 1										
Esfuerzo de fluencia de los patines	3500	OK									kg/cm2
Límite de esbeltez del alma (2Dc/tw)	71.85	OK									
Razón de Inercias (I_{yc}/I_{yt})	1.0	OK									

Patines en tensión

Factor de resistencia por Flexion	ϕf =	1.0	
Patines arriostrados continuamente	=	Si	**AASHTO 6.10.8.1.3**
Factor hibrido	Rh =	1.0	***AASHTO 6.10.1.10.1***

Grafico demanda capacidad

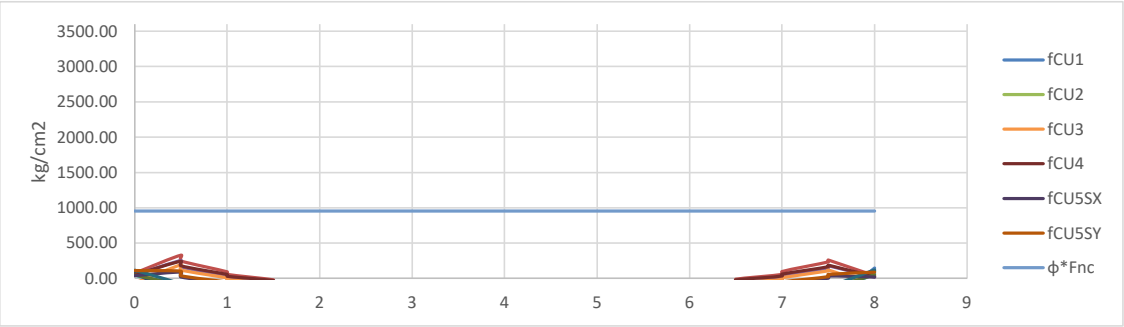


Patines en compresión **AASHTO 6.10.8.1.1**

		TRAMO 1					
	Rb	1.00					
	Rh	1.0					
	Fyc	3500					kgf/cm2
	Fyw	3500					kgf/cm2
	Fyr	2450					kg/cm2
Pandeo Local del patín a compresión	λf	7.60					
	λrf	16.12					
	λpf	9.15					
	Fnc	3500.0					kgf/cm2
Pandeo Lateral Torsional	rt	5.52					cm
	Lb	800.00					cm
	Lp	132.85					cm
	Lr	498.83					cm
	Fcr	952.55					kg/cm2
	Cb	1.00					
	Fnc	952.55					kg/cm2

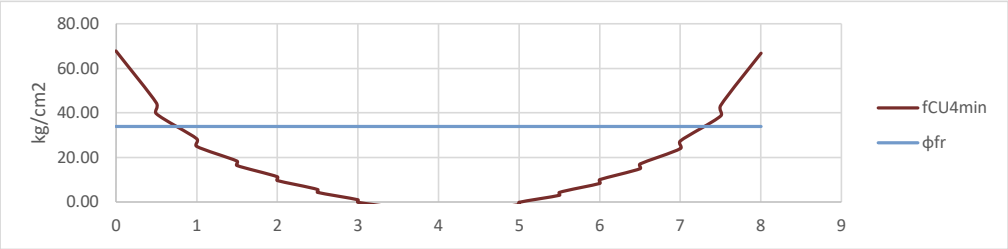
AASHTO 6.10.1.10.2
AASHTO 6.10.1.10.1
AASHTO 6.10.8.2.2

Grafico demanda capacidad



Revisión de Refuerzo mínimo en flexión Negativa ***AASHTO 6.10.1.7***

Módulo de ruptura	fr =	37.6	kg/cm2
	ϕ =	0.9	
Esfuerzo límite en tensión del concreto	ϕ*fr =	33.8	kg/cm2



Acero de refuerzo longitudinal mínimo en las zonas donde fCU4 es mayor a ϕfr (LOSA 20cm)	=	20 cm2/m	*2/3 deben colocarse en el
Acero de refuerzo longitudinal mínimo en las zonas donde fCU4 es mayor a ϕfr (LOSA 30cm)	=	30 cm2/m	lecho superior

Acero de refuerzo longitudinal colocado

LOSA 20cm					LOSA 30cm				
Malla superior	=	# 5	@ 20 cm		Malla superior	=	# 6	@ 20 cm	
		# 3	@ 20 cm	OK			# 5	@ 20 cm	OK
Malla inferior	=	# 5	@ 20 cm		Malla inferior	=	# 5	@ 20 cm	
		# 3	@ 20 cm				# 0	@ 20 cm	
Area de acero Total	=	26.9	cm2/m	OK	Area de acero Total	=	34.0	cm2/m	OK

3.5 Diseño Conectores de Cortante

AASHTO 6.10.10

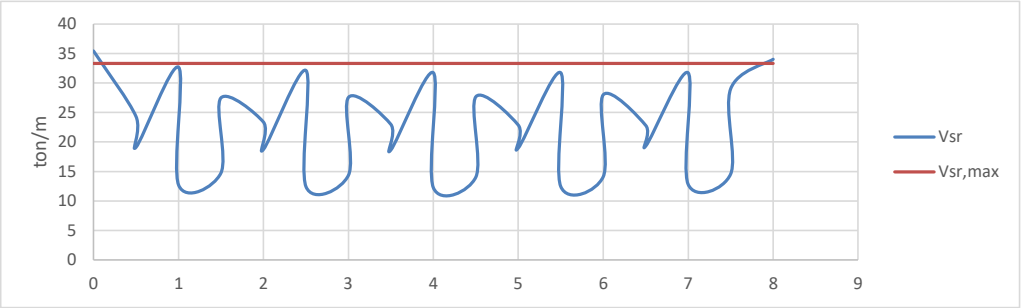
	Distribucion de studs colocados									
Estacion inicial	0									
Estacion final	8									
Diametro studs	2.5								cm	
Cant.max.studs x linea	2.0									
Cant.studs x linea	2.0									OK
pitch $_{max}$	60								cm	
pitch $_{min}$	15.0									
pitch	16								cm	OK
losa con metaldeck?	No									
altura min studs	15								cm	
altura de sutds	15.24								cm	OK
h/d	6.10									OK

Fatiga

AASHTO 6.10.10.2

	TRAMO1					
Q (momento positivo)	5558.14					cm3
Q (momento negativo)	5558.14					cm3

	Distribucion de studs								
Estacion inicial	0								
Estacion final	8.01								
Zr	2.66								ton
Vsrmax	33.301								ton/m



Resistencia ***AASHTO 6.10.10.4***

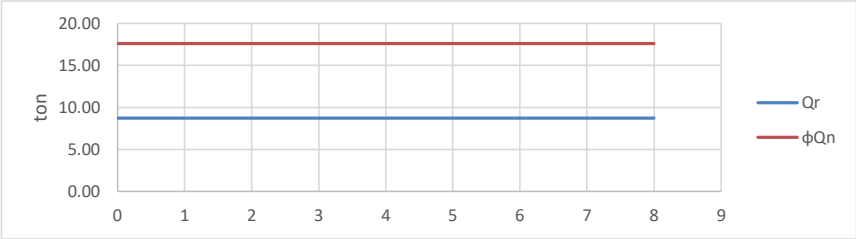
Factor de resistencia ϕsc = 0.85

	TRAMO1					
P1p	1535					ton
P2p	454					ton
Pp	454					ton
Fp	0					ton
P1n	454					ton
P2n	813					ton
Pn	454					ton
Pt	908					ton
Ft	0					ton
$P_{al\ extremo\ del\ elemento}$	454					ton
$P_{al\ apoyo\ intermedio\ (M-)}$	908					ton

	Primer Luz					
	max	min				
inicio de tramo	0					
ubicacion momento veh max positivo	4					
final del tramo	8					

Cantidad de studs tramo azul 52

Cantidad de studs tramo rojo 52



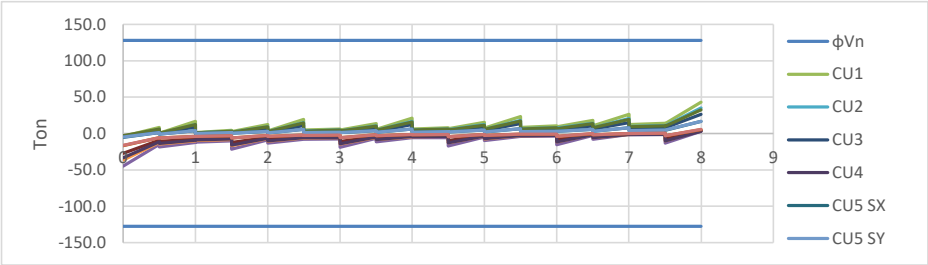
3.6 Diseño por Cortante

AASHTO 6.10.6.3/AASHTO 6.10.9/6.1

Factor de resistencia ϕv = 1.0

	Paneles intermedios					
	TRAMO1					
D/tw	52.09					
do paneles internos	223					cm
Rigidizadores Longitudinales?	No					
Alma rigidizada?	No					
sidera el alma rigidizada para la capacidad?	No					
Vp	127.95					ton
k	5.00					
C	1.00					
Vn	127.95					ton

	Paneles en zona de apoyo					
	TRAMO1					
D/tw	52.09					
do paneles internos	130					cm
Alma rigidizada?	No					
Vp	127.95					ton
k	5.00					
C	1.00					
Vn	127.95					ton

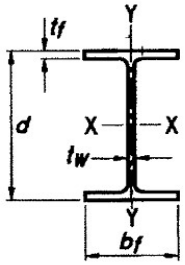


II. DISEÑO DE LA SUPERESTRUCTURA (Viga Secundaria zona de Pilas)

1.GEOMETRÍA

A continuación se muestran las dimensiones generales y propiedadesgeométricas de la vigas secundarias

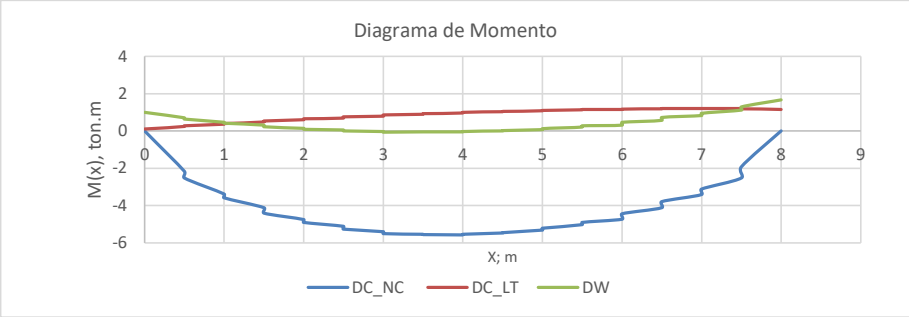
		unid.	TRAMO1					
Seccion Simple	d	cm	60.30					2
	tw	cm	1.10					3
	bf_{inf}	cm	22.80					4
	tf_{inf}	cm	1.50					5
	bf_{sup}	cm	22.80					6
	tf_{sup}	cm	1.50					7
	A	cm^2	129.7					8
	y	cm	30.15					9
	Ix	cm^4	76170.4					10
	Iy	cm^4	2930.3					11
	Sy_{top}	cm^3	257.0					12
	Sy_{bot}	cm^3	257.0					13
	Sx_{top}	cm^3	2526.4					14
	Sx_{bot}	cm^3	2526.4					15
Seccion Compuesta, M+ (cargas de largo plazo)	A	cm^2	480.1					16
	y	cm	62.2					17
	I	cm^4	281266.4					18
	S_{conc}	cm^3	10955.9					19
	$S_{topflan}$	cm^3	145932.4					20
	$S_{botflan}$	cm^3	4520.0					21
Seccion Compuesta, M+ (cargas de corto plazo)	A	cm^2	1181.0					22
	y	cm	69.3					23
	I	cm^4	365919.3					24
	S_{conc}	cm^3	19644.8					25
	$S_{topflan}$	cm^3	40779.2					26
	$S_{botflan}$	cm^3	5282.3					27
Seccion Compuesta, M- (concreto no efectivo en tensión)	A	cm^2	164.9					28
	y	cm	40.4					29
	I	cm^4	141825.9					30
	$S_{topflan}$	cm^3	7116.0					31
	$S_{botflan}$	cm^3	3513.2					32

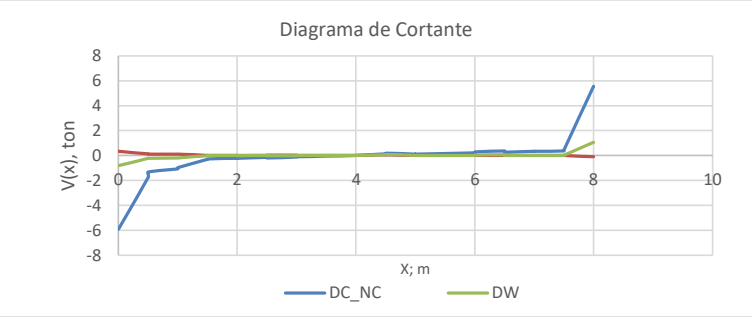


3. DISEÑO DE VIGAS Secundarias

3.3 Estimación de demandas (Vigas Exteriores)

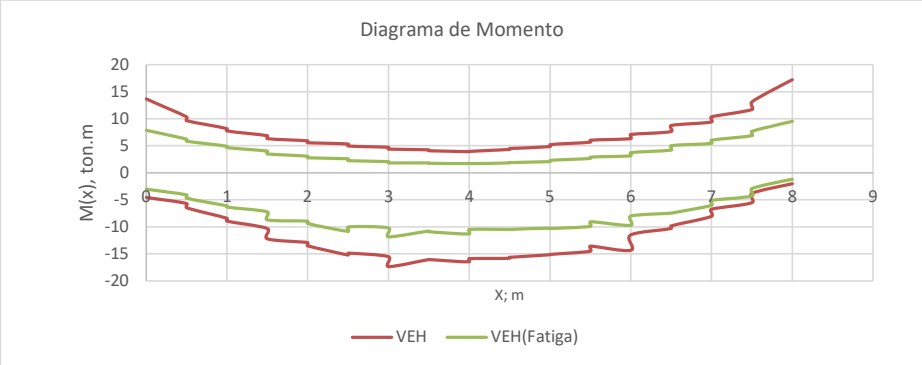
3.3.1 Cargas Permantes

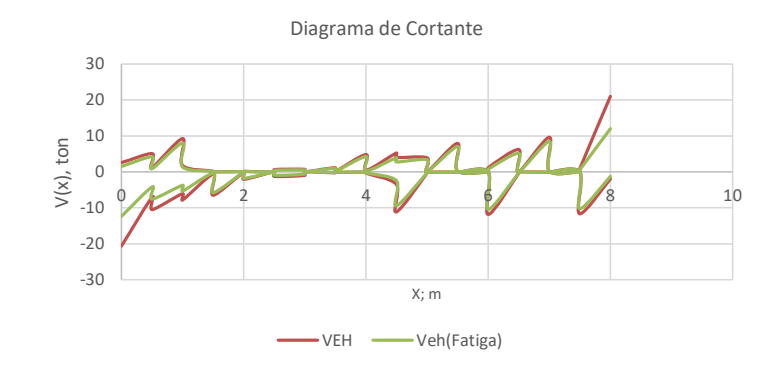




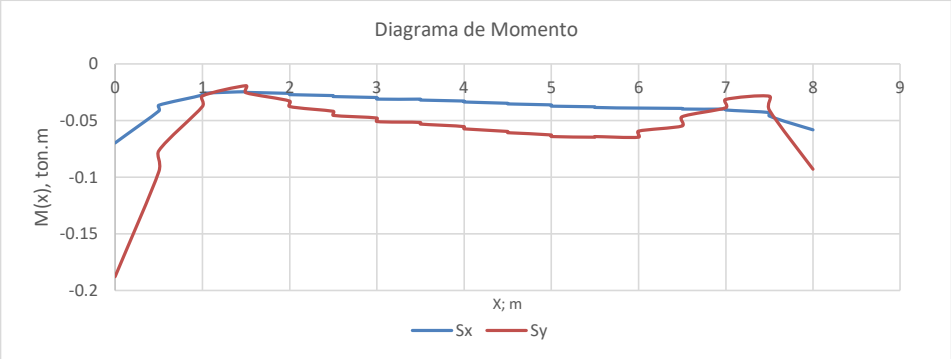
3.3.3 Carga Vehicular (LL+IM)

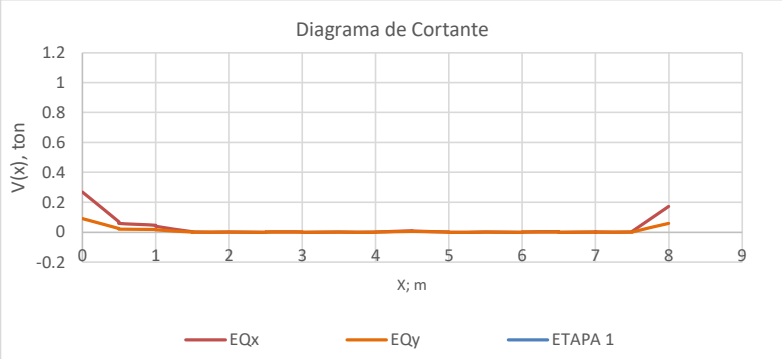
F_{IM} = 1.33 $F_{IM(FATIGA)}$ = 1.15 ***AASHTO 3.6.2.1***





3.3.4 Carga de Sismo

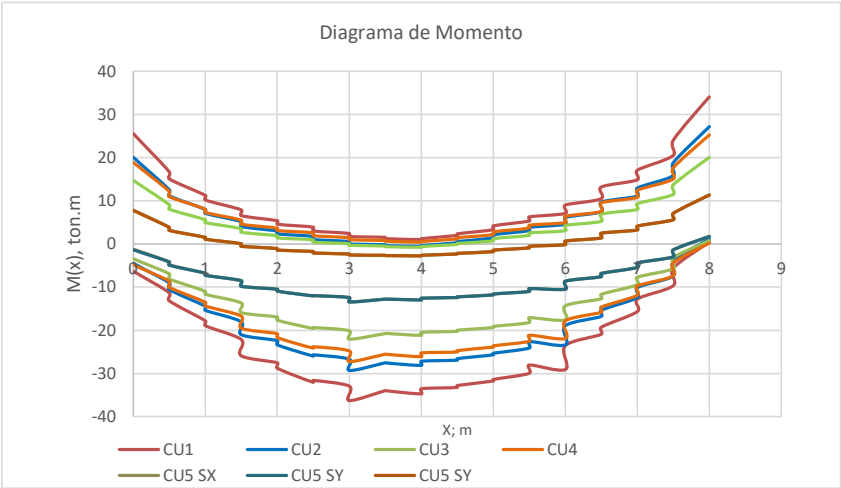


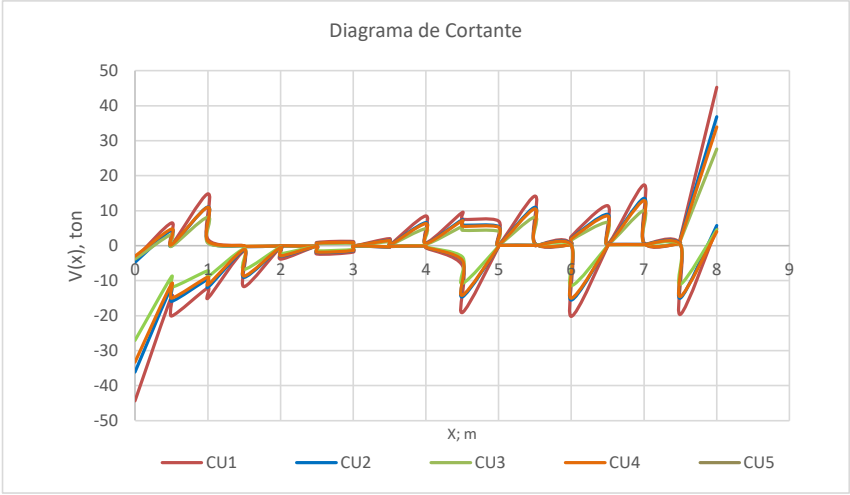


3.3.5 Demandas Últimas

AASHTO 3.4.1

	Factores de carga			
	DC	DW	LL+IM	EQ
CU1 (Strenght I)	1.25	1.5	1.75	0.00
CU2 (Strenght II)	1.25	1.5	1.35	0.00
CU3 (Service I)	1.00	1.0	1.00	0.00
CU4 (Service II)	1.00	1.0	1.30	0.00
CU5 (Extreme Event I)	1.00	1.0	0.50	1.00
CU6 (Fatigue I)	0.00	0.0	1.75	0.00
CU7 (Fatigue II)	0.00	0.0	0.80	0.00





3.4 Diseño por Flexión

3.4.1 Limites de proporcionalidad de las secciones

AASHTO 6.10.2

	TRAMO1									
D/tw:Alma Sin rigidizadores Long.	52.09091	OK								
D/tw:Alma con rigidizadores long.		OK								
bf_{bot}	22.80	OK								
tf_{bot}	1.50	OK								
$bf/2tf_{(bot)}$	7.6	OK								
bf_{top}	22.80	OK								
tf_{top}	1.50	OK								
$bf/2tf_{(top)}$	7.6	OK								
Iy_{bot}/Iy_{top}	1	OK								
Iy_{top}/Iy_{bot}	1	OK								

3.4.2 Estado Límite de Servicio

AASHTO 6.10.4

Deformación Elástica

AASHTO 6.10.4.1

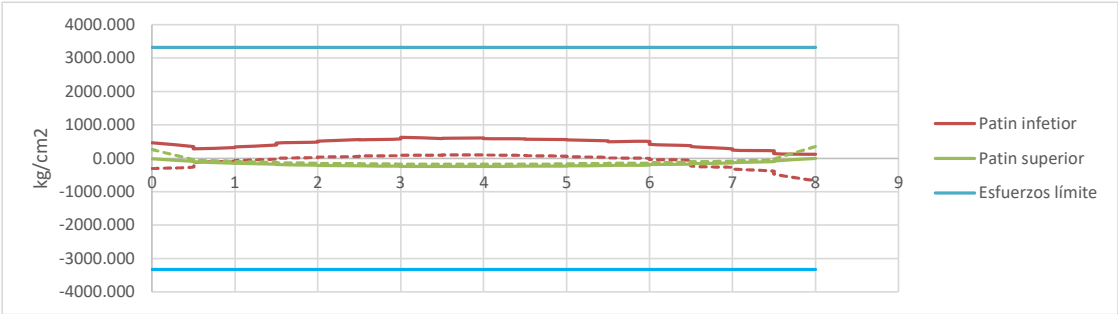
Longitud entre apoyos	8				m
Deflexion por carga vehicular	0.5	OK			cm

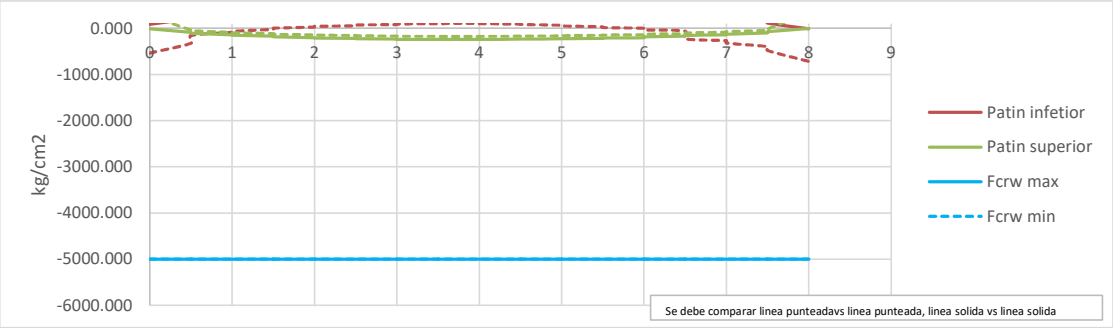
AASHTO 2.5.2.6.2

Deformaciones Permanentes

AASHTO 6.10.4.2

Sección compuesta?	=	Si
Viga continua?	=	No
Construcción apuntalada	=	No
Concreto es efectivo a tensión	=	Si
Se detallan rigidizadores longitudinales	=	No
Se cumple AASHTO 6.10.1.7	=	Si





3.4.3 Momento Positivo

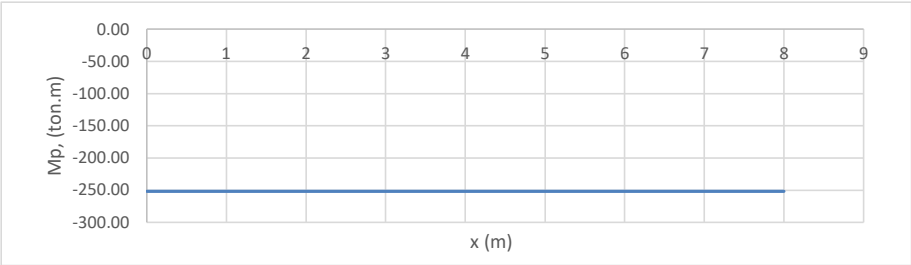
Revisión de sección compacta ***AASHTO 6.10.6.2.2***

	TRAMO 1										
Esfuerzo de fluencia de los patines	3500	OK									kg/cm2
Límite de esbeltez del alma ($2D_{cp}/t_w$)	0	OK									
Requisito de ductilidad (Dp)	11.62	OK									

AASHTO 6.10.7.3

Cálculo de Momento Plástico ***AASHTO D.6.1***

	TRAMO 1					
Dt	**87.9**					cm
Y	**78.7**					cm
D_p	**11.6**					cm
D_{cp}	**0.0**					cm
M_p	**251.9**					ton.m



Cálculo de Momento de Fluencia ***AASHTO D.6.2***

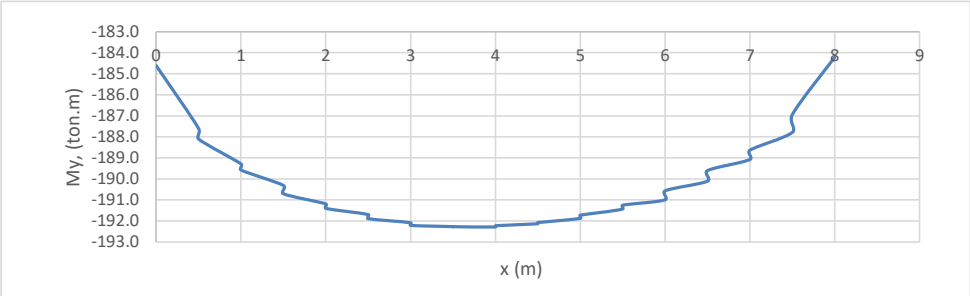
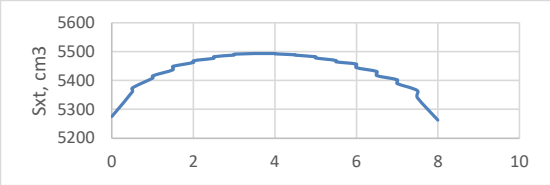
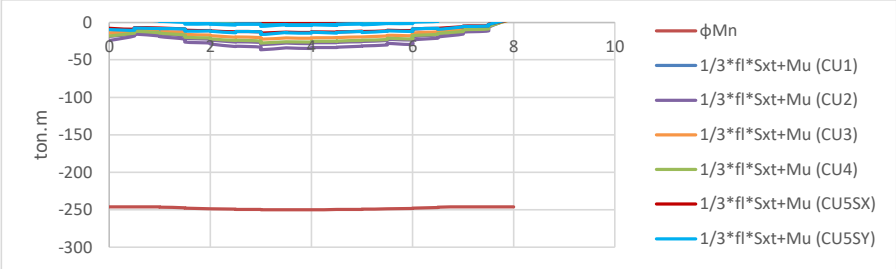


Grafico Demanda/Capacidad para momento positivo ***AASHTO 6.10.7.1.2***

Factor hibrido	Rh	=	1.0	***AASHTO 6.10.1.10.1***
Factor de resistencia por Flexion	ϕf	=	1.0	***AASHTO 6.5.4.2***
Modulo de seccion elastico		=		





3.4.4 Momento Negativo

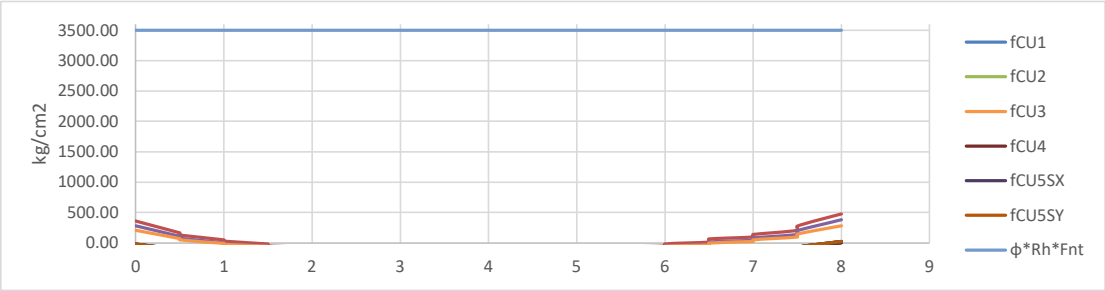
Revisión de sección compacta ***AASHTO 6.10.6.2.3***

	TRAMO 1										
Esfuerzo de fluencia de los patines	3500	OK									kg/cm2
Límite de esbeltez del alma (2Dc/tw)	70.67	OK									
Razón de Inercias (I_{yc}/I_{yt})	1.0	OK									

Patines en tensión

Factor de resistencia por Flexion	ϕf =	1.0	
Patines arriostrados continuamente	=	Si	**AASHTO 6.10.8.1.3**
Factor hibrido	Rh =	1.0	***AASHTO 6.10.1.10.1***

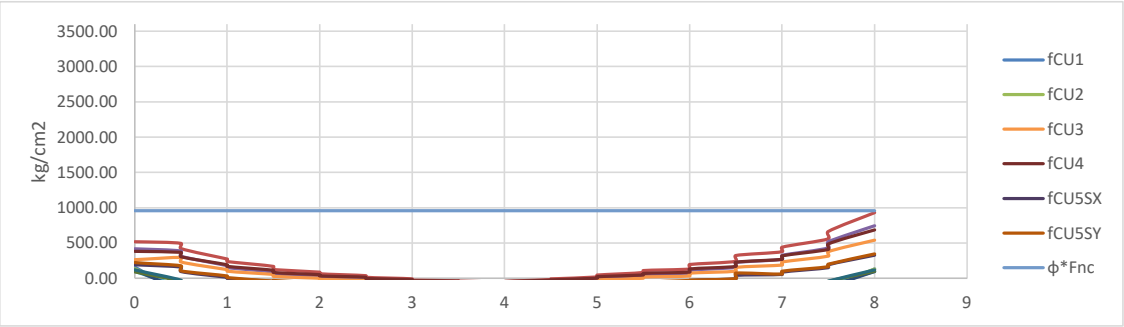
Grafico demanda capacidad



Patines en compresión **AASHTO 6.10.8.1.1**

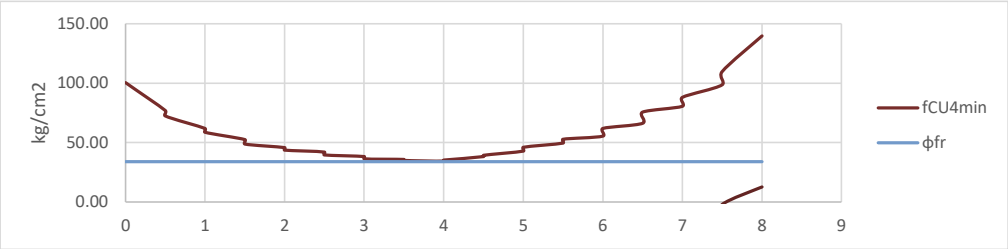
		TRAMO 1						
	Rb	1.00						**AASHTO 6.10.1.10.2**
	Rh	1.0						***AASHTO 6.10.1.10.1***
	Fyc	3500					kgf/cm2	
	Fyw	3500					kgf/cm2	
	Fyr	2450					kg/cm2	
Pandeo Local del patín a compresión	λf	7.60						***AASHTO 6.10.8.2.2***
	λrf	16.12						
	λpf	9.15						
	Fnc	3500.0					kgf/cm2	
Pandeo Lateral Torsional	rt	5.53					cm	
	Lb	800.00					cm	
	Lp	133.17					cm	
	Lr	500.05					cm	
	Fcr	957.23					kg/cm2	
	Cb	1.00						
	Fnc	957.23					kg/cm2	

Grafico demanda capacidad



Revisión de Refuerzo mínimo en flexión Negativa ***AASHTO 6.10.1.7***

Módulo de ruptura	fr =	37.6	kg/cm2
	ϕ =	0.9	
Esfuerzo límite en tensión del concreto	ϕ*fr =	33.8	kg/cm2



Acero de refuerzo longitudinal mínimo en las zonas donde fCU4 es mayor a ϕfr (LOSA 20cm)	=	20 cm2/m	*2/3 deben colocarse en el
Acero de refuerzo longitudinal mínimo en las zonas donde fCU4 es mayor a ϕfr (LOSA 30cm)	=	30 cm2/m	lecho superior

Acero de refuerzo longitudinal colocado

LOSA 20cm					LOSA 30cm				
Malla superior	=	# 5	@ 20 cm		Malla superior	=	# 8	@ 20 cm	
		# 3	@ 20 cm	OK			# 0	@ 20 cm	OK
Malla inferior	=	# 5	@ 20 cm		Malla inferior	=	# 5	@ 20 cm	
		# 3	@ 20 cm				# 0	@ 20 cm	
Area de acero Total	=	26.9	cm2/m	OK	Area de acero Total	=	35.2	cm2/m	OK

3.5 Diseño Conectores de Cortante

AASHTO 6.10.10

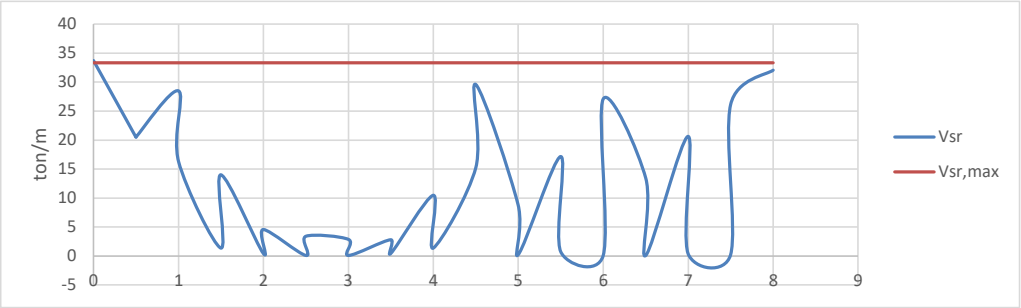
	Distribucion de studs colocados									
Estacion inicial	0									
Estacion final	8									
Diametro studs	2.5								cm	
Cant.max.studs x linea	2.0									
Cant.studs x linea	2.0									OK
pitch $_{max}$	60								cm	
pitch $_{min}$	15.0									
pitch	16								cm	OK
losa con metaldeck?	No									
altura min studs	15								cm	
altura de sutds	15.24								cm	OK
h/d	6.10									OK

Fatiga

AASHTO 6.10.10.2

	TRAMO1					
Q (momento positivo)	5074.28					cm3
Q (momento negativo)	5074.28					cm3

	Distribucion de studs								
Estacion inicial	0								
Estacion final	8.01								
Zr	2.66								ton
Vsrmax	33.301								ton/m



Resistencia ***AASHTO 6.10.10.4***

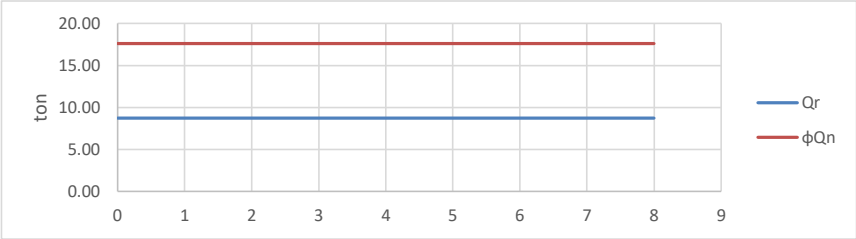
Factor de resistencia ϕsc = 0.85

	TRAMO1					
P1p	2118					ton
P2p	454					ton
Pp	454					ton
Fp	0					ton
P1n	454					ton
P2n	1122					ton
Pn	454					ton
Pt	908					ton
Ft	0					ton
$P_{al\ extremo\ del\ elemento}$	454					ton
$P_{al\ apoyo\ intermedio\ (M-)}$	908					ton

	Primer Luz					
	max	min				
inicio de tramo	0					
ubicacion momento veh max positivo	4					
final del tramo	8					

Cantidad de studs tramo azul 52

Cantidad de studs tramo rojo 52



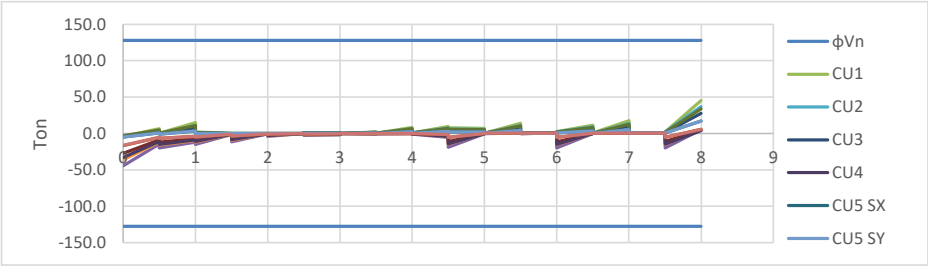
3.6 Diseño por Cortante

AASHTO 6.10.6.3/AASHTO 6.10.9/6.1

Factor de resistencia ϕv = 1.0

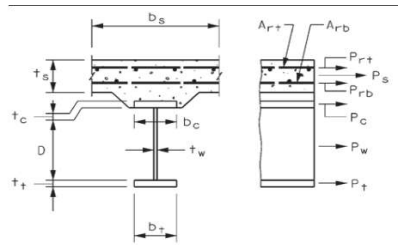
	Paneles intermedios					
	TRAMO1					
D/tw	52.09					
do paneles internos	223					cm
Rigidizadores Longitudinales?	No					
Alma rigidizada?	No					
sidera el alma rigidizada para la capacidad?	No					
Vp	127.95					ton
k	5.00					
C	1.00					
Vn	127.95					ton

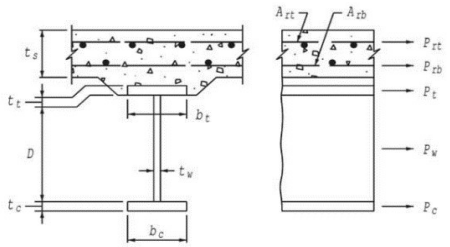
	Paneles en zona de apoyo					
	TRAMO1					
D/tw	52.09					
do paneles internos	130					cm
Alma rigidizada?	No					
Vp	127.95					ton
k	5.00					
C	1.00					
Vn	127.95					ton



VIGA SECUNDARIA (SALITRAL)

		Momento Plastico Flexión Positiva					Momento Plástico Flexión Negativa				
		TRAMO 1					**TRAMO 1**				
		W24x68					**W24x68**				
	Dt	**87.9**					**87.9**				
	Y	**78.68**					**49.38**				
Patín Inferior en tensión	*dbt (cm)*	***1.50***					**1.5**				
	Ybt (cm)	***0.75***					**0.8**				
	Pbt (ton)	**119.7**					**-119.7**				
Patín Inferior en compresión	*dbc (cm)*	***0.00***					**0.0**				
	Ybc (cm)	**1.50**					**1.5**				
	Pbc (ton)	**0.0**					**0.0**				
Alma en tensión	*dwt (cm)*	***57.3***					**47.9**				
	Ywt (cm)	***30.2***					**25.4**				
	Pwt (ton)	**220.6**					**-184.3**				
Alma en compresión	*dwc (cm)*	***0.0***					**9.4**				
	Ywc (cm)	***58.8***					**54.1**				
	Pwc (ton)	**0.0**					**36.3**				
Patín Superior en tensión	*dtt (cm)*	***1.50***					**0.0**				
	Ytt (cm)	***59.6***					**58.8**				
	Ptt (ton)	**119.7**					**0.0**				
Patín Superior en compresión	*dtc (cm)*	***0.00***					**1.5**				
	Ytc (cm)	**60.30**					**59.6**				
	Ptc (ton)	**0.0**					**119.7**				
Concreto en compresión	β1	**0.65**									
	a (cm)	***6.0***									
	ds (cm)	***6.0***									
	Ys (cm)	***84.9***									
	Ps (ton)	**-460.0**									
Acero long. cama inferior	*Arb (cm2)*						**9.9**				
	Yrb (cm)						*65.2*				
	Prb (ton)						**41.6**				
Acero long. cama superior	*Art*						**25.3**				
	Yrt (cm)						*83.0*				
	Prt (ton)						**106.4**				
	Suma de fuerzas	-0.008					**-0.0966**				
	Dcp	**0.0**					**47.9**				
	M_p (ton.m)	**251.9**					**-158.6**				
	Dt *(cm)*	90.30									
	Dp *(cm)*	11.62					38.52				





VIGA SECUNDARIA (SALITRAL)

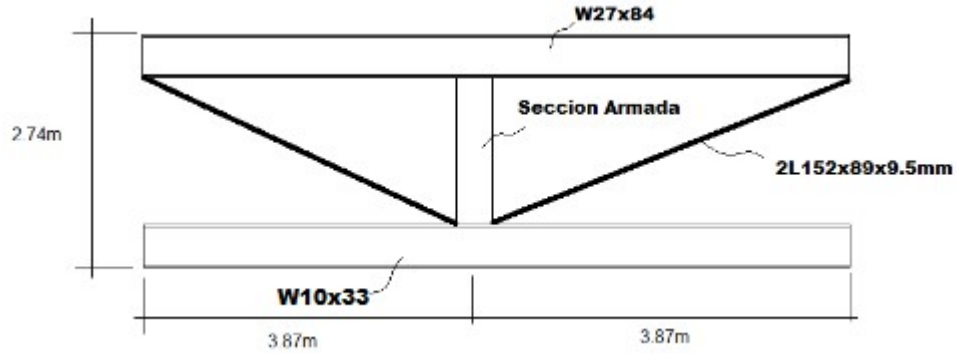
Ubicación	Sección	Sección No Compuesta							Sección Compuesta Momento Positivo															
		SNC_{top} (cm3)	SNC_{bot} (cm3)	Fy_{ftop} (kg/cm2)	Fy_{fboy} (kg/cm2)	My_{top} (ton.m)	My_{bot} (ton.m)	My (ton.m)	SNC_{top} (cm3)	SST_{top} (cm3)	SLT_{top} (cm3)	$MD1_{top}$ (ton.m)	$MD2_{top}$ (ton.m)	MAD_{top} (ton.m)	My_{top} (ton.m)	SNC_{bot} (cm3)	SST_{bot} (cm3)	SLT_{bot} (cm3)	$MD1_{bot}$ (ton.m)	$MD2_{bot}$ (ton.m)	MAD_{bot} (ton.m)	My_{bot} (ton.m)	My (ton.m)
0	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	0.0	-0.4	1047.9	1047.5	2526.381	5209.372	4744.652	0	-0.41489	182.8	182.4	**-182.4**
0.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-2.8	-0.9	1081.2	1077.6	2526.381	5209.372	4744.652	-2.80316	-0.86713	189.1	185.4	**-185.4**
0.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-3.3	-1.0	1086.9	1082.6	2526.381	5209.372	4744.652	-3.27356	-0.97494	190.1	185.9	**-185.9**
1	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-4.4	-1.2	1100.3	1094.6	2526.381	5209.372	4744.652	-4.39861	-1.24004	192.8	187.1	**-187.1**
1	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-4.7	-1.3	1103.4	1097.4	2526.381	5209.372	4744.652	-4.66163	-1.32933	193.4	187.4	**-187.4**
1.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-5.4	-1.5	1111.6	1104.7	2526.381	5209.372	4744.652	-5.35021	-1.54489	195.1	188.2	**-188.2**
1.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-5.7	-1.6	1116.1	1108.8	2526.381	5209.372	4744.652	-5.72938	-1.61666	195.9	188.6	**-188.6**
2	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.2	-1.8	1121.5	1113.5	2526.381	5209.372	4744.652	-6.17466	-1.78798	197.0	189.1	**-189.1**
2	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.4	-1.8	1123.9	1115.7	2526.381	5209.372	4744.652	-6.38026	-1.84416	197.5	189.3	**-189.3**
2.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.7	-2.0	1127.2	1118.5	2526.381	5209.372	4744.652	-6.65083	-1.97566	198.2	189.6	**-189.6**
2.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.8	-2.0	1129.5	1120.7	2526.381	5209.372	4744.652	-6.8499	-2.01765	198.7	189.8	**-189.8**
3	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.0	-2.1	1131.8	1122.6	2526.381	5209.372	4744.652	-7.03698	-2.11241	199.2	190.0	**-190.0**
3	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.2	-2.1	1133.5	1124.1	2526.381	5209.372	4744.652	-7.17625	-2.14119	199.5	190.2	**-190.2**
3.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.2	-2.2	1134.1	1124.7	2526.381	5209.372	4744.652	-7.2298	-2.2015	199.7	190.2	**-190.2**
3.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.3	-2.2	1134.4	1124.9	2526.381	5209.372	4744.652	-7.25495	-2.21774	199.7	190.2	**-190.2**
4	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.3	-2.2	1134.7	1125.1	2526.381	5209.372	4744.652	-7.27496	-2.24497	199.8	190.3	**-190.3**
4	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.2	-2.2	1134.3	1124.8	2526.381	5209.372	4744.652	-7.24206	-2.24904	199.7	190.2	**-190.2**
4.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.2	-2.2	1133.3	1123.9	2526.381	5209.372	4744.652	-7.1644	-2.24374	199.6	190.2	**-190.2**
4.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.1	-2.2	1132.9	1123.5	2526.381	5209.372	4744.652	-7.12779	-2.23569	199.5	190.1	**-190.1**
5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-7.0	-2.2	1130.9	1121.8	2526.381	5209.372	4744.652	-6.96371	-2.19748	199.1	189.9	**-189.9**
5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.8	-2.2	1129.5	1120.5	2526.381	5209.372	4744.652	-6.84301	-2.17699	198.8	189.8	**-189.8**
5.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.6	-2.1	1126.5	1117.8	2526.381	5209.372	4744.652	-6.59414	-2.10471	198.2	189.5	**-189.5**
5.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.4	-2.1	1124.6	1116.1	2526.381	5209.372	4744.652	-6.43389	-2.0712	197.9	189.4	**-189.4**
6	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-6.2	-2.0	1122.1	1113.9	2526.381	5209.372	4744.652	-6.22009	-1.96283	197.3	189.1	**-189.1**
6	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-5.8	-1.9	1117.6	1109.8	2526.381	5209.372	4744.652	-5.84518	-1.9154	196.5	188.7	**-188.7**
6.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-5.4	-1.8	1112.7	1105.5	2526.381	5209.372	4744.652	-5.43755	-1.76813	195.5	188.3	**-188.3**
6.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-5.0	-1.7	1107.4	1100.7	2526.381	5209.372	4744.652	-4.98804	-1.70553	194.5	187.8	**-187.8**
7	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-4.5	-1.5	1101.7	1095.7	2526.381	5209.372	4744.652	-4.51154	-1.51537	193.3	187.3	**-187.3**
7	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-4.1	-1.4	1097.0	1091.4	2526.381	5209.372	4744.652	-4.11425	-1.43587	192.4	186.8	**-186.8**
7.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-3.3	-1.2	1087.5	1082.9	2526.381	5209.372	4744.652	-3.31854	-1.19814	190.5	186.0	**-186.0**
7.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	-2.5	-1.1	1077.4	1073.8	2526.381	5209.372	4744.652	-2.47061	-1.10113	188.6	185.1	**-185.1**
8	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	29936.2	98704.3	0.0	-0.7	1048.0	1047.3	2526.381	5209.372	4744.652	7.86E-14	-0.68069	183.1	182.4	**-182.4**

VIGA SECUNDARIA ZONA DE PILAS (SALITRAL)

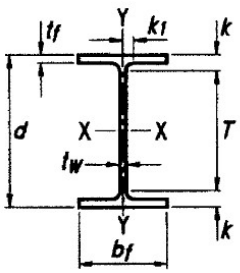
Ubicación	Sección	Sección No Compuesta							Sección Compuesta Momento Positivo														
		SNC_{top} (cm3)	SNC_{bot} (cm3)	Fy_{ftop} (kg/cm2)	Fy_{fboy} (kg/cm2)	My_{top} (ton.m)	My_{bot} (ton.m)	My (ton.m)	SNC_{top} (cm3)	SST_{top} (cm3)	SLT_{top} (cm3)	$MD1_{top}$ (ton.m)	$MD2_{top}$ (ton.m)	MAD_{top} (ton.m)	My_{top} (ton.m)	SNC_{bot} (cm3)	SST_{bot} (cm3)	SLT_{bot} (cm3)	$MD1_{bot}$ (ton.m)	$MD2_{bot}$ (ton.m)	MAD_{bot} (ton.m)	My_{bot} (ton.m)	My (ton.m)
0	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	0.0	1.6	1426.8	1428.4	2526.381	5282.265	4519.978	0	1.6242	183.0	184.6	**-184.6**
0.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-2.7	1.4	1470.6	1469.2	2526.381	5282.265	4519.978	-2.70535	1.352378	189.0	187.6	**-187.6**
0.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-3.1	1.3	1477.7	1475.9	2526.381	5282.265	4519.978	-3.14769	1.29639	189.9	188.1	**-188.1**
1	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-4.2	1.2	1495.1	1492.1	2526.381	5282.265	4519.978	-4.22356	1.165098	192.3	189.3	**-189.3**
1	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-4.5	1.1	1499.2	1495.8	2526.381	5282.265	4519.978	-4.47376	1.125368	192.9	189.6	**-189.6**
1.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-5.1	1.0	1509.9	1505.8	2526.381	5282.265	4519.978	-5.13938	1.04867	194.4	190.3	**-190.3**
1.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-5.5	1.0	1515.7	1511.2	2526.381	5282.265	4519.978	-5.4981	0.995305	195.2	190.7	**-190.7**
2	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-5.9	1.0	1522.7	1517.8	2526.381	5282.265	4519.978	-5.93021	0.960853	196.2	191.2	**-191.2**
2	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.1	0.9	1525.8	1520.7	2526.381	5282.265	4519.978	-6.12323	0.943898	196.6	191.4	**-191.4**
2.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.4	0.9	1530.1	1524.7	2526.381	5282.265	4519.978	-6.38808	0.927755	197.2	191.7	**-191.7**
2.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.6	0.9	1533.1	1527.4	2526.381	5282.265	4519.978	-6.57069	0.940608	197.5	191.9	**-191.9**
3	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.8	1.0	1536.0	1530.2	2526.381	5282.265	4519.978	-6.75084	0.955443	197.9	192.1	**-192.1**
3	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.9	1.0	1538.0	1532.1	2526.381	5282.265	4519.978	-6.87593	0.988038	198.1	192.2	**-192.2**
3.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.9	1.0	1538.8	1532.9	2526.381	5282.265	4519.978	-6.9278	1.022683	198.2	192.3	**-192.3**
3.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.9	1.1	1539.1	1533.2	2526.381	5282.265	4519.978	-6.94729	1.064423	198.2	192.3	**-192.3**
4	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-7.0	1.1	1539.3	1533.5	2526.381	5282.265	4519.978	-6.96224	1.1268	198.1	192.3	**-192.3**
4	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.9	1.2	1538.7	1533.0	2526.381	5282.265	4519.978	-6.92566	1.201025	198.0	192.2	**-192.2**
4.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.8	1.3	1537.4	1531.9	2526.381	5282.265	4519.978	-6.84521	1.297468	197.7	192.1	**-192.1**
4.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.8	1.3	1536.8	1531.3	2526.381	5282.265	4519.978	-6.80796	1.342155	197.5	192.1	**-192.1**
5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.6	1.5	1534.1	1528.9	2526.381	5282.265	4519.978	-6.64358	1.463005	197.1	191.9	**-191.9**
5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.5	1.6	1532.1	1527.2	2526.381	5282.265	4519.978	-6.52409	1.57601	196.7	191.7	**-191.7**
5.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.3	1.7	1528.1	1523.6	2526.381	5282.265	4519.978	-6.2781	1.714685	196.0	191.4	**-191.4**
5.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-6.1	1.8	1525.6	1521.3	2526.381	5282.265	4519.978	-6.1227	1.836023	195.5	191.2	**-191.2**
6	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-5.9	1.9	1522.1	1518.1	2526.381	5282.265	4519.978	-5.9076	1.922155	195.0	191.0	**-191.0**
6	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-5.6	2.2	1516.3	1512.9	2526.381	5282.265	4519.978	-5.55113	2.16283	194.0	190.6	**-190.6**
6.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-5.2	2.3	1509.8	1507.0	2526.381	5282.265	4519.978	-5.15279	2.32799	192.9	190.1	**-190.1**
6.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-4.7	2.6	1502.9	1500.7	2526.381	5282.265	4519.978	-4.72885	2.59247	191.7	189.6	**-189.6**
7	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-4.3	2.7	1495.4	1493.9	2526.381	5282.265	4519.978	-4.2697	2.738943	190.6	189.1	**-189.1**
7	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-3.9	2.9	1489.4	1488.5	2526.381	5282.265	4519.978	-3.90138	2.92949	189.6	188.6	**-188.6**
7.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-3.2	3.2	1477.4	1477.4	2526.381	5282.265	4519.978	-3.15804	3.181295	187.8	187.8	**-187.8**
7.5	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	-2.4	3.4	1465.1	1466.1	2526.381	5282.265	4519.978	-2.40249	3.42878	185.9	186.9	**-186.9**
8	W24x68	2526.381	2526.381	3500	3500	88.4	88.4	**88.4**	2526.4	40779.2	145932.4	0.0	3.9	1426.2	1430.1	2526.381	5282.265	4519.978	-3.4E-14	3.94005	180.3	184.2	**-184.2**

Revisión Diafragma Central (Cuerda Inferior)

- Geometría



$Sec = \text{“W10X33”}$ $\quad L := 7.74 \cdot m$ $\quad W_s = 33 \dfrac{lbf}{ft}$



$D = 24.714\ cm$

$t_w = 0.737\ cm$ $\quad F_y := 50 \cdot ksi$ $\quad E := 29000000 \cdot \dfrac{lbf}{in^2}$

$t_f = 1.105\ cm$

$b_f = 20.218\ cm$

Propiedades de la Sección

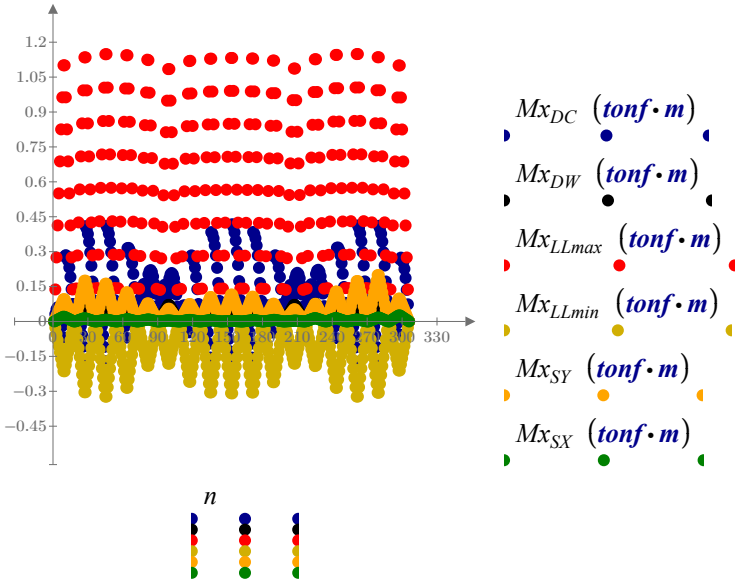
$I_x = \left(7.118 \cdot 10^3\right)\ cm^4$ $\quad I_y = \left(1.523 \cdot 10^3\right)\ cm^4$ $\quad h_o = 23.622\ cm$

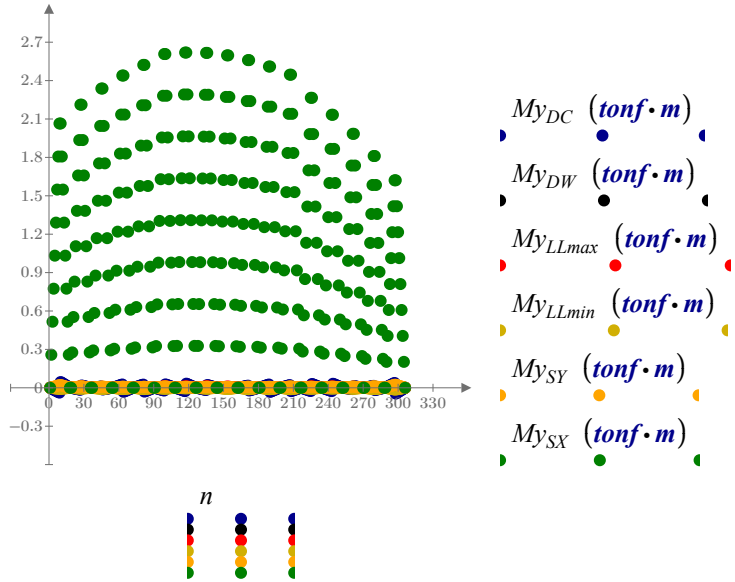
$S_x = 573.547\ cm^3$ $\quad S_y = 150.761\ cm^3$ $\quad C_w = \left(2.124 \cdot 10^5\right)\ cm^6$

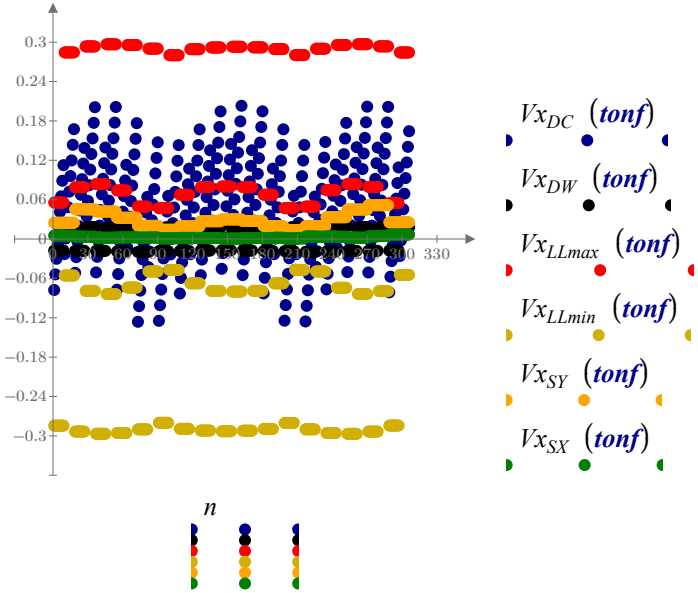
$r_x = 10.643\ cm$ $\quad r_y = 4.928\ cm$ $\quad J = 24.266\ cm^4$

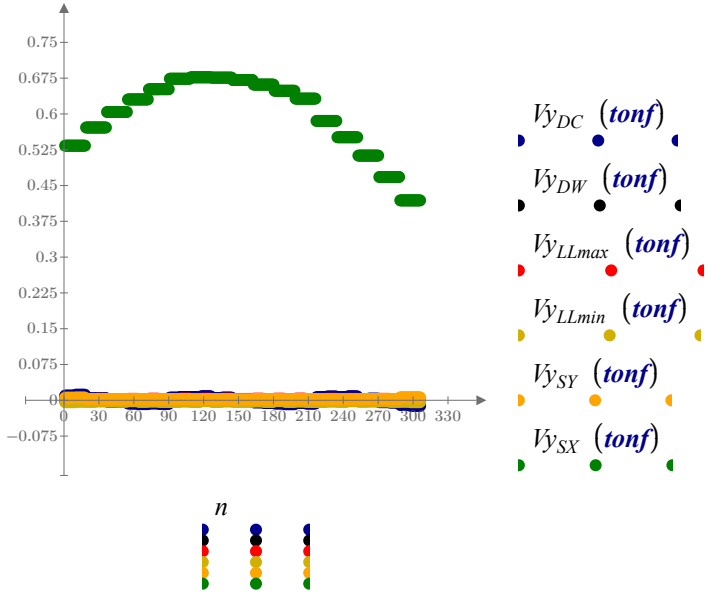
$Z_x = 635.818\ cm^3$ $\quad Z_y = 229.419\ cm^3$

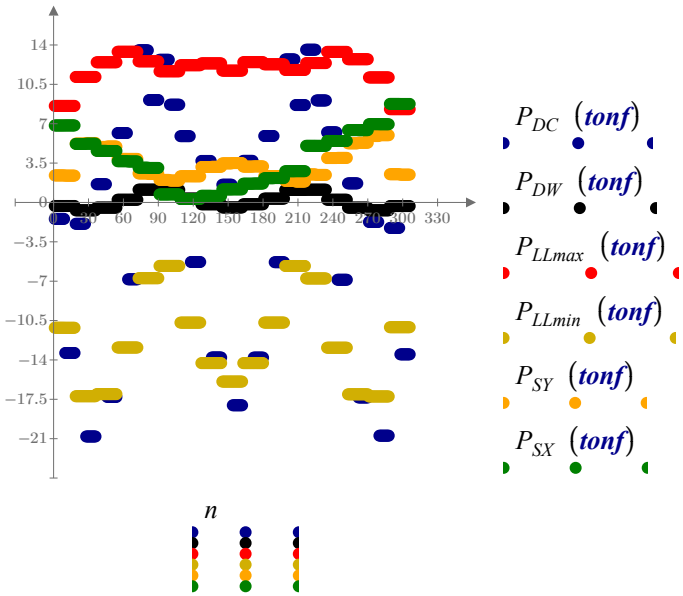
Demandas


Mx_{DC} $(tonf \cdot m)$
Mx_{DW} $(tonf \cdot m)$
Mx_{LLmax} $(tonf \cdot m)$
Mx_{LLmin} $(tonf \cdot m)$
Mx_{SY} $(tonf \cdot m)$
Mx_{SX} $(tonf \cdot m)$
n


My_{DC} $(tonf \cdot m)$
My_{DW} $(tonf \cdot m)$
My_{LLmax} $(tonf \cdot m)$
My_{LLmin} $(tonf \cdot m)$
My_{SY} $(tonf \cdot m)$
My_{SX} $(tonf \cdot m)$
n


Vx_{DC} $(tonf)$
Vx_{DW} $(tonf)$
Vx_{LLmax} $(tonf)$
Vx_{LLmin} $(tonf)$
Vx_{SY} $(tonf)$
Vx_{SX} $(tonf)$
n


Vy_{DC} $(tonf)$
Vy_{DW} $(tonf)$
Vy_{LLmax} $(tonf)$
Vy_{LLmin} $(tonf)$
Vy_{SY} $(tonf)$
Vy_{SX} $(tonf)$
n



$$P_{DW} = \begin{bmatrix} -2.777 \cdot 10^3 \\ -2.777 \cdot 10^3 \\ -2.777 \cdot 10^3 \\ -2.777 \cdot 10^3 \\ -2.777 \cdot 10^3 \\ \vdots \end{bmatrix} N$$

Demanada última

$$PU_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$PU_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$G := 11200 \cdot ksi$$

$$VUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

Capacidad a Flexión

$\phi_b := 0.9$ $L_b := 3.87 \cdot m$ $C_b := 1$

Clasificación de la sección por pandeo Local **(A**

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 9.149$$

$$\lambda_{pf} := 0.38 \cdot \sqrt{\frac{E}{F_y}} = 9.152 \qquad \lambda_{rf} := 1.0 \cdot \sqrt{\frac{E}{F_y}} = 24.083$$

$Alas \rightarrow$ "Sección No Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.225\ m$$

$$\lambda w := \frac{h}{t_w} = 30.552$$

$$\lambda_{pw} := 3.76 \cdot \sqrt{\frac{E}{F_y}} = 90.553 \qquad \lambda_{rw} := 5.70 \cdot \sqrt{\frac{E}{F_y}} = 137.274$$

$Alma \rightarrow$ "Sección Compacta"

Capacidad de una sección doblemente simétrica compacta alrededor del eje fuerte

- Cedencia

$$M_p := F_y \cdot Z_x = 24.638\ tonf \cdot m$$

- Pandeo Lateral Torsional

$$r_{ts} := \sqrt{\frac{\sqrt{I_y \cdot C_w}}{S_x}} = 0.056\ m$$

$$c := \left(\frac{h_o}{2}\right) \cdot \sqrt{\frac{I_y}{C_w}} = 1$$

$$L_p := 1.76 \cdot r_y \cdot \sqrt{\frac{E}{F_y}} = 2.089 \ \boldsymbol{m}$$

$$L_r := 1.95 \cdot r_{ts} \cdot \left(\frac{E}{(0.7 \cdot F_y)}\right) \cdot \sqrt{\left(\frac{(J \cdot c)}{S_x \cdot h_o}\right) + \sqrt{\left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right)^2 + 6.76 \cdot \left(\frac{(0.7 \cdot F_y)}{E}\right)^2}} = 6.652 \ \boldsymbol{m}$$

$$F_{cr}(l_b) := \left(\frac{(C_b \cdot \pi^2 \cdot E)}{\left(\frac{l_b}{r_{ts}}\right)^2}\right) \cdot \sqrt{1 + 0.078 \cdot \left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right) \cdot \left(\frac{l_b}{r_{ts}}\right)^2}$$

$$M_{n1}(l_b) := \mathbf{if}\left(l_b \le L_p, M_p, \left(\mathbf{if}\left(l_b \le L_r, C_b \cdot \left(M_p - (M_p - 0.7 \cdot F_y \cdot S_x) \cdot \left(\frac{(l_b - L_p)}{(L_r - L_p)}\right)\right), F_{cr}(l_b) \cdot S_x\right)\right)\right)$$

Capacidad de una sección doblemente simétrica con alma compacta y patines no compactos o esbeltos alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$k_c := \frac{4}{\sqrt{\frac{h}{t_w}}} = 0.724$$

$$M_{n2}(\lambda) := \begin{cases} \text{if } \lambda < \lambda_{pf} \\ \quad M_p \\ \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \quad \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) \\ \text{else} \\ \quad \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} \end{cases}$$

Capacidad de una sección doblemente simétrica con alma no compacta alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$M_{n3}(\lambda) := \begin{cases} \text{if } \lambda < \lambda_{pf} \\ \quad M_p \\ \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \quad \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) \\ \text{else} \\ \quad \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} \end{cases}$$

$$M_{nx} := \left\| \begin{array}{l} \text{if } Alas = \text{“Sección Compacta”} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n1}(L_b) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \\ \text{else} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n2}(\lambda f) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \end{array} \right. = 24.638\ tonf \cdot m$$

Capacidad de la sección alrededor del eje debil **(AISC 360-10.F6)**

- Cedencia

$$M_{py} := min\left(F_y \cdot Z_y, 1.6 \cdot F_y \cdot S_y\right)$$

- Pandeo Local del ala

$$F_{crf}(\lambda_f) := \frac{(0.69 \cdot E)}{(\lambda_f)^2}$$

$$M_{ny}(\lambda_f) := \mathbf{if}\left(\lambda_f \le \lambda_{pf}, M_{py}, \mathbf{if}\left(\lambda_f \le \lambda_{rf}, \left(M_{py} - (M_{py} - 0.7 \cdot F_y \cdot S_y) \cdot \left(\frac{(\lambda_f - \lambda_{pf})}{(\lambda_{rf} - \lambda_{pf})}\right)\right), F_{crf}(\lambda_f) \cdot S_y\right)\right)$$

$$M_{ny} := M_{ny}(\lambda f)$$

Capacidad a Compresión

Clasificación de la sección por pandeo Local

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 9.149 \qquad \lambda_{rf} := 0.56 \cdot \sqrt{\frac{E}{F_y}} = 13.487$$

Alas → "Sección Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.225 \ m$$

$$\lambda w := \frac{h}{t_w} = 30.552$$

$$\lambda_{rw} := 1.49 \cdot \sqrt{\frac{E}{F_y}} = 35.884$$

Alma → "Sección Compacta"

$$K := 1$$

$$r := \max(r_x, r_y) = 0.106 \ m$$

$$F_e := \frac{\pi^2 \cdot E}{\left(\frac{K \cdot L}{r}\right)^2} = \left(3.731 \cdot 10^8\right) \ Pa$$

$$F_{cr} := \begin{cases} \text{if } \frac{F_y}{F_e} \le 2.25 \\ \quad \left(0.658^{\frac{F_y}{F_e}}\right) \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(2.342 \cdot 10^8\right) \ Pa$$

$$b_e := \begin{cases} \left(1.92 \cdot t_w \cdot \sqrt{\frac{E}{F_{cr}}} \cdot \left(1 - \frac{0.34}{\left(\frac{h}{t_w}\right)} \cdot \sqrt{\frac{E}{F_{cr}}}\right)\right) & \text{if } \lambda w \geq 1.49 \cdot \sqrt{\frac{E}{F_{cr}}} \\ h & \text{else} \end{cases} = 0.225\ m$$

$A_e := b_e \cdot t_w = 0.002\ m^2$ $\qquad$ $A_{gl} := h \cdot t_w = 0.002\ m^2$

$$Q_a := \frac{A_e}{A_{gl}} = 1$$

$$Q_s := \begin{cases} 1 & \text{if } \frac{b_f}{2 \cdot t_f} \leq 0.56 \cdot \sqrt{\frac{E}{F_y}} \\ 1.415 - 0.74 \cdot \left(\frac{b_f}{2 \cdot t_f}\right) \cdot \sqrt{\frac{F_y}{E}} & \text{also if } 0.56 \cdot \sqrt{\frac{E}{F_y}} < \frac{b_f}{2 \cdot t_f} \leq 1.03 \cdot \sqrt{\frac{E}{F_y}} \\ \frac{0.69 \cdot E}{F_y \cdot \left(\frac{b_f}{2 \cdot t_f}\right)^2} & \text{else} \end{cases} = 1$$

$$Q := Q_a \cdot Q_s$$

$$F_{cr} := \begin{cases} \left(0.658^{\frac{Q \cdot F_y}{F_e}}\right) \cdot Q \cdot F_y & \text{if } \frac{Q \cdot F_y}{F_e} \leq 2.25 \\ 0.877 \cdot F_e & \text{else} \end{cases} = \left(2.342 \cdot 10^8\right)\ Pa$$

$P_n := F_{cr} \cdot A_g = 164.894$ ***tonf***

$\phi_c := 0.9$

Flexo compresión

$$RazonCapacidad1_i := \begin{cases} \text{if } \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{Strenght1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad2_i := \begin{cases} \text{if } \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{Strenght1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad3_i := \begin{cases} \text{if } \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ServiceI1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

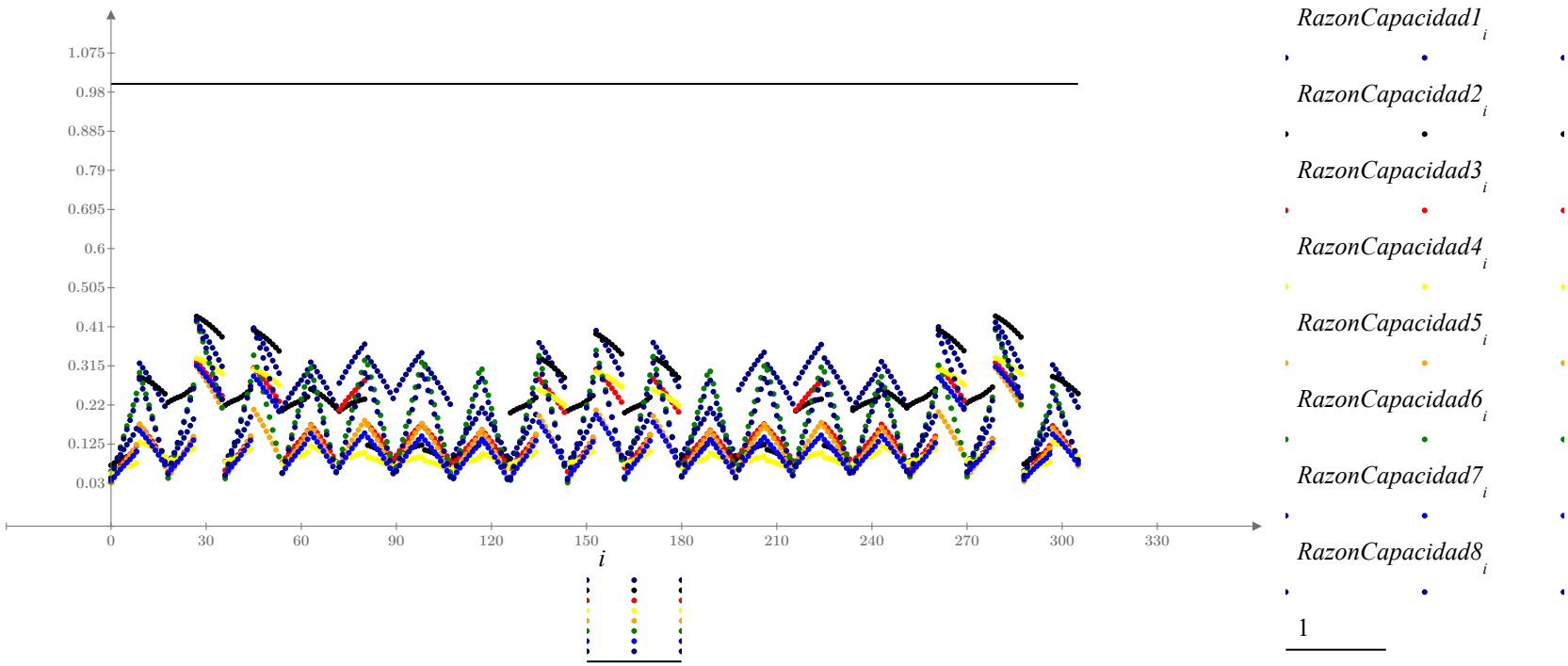
$$RazonCapacidad4_i := \begin{cases} \text{if } \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ServiceI1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad5_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIa_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad6_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIb_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad7_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIc_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad8_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventId_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$



Cortante

$\phi_v := 0.9$

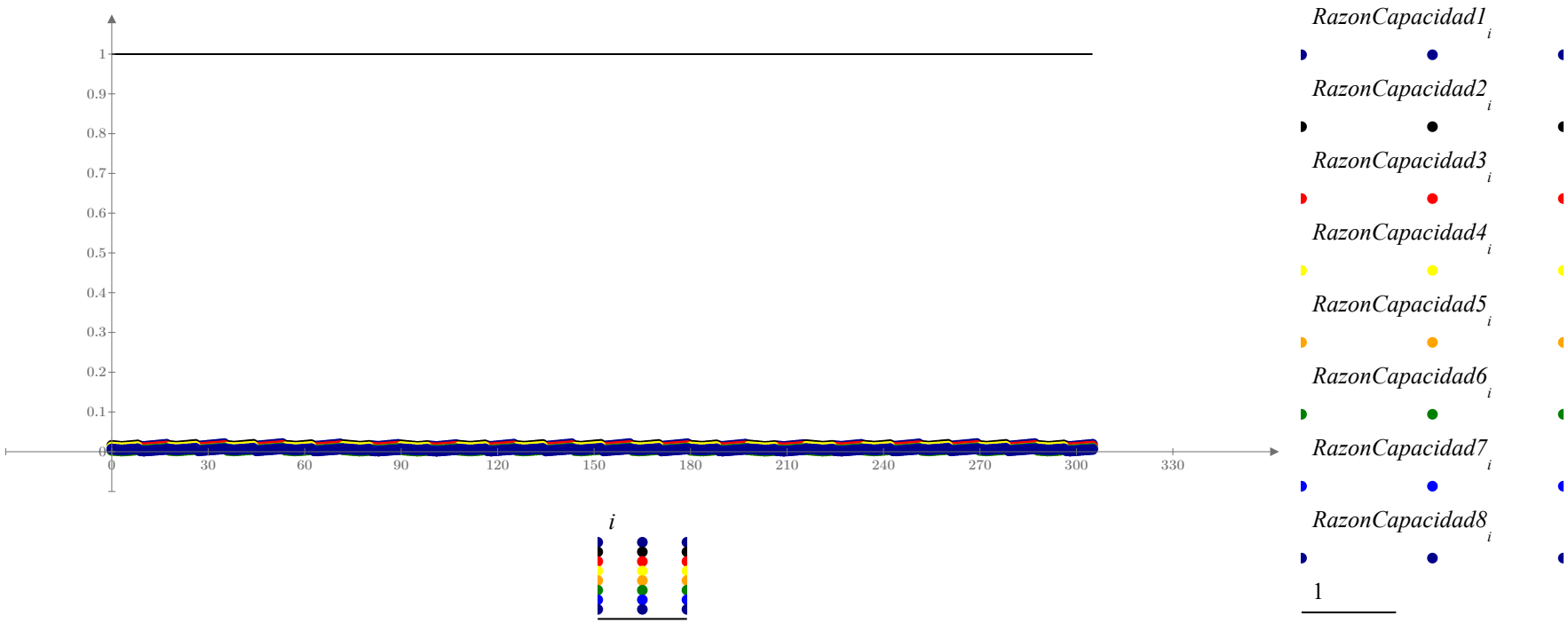
$A_w := h \cdot t_w = 0.002\ m^2$

$C_v := 1.0$

$V_n := 0.6 \cdot F_y \cdot A_w \cdot C_v = 38.541\ tonf$

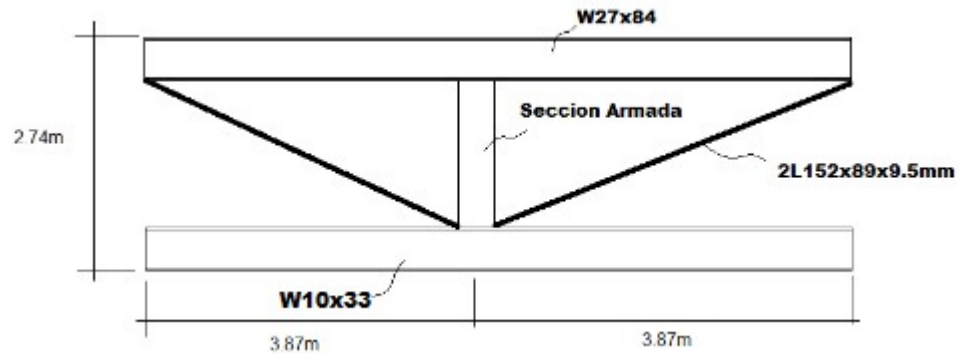
$RazonCapacidad1_i := \frac{VUx_{Strenght1a_i}}{V_n}$ $RazonCapacidad2_i := \frac{VUx_{Strenght1b_i}}{V_n}$ $RazonCapacidad3_i := \frac{VUx_{ServiceI1a_i}}{V_n}$ $RazonCapacidad4_i := \frac{VUx_{ServiceI1b_i}}{V_n}$

$RazonCapacidad5_i := \frac{VUx_{ExtremEventIa_i}}{V_n}$ $RazonCapacidad6_i := \frac{VUx_{ExtremEventIb_i}}{V_n}$ $RazonCapacidad7_i := \frac{VUx_{ExtremEventIc_i}}{V_n}$ $RazonCapacidad8_i := \frac{VUx_{ExtremEventId_i}}{V_n}$

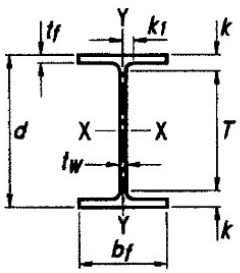

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
30
60
90
120
150
180
210
240
270
300
330
i
RazonCapacidad1 i
RazonCapacidad2 i
RazonCapacidad3 i
RazonCapacidad4 i
RazonCapacidad5 i
RazonCapacidad6 i
RazonCapacidad7 i
RazonCapacidad8 i
1

Revisión Diafragma Central (Cuerda Superior)

- Geometría



$Sec = \text{“W27X84”}$ $\quad L := 7.74 \cdot m$ $\quad W_s = 84 \dfrac{lbf}{ft}$



$D = 67.818\ cm$

$t_w = 1.168\ cm$ $\quad F_y := 50 \cdot ksi$ $\quad E := 29000000 \cdot \dfrac{lbf}{in^2}$

$t_f = 1.626\ cm$

$b_f = 25.4\ cm$

Propiedades de la Sección

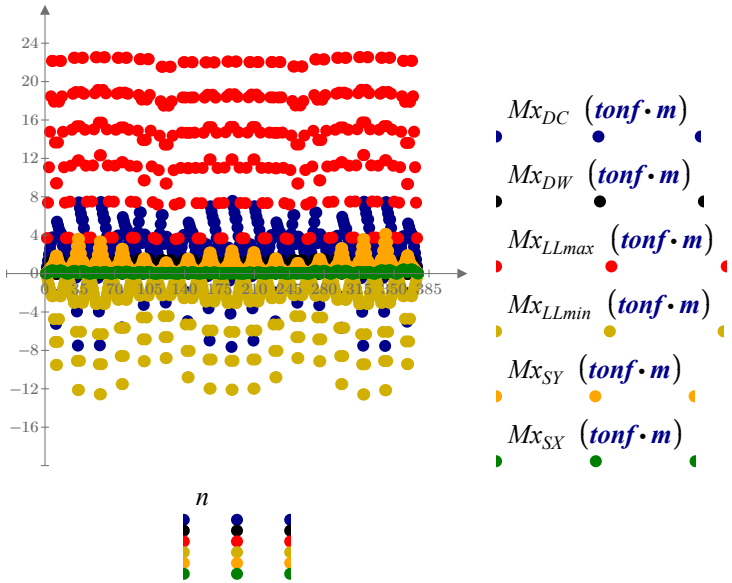
$I_x = (1.186 \cdot 10^5)\ cm^4$ $\quad I_y = (4.412 \cdot 10^3)\ cm^4$ $\quad h_o = 66.294\ cm$

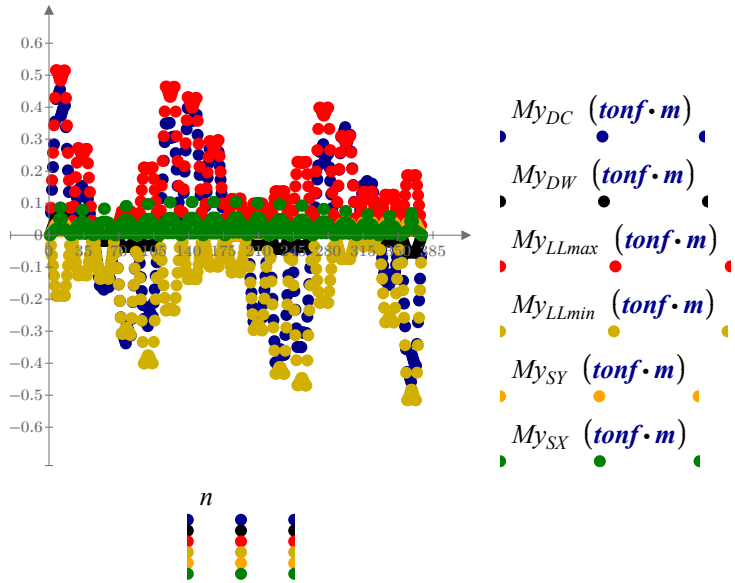
$S_x = (3.49 \cdot 10^3)\ cm^3$ $\quad S_y = 347.406\ cm^3$ $\quad C_w = (4.807 \cdot 10^6)\ cm^6$

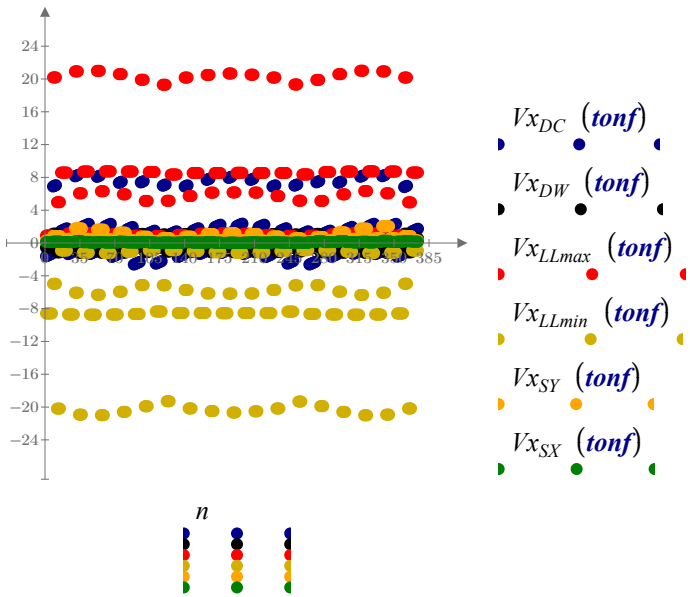
$r_x = 27.178\ cm$ $\quad r_y = 5.258\ cm$ $\quad J = 116.961\ cm^4$

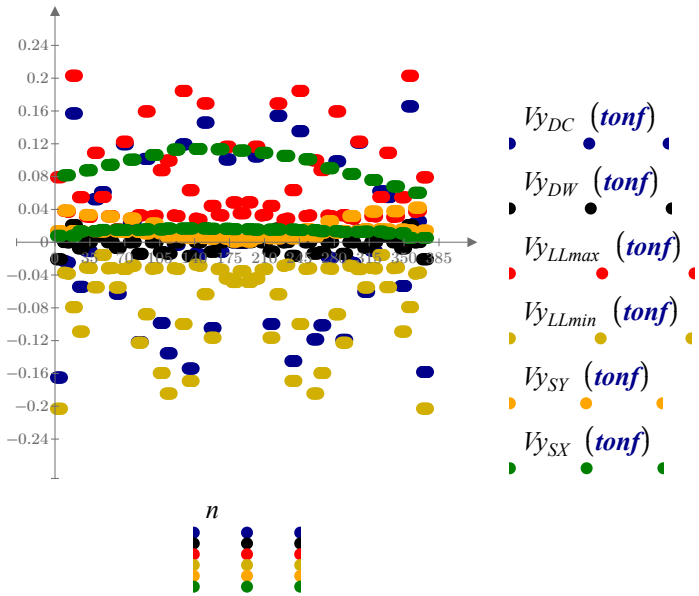
$Z_x = (3.998 \cdot 10^3)\ cm^3$ $\quad Z_y = 544.051\ cm^3$

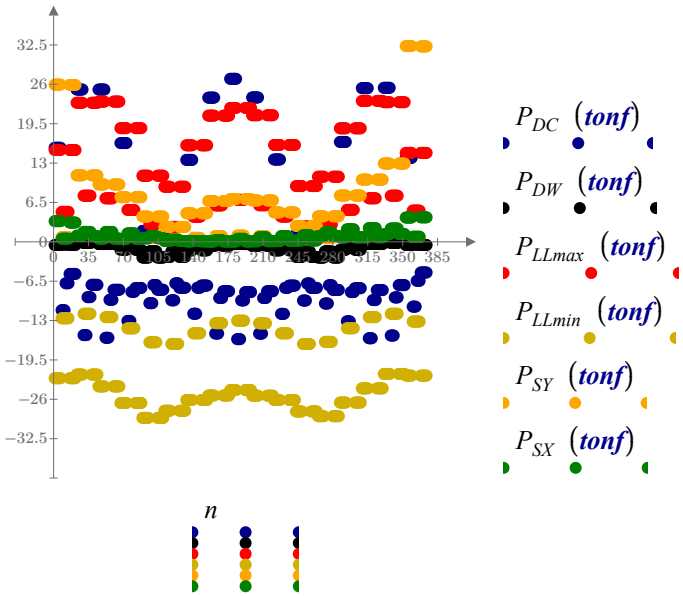
Demandas


Mx_{DC} $(tonf \cdot m)$
Mx_{DW} $(tonf \cdot m)$
Mx_{LLmax} $(tonf \cdot m)$
Mx_{LLmin} $(tonf \cdot m)$
Mx_{SY} $(tonf \cdot m)$
Mx_{SX} $(tonf \cdot m)$
n


My_{DC} $(tonf \cdot m)$
My_{DW} $(tonf \cdot m)$
My_{LLmax} $(tonf \cdot m)$
My_{LLmin} $(tonf \cdot m)$
My_{SY} $(tonf \cdot m)$
My_{SX} $(tonf \cdot m)$
n


Vx_{DC} $(tonf)$
Vx_{DW} $(tonf)$
Vx_{LLmax} $(tonf)$
Vx_{LLmin} $(tonf)$
Vx_{SY} $(tonf)$
Vx_{SX} $(tonf)$
n


Vy_{DC} $(tonf)$
Vy_{DW} $(tonf)$
Vy_{LLmax} $(tonf)$
Vy_{LLmin} $(tonf)$
Vy_{SY} $(tonf)$
Vy_{SX} $(tonf)$
n



Demanada última

$$PU_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^{T}$$

$$PU_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^{T}$$

$$PU_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^{T}$$

$$PU_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^{T}$$

$$PU_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^{T}$$

$$PU_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^{T}$$

$$PU_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$PU_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^T$$

$$VUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$G := 11200 \cdot ksi$$

$$VUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

Capacidad a Flexión

$\phi_b := 0.9$ $L_b := 2.58 \cdot m$ $C_b := 1$

Clasificación de la sección por pandeo Local **(A**

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 7.813$$

$$\lambda_{pf} := 0.38 \cdot \sqrt{\frac{E}{F_y}} = 9.152 \qquad \lambda_{rf} := 1.0 \cdot \sqrt{\frac{E}{F_y}} = 24.083$$

$Alas \rightarrow$ "Sección No Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.646\ m$$

$$\lambda w := \frac{h}{t_w} = 55.261$$

$$\lambda_{pw} := 3.76 \cdot \sqrt{\frac{E}{F_y}} = 90.553 \qquad \lambda_{rw} := 5.70 \cdot \sqrt{\frac{E}{F_y}} = 137.274$$

$Alma \rightarrow$ "Sección Compacta"

Capacidad de una sección doblemente simétrica compacta alrededor del eje fuerte

- Cedencia

$$M_p := F_y \cdot Z_x = 154.94\ tonf \cdot m$$

- Pandeo Lateral Torsional

$$r_{ts} := \sqrt{\frac{\sqrt{I_y \cdot C_w}}{S_x}} = 0.065\ m$$

$$c := \left(\frac{h_o}{2}\right) \cdot \sqrt{\frac{I_y}{C_w}} = 1.004$$

$$L_p := 1.76 \cdot r_y \cdot \sqrt{\frac{E}{F_y}} = 2.229 \ \boldsymbol{m}$$

$$L_r := 1.95 \cdot r_{ts} \cdot \left(\frac{E}{(0.7 \cdot F_y)}\right) \cdot \sqrt{\left(\frac{(J \cdot c)}{S_x \cdot h_o}\right) + \sqrt{\left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right)^2 + 6.76 \cdot \left(\frac{(0.7 \cdot F_y)}{E}\right)^2}} = 6.336 \ \boldsymbol{m}$$

$$F_{cr}(l_b) := \left(\frac{(C_b \cdot \pi^2 \cdot E)}{\left(\frac{l_b}{r_{ts}}\right)^2}\right) \cdot \sqrt{1 + 0.078 \cdot \left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right) \cdot \left(\frac{l_b}{r_{ts}}\right)^2}$$

$$M_{n1}(l_b) := \mathbf{if}\left(l_b \le L_p, M_p, \left(\mathbf{if}\left(l_b \le L_r, C_b \cdot \left(M_p - (M_p - 0.7 \cdot F_y \cdot S_x) \cdot \left(\frac{(l_b - L_p)}{(L_r - L_p)}\right)\right), F_{cr}(l_b) \cdot S_x\right)\right)\right)$$

Capacidad de una sección doblemente simétrica con alma compacta y patines no compactos o esbeltos alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$k_c := \frac{4}{\sqrt{\frac{h}{t_w}}} = 0.538$$

$$M_{n2}(\lambda) := \begin{cases} M_p & \text{if } \lambda < \lambda_{pf} \\ \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) & \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} & \text{else} \end{cases}$$

Capacidad de una sección doblemente simétrica con alma no compacta alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$M_{n3}(\lambda) := \begin{cases} M_p & \text{if } \lambda < \lambda_{pf} \\ \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) & \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} & \text{else} \end{cases}$$

$$M_{nx} := \left\| \begin{array}{l} \text{if } Alas = \text{“Sección Compacta”} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n1}(L_b) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \\ \text{else} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n2}(\lambda f) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \end{array} \right. = 154.94 \ tonf \cdot m$$

Capacidad de la sección alrededor del eje debil **(AISC 360-10.F6)**

- Cedencia

$$M_{py} := min\left(F_y \cdot Z_y, 1.6 \cdot F_y \cdot S_y\right)$$

- Pandeo Local del ala

$$F_{crf}(\lambda_f) := \frac{(0.69 \cdot E)}{(\lambda_f)^2}$$

$$M_{ny}(\lambda_f) := \mathbf{if}\left(\lambda_f \le \lambda_{pf}, M_{py}, \mathbf{if}\left(\lambda_f \le \lambda_{rf}, \left(M_{py} - (M_{py} - 0.7 \cdot F_y \cdot S_y) \cdot \left(\frac{(\lambda_f - \lambda_{pf})}{(\lambda_{rf} - \lambda_{pf})}\right)\right), F_{crf}(\lambda_f) \cdot S_y\right)\right)$$

$$M_{ny} := M_{ny}(\lambda f)$$

Capacidad a Compresión

Clasificación de la sección por pandeo Local

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 7.813 \qquad \lambda_{rf} := 0.56 \cdot \sqrt{\frac{E}{F_y}} = 13.487$$

$Alas \rightarrow$ "Sección Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.646 \ \boldsymbol{m}$$

$$\lambda w := \frac{h}{t_w} = 55.261$$

$$\lambda_{rw} := 1.49 \cdot \sqrt{\frac{E}{F_y}} = 35.884$$

$Alma \rightarrow$ "Sección Esbelta"

$$K := 1$$

$$r := \max(r_x, r_y) = 0.272 \ \boldsymbol{m}$$

$$F_e := \frac{\pi^2 \cdot E}{\left(\frac{K \cdot L}{r}\right)^2} = \left(2.433 \cdot 10^9\right) \ \boldsymbol{Pa}$$

$$F_{cr} := \begin{cases} \text{if } \frac{F_y}{F_e} \le 2.25 \\ \quad \left(0.658^{\frac{F_y}{F_e}}\right) \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(3.249 \cdot 10^8\right) \ \boldsymbol{Pa}$$

$$b_e := \begin{cases} \text{if } \lambda w \geq 1.49 \cdot \sqrt{\dfrac{E}{F_{cr}}} \\ \quad \left(1.92 \cdot t_w \cdot \sqrt{\dfrac{E}{F_{cr}}} \cdot \left(1 - \dfrac{0.34}{\left(\dfrac{h}{t_w}\right)} \cdot \sqrt{\dfrac{E}{F_{cr}}}\right)\right) \\ \text{else} \\ \quad h \end{cases} = 0.472\ \boldsymbol{m}$$

$A_e := b_e \cdot t_w = 0.006\ \boldsymbol{m}^2$ $\qquad$ $A_{gl} := h \cdot t_w = 0.008\ \boldsymbol{m}^2$

$$Q_a := \frac{A_e}{A_{gl}} = 0.73$$

$$Q_s := \begin{cases} \text{if } \dfrac{b_f}{2 \cdot t_f} \leq 0.56 \cdot \sqrt{\dfrac{E}{F_y}} \\ \quad 1 \\ \text{also if } 0.56 \cdot \sqrt{\dfrac{E}{F_y}} < \dfrac{b_f}{2 \cdot t_f} \leq 1.03 \cdot \sqrt{\dfrac{E}{F_y}} \\ \quad 1.415 - 0.74 \cdot \left(\dfrac{b_f}{2 \cdot t_f}\right) \cdot \sqrt{\dfrac{F_y}{E}} \\ \text{else} \\ \quad \dfrac{0.69 \cdot E}{F_y \cdot \left(\dfrac{b_f}{2 \cdot t_f}\right)^2} \end{cases} = 1$$

$$Q := Q_a \cdot Q_s$$

$$F_{cr} := \begin{cases} \text{if } \dfrac{Q \cdot F_y}{F_e} \leq 2.25 \\ \quad \left(0.658^{\frac{Q \cdot F_y}{F_e}}\right) \cdot Q \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(2.411 \cdot 10^8\right)\ \boldsymbol{Pa}$$

$P_n := F_{cr} \cdot A_g = 431.889$ ***tonf***

$\phi_c := 0.9$

Flexo compresión

$$RazonCapacidad1_i := \begin{cases} \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{Strenght1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

$$RazonCapacidad2_i := \begin{cases} \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{Strenght1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

$$RazonCapacidad3_i := \begin{cases} \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{ServiceI1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

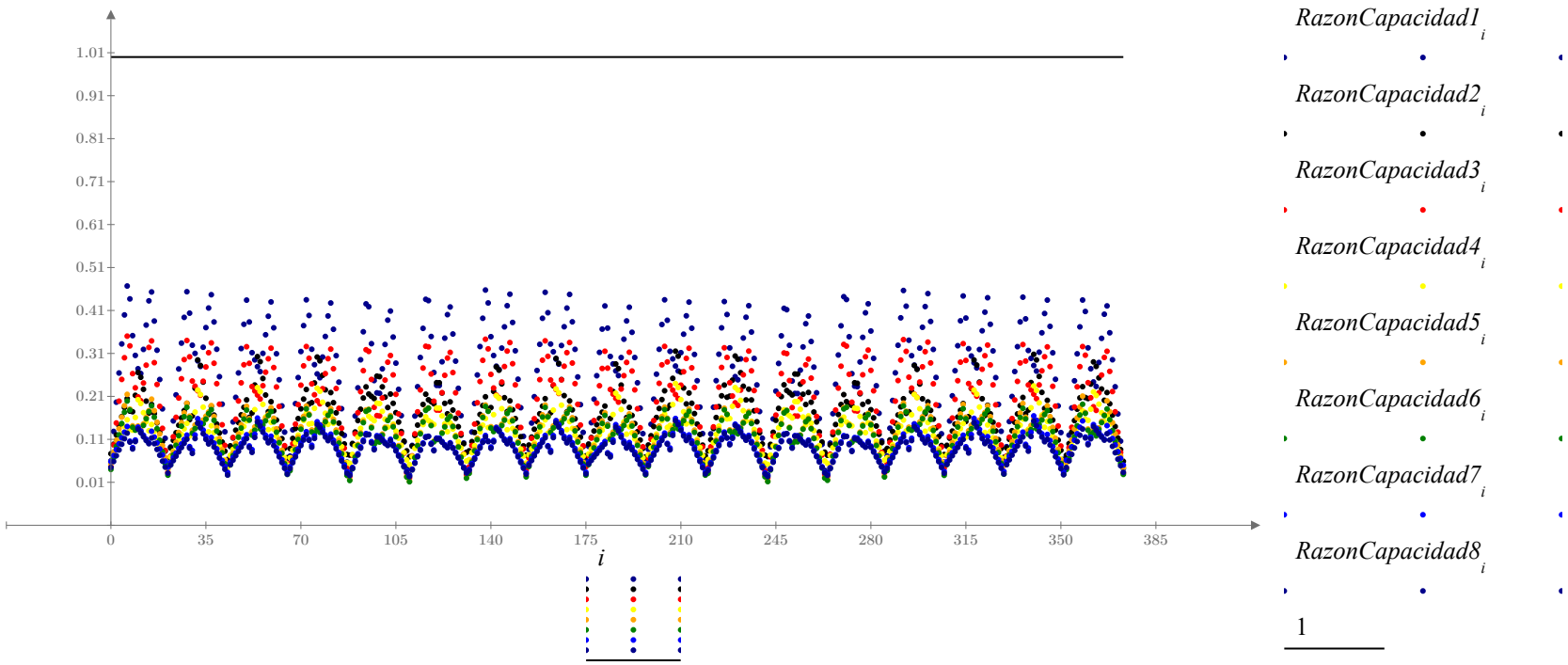
$$RazonCapacidad4_i := \begin{cases} \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{ServiceI1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

$$RazonCapacidad5_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIa_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad6_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIb_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad7_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIc_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad8_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventId_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$



Cortante

$\phi_v := 0.9$

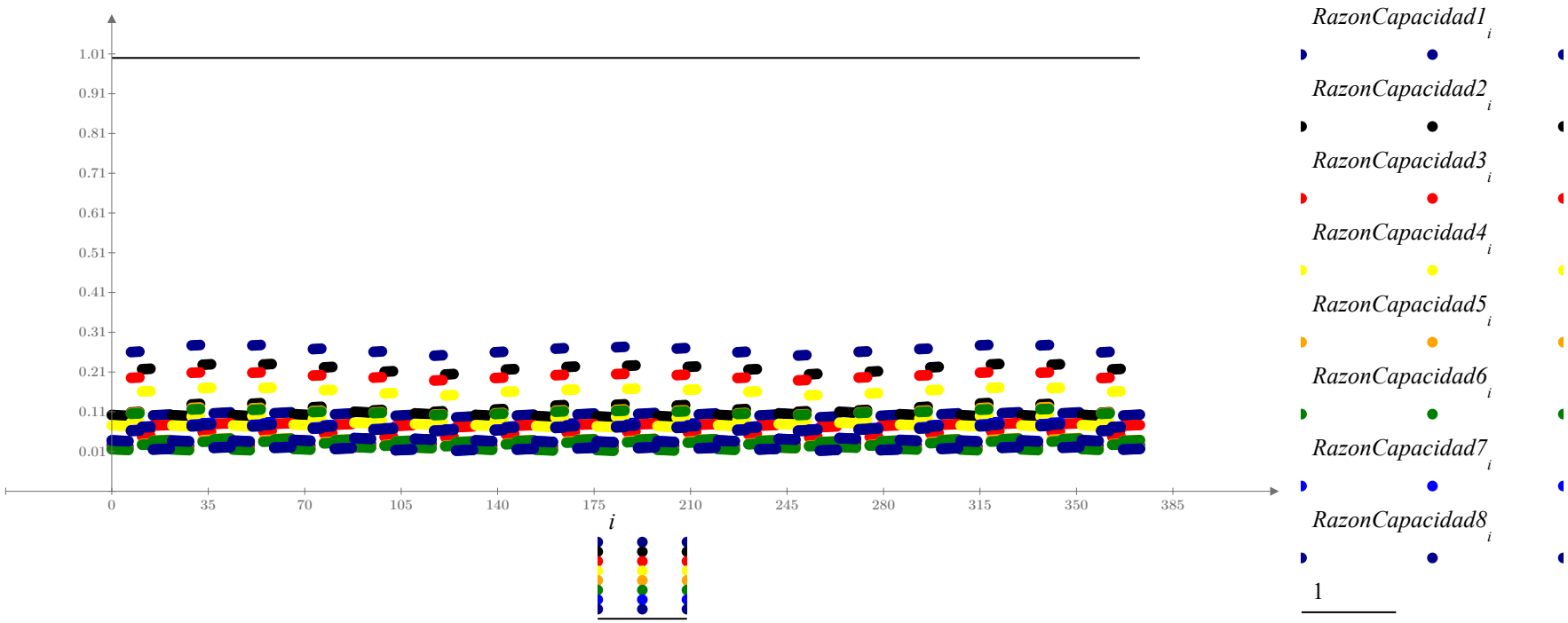
$A_w := h \cdot t_w = 0.008\ m^2$

$C_v := 1.0$

$V_n := 0.6 \cdot F_y \cdot A_w \cdot C_v = 175.398\ tonf$

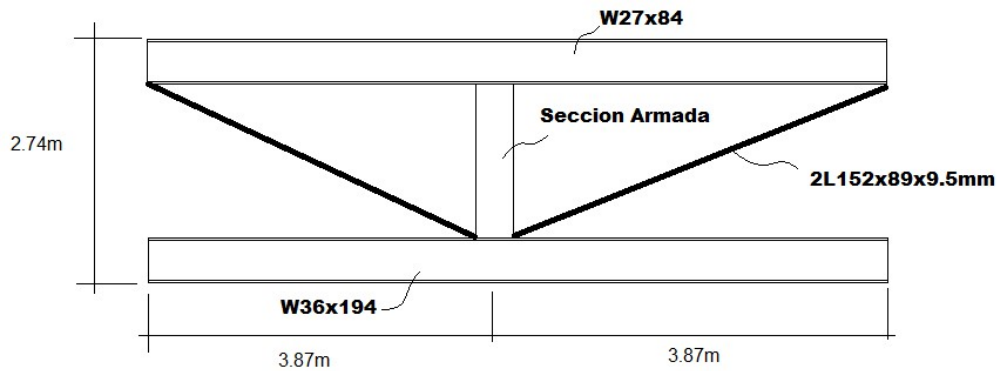
$RazonCapacidad1_i := \frac{VUx_{Strenght1a_i}}{V_n}$ $RazonCapacidad2_i := \frac{VUx_{Strenght1b_i}}{V_n}$ $RazonCapacidad3_i := \frac{VUx_{ServiceI1a_i}}{V_n}$ $RazonCapacidad4_i := \frac{VUx_{ServiceI1b_i}}{V_n}$

$RazonCapacidad5_i := \frac{VUx_{ExtremEventIa_i}}{V_n}$ $RazonCapacidad6_i := \frac{VUx_{ExtremEventIb_i}}{V_n}$ $RazonCapacidad7_i := \frac{VUx_{ExtremEventIc_i}}{V_n}$ $RazonCapacidad8_i := \frac{VUx_{ExtremEventId_i}}{V_n}$

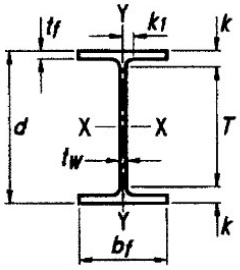

1.01
0.91
0.81
0.71
0.61
0.51
0.41
0.31
0.21
0.11
0.01
0
35
70
105
140
175
210
245
280
315
350
385
i
RazonCapacidad1 i
RazonCapacidad2 i
RazonCapacidad3 i
RazonCapacidad4 i
RazonCapacidad5 i
RazonCapacidad6 i
RazonCapacidad7 i
RazonCapacidad8 i
1

Revisión Diafragma en Apoyos (Cuerda Inferior)

- Geometría



$Sec =$ "W36X194" $\quad L := 7.74 \cdot m \quad W_s = 194 \ \frac{lbf}{ft}$



$D = 92.71 \ cm$

$t_w = 1.943 \ cm \quad F_y := 50 \cdot ksi \quad E := 29000000 \cdot \frac{lbf}{in^2}$

$t_f = 3.2 \ cm$

$b_f = 30.734 \ cm$

Propiedades de la Sección

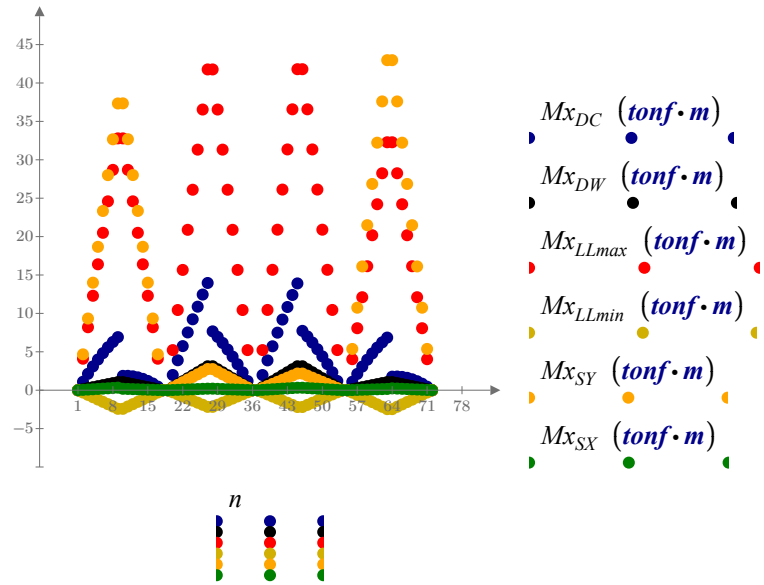
$I_x = (5.036 \cdot 10^5) \ cm^4 \quad I_y = (1.561 \cdot 10^4) \ cm^4 \quad h_o = 89.408 \ cm$

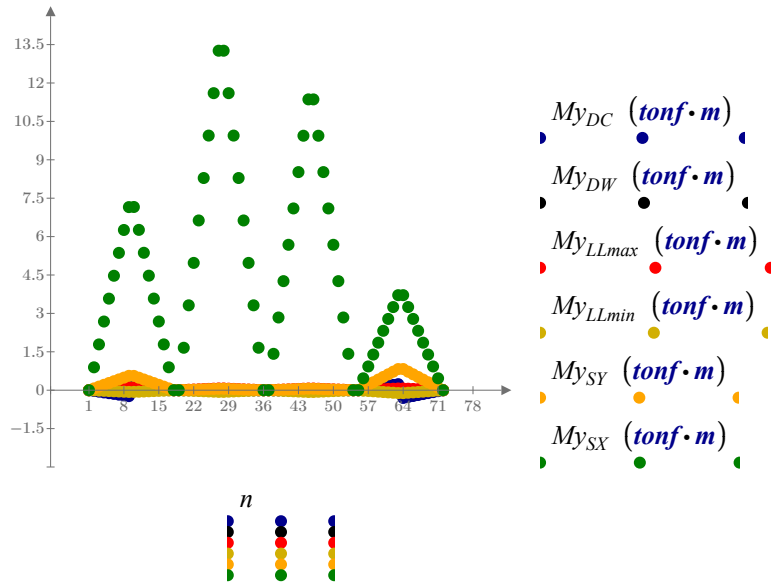
$S_x = (1.088 \cdot 10^4) \ cm^3 \quad S_y = (1.014 \cdot 10^3) \ cm^3 \quad C_w = (3.115 \cdot 10^7) \ cm^6$

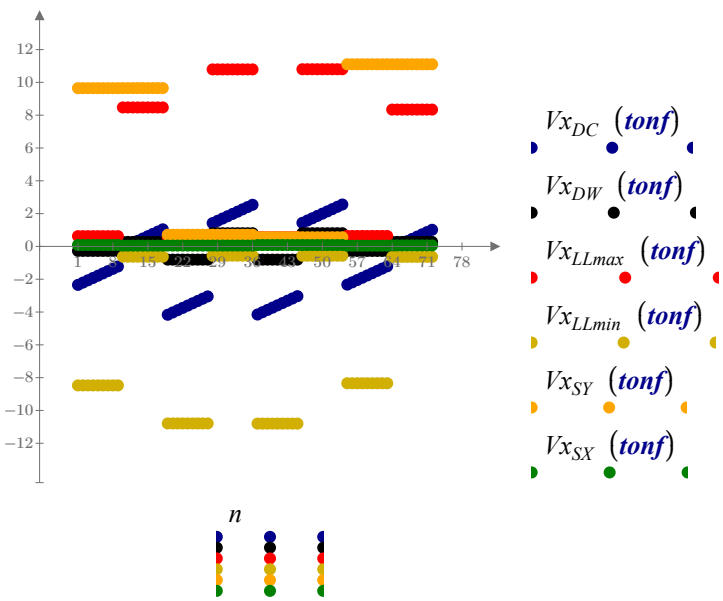
$r_x = 37.084 \ cm \quad r_y = 6.502 \ cm \quad J = 924.034 \ cm^4$

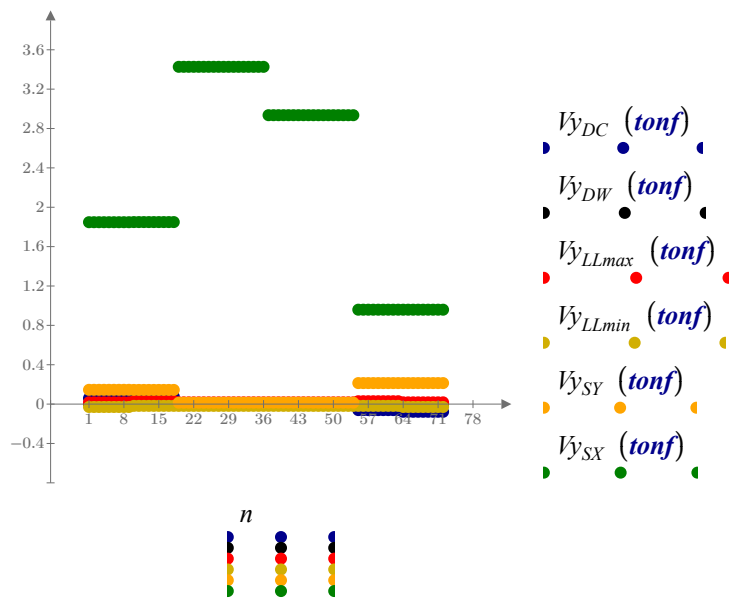
$Z_x = (1.257 \cdot 10^4) \ cm^3 \quad Z_y = (1.601 \cdot 10^3) \ cm^3$

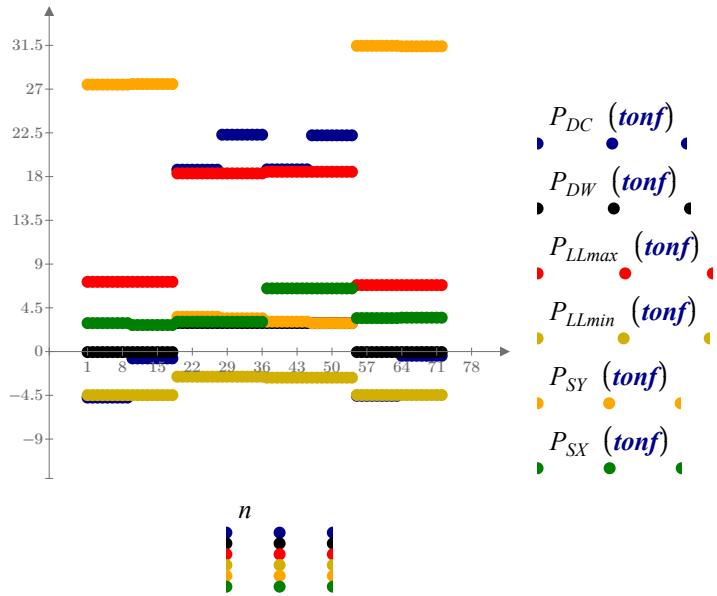
Demandas


Mx_{DC} $(tonf \cdot m)$
Mx_{DW} $(tonf \cdot m)$
Mx_{LLmax} $(tonf \cdot m)$
Mx_{LLmin} $(tonf \cdot m)$
Mx_{SY} $(tonf \cdot m)$
Mx_{SX} $(tonf \cdot m)$
n


My_{DC} $(tonf \cdot m)$
My_{DW} $(tonf \cdot m)$
My_{LLmax} $(tonf \cdot m)$
My_{LLmin} $(tonf \cdot m)$
My_{SY} $(tonf \cdot m)$
My_{SX} $(tonf \cdot m)$
n


Vx_{DC} $(tonf)$
Vx_{DW} $(tonf)$
Vx_{LLmax} $(tonf)$
Vx_{LLmin} $(tonf)$
Vx_{SY} $(tonf)$
Vx_{SX} $(tonf)$
n


Vy_{DC} $(tonf)$
Vy_{DW} $(tonf)$
Vy_{LLmax} $(tonf)$
Vy_{LLmin} $(tonf)$
Vy_{SY} $(tonf)$
Vy_{SX} $(tonf)$
n



Demanada última

$$PU_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \|P_{DC_i}\| & \|P_{DW_i}\| & \|P_{LLmax_i}\| & \|P_{LLmin_i}\| & \|P_{SY_i}\| & \|P_{SX_i}\| \end{bmatrix}^T$$

$$PU_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$PU_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$VUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

$$G := 11200 \cdot ksi$$

$$VUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^T$$

Capacidad a Flexión

$\phi_b := 0.9$ $L_b := 3.87 \cdot m$ $C_b := 1$

Clasificación de la sección por pandeo Local **(A**

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 4.802$$

$$\lambda_{pf} := 0.38 \cdot \sqrt{\frac{E}{F_y}} = 9.152 \qquad \lambda_{rf} := 1.0 \cdot \sqrt{\frac{E}{F_y}} = 24.083$$

$Alas \rightarrow$ "Sección No Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.863 \ m$$

$$\lambda w := \frac{h}{t_w} = 44.418$$

$$\lambda_{pw} := 3.76 \cdot \sqrt{\frac{E}{F_y}} = 90.553 \qquad \lambda_{rw} := 5.70 \cdot \sqrt{\frac{E}{F_y}} = 137.274$$

$Alma \rightarrow$ "Sección Compacta"

Capacidad de una sección doblemente simétrica compacta alrededor del eje fuerte

- Cedencia

$$M_p := F_y \cdot Z_x = 487.045 \ tonf \cdot m$$

- Pandeo Lateral Torsional

$$r_{ts} := \sqrt{\frac{\sqrt{I_y \cdot C_w}}{S_x}} = 0.08 \ m$$

$$c := \left(\frac{h_o}{2}\right) \cdot \sqrt{\frac{I_y}{C_w}} = 1.001$$

$$L_p := 1.76 \cdot r_y \cdot \sqrt{\frac{E}{F_y}} = 2.756 \ \boldsymbol{m}$$

$$L_r := 1.95 \cdot r_{ts} \cdot \left(\frac{E}{(0.7 \cdot F_y)}\right) \cdot \sqrt{\left(\frac{(J \cdot c)}{S_x \cdot h_o}\right) + \sqrt{\left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right)^2 + 6.76 \cdot \left(\frac{(0.7 \cdot F_y)}{E}\right)^2}} = 8.411 \ \boldsymbol{m}$$

$$F_{cr}(l_b) := \left(\frac{(C_b \cdot \pi^2 \cdot E)}{\left(\frac{l_b}{r_{ts}}\right)^2}\right) \cdot \sqrt{1 + 0.078 \cdot \left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right) \cdot \left(\frac{l_b}{r_{ts}}\right)^2}$$

$$M_{n1}(l_b) := \mathbf{if}\left(l_b \le L_p, M_p, \left(\mathbf{if}\left(l_b \le L_r, C_b \cdot \left(M_p - (M_p - 0.7 \cdot F_y \cdot S_x) \cdot \left(\frac{(l_b - L_p)}{(L_r - L_p)}\right)\right), F_{cr}(l_b) \cdot S_x\right)\right)\right)$$

Capacidad de una sección doblemente simétrica con alma compacta y patines no compactos o esbeltos alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$k_c := \frac{4}{\sqrt{\frac{h}{t_w}}} = 0.6$$

$$M_{n2}(\lambda) := \begin{cases} M_p & \text{if } \lambda < \lambda_{pf} \\ \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) & \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} & \text{else} \end{cases}$$

Capacidad de una sección doblemente simétrica con alma no compacta alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$M_{n3}(\lambda) := \begin{cases} M_p & \text{if } \lambda < \lambda_{pf} \\ \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) & \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} & \text{else} \end{cases}$$

$$M_{nx} := \left\| \begin{array}{l} \text{if } Alas = \text{“Sección Compacta”} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n1}(L_b) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \\ \text{else} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n2}(\lambda f) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \end{array} \right. = 487.045 \ tonf \cdot m$$

Capacidad de la sección alrededor del eje debil **(AISC 360-10.F6)**

- Cedencia

$$M_{py} := min\left(F_y \cdot Z_y, 1.6 \cdot F_y \cdot S_y\right)$$

- Pandeo Local del ala

$$F_{crf}(\lambda_f) := \frac{(0.69 \cdot E)}{(\lambda_f)^2}$$

$$M_{ny}(\lambda_f) := \mathbf{if}\left(\lambda_f \le \lambda_{pf}, M_{py}, \mathbf{if}\left(\lambda_f \le \lambda_{rf}, \left(M_{py} - \left(M_{py} - 0.7 \cdot F_y \cdot S_y\right) \cdot \left(\frac{(\lambda_f - \lambda_{pf})}{(\lambda_{rf} - \lambda_{pf})}\right)\right), F_{crf}(\lambda_f) \cdot S_y\right)\right)$$

$$M_{ny} := M_{ny}(\lambda f)$$

Capacidad a Compresión

Clasificación de la sección por pandeo Local

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 4.802 \qquad \lambda_{rf} := 0.56 \cdot \sqrt{\frac{E}{F_y}} = 13.487$$

$Alas \rightarrow$ "Sección Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.863 \ m$$

$$\lambda w := \frac{h}{t_w} = 44.418$$

$$\lambda_{rw} := 1.49 \cdot \sqrt{\frac{E}{F_y}} = 35.884$$

$Alma \rightarrow$ "Sección Esbelta"

$$K := 1$$

$$r := \max(r_x, r_y) = 0.371 \ m$$

$$F_e := \frac{\pi^2 \cdot E}{\left(\frac{K \cdot L}{r}\right)^2} = \left(4.53 \cdot 10^9\right) \ Pa$$

$$F_{cr} := \begin{cases} \text{if } \frac{F_y}{F_e} \le 2.25 \\ \quad \left(0.658^{\frac{F_y}{F_e}}\right) \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(3.339 \cdot 10^8\right) \ Pa$$

$$b_e := \begin{cases} \text{if } \lambda w \geq 1.49 \cdot \sqrt{\dfrac{E}{F_{cr}}} \\ \quad \left(1.92 \cdot t_w \cdot \sqrt{\dfrac{E}{F_{cr}}} \cdot \left(1 - \dfrac{0.34}{\left(\dfrac{h}{t_w}\right)} \cdot \sqrt{\dfrac{E}{F_{cr}}}\right)\right) \\ \text{else} \\ \quad h \end{cases} = 0.742\ m$$

$A_e := b_e \cdot t_w = 0.014\ m^2$ $\qquad$ $A_{gl} := h \cdot t_w = 0.017\ m^2$

$$Q_a := \frac{A_e}{A_{gl}} = 0.86$$

$$Q_s := \begin{cases} \text{if } \dfrac{b_f}{2 \cdot t_f} \leq 0.56 \cdot \sqrt{\dfrac{E}{F_y}} \\ \quad 1 \\ \text{also if } 0.56 \cdot \sqrt{\dfrac{E}{F_y}} < \dfrac{b_f}{2 \cdot t_f} \leq 1.03 \cdot \sqrt{\dfrac{E}{F_y}} \\ \quad 1.415 - 0.74 \cdot \left(\dfrac{b_f}{2 \cdot t_f}\right) \cdot \sqrt{\dfrac{F_y}{E}} \\ \text{else} \\ \quad \dfrac{0.69 \cdot E}{F_y \cdot \left(\dfrac{b_f}{2 \cdot t_f}\right)^2} \end{cases} = 1$$

$$Q := Q_a \cdot Q_s$$

$$F_{cr} := \begin{cases} \text{if } \dfrac{Q \cdot F_y}{F_e} \leq 2.25 \\ \quad \left(0.658^{\frac{Q \cdot F_y}{F_e}}\right) \cdot Q \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(2.883 \cdot 10^8\right)\ Pa$$

$P_n := F_{cr} \cdot A_g = \left(1.192 \cdot 10^3\right)$ ***tonf***

$\phi_c := 0.9$

Flexo compresión

$$RazonCapacidad1_i := \begin{cases} \text{if } \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{Strenght1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad2_i := \begin{cases} \text{if } \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{Strenght1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad3_i := \begin{cases} \text{if } \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ServiceI1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

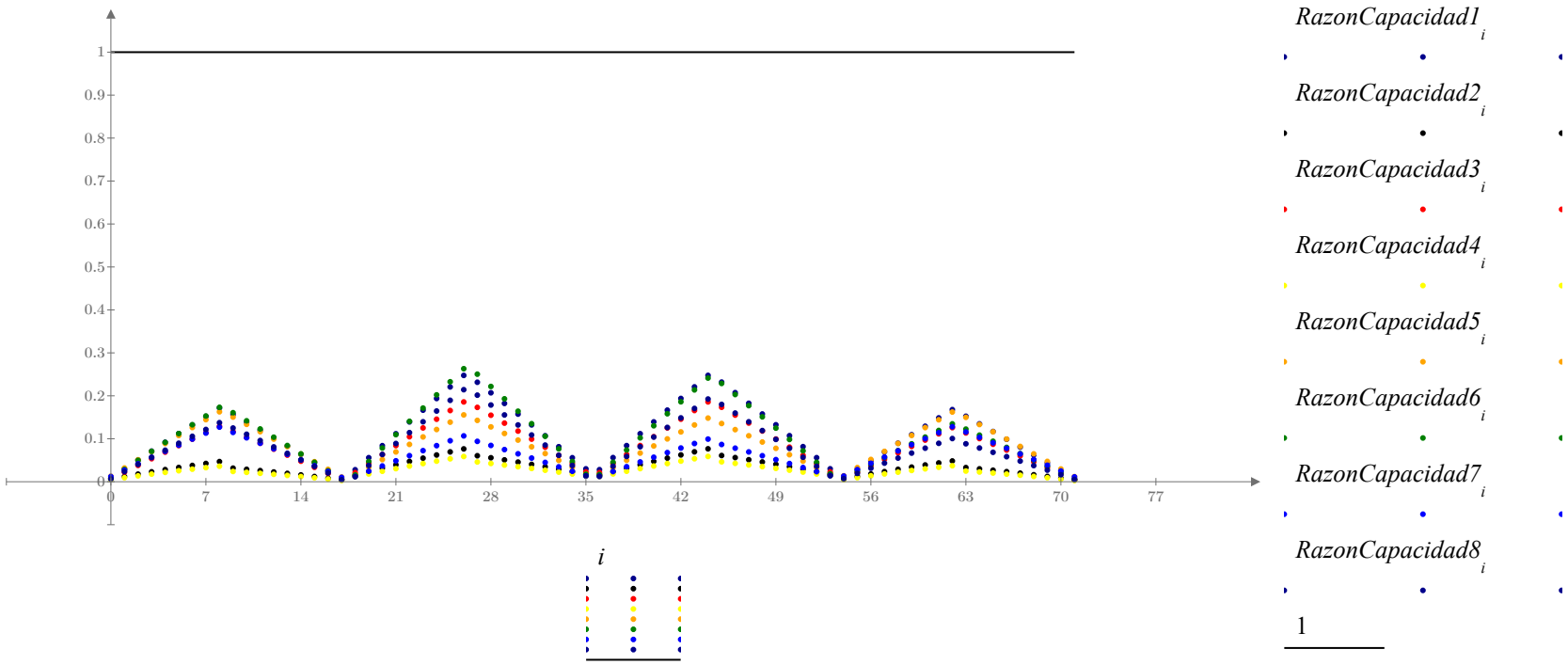
$$RazonCapacidad4_i := \begin{cases} \text{if } \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ServiceI1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad5_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIa_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad6_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIb_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad7_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIc_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad8_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventId_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$



Cortante

$\phi_v := 0.9$

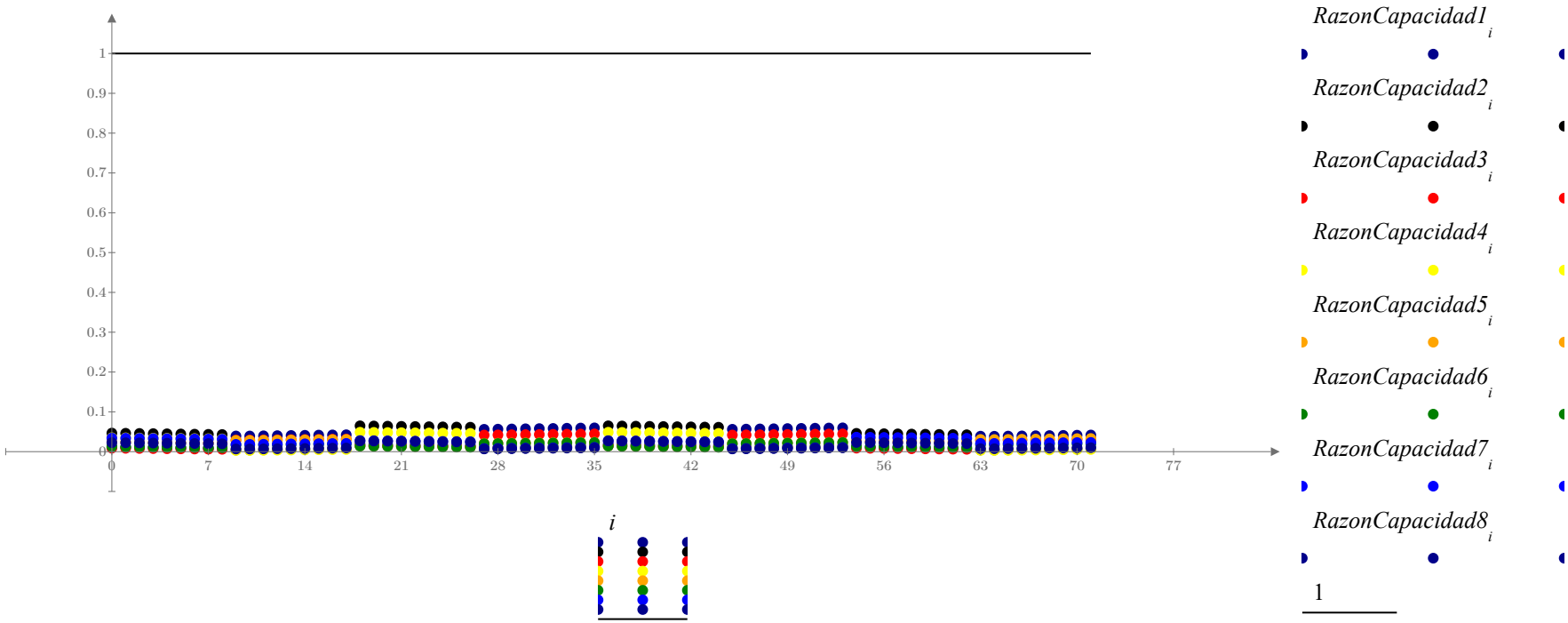
$A_w := h \cdot t_w = 0.017\ m^2$

$C_v := 1.0$

$V_n := 0.6 \cdot F_y \cdot A_w \cdot C_v = 389.921\ tonf$

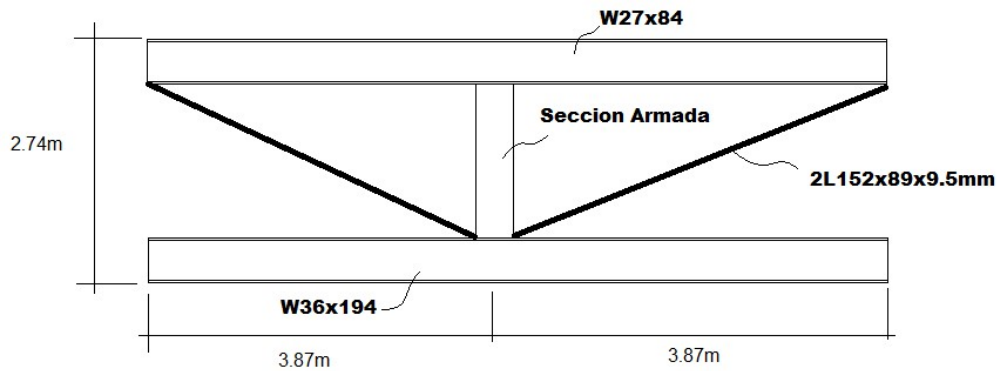
$RazonCapacidad1_i := \frac{VUx_{Strenght1a_i}}{V_n}$ $RazonCapacidad2_i := \frac{VUx_{Strenght1b_i}}{V_n}$ $RazonCapacidad3_i := \frac{VUx_{ServiceI1a_i}}{V_n}$ $RazonCapacidad4_i := \frac{VUx_{ServiceI1b_i}}{V_n}$

$RazonCapacidad5_i := \frac{VUx_{ExtremEventIa_i}}{V_n}$ $RazonCapacidad6_i := \frac{VUx_{ExtremEventIb_i}}{V_n}$ $RazonCapacidad7_i := \frac{VUx_{ExtremEventIc_i}}{V_n}$ $RazonCapacidad8_i := \frac{VUx_{ExtremEventId_i}}{V_n}$

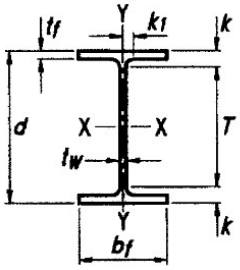

1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
7
14
21
28
35
42
49
56
63
70
77
i
RazonCapacidad1 i
RazonCapacidad2 i
RazonCapacidad3 i
RazonCapacidad4 i
RazonCapacidad5 i
RazonCapacidad6 i
RazonCapacidad7 i
RazonCapacidad8 i
1

Revisión Diafragma en Apoyos (Cuerda Superior)

- Geometría



$Sec =$ "W27X84" $\quad L := 7.74 \cdot m \quad W_s = 84 \ \frac{lbf}{ft}$



$D = 67.818 \ cm$

$t_w = 1.168 \ cm \quad F_y := 50 \cdot ksi \quad E := 29000000 \cdot \frac{lbf}{in^2}$

$t_f = 1.626 \ cm$

$b_f = 25.4 \ cm$

Propiedades de la Sección

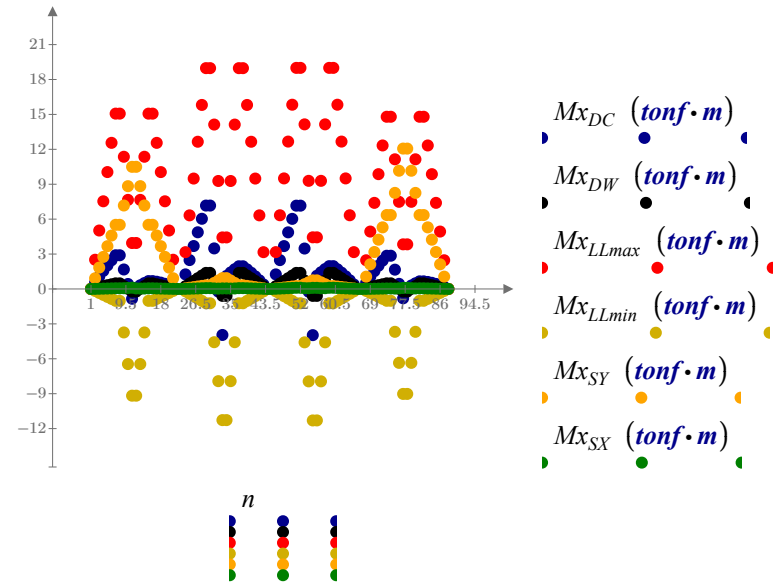
$I_x = (1.186 \cdot 10^5) \ cm^4 \quad I_y = (4.412 \cdot 10^3) \ cm^4 \quad h_o = 66.294 \ cm$

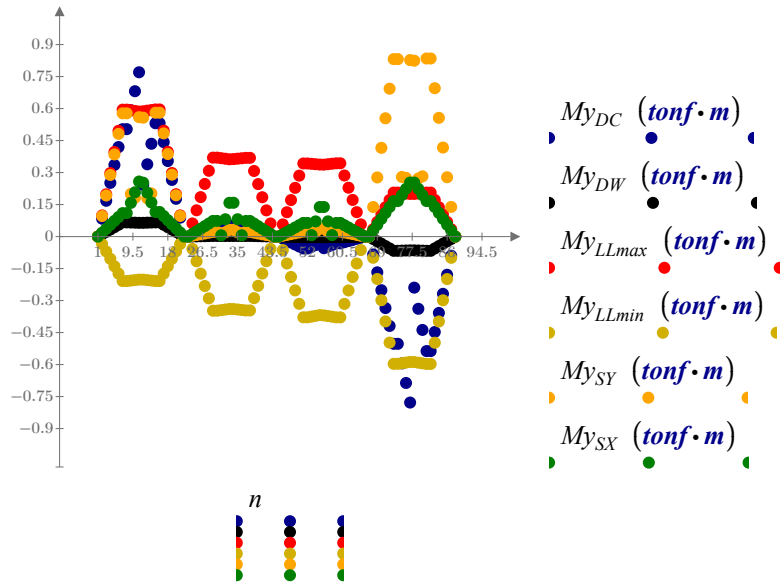
$S_x = (3.49 \cdot 10^3) \ cm^3 \quad S_y = 347.406 \ cm^3 \quad C_w = (4.807 \cdot 10^6) \ cm^6$

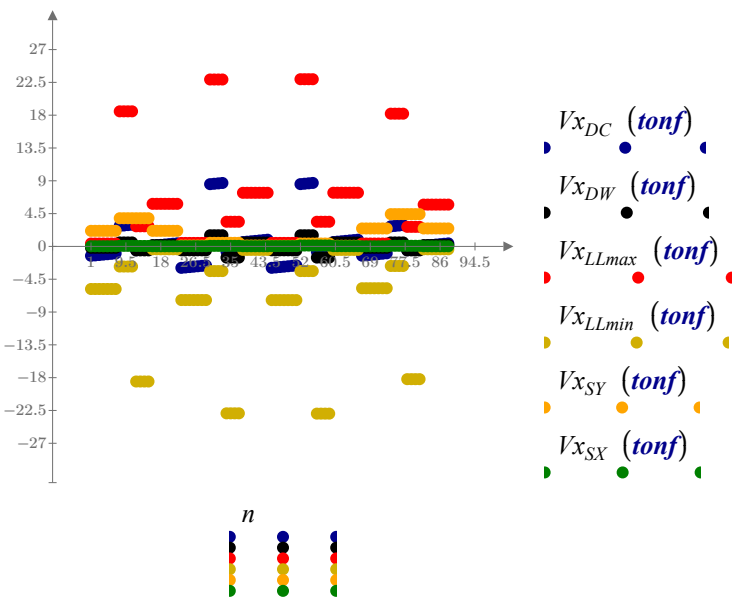
$r_x = 27.178 \ cm \quad r_y = 5.258 \ cm \quad J = 116.961 \ cm^4$

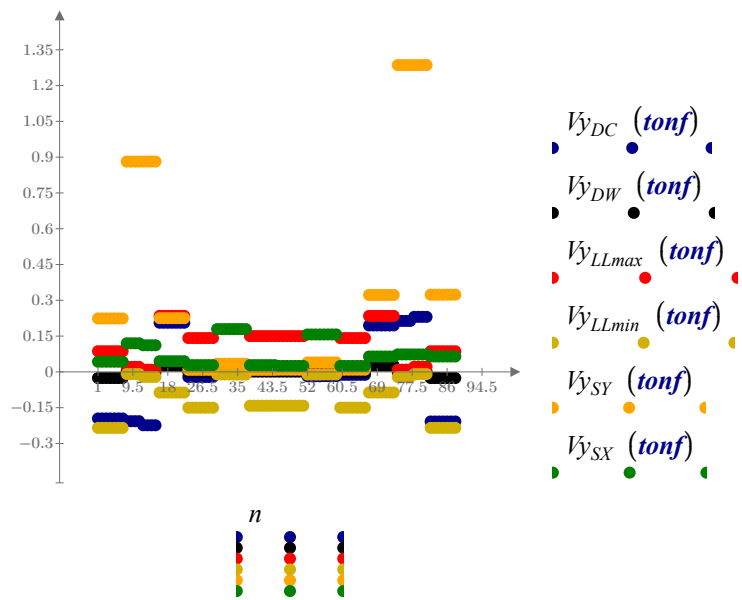
$Z_x = (3.998 \cdot 10^3) \ cm^3 \quad Z_y = 544.051 \ cm^3$

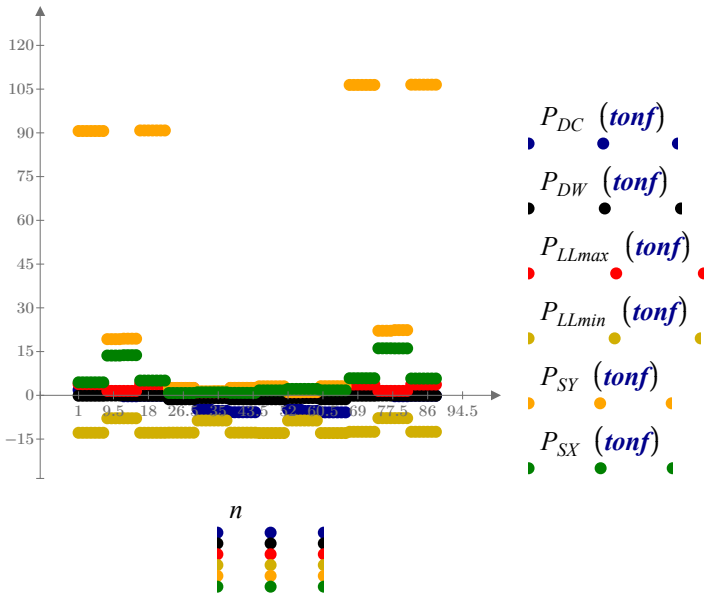
Demandas


Mx_{DC} $(tonf \cdot m)$
Mx_{DW} $(tonf \cdot m)$
Mx_{LLmax} $(tonf \cdot m)$
Mx_{LLmin} $(tonf \cdot m)$
Mx_{SY} $(tonf \cdot m)$
Mx_{SX} $(tonf \cdot m)$
n


My_{DC} $(tonf \cdot m)$
My_{DW} $(tonf \cdot m)$
My_{LLmax} $(tonf \cdot m)$
My_{LLmin} $(tonf \cdot m)$
My_{SY} $(tonf \cdot m)$
My_{SX} $(tonf \cdot m)$
n


Vx_{DC} $(tonf)$
Vx_{DW} $(tonf)$
Vx_{LLmax} $(tonf)$
Vx_{LLmin} $(tonf)$
Vx_{SY} $(tonf)$
Vx_{SX} $(tonf)$
n


Vy_{DC} $(tonf)$
Vy_{DW} $(tonf)$
Vy_{LLmax} $(tonf)$
Vy_{LLmin} $(tonf)$
Vy_{SY} $(tonf)$
Vy_{SX} $(tonf)$
n



Demanada última

$$PU_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^{T}$$

$$PU_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^{T}$$

$$PU_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^{T}$$

$$PU_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^{T}$$

$$PU_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^{T}$$

$$PU_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^{T}$$

$$PU_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$PU_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|P_{DC_i}\right\| & \left\|P_{DW_i}\right\| & \left\|P_{LLmax_i}\right\| & \left\|P_{LLmin_i}\right\| & \left\|P_{SY_i}\right\| & \left\|P_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Mx_{DC_i}\right\| & \left\|Mx_{DW_i}\right\| & \left\|Mx_{LLmax_i}\right\| & \left\|Mx_{LLmin_i}\right\| & \left\|Mx_{SY_i}\right\| & \left\|Mx_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^T$$

$$MUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$MUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|My_{DC_i}\right\| & \left\|My_{DW_i}\right\| & \left\|My_{LLmax_i}\right\| & \left\|My_{LLmin_i}\right\| & \left\|My_{SY_i}\right\| & \left\|My_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUx_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\|Vx_{DC_i}\right\| & \left\|Vx_{DW_i}\right\| & \left\|Vx_{LLmax_i}\right\| & \left\|Vx_{LLmin_i}\right\| & \left\|Vx_{SY_i}\right\| & \left\|Vx_{SX_i}\right\| \end{bmatrix}^{T}$$

$$VUy_{Strenght1a_i} := \begin{bmatrix} 1.25 & 1.5 & 1.75 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$VUy_{Strenght1b_i} := \begin{bmatrix} 1.25 & 1.5 & 0 & 1.75 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$VUy_{ServiceI1a_i} := \begin{bmatrix} 1 & 1 & 1.3 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$VUy_{ServiceI1b_i} := \begin{bmatrix} 1 & 1 & 0 & 1.3 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$VUy_{ExtremEventIa_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$VUy_{ExtremEventIb_i} := \begin{bmatrix} 1 & 1 & 0.5 & 0 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$VUy_{ExtremEventIc_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{1}{R} & \frac{0.3}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

$$G := 11200 \cdot ksi$$

$$VUy_{ExtremEventId_i} := \begin{bmatrix} 1 & 1 & 0 & 0.5 & \frac{0.3}{R} & \frac{1}{R} \end{bmatrix} \cdot \begin{bmatrix} \left\| Vy_{DC_i} \right\| & \left\| Vy_{DW_i} \right\| & \left\| Vy_{LLmax_i} \right\| & \left\| Vy_{LLmin_i} \right\| & \left\| Vy_{SY_i} \right\| & \left\| Vy_{SX_i} \right\| \end{bmatrix}^{T}$$

Capacidad a Flexión

$\phi_b := 0.9$ $L_b := 2.58 \cdot m$ $C_b := 1$

Clasificación de la sección por pandeo Local (A

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 7.813$$

$$\lambda_{pf} := 0.38 \cdot \sqrt{\frac{E}{F_y}} = 9.152 \qquad \lambda_{rf} := 1.0 \cdot \sqrt{\frac{E}{F_y}} = 24.083$$

Alas → "Sección No Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.646\ m$$

$$\lambda w := \frac{h}{t_w} = 55.261$$

$$\lambda_{pw} := 3.76 \cdot \sqrt{\frac{E}{F_y}} = 90.553 \qquad \lambda_{rw} := 5.70 \cdot \sqrt{\frac{E}{F_y}} = 137.274$$

Alma → "Sección Compacta"

Capacidad de una sección doblemente simétrica compacta alrededor del eje fuerte

- Cedencia

$$M_p := F_y \cdot Z_x = 154.94\ tonf \cdot m$$

- Pandeo Lateral Torsional

$$r_{ts} := \sqrt{\frac{\sqrt{I_y \cdot C_w}}{S_x}} = 0.065\ m$$

$$c := \left(\frac{h_o}{2}\right) \cdot \sqrt{\frac{I_y}{C_w}} = 1.004$$

$$L_p := 1.76 \cdot r_y \cdot \sqrt{\frac{E}{F_y}} = 2.229 \ \boldsymbol{m}$$

$$L_r := 1.95 \cdot r_{ts} \cdot \left(\frac{E}{(0.7 \cdot F_y)}\right) \cdot \sqrt{\left(\frac{(J \cdot c)}{S_x \cdot h_o}\right) + \sqrt{\left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right)^2 + 6.76 \cdot \left(\frac{(0.7 \cdot F_y)}{E}\right)^2}} = 6.336 \ \boldsymbol{m}$$

$$F_{cr}(l_b) := \left(\frac{(C_b \cdot \pi^2 \cdot E)}{\left(\frac{l_b}{r_{ts}}\right)^2}\right) \cdot \sqrt{1 + 0.078 \cdot \left(\frac{(J \cdot c)}{(S_x \cdot h_o)}\right) \cdot \left(\frac{l_b}{r_{ts}}\right)^2}$$

$$M_{n1}(l_b) := \mathbf{if}\left(l_b \le L_p, M_p, \left(\mathbf{if}\left(l_b \le L_r, C_b \cdot \left(M_p - (M_p - 0.7 \cdot F_y \cdot S_x) \cdot \left(\frac{(l_b - L_p)}{(L_r - L_p)}\right)\right), F_{cr}(l_b) \cdot S_x\right)\right)\right)$$

Capacidad de una sección doblemente simétrica con alma compacta y patines no compactos o esbeltos alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$k_c := \frac{4}{\sqrt{\frac{h}{t_w}}} = 0.538$$

$$M_{n2}(\lambda) := \begin{cases} M_p & \text{if } \lambda < \lambda_{pf} \\ \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) & \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} & \text{else} \end{cases}$$

Capacidad de una sección doblemente simétrica con alma no compacta alrededor del eje fuerte

- Pandeo Local por compresión del patín

$$M_{n3}(\lambda) := \begin{cases} M_p & \text{if } \lambda < \lambda_{pf} \\ \left(M_p - \left(M_p - 0.7 \cdot F_y \cdot S_x\right) \cdot \left(\frac{\lambda - \lambda_{pf}}{\lambda_{rf} - \lambda_{pf}}\right)\right) & \text{also if } \lambda_{pf} < \lambda < \lambda_{rf} \\ \frac{0.9 \cdot E \cdot k_c \cdot S_x}{\lambda^2} & \text{else} \end{cases}$$

$$M_{nx} := \left\| \begin{array}{l} \text{if } Alas = \text{“Sección Compacta”} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n1}(L_b) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \\ \text{else} \\ \quad \left\| \begin{array}{l} \text{if } Alma = \text{“Sección Compacta”} \\ \quad \left\| M_{n2}(\lambda f) \right. \\ \text{else} \\ \quad \left\| M_{n3}(\lambda f) \right. \end{array} \right. \end{array} \right. = 154.94\ tonf \cdot m$$

Capacidad de la sección alrededor del eje debil **(AISC 360-10.F6)**

- Cedencia

$$M_{py} := min\left(F_y \cdot Z_y, 1.6 \cdot F_y \cdot S_y\right)$$

- Pandeo Local del ala

$$F_{crf}(\lambda_f) := \frac{(0.69 \cdot E)}{(\lambda_f)^2}$$

$$M_{ny}(\lambda_f) := \mathbf{if}\left(\lambda_f \le \lambda_{pf}, M_{py}, \mathbf{if}\left(\lambda_f \le \lambda_{rf}, \left(M_{py} - (M_{py} - 0.7 \cdot F_y \cdot S_y) \cdot \left(\frac{(\lambda_f - \lambda_{pf})}{(\lambda_{rf} - \lambda_{pf})}\right)\right), F_{crf}(\lambda_f) \cdot S_y\right)\right)$$

$$M_{ny} := M_{ny}(\lambda f)$$

Capacidad a Compresión

Clasificación de la sección por pandeo Local

Alas

$$\lambda f := \frac{b_f}{2 \cdot t_f} = 7.813 \qquad \lambda_{rf} := 0.56 \cdot \sqrt{\frac{E}{F_y}} = 13.487$$

Alas → "Sección Compacta"

Alma

$$h := D - 2 \cdot t_f = 0.646 \ \boldsymbol{m}$$

$$\lambda w := \frac{h}{t_w} = 55.261$$

$$\lambda_{rw} := 1.49 \cdot \sqrt{\frac{E}{F_y}} = 35.884$$

Alma → "Sección Esbelta"

$$K := 1$$

$$r := \max(r_x, r_y) = 0.272 \ \boldsymbol{m}$$

$$F_e := \frac{\pi^2 \cdot E}{\left(\frac{K \cdot L}{r}\right)^2} = \left(2.433 \cdot 10^9\right) \ \boldsymbol{Pa}$$

$$F_{cr} := \begin{cases} \text{if } \frac{F_y}{F_e} \le 2.25 \\ \quad \left(0.658^{\frac{F_y}{F_e}}\right) \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(3.249 \cdot 10^8\right) \ \boldsymbol{Pa}$$

$$b_e := \begin{cases} \text{if } \lambda w \geq 1.49 \cdot \sqrt{\dfrac{E}{F_{cr}}} \\ \quad \left(1.92 \cdot t_w \cdot \sqrt{\dfrac{E}{F_{cr}}} \cdot \left(1 - \dfrac{0.34}{\left(\dfrac{h}{t_w}\right)} \cdot \sqrt{\dfrac{E}{F_{cr}}}\right)\right) \\ \text{else} \\ \quad h \end{cases} = 0.472\ \boldsymbol{m}$$

$A_e := b_e \cdot t_w = 0.006\ \boldsymbol{m}^2$ $\qquad$ $A_{gl} := h \cdot t_w = 0.008\ \boldsymbol{m}^2$

$$Q_a := \frac{A_e}{A_{gl}} = 0.73$$

$$Q_s := \begin{cases} \text{if } \dfrac{b_f}{2 \cdot t_f} \leq 0.56 \cdot \sqrt{\dfrac{E}{F_y}} \\ \quad 1 \\ \text{also if } 0.56 \cdot \sqrt{\dfrac{E}{F_y}} < \dfrac{b_f}{2 \cdot t_f} \leq 1.03 \cdot \sqrt{\dfrac{E}{F_y}} \\ \quad 1.415 - 0.74 \cdot \left(\dfrac{b_f}{2 \cdot t_f}\right) \cdot \sqrt{\dfrac{F_y}{E}} \\ \text{else} \\ \quad \dfrac{0.69 \cdot E}{F_y \cdot \left(\dfrac{b_f}{2 \cdot t_f}\right)^2} \end{cases} = 1$$

$$Q := Q_a \cdot Q_s$$

$$F_{cr} := \begin{cases} \text{if } \dfrac{Q \cdot F_y}{F_e} \leq 2.25 \\ \quad \left(0.658^{\frac{Q \cdot F_y}{F_e}}\right) \cdot Q \cdot F_y \\ \text{else} \\ \quad 0.877 \cdot F_e \end{cases} = \left(2.411 \cdot 10^8\right)\ \boldsymbol{Pa}$$

$P_n := F_{cr} \cdot A_g = 431.889$ ***tonf***

$\phi_c := 0.9$

Flexo compresión

$$RazonCapacidad1_i := \begin{cases} \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{Strenght1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{Strenght1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

$$RazonCapacidad2_i := \begin{cases} \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{Strenght1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{Strenght1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{Strenght1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{Strenght1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

$$RazonCapacidad3_i := \begin{cases} \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{ServiceI1a_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{ServiceI1a_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1a_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1a_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

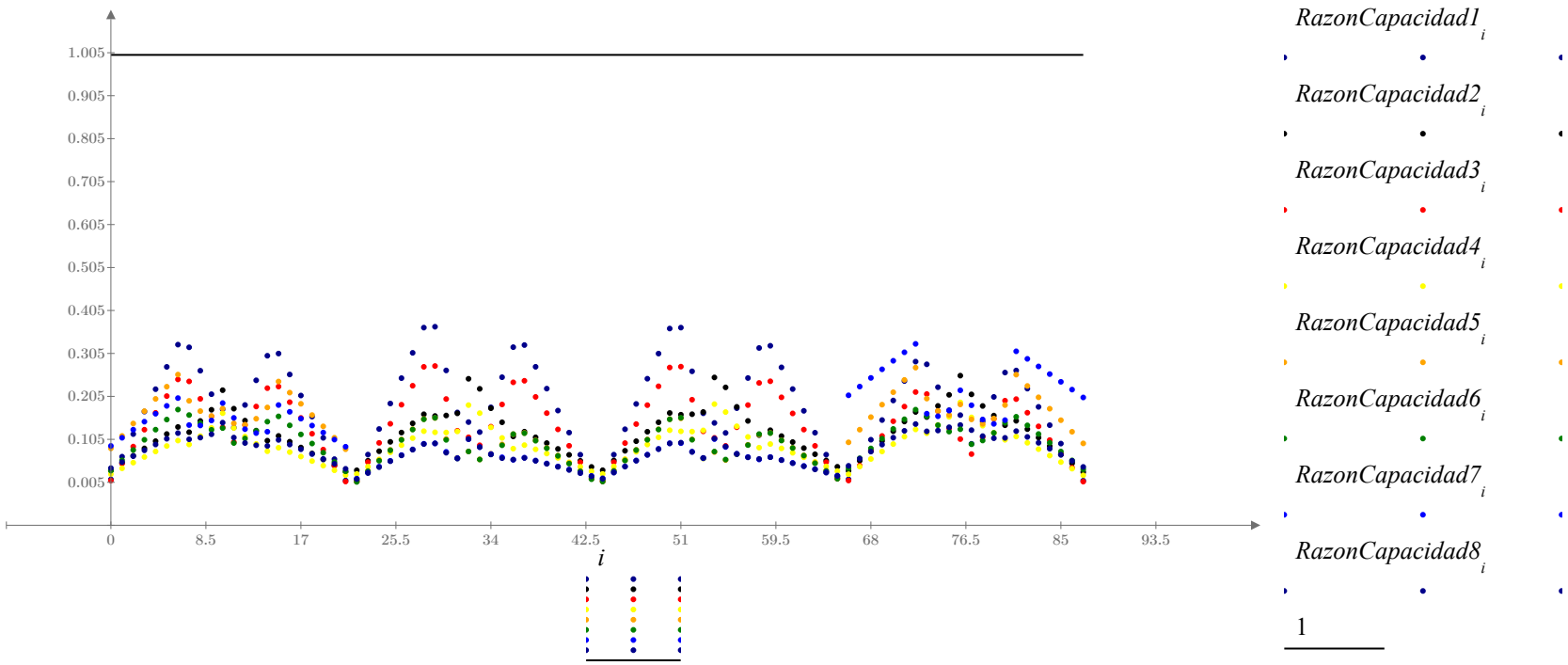
$$RazonCapacidad4_i := \begin{cases} \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{if } \dfrac{PU_{ServiceI1b_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \dfrac{PU_{ServiceI1b_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ServiceI1b_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ServiceI1b_i}}{\phi_b \cdot M_{ny}} \right) & \text{else} \end{cases}$$

$$RazonCapacidad5_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIa_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIa_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIa_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIa_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad6_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIb_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIb_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIb_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIb_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad7_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventIc_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventIc_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventIc_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventIc_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$

$$RazonCapacidad8_i := \begin{cases} \text{if } \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} \geq 0.2 \\ \quad \dfrac{PU_{ExtremEventId_i}}{\phi_c \cdot P_n} + \dfrac{8}{9} \cdot \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \\ \text{else} \\ \quad \dfrac{PU_{ExtremEventId_i}}{2 \cdot \phi_c \cdot P_n} + \left(\dfrac{MUx_{ExtremEventId_i}}{\phi_b \cdot M_{nx}} + \dfrac{MUy_{ExtremEventId_i}}{\phi_b \cdot M_{ny}} \right) \end{cases}$$



Cortante

$\phi_v := 0.9$

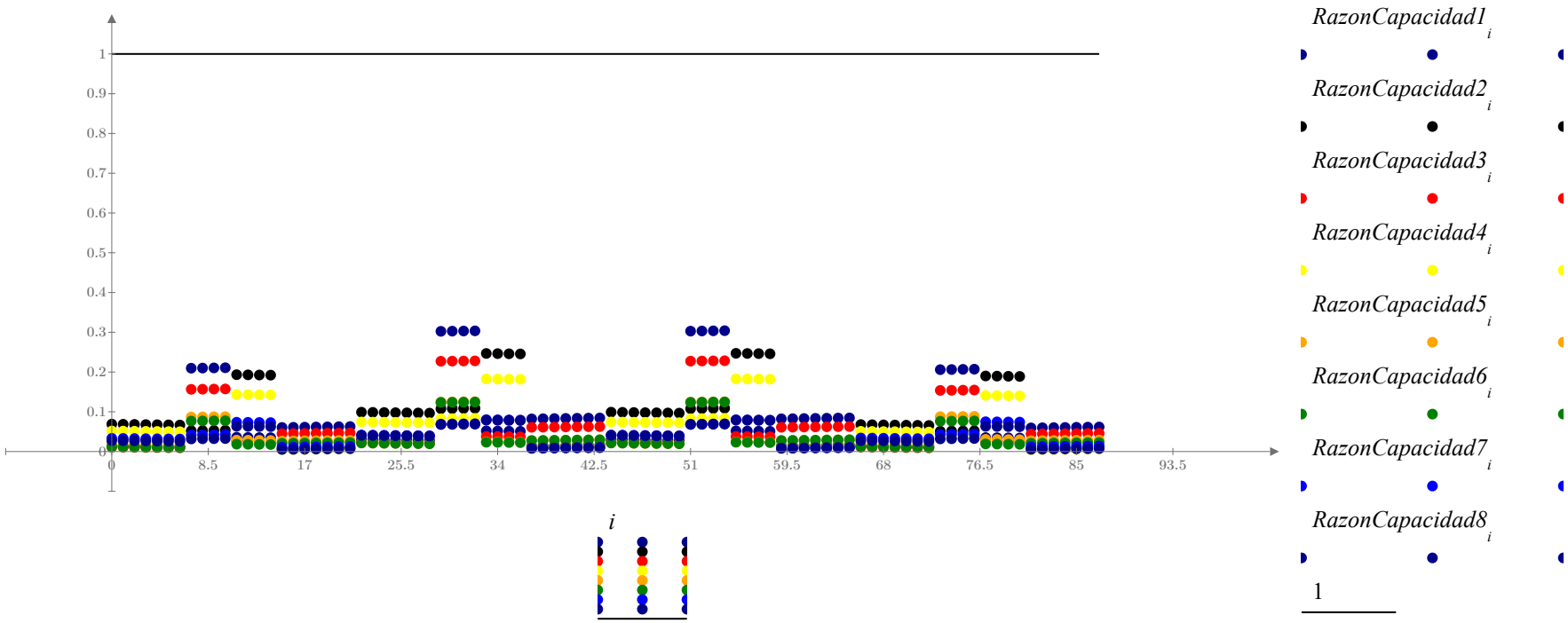
$A_w := h \cdot t_w = 0.008\ \boldsymbol{m}^2$

$C_v := 1.0$

$V_n := 0.6 \cdot F_y \cdot A_w \cdot C_v = 175.398\ \boldsymbol{tonf}$

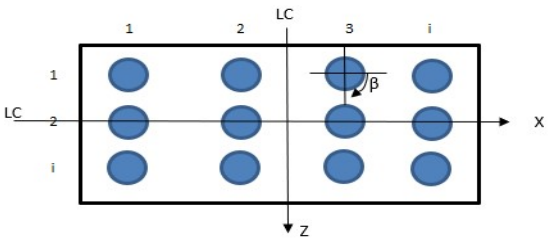
$RazonCapacidad1_i := \dfrac{VUx_{Strenght1a_i}}{V_n}$ $\quad RazonCapacidad2_i := \dfrac{VUx_{Strenght1b_i}}{V_n}$ $\quad RazonCapacidad3_i := \dfrac{VUx_{ServiceI1a_i}}{V_n}$ $\quad RazonCapacidad4_i := \dfrac{VUx_{ServiceI1b_i}}{V_n}$

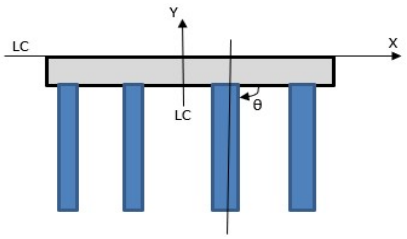
$RazonCapacidad5_i := \dfrac{VUx_{ExtremEventIa_i}}{V_n}$ $\quad RazonCapacidad6_i := \dfrac{VUx_{ExtremEventIb_i}}{V_n}$ $\quad RazonCapacidad7_i := \dfrac{VUx_{ExtremEventIc_i}}{V_n}$ $\quad RazonCapacidad8_i := \dfrac{VUx_{ExtremEventId_i}}{V_n}$


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
8.5
17
25.5
34
42.5
51
59.5
68
76.5
85
93.5
i
RazonCapacidad1 i
RazonCapacidad2 i
RazonCapacidad3 i
RazonCapacidad4 i
RazonCapacidad5 i
RazonCapacidad6 i
RazonCapacidad7 i
RazonCapacidad8 i
1

4.5 Diseño de Fundaciones

4.5.1 Distribución de Pilotes





Ubicación de pilotes (X) (m)

	1	2	3	4	5	6	7	8
1	-	-4.47	-	-3.17	3.17	-	4.47	-
2	-	-4.47	-	-3.17	3.17	-	4.47	-
3	-	-	**-3.47**	-	-	**3.47**	-	-
4	-5.07	-	-	-	-	-	-	5.07
5	-5.07	-	-	-	-	-	-	5.07
6	-	-	**-3.47**	-	-	**3.47**	-	-
7	-5.07	-	-	-	-	-	-	5.07
8	-	-	**-3.47**	-	-	**3.47**	-	-
9	-5.07	-	-	-	-	-	-	5.07
10	-	-	**-3.47**	-	-	**3.47**	-	-
11	**-5.07**	-	**-3.47**	-	-	**3.47**	-	**5.07**
12	**-5.07**	-	**-3.47**	-	-	**3.47**	-	**5.07**

Ubicación de pilotes (Z) (m)

	1	2	3	4	5	6	7	8
1	-	6.6	-	6.6	6.6	-	6.6	-
2	-	5.07	-	5.07	5.07	-	5.07	-
3	-	-	**1.45**	-	-	**1.45**	-	-
4	1.39	-	-	-	-	-	-	1.39
5	0.19	-	-	-	-	-	-	**0.19**
6	-	-	**-0.15**	-	-	**-0.15**	-	-
7	-1.02	-	-	-	-	-	-	-1.02
8	-	-	**-1.75**	-	-	**-1.75**	-	-
9	-2.22	-	-	-	-	-	-	-2.22
10	-	-	**-3.35**	-	-	**-3.35**	-	-
11	**-4.95**	-	**-4.95**	-	-	**-4.95**	-	**-4.95**
12	**-6.55**	-	**-6.55**	-	-	**-6.55**	-	**-6.55**

Inclinación Horizontal (β) (°)

	1	2	3	4	5	6	7	8
1	-	0.0	-	0.0	0.0	-	0.0	-
2	-	0.00	-	0.00	0.00	-	0.00	-
3	-	-	**0.00**	-	-	**0.00**	-	-
4	0.00	-	-	-	-	-	-	0.00
5	0.00	-	-	-	-	-	-	**0.00**
6	-	-	**0.00**	-	-	**0.00**	-	-
7	0.00	-	-	-	-	-	-	0.00
8	-	-	**0.00**	-	-	**0.00**	-	-
9	0.00	-	-	-	-	-	-	0.00
10	-	-	**0.00**	-	-	**0.00**	-	-
11	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**
12	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**

Inclinación Vertical (θ) (°)

	1	2	3	4	5	6	7	8
1	-	90	-	90	90	-	90	-
2	-	90	-	90	90	-	90	-
3	-	-	**90**	-	-	**90**	-	-
4	90	-	-	-	-	-	-	90
5	90	-	-	-	-	-	-	90
6	-	-	**90**	-	-	**90**	-	-
7	90	-	-	-	-	-	-	90
8	-	-	**90**	-	-	**90**	-	-
9	90	-	-	-	-	-	-	90
10	-	-	**90**	-	-	**90**	-	-
11	**90**	-	**90**	-	-	**90**	-	**90**
12	**90**	-	**90**	-	-	**90**	-	**90**

4.5.2 Propiedades de Pilotes

Pilotes existentes

Dimensión del lado del pilote (D)	=	60	cm
Área de pilote	=	2827.43	cm^2
Longitud del pilote (m)	=	7	m
Cantidad de pilotes (N)	=	16	
Capacidad última a compresión (Qu_c)	=	150	Ton

Pilotes nuevos

Dimensión del lado del pilote (D)	=	80	cm
Área de pilote	=	5026.55	cm^2
Longitud del pilote (m)	=	7	m
Cantidad de pilotes (N)	=	16	
Capacidad última a compresión (Qu_c)	=	45	Ton

$\Phi_{SERVICE}$	=	1.00	***AASHTO 10.5.5.1***
$\Phi_{STRENGHT}$	=	0.75	***AASHTO 10.5.5.2***
$\Phi_{EXTREME,UPLIFT}$	=	0.80	***AASHTO 10.5.5.3***
$\Phi_{EXTREME}$	=	1.00	***AASHTO 10.5.5.3***

Demanda última

	Factores de carga							
	DC	DW	LL	EV	EH	ES	EQ	EP
Strenght I	1.25	1.5	1.75	1.35	1.50	1.50	0.0	0.5
Service I	1.00	1.0	1.00	1.00	1.00	1.00	0.0	0.5
Extreme Event I	1.00	1.0	0.50	1.00	1.00	1.00	1.0	0.5

El estudio de suelos no cuenta con la información necesaria para poder realizar el análisis de los pilotes de la cimentación.

4.5.3 Distribución de Fuerzas en Pilotes

DC (Ton)

	1	2	3	4	5	6	7	8
1	-	52.49	-	53.8	53.8	-	52.5	-
2	-	35.81	-	36.41	36.41	-	35.81	-
3	-	-	**25.75**	-	-	**25.75**	-	-
4	7.04	-	-	-	-	-	-	7.04
5	9.68	-	-	-	-	-	-	**9.68**
6	-	-	**25.75**	-	-	**25.75**	-	-
7	12.80	-	-	-	-	-	-	12.80
8	-	-	**25.75**	-	-	**25.75**	-	-
9	14.08	-	-	-	-	-	-	14.08
10	-	-	**25.75**	-	-	**25.75**	-	-
11	**25.75**	-	**25.75**	-	-	**25.75**	-	**25.75**
12	**25.75**	-	**25.75**	-	-	**25.75**	-	**25.75**

DW (Ton)

	1	2	3	4	5	6	7	8
1	-	2.0	-	2.0	2.0	-	2.0	-
2	-	1.17	-	1.17	1.17	-	1.17	-
3	-	-	**0.06**	-	-	**0.06**	-	-
4	0.03	-	-	-	-	-	-	0.03
5	0.03	-	-	-	-	-	-	**0.03**
6	-	-	**0.06**	-	-	**0.06**	-	-
7	0.03	-	-	-	-	-	-	0.03
8	-	-	**0.06**	-	-	**0.06**	-	-
9	0.03	-	-	-	-	-	-	0.03
10	-	-	**0.06**	-	-	**0.06**	-	-
11	**0.06**	-	**0.06**	-	-	**0.06**	-	**0.06**
12	**0.06**	-	**0.06**	-	-	**0.06**	-	**0.06**

LL+IM (max) (Ton)

	1	2	3	4	5	6	7	8
1	-	24.8	-	24.0	24.0	-	24.8	-
2	-	14.08	-	13.23	13.23	-	14.08	-
3	-	-	**0.00**	-	-	**0.00**	-	-
4	0.85	-	-	-	-	-	-	0.85
5	0.52	-	-	-	-	-	-	**0.52**
6	-	-	**0.00**	-	-	**0.00**	-	-
7	0.13	-	-	-	-	-	-	0.13
8	-	-	**0.00**	-	-	**0.00**	-	-
9	0.27	-	-	-	-	-	-	0.27
10	-	-	**0.00**	-	-	**0.00**	-	-
11	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**
12	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**

LL+IM (min) (Ton)

	1	2	3	4	5	6	7	8
1	-	-3.3	-	-3.3	-3.3	-	-3.3	-
2	-	-1.84	-	-1.83	-1.83	-	-1.84	-
3	-	-	**0.00**	-	-	**0.00**	-	-
4	-6.42	-	-	-	-	-	-	-6.42
5	-3.91	-	-	-	-	-	-	**-3.91**
6	-	-	**0.00**	-	-	**0.00**	-	-
7	-0.95	-	-	-	-	-	-	-0.95
8	-	-	**0.00**	-	-	**0.00**	-	-
9	-0.04	-	-	-	-	-	-	-0.04
10	-	-	**0.00**	-	-	**0.00**	-	-
11	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**
12	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**

ES (Ton)

	1	2	3	4	5	6	7	8
1	-	0.0	-	0.0	0.0	-	0.0	-
2	-	0.00	-	0.00	0.00	-	0.00	-
3	-	-	**0.00**	-	-	**0.00**	-	-
4	0.00	-	-	-	-	-	-	0.00
5	0.00	-	-	-	-	-	-	**0.00**
6	-	-	**0.00**	-	-	**0.00**	-	-
7	0.00	-	-	-	-	-	-	0.00
8	-	-	**0.00**	-	-	**0.00**	-	-
9	0.00	-	-	-	-	-	-	0.00
10	-	-	**0.00**	-	-	**0.00**	-	-
11	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**
12	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**

EH (Ton)

	1	2	3	4	5	6	7	8
1	-	0.0	-	0.0	0.0	-	0.0	-
2	-	0.00	-	0.00	0.00	-	0.00	-
3	-	-	**0.00**	-	-	**0.00**	-	-
4	0.00	-	-	-	-	-	-	0.00
5	0.00	-	-	-	-	-	-	**0.00**
6	-	-	**0.00**	-	-	**0.00**	-	-
7	0.00	-	-	-	-	-	-	0.00
8	-	-	**0.00**	-	-	**0.00**	-	-
9	0.00	-	-	-	-	-	-	0.00
10	-	-	**0.00**	-	-	**0.00**	-	-
11	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**
12	**0.00**	-	**0.00**	-	-	**0.00**	-	**0.00**

EQ x (Ton)

	1	2	3	4	5	6	7	8
1	-	1.9	-	2.0	2.0	-	1.9	-
2	-	1.65	-	1.73	1.73	-	1.65	-
3	-	-	**0.68**	-	-	**0.68**	-	-
4	0.36	-	-	-	-	-	-	0.36
5	0.36	-	-	-	-	-	-	**0.36**
6	-	-	**0.68**	-	-	**0.68**	-	-
7	0.36	-	-	-	-	-	-	0.36
8	-	-	**0.68**	-	-	**0.68**	-	-
9	0.36	-	-	-	-	-	-	0.36
10	-	-	**0.68**	-	-	**0.68**	-	-
11	**0.68**	-	**0.68**	-	-	**0.68**	-	**0.68**
12	**0.68**	-	**0.68**	-	-	**0.68**	-	**0.68**

EQ y (Ton)

	1	2	3	4	5	6	7	8
1	-	19.9	-	8.0	8.0	-	19.9	-
2	-	14.86	-	3.31	3.31	-	14.86	-
3	-	-	**4.61**	-	-	**4.61**	-	-
4	2.45	-	-	-	-	-	-	2.45
5	2.45	-	-	-	-	-	-	**2.45**
6	-	-	**4.61**	-	-	**4.61**	-	-
7	2.45	-	-	-	-	-	-	2.45
8	-	-	**4.61**	-	-	**4.61**	-	-
9	2.45	-	-	-	-	-	-	2.45
10	-	-	**4.61**	-	-	**4.61**	-	-
11	**4.61**	-	**4.61**	-	-	**4.61**	-	**4.61**
12	**4.61**	-	**4.61**	-	-	**4.61**	-	**4.61**

4.5.4 Demanda última en Pilotes

	Factores de carga							
	DC	DW	LL	EV	EH	ES	EQ	EP
Strenght I	1.25	1.5	1.75	1.35	1.50	1.50	0.0	0.5
Service I	1.00	1.0	1.00	1.00	1.00	1.00	0.0	0.5
Extreme Event I	1.00	1.0	0.50	1.00	1.00	1.00	1.0	0.5

CU1 (Strenght I) max (Ton)

$\phi Qu_{c(D60)}$ = 112.5 ton

$\phi Qu_{c(D80)}$ = 33.8 ton

	1	2	3	4	5	6	7	8
1	-	112	-	112	112	-	112	-
2	-	71	-	70	70	-	71	-
3	-	-	32	-	-	32	-	-
4	10	-	-	-	-	-	-	10
5	13	-	-	-	-	-	-	13
6	-	-	32	-	-	32	-	-
7	16	-	-	-	-	-	-	16
8	-	-	32	-	-	32	-	-
9	18	-	-	-	-	-	-	18
10	-	-	32	-	-	32	-	-
11	32	-	32	-	-	32	-	32
12	32	-	32	-	-	32	-	32

CU2 (Strenght I) min (Ton)

$\phi Qu_{c(D60)}$ = 112.5 ton

$\phi Qu_{c(D80)}$ = 33.8 ton

	1	2	3	4	5	6	7	8
1	-	63	-	65	65	-	63	-
2	-	43	-	44	44	-	43	-
3	-	-	32	-	-	32	-	-
4	-2	-	-	-	-	-	-	-2
5	5	-	-	-	-	-	-	5
6	-	-	32	-	-	32	-	-
7	14	-	-	-	-	-	-	14
8	-	-	32	-	-	32	-	-
9	18	-	-	-	-	-	-	18
10	-	-	32	-	-	32	-	-
11	32	-	32	-	-	32	-	32
12	32	-	32	-	-	32	-	32

CU3 (Servicet I) max (Ton) $\phi Qu_{c(D60)}$ = 150.0 ton
$\phi Qu_{c(D80)}$ = 45.0 ton

	1	2	3	4	5	6	7	8
1	-	79	-	80	80	-	79	-
2	-	51	-	51	51	-	51	-
3	-	-	26	-	-	26	-	-
4	8	-	-	-	-	-	-	8
5	10	-	-	-	-	-	-	10
6	-	-	26	-	-	26	-	-
7	13	-	-	-	-	-	-	13
8	-	-	26	-	-	26	-	-
9	14	-	-	-	-	-	-	14
10	-	-	26	-	-	26	-	-
11	26	-	26	-	-	26	-	26
12	26	-	26	-	-	26	-	26

CU4 (Servicet I) min (Ton) $\phi Qu_{c(D60)}$ = 150.0 ton
$\phi Qu_{c(D80)}$ = 45.0 ton

	1	2	3	4	5	6	7	8
1	-	51	-	53	53	-	51	-
2	-	35	-	36	36	-	35	-
3	-	-	26	-	-	26	-	-
4	1	-	-	-	-	-	-	1
5	6	-	-	-	-	-	-	6
6	-	-	26	-	-	26	-	-
7	12	-	-	-	-	-	-	12
8	-	-	26	-	-	26	-	-
9	14	-	-	-	-	-	-	14
10	-	-	26	-	-	26	-	-
11	26	-	26	-	-	26	-	26
12	26	-	26	-	-	26	-	26

CU5 (Ext.Event I X) max (Ton) $\phi Qu_{c(D60)}$ = 150.0 ton
$\phi Qu_{c(D80)}$ = 45.0 ton

	1	2	3	4	5	6	7	8
1	-	75	-	72	72	-	75	-
2	-	50	-	47	47	-	50	-
3	-	-	28	-	-	28	-	-
4	9	-	-	-	-	-	-	9
5	11	-	-	-	-	-	-	11
6	-	-	28	-	-	28	-	-
7	14	-	-	-	-	-	-	14
8	-	-	28	-	-	28	-	-
9	15	-	-	-	-	-	-	15
10	-	-	28	-	-	28	-	-
11	28	-	28	-	-	28	-	28
12	28	-	28	-	-	28	-	28

CU6 (Ext. Event I X) min (Ton) $\phi Qu_{c(D60)}$ = 150.0 ton
$\phi Qu_{c(D80)}$ = 45.0 ton

	1	2	3	4	5	6	7	8
1	-	61	-	59	59	-	61	-
2	-	42	-	39	39	-	42	-
3	-	-	28	-	-	28	-	-
4	5	-	-	-	-	-	-	5
5	9	-	-	-	-	-	-	9
6	-	-	28	-	-	28	-	-
7	13	-	-	-	-	-	-	13
8	-	-	28	-	-	28	-	-
9	15	-	-	-	-	-	-	15
10	-	-	28	-	-	28	-	-
11	28	-	28	-	-	28	-	28
12	28	-	28	-	-	28	-	28

CU7 (Ext. Event I Y) max (Ton) $\phi Qu_{c(D60)}$ = 150.0 ton
$\phi Qu_{c(D80)}$ = 45.0 ton

	1	2	3	4	5	6	7	8
1	-	87	-	76	76	-	87	-
2	-	59	-	48	48	-	59	-
3	-	-	31	-	-	31	-	-
4	10	-	-	-	-	-	-	10
5	13	-	-	-	-	-	-	13
6	-	-	31	-	-	31	-	-
7	15	-	-	-	-	-	-	15
8	-	-	31	-	-	31	-	-
9	17	-	-	-	-	-	-	17
10	-	-	31	-	-	31	-	-
11	31	-	31	-	-	31	-	31
12	31	-	31	-	-	31	-	31

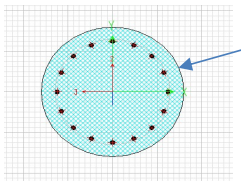
CU8 (Ext. Event I Y) min (Ton) $\phi Qu_{c(D60)}$ = 150.0 ton
$\phi Qu_{c(D80)}$ = 45.0 ton

	1	2	3	4	5	6	7	8
1	-	73	-	63	63	-	73	-
2	-	51	-	40	40	-	51	-
3	-	-	31	-	-	31	-	-
4	6	-	-	-	-	-	-	6
5	10	-	-	-	-	-	-	10
6	-	-	31	-	-	31	-	-
7	15	-	-	-	-	-	-	15
8	-	-	31	-	-	31	-	-
9	17	-	-	-	-	-	-	17
10	-	-	31	-	-	31	-	-
11	31	-	31	-	-	31	-	31
12	31	-	31	-	-	31	-	31

4.5.5 Diseño de Pilote Flexocompresión

Pilotes Existentes D60 TIPO 1

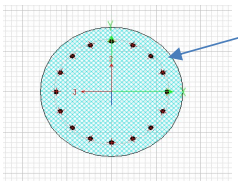
TRAMO 1



8 # 9

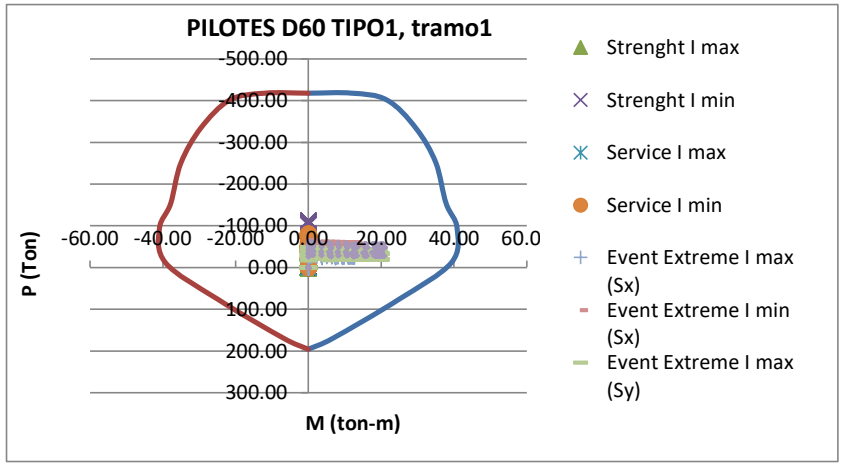
Acero mínimo		28.27	cm^2	
Acero máximo		113.10	cm^2	
As, colocado	=	51.3	cm^2	OK

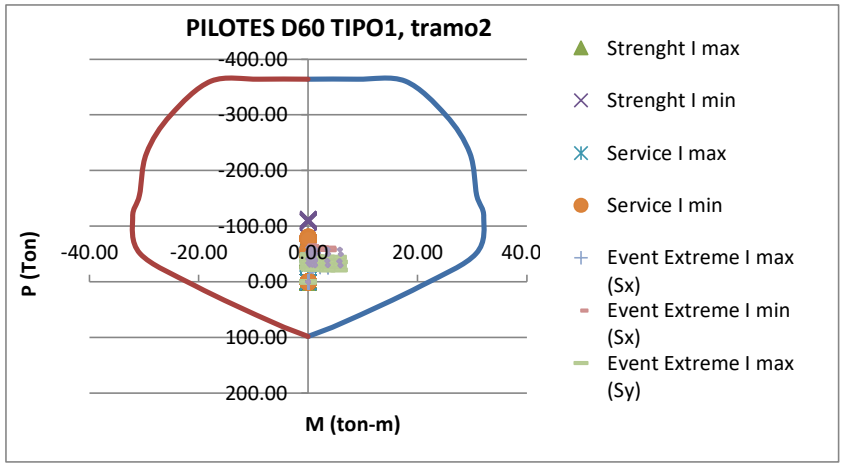
TRAMO 2



4 # 9

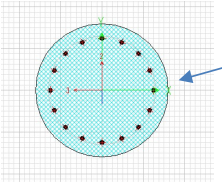
Acero mínimo		28.27	cm^2	***AASHTO 5.6.4.2-3***
Acero máximo		113.10	cm^2	***AASHTO 5.6.4.2-1***
As, colocado	=	25.7	cm^2	X





Pilotes Existentes D60 TIPO 2

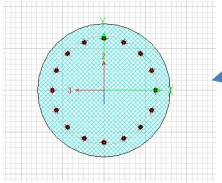
TRAMO 1



8 # 8

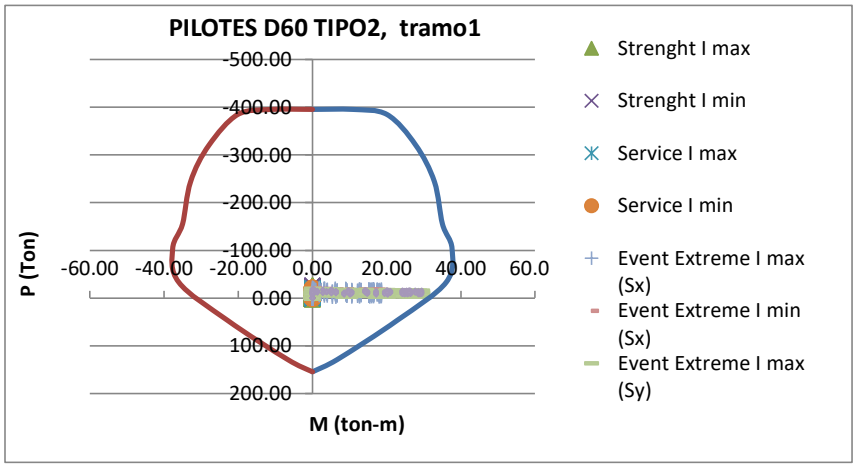
Acero mínimo		28.27	cm^2	
Acero máximo		113.10	cm^2	
As, colocado	=	40.5	cm^2	OK

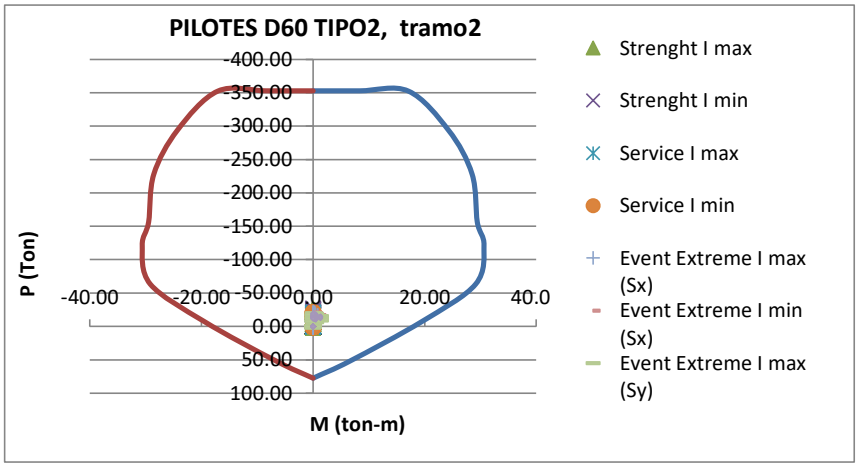
TRAMO 2



4 # 8

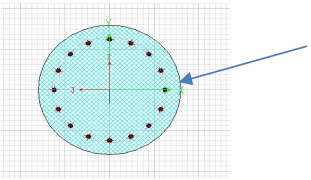
Acero mínimo		28.27	cm^2	***AASHTO 5.6.4.2-3***
Acero máximo		113.10	cm^2	***AASHTO 5.6.4.2-1***
As, colocado	=	20.3	cm^2	X





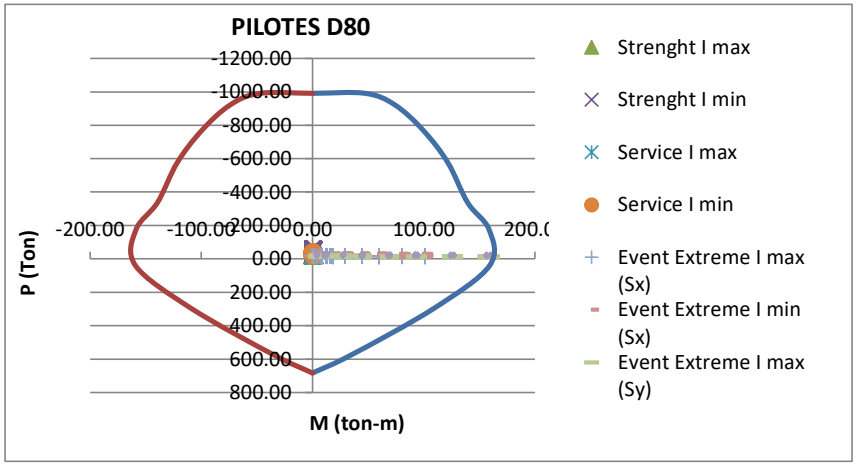
Pilotes Existentes D80

TRAMO 1

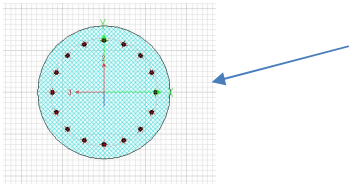


22 # 10

Acero mínimo		50.27	cm^2	
Acero máximo		201.06	cm^2	
As, colocado	=	174.2	cm^2	OK

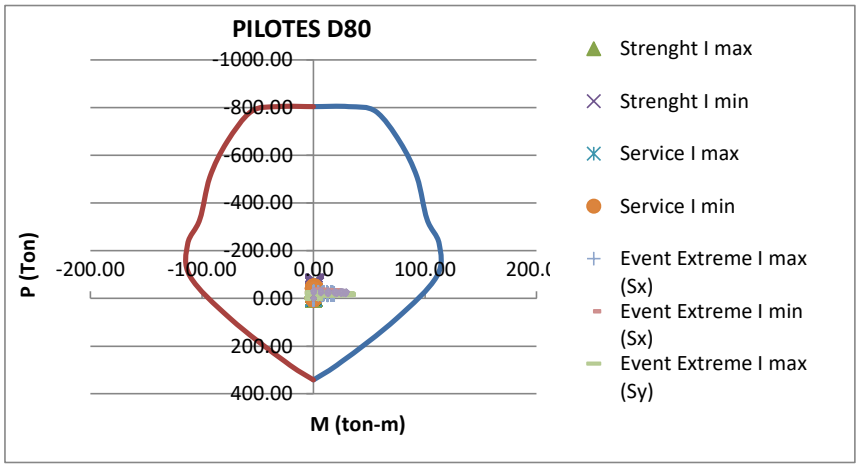


TRAMO 1



11 # 10

Acero mínimo		50.27	cm^2	***AASHTO 5.6.4.2-3***
Acero máximo		201.06	cm^2	***AASHTO 5.6.4.2-1***
As, colocado	=	87.1	cm^2	OK



4.5.7 Diseño de Pilote Cortante

Pilotes D60

Φ	=	0.9	
Vc	=	23.69	Ton

Acero de refuerzo

#	3	@	10	cm
Vs	=	31.42	Ton	

A_s = 0.7 cm2 cm^2/m

Φ Vn	=	49.61	Ton
Vu	=	35.78	Ton
Φ Vn/Vu	=	1.39	

OK

Refuerzo por confinamiento

Longitud minima de confinamiento = 120 cm

cuantia de refuerzo por confinamiento

ρsmin = 0.00714 ***AASHTO 5.11.4.1.4-1***

S req = 8.87

Pilotes D80

Φ	=	0.9	
Vc	=	44.58	Ton

Acero de refuerzo

#	5	@	10	cm	
Vs	=	87.29	Ton		
Φ Vn	=	118.68	Ton		
Vu	=	116.84	Ton		
Φ Vn/Vu	=	1.02		OK	

A_s = 2.0 cm2 cm^2/m

Refuerzo por confinamiento

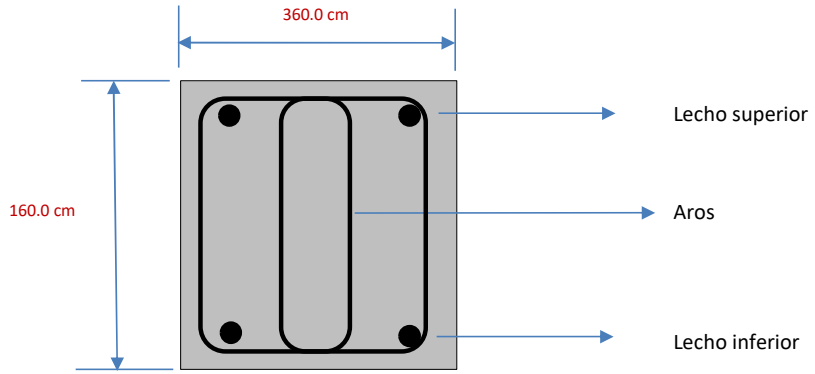
Longitud minima de confinamiento = #REF! cm

cuantia de refuerzo por confinamiento

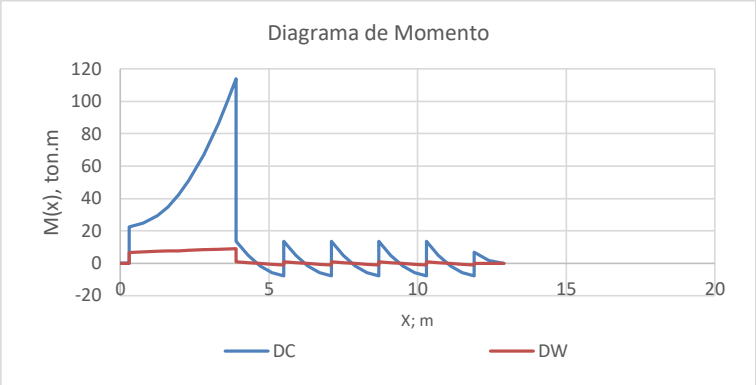
ρsmin = 0.008 ***AASHTO 5.11.4.1.4-1***

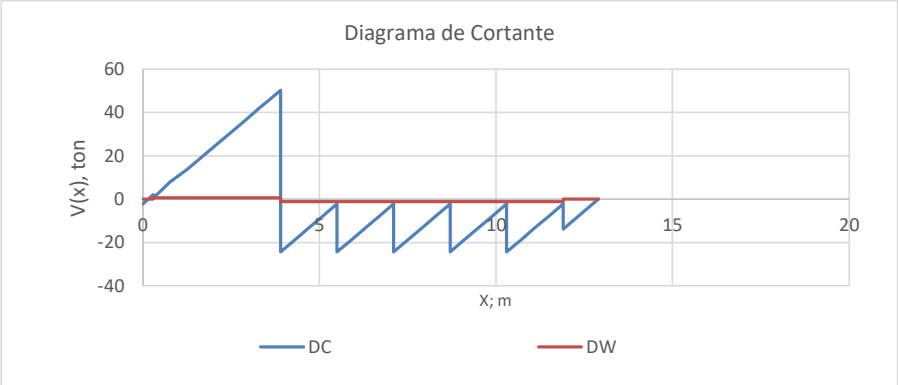
S req = 15.23

5.5.8 Diseño Viga Cabezal

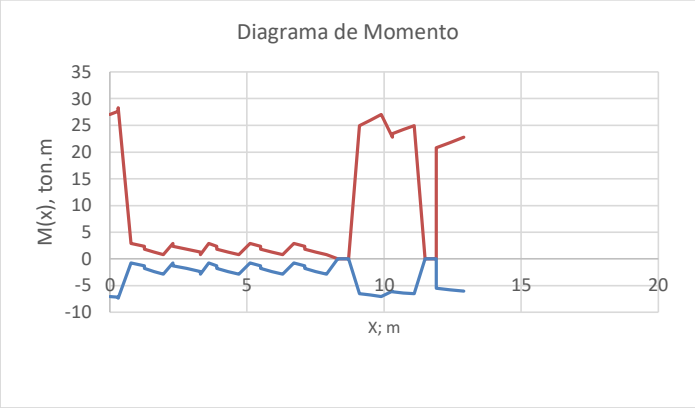


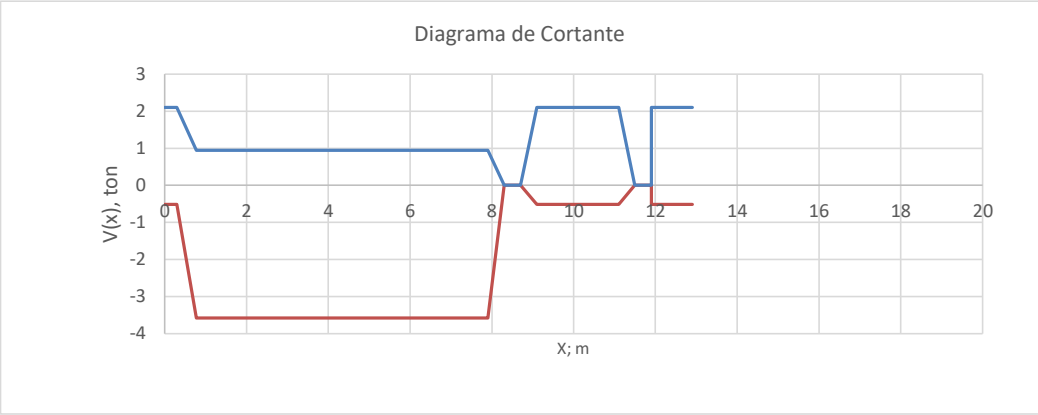
a) Cargas Permantes Eje Fuerte



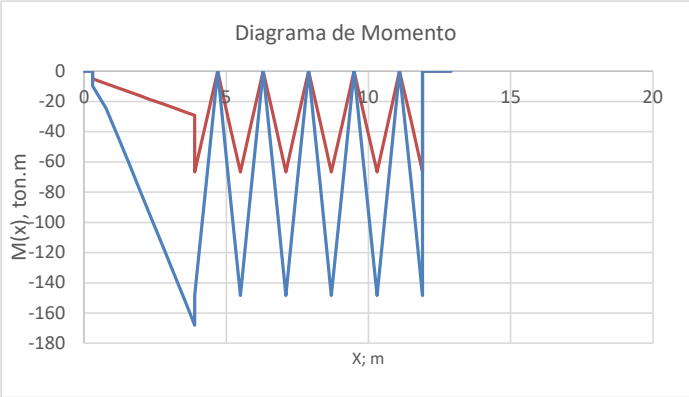


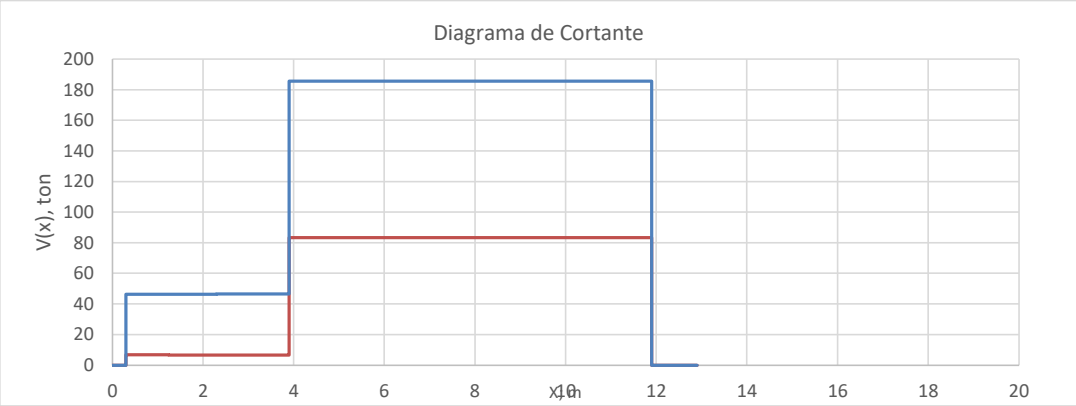
b) Cargas Vehiculares Eje Fuerte





c) Carga de Sismo Eje Fuerte

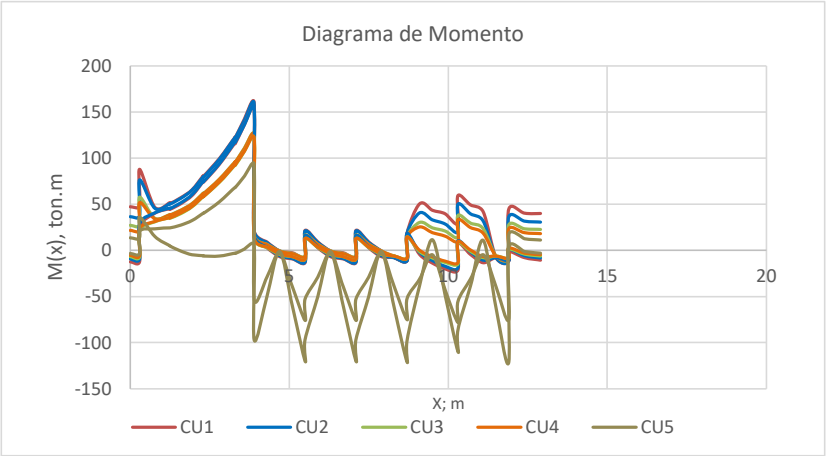


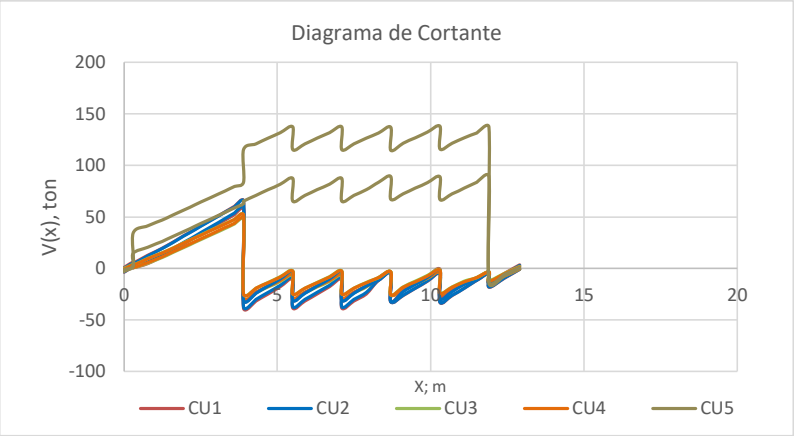


d) Demandas Últimas Eje Fuerte

	Factores de carga				
	DC	DW	LL+IM	PL	EQ
CU1 (Strenght I)	1.25	1.5	1.75	1.75	0.00
CU2 (Strenght II)	1.25	1.5	1.35	1.35	0.00
CU3 (Service I)	1.00	1.0	1.00	1.00	0.00
CU4 (Service III)	1.00	1.0	0.80	0.80	0.00
CU5 (Extreme Event I)	1.00	1.0	0.50	0.50	1.00

AASHTO 3.4.1





e) Capacidad Momento Negativo Eje Fuerte

MU	=	160	ton.m
Mr	=	212.8	ton.m

Acero colocado lecho superior

14	#	8
4	#	9

A_S = 96.6 cm2

ϕ	=	0.9	
As	=	96.6	cm^2
y_p	=	10	cm
d	=	150.00	cm
b	=	360.0	cm
a	=	4.7	cm

As_{min} = 90.00 cm^2 OK

ϕMn	=	539.0	ton-m
ϕMn/Mu		3.37	

e) Capacidad Momento Positivo Eje Fuerte

MU	=	120	ton.m
Mr	=	159.6	ton.m

Acero colocado lecho inferior

14	#	8
4	#	9

A_S = 96.6 cm2

ϕ	=	0.9	
As	=	96.6	cm^2
y_p	=	10	cm
d	=	150.00	cm
b	=	360.0	cm
a	=	4.7	cm

As_{min} = 90.00 cm^2 OK

ϕMn	=	539.0	ton-m
ϕMn/Mu		4.49	

f) Capacidad Cortante Eje Fuerte

Capacidad a cortante

Vu = 150 ton

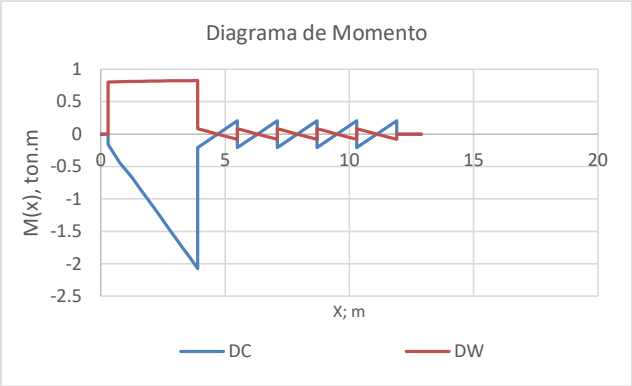
bf	=	360.00	cm
dp	=	150.00	cm
Vc	=	478.90	Ton

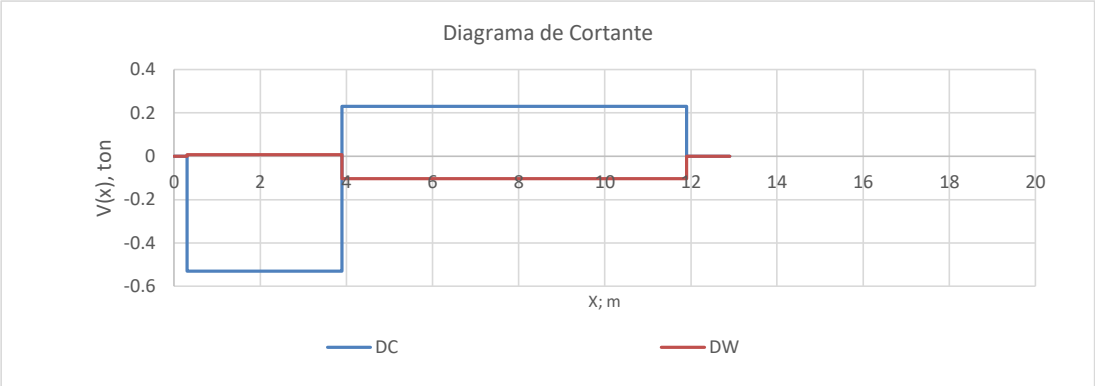
Acero colocado

4 @ 25 cm As = 5.1 cm2 cm^2/m

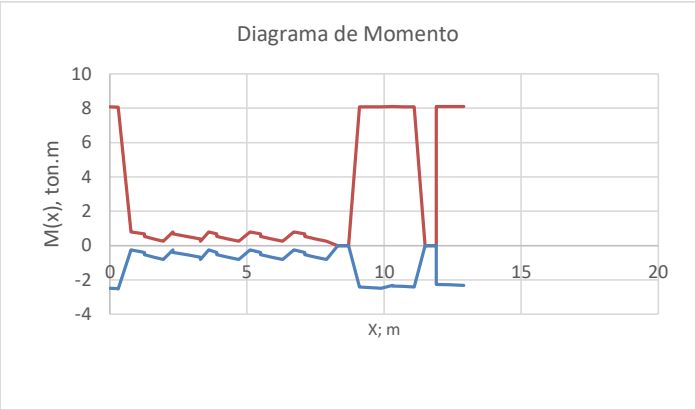
Cantidad de varillas	=	2.00	
Av	=	2.53	cm2
Vs	=	63.85	ton
Φ	=	0.75	
Φ Vn	=	407.06	Ton
Φ Vn/Vu	=	2.71	OK

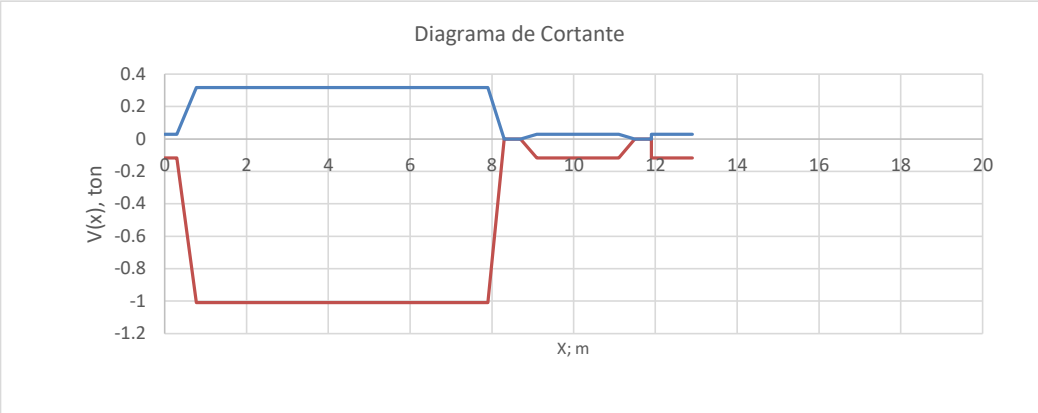
g) Cargas Permantes Eje Debil



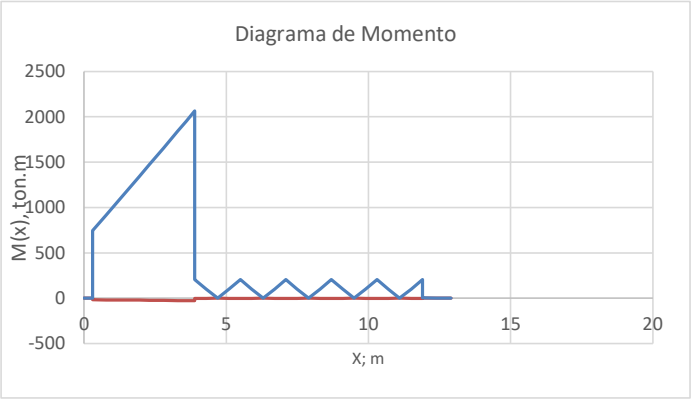


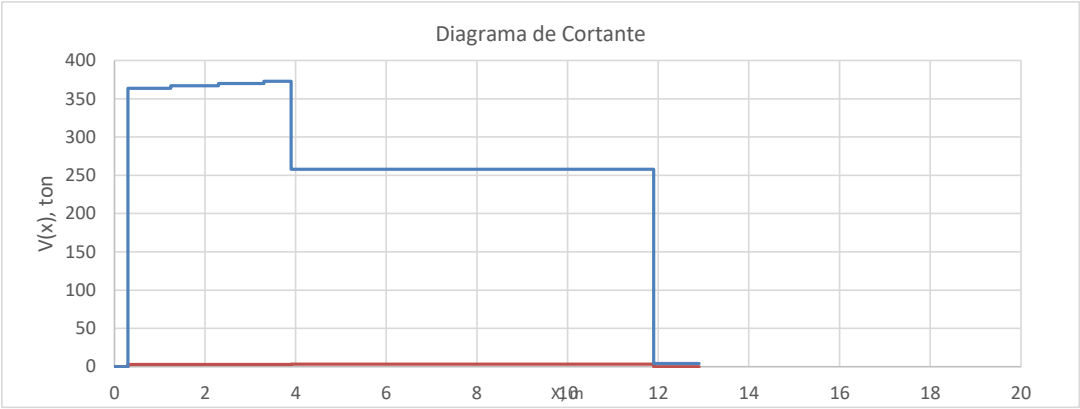
h) Cargas Vehiculares Eje Debil





i) Carga de Sismo Eje Debil

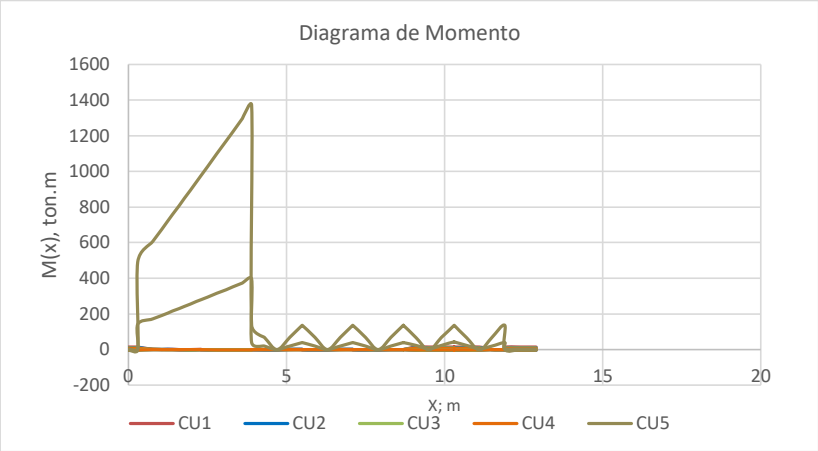


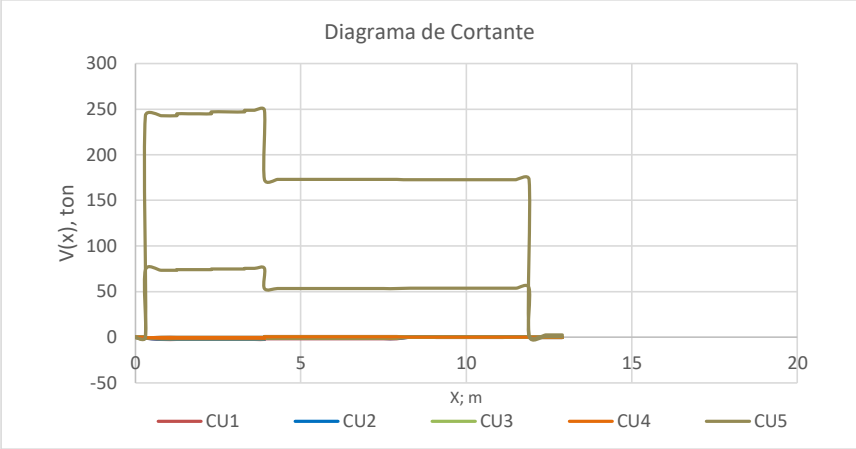


j) Demandas Últimas Eje Debil

	Factores de carga				
	DC	DW	LL+IM	PL	EQ
CU1 (Strenght I)	1.25	1.5	1.75	1.75	0.00
CU2 (Strenght II)	1.25	1.5	1.35	1.35	0.00
CU3 (Service I)	1.00	1.0	1.00	1.00	0.00
CU4 (Service III)	1.00	1.0	0.80	0.80	0.00
CU5 (Extreme Event I)	1.00	1.0	0.50	0.50	1.00

AASHTO 3.4.1





k) Capacidad Momento Eje Debil

MU	=	1369	ton.m
Mr	=	1283	ton.m

Acero colocado lecho superior

18	#	9
0	#	9

A_S = 115.4 cm2

ϕ	=	0.9	
As	=	115.4	cm^2
y_p	=	15	cm
d	=	345.00	cm
b	=	160.0	cm
a	=	12.7	cm

As_{min} = 92.00 cm^2 OK

ϕMn	=	1477.6	ton-m
ϕMn/Mu		1.08	

l) Capacidad Cortante Eje Debil

Capacidad a cortante

Vu = 250 ton

bf	=	160.00	cm
dp	=	345.00	cm
Vc	=	489.55	Ton

Acero colocado

4 @ 25 cm

As = 5.1 cm2 cm^2/m

Cantidad de varillas	=	4.00	
Av	=	5.07	cm2
Vs	=	293.69	ton
Φ	=	0.75	
Φ Vn	=	587.43	Ton
Φ Vn/Vu	=	2.35	OK

Diseño en Tensión

Demanda

	Tu (ton)
TDC	0.25
TDW	0.15
TLL	0.773
TEQ	1207

	Tu (ton)
Strenght I	1.6
Service I	1.13
Extreme Event I	1207.8

Tu = 1207.7865 ton

Acero colocado

28 # 8

36 # 9

A_S = 372.7 cm2 cm^2

Calculo de capacidad

ϕ = 0.9

recub. Superior = 5 cm ***AASHTO 5.10.1***

ϕTn = 1409.0 ton

$\phi T_n/T_u$ = 1.17 OK

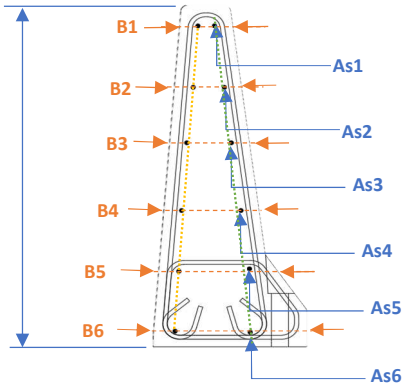
III. Diseño de las barandas vehiculares

1. Materiales

Concreto Baranda	f'_c	280	kg/cm2
Concreto Losa	f'_c	350	kg/cm2
Acero de refuerzo	f_y	4200	kg/cm2

2. Capacidad de la baranda en su eje vertical (Mw)

110.9 m



Sección	B (cm)	As interno	As externo
1	15.6	# 4	# 4
2	19.7	# 4	# 4
3	23.4	# 4	# 4
4	27.9	# 4	# 4
5	34.9	# 4	# 4
6	45	# 4	# 4

Calculo de Mw región interior

Sección	rec. (cm)	d (cm)	As int (cm2)	a (cm)	ϕMn interna (tonf.m)	As ext (cm2)	a (cm)	ϕMn externa (tonf.m)
1	5	10.6	1.27	1.21	0.53	1.27	1.21	0.53
2	5	14.7	1.27		0.75	1.27		0.75
3	5	18.4	1.27		0.95	1.27		0.95
4	5	22.9	1.27		1.19	1.27		1.19
5	5	29.9	1.27		1.56	1.27		1.56
6	5	40	1.27		2.10	1.27		2.10
					7.07			7.07

Mwinterno	**6.37**	**tonf.m/m**
Mwexterno	**6.37**	**tonf.m/m**
Mw promedio	**6.37**	**tonf.m/m**

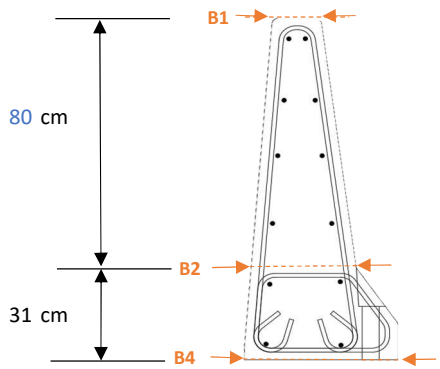
Mw región de extremos

Lc supuesto 196 cm
Longitud de desarrollo 30 cm

Sección	Ubicación en Altura (cm)	Longitud embedida (cm)	rec. (cm)	Fracción desarrollada	As int (cm2)	d (cm)	a (cm)	ϕMn interna (tonf.m)
1	104.3	184.3	5	1.00	1.27	10.60	1.07	0.54
2	84.3	149.0	5	1.00	1.27	14.70		0.75
3	66.3	117.2	5	1.00	1.27	18.40		0.95
4	44.3	78.3	5	1.00	1.27	22.90		1.19
5	24.6	43.5	5	1.00	1.27	29.90		1.56
6	5.1	9.0	5	0.30	0.38	40.00		0.63
								5.62

Mwi prom 5.07 tonf.m/m

3. Capacidad de la baranda en su eje horizontal



	Sección	B (cm)	Bprom
TOP	1	15	23.3
	2	31.5	
BOT	3	31.5	38.25
	4	45	

Mc región interior

	Acero col		Fracción de desarroll	As (cm	a	rec (cm)	d (cm)	ϕMn tonf.m/m
TOP	# 4	@20cm	1	6.33	1.12	5.00	18.25	4.71
BOT	# 7	@20cm	0.94	18.21	2.76	5.00	33.25	20.97

Mci prom 9.237 tonf.m/m

Mc región externa

	Acero col		Fracción de desa	As (cm	a	rec (cm)	d (cm)	ϕMn tonf.m/m
TOP	# 4	@20cm	1	6.33	1.12	5.00	18.25	4.71
BOT	# 7	@20cm	0.939	18.21	2.76	5.00	33.25	20.97

Mce prom 9.237 tonf.m/m

4. Capacidad de la branda

	Interior	Exterior	
Lt	1.2	1.2	m
Ft	27	27	ton
H	1.109	1.109	m
Mb	0	0	tonf.m/m
Mw	6.37	5.07	tonf.m/m
Mc	9.24	9.24	tonf.m/m
	18.47	18.47	kip.ft/ft
Lc	3.27	1.62	m
Rw	54.5	26.9	Ton

OK

* A criterio de diseñador se considera adecuado

5. Revisión de Cortante

Ft	27	ton
Fl	9	ton
Vres	28.46	ton/Lc

Acero Colocado **# 7** **@20cm**

As	31.37	cm2/Lc
μ	1	
Vn	113.32	tonf/Lc

OK

6. Revisión de anclaje del acero de refuerzo

Se asume anclaje químico (HIT RE-500SD) para varilla #7 G60

Profundidad embebido para desarrollar esfuerzo de ruptura	=	18.50	cm	*Especificación HIT-RE500
Factor de ajuste por separación @ 20cm	=	0.86		
Esfuerzo capaz de desarrollar	=	3612	kg/cm2	
Fracción de desarrollo considerando interacción Tensión/cortante	=	0.939		

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2. Revisión de la losa

En la zona cercana a las pilas

MDC	=	-2.00	ton-m	
MDW	=	-0.08	ton-m	
MLL max	=	0.44		
MLLmin	=	-1.30		
MCT	=	-9.24		
$MU_{Ext.EventII}$	=	-11.10	ton-m	Considerando que se dasarrolla la resistencia tras el impacto
		-11.97	ton-m	
T	=	9.93	ton/m	**LRFD A13.4.2-1**
ds	=	20.21	cm	

Arreglo supuesto de varillas

Díametro de varilla	Dvar	#	5		Bastones	Díametro de varilla	Dvar	4	
Área de las varilla	Avar	1.98	cm2			Área de las varilla	Avar	1.27	cm2
Distancia d	de	20.21	cm			Distancia d	de	20.21	cm
Separación	S	**20**	cm			Separación	S	**20**	cm
	As	16.23	cm2						
	Ta	68167.99	kg						
	C	58237.78	kg						
	a	1.96	cm						
Momento resistente	Mr	12.61	ton-m	**SI CUMPLE**					

Revisión acero máximo

c	2.30	cm	
c/d	0.11		**SI CUMPLE**

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En la zona cercana a los centros de claros

MDC	=	-1.30	ton-m	
MDW	=	-0.06	ton-m	
MLL min	=	0.60		
MLLmax	=	-1.15		
MCT	=	-9.24		
$MU_{Ext.EventII}$	=	-10.30	ton-m	Considerando que se dasarrolla la resistencia tras el impacto
		-11.17	ton-m	
T	=	9.93	ton/m	**LRFD A13.4.2-1**
ds	=	20.21	cm	

Arreglo supuesto de varillas

Díametro de varilla	Dvar	#	5		Bastones	Díametro de varilla	Dvar	4	
Área de las varilla	Avar	1.98	cm2			Área de las varilla	Avar	1.27	cm2
Distancia d	de	20.21	cm			Distancia d	de	20.21	cm
Separación	S	**20**	cm			Separación	S	**20**	cm
	As	16.23	cm2						
	Ta	68167.99	kg						
	C	58237.78	kg						
	a	1.96	cm						
Momento resistente	Mr	12.61	ton-m	**SI CUMPLE**					

Revisión acero máximo

c	2.30	cm	
c/d	0.11		**SI CUMPLE**