ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

Longitud del puente:	30	m.
Flecha	3	m.
Relacion Flecha - Luz	0.1	
Numero de Cables principales:	2	Und.
Distancia entre pendolones	3	m.
Mayor dist. entre ariostramientos laterale	10	m.
diferencia de nivel entre torres	-7.61	m
angulo (α) de inclinacion entre torres	-14.23	grados

angulo de inclinacion (β) del cable en la primer torre	-33.2	grados
angulo de inclinacion (β) del cable en la segunda torre	8.3	grados

distancia del primer anclaje a la torre L1	4.59	m
distancia del segundo anclaje a la torre L	20.50	m

distancia L1 asumida	**4.59**	**m**
distancia L2 asumida	**20.50**	**m**

angulo de inclinacion (β') del cable del lado del anclaje en la primer torre	33.2	grados
angulo de inclinacion (β') del cable del lado del anclaje en la segunda torre	8.3	grados

cota de entrada	1566.21	-7.61
cota de salida	1558.6	

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

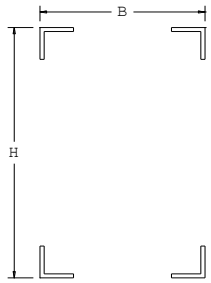
MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

CALCULO DE CARGAS:

CARGA MUERTA:

GEOMETRIA DE LA VIGA DE RIGIDEZ:



B?:				0.4	m.
H?:				0.6	m.

	ala		e		
Angulo de Cordones:	1 "	1/2	x	3/16	pulg.
Celocia :	1		x	1/8	pulg.
Celocia cada:				1.00	m.
Longitud de Celocia:				5.49	m.
Diametro del Tubo:	#	0			pulg.
Peso del tubo:				4.76	Kg/m.
Diametro del Cable:		9/16			pulg.
Peso de Herraje:				10.00	Kg/m.
Sobrecarga:				10.00	Kg/m.
Carga Muerta:				43.26	Kg/m.
Carga del agua:				50.67	Kg/m.
Total Muerta				113.93	Kg/m.
CARGA VIVA:					
Carga Viva:				100	Kg/m^2.
				213.93	

CARGA PUNTUAL VIVA O MUERTA:

Carga Puntual:	213.93	Kg.

IDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELAC
MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA
DISEÑO ESTRUCTURAL VIADUCTO L=30 M

VIGA DEL PUENTE COLGANTE

PROPIEDADES GEOMETRICAS DE LOS ANGULOS:

1.00	0.50	0.19	0.60	0.40

Cordon Superior:

Area:	0.000340	m^2.	area de un solo angulo
x = y:	0.011271	m.	
Ix = I	0.0000000458	m^4.	
Rmin:	0.007400	m.	de tabla

PROPIEDADES GEOMETRICAS DE LA SECCION:

Yb:	0.288729	m.	Sbx:	0.0003929264	m^3.
Yt:	0.288729	m.	Rx:	0.083364	m.
Ix:	0.0001134492	m^4.	Ry:	0.188729	m.
Stx:	0.0003929264	m^3.	Stby:	0.0002568380	m^3.

fuerza Resistente

KL/Rx	35.99	Toma dist entre péndolas
KL/Ry	52.99	Toma distancia entre arriostramientos laterales
Lo/Rmin	135.14	Toma dist entre celosía
Fa (Kg/cm2)	**1271.00 Kg/cm**	por distancia lateral

momentos actuantes

Mx	1505.54	Mx/Sx + My/Sy	398.90	a L/2	debe ser menor a Fa
Mx/Sx	383.16	Mx/Sx + My/Sy	446.12	a L/3	debe ser menor a Fa
My L/2	80.85				
My/Sy	15.74				
My L/3	323.38				
My/Sy	62.95				

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

CARGA DE VIENTO EN LA VIGA ANÁLISIS COMPLETO

Velocidad del viento básico NSR-10	120	Km/h
velocidad del viento	33.3	m/s
Factor de direccionalidad del viento Kd	0.9	
Factor de importancia (grupo IV)	1.2	
Categoria y coeficientes de exposicion Kz	0.7	
Factor topografico Kzt (efectos topograficos)	1.0	
Factor de rafaga G o Gf	0.9	
clasificar el cerramiento	edificio abierto	
coeficiente de presion neta CN	0.8	
Presion por velocidad **qh**	466.05	
Carga de viento P	316.91	N/m2
Carga de viento	**32.34**	**Kg/m2**

$$P = qh * GC_N$$

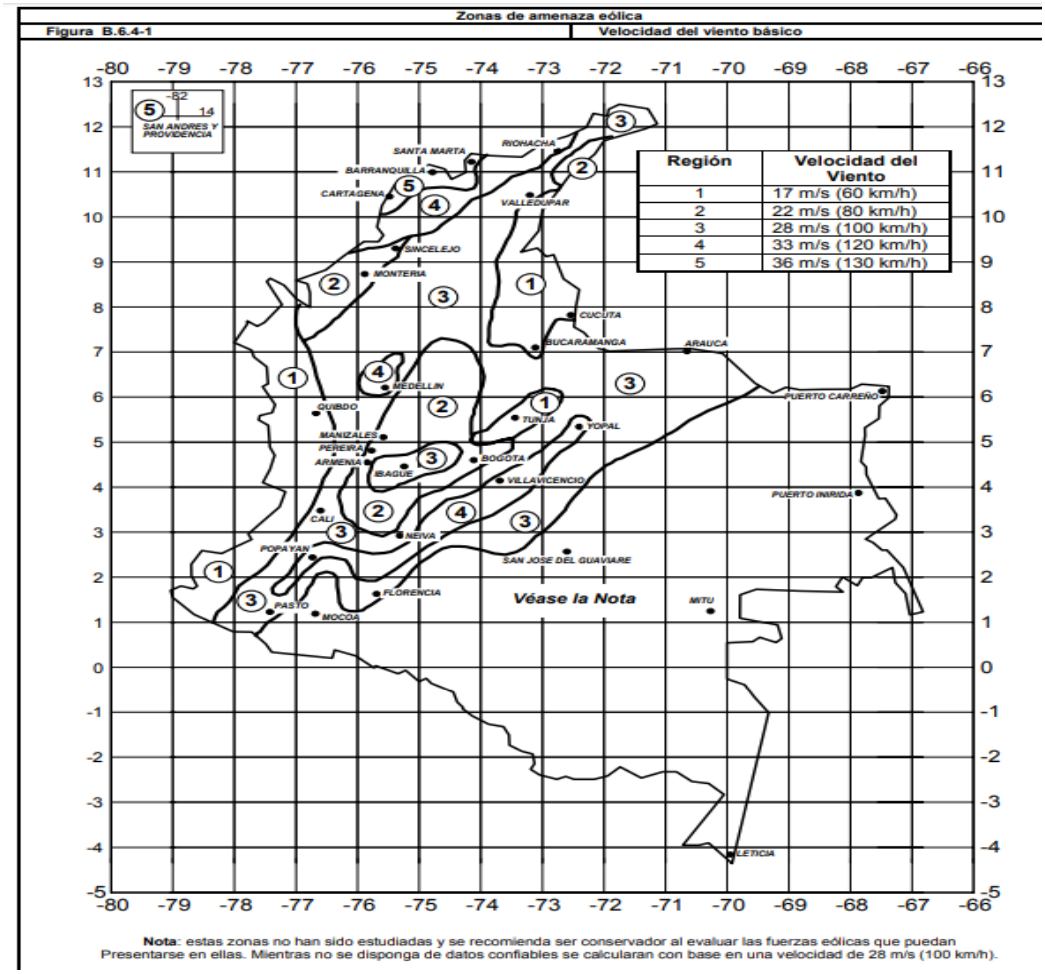
$$q_z = 0.613 K_z K_{zt} K_d V^2 \text{ en } (N/m^2);\ V \text{ en m/s} \qquad (B.6.5\text{-}13)$$

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

CARGA DE VIENTO EN LA VIGA ANÁLISIS COMPLETO



ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

		Carga Uniforme (Muerta+agua)			Carga Uniforme (Peatonal Parcial)			Carga Puntual Kg.		
k %	X (m)	y (m)	H (Kg). (M+A)	Momento Kg-m. (M+A)	H Parcial (Kg). (V)	Momento (+) Kg-m.	Momento (-) Kg-m.	H Parcial (Kg). (P)	Momento (+) Kg-m.	Momento (-) Kg-m.
0.000	0.00	0.00	3522.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.017	0.50	0.20	3522.40	692.74	0.69	4.78	-0.33	17.88	101.67	-13.49
0.033	1.00	0.39	3522.40	1361.99	2.77	17.93	-1.32	35.70	193.00	-26.84
0.050	1.50	0.57	3522.40	2007.77	6.22	39.20	-2.95	53.41	274.41	-39.94
0.067	2.00	0.75	3522.40	2630.06	11.04	66.42	-5.20	70.94	346.37	-52.65
0.083	2.50	0.92	3522.40	3228.87	17.21	98.81	-8.05	88.25	409.36	-64.87
0.100	3.00	1.08	3522.40	3804.19	24.71	137.35	-11.45	105.30	463.89	-76.47
0.117	3.50	1.24	3522.40	4356.03	33.52	179.29	-15.37	122.01	510.51	-87.34
0.133	4.00	1.39	3522.40	4884.39	43.62	223.73	-19.74	138.36	549.76	-97.39
0.150	4.50	1.53	3522.40	5389.27	54.96	269.79	-24.52	154.30	582.21	-106.60
0.167	5.00	1.67	3522.40	5870.66	67.52	319.71	-29.64	169.78	608.41	-114.88
0.183	5.50	1.80	3522.40	6328.58	81.26	369.92	-35.08	184.76	628.94	-122.08
0.200	6.00	1.92	3522.40	6763.01	96.14	419.90	-40.74	199.21	644.38	-128.14
0.217	6.50	2.04	3522.40	7173.95	112.12	472.30	-46.53	213.09	655.27	-132.97
0.233	7.00	2.15	3522.40	7561.42	129.15	523.29	-52.38	226.36	662.18	-136.55
0.250	7.50	2.25	3522.40	7925.40	147.19	574.30	-58.20	238.99	665.64	-139.10
0.267	8.00	2.35	3522.40	8265.90	166.18	624.94	-63.90	250.95	666.17	-140.28
0.283	8.50	2.44	3522.40	8582.91	186.06	673.76	-69.38	262.20	664.29	-140.03
0.300	9.00	2.52	3522.40	8876.45	206.80	722.82	-74.66	272.74	660.47	-138.58
0.317	9.50	2.60	3522.40	9146.50	228.32	768.91	-79.69	282.52	655.16	-135.97
0.333	10.00	2.67	3522.40	9393.06	250.56	815.45	-84.27	291.53	648.80	-131.87
0.350	10.50	2.73	3522.40	9616.15	273.48	858.43	-88.30	299.74	641.79	-126.71
0.367	11.00	2.79	3522.40	9815.75	297.00	901.75	-91.67	307.14	634.50	-120.40
0.383	11.50	2.84	3522.40	9991.87	321.06	941.36	-94.48	313.70	627.25	-112.81
0.400	12.00	2.88	3522.40	10144.51	345.60	980.99	-96.77	319.43	620.35	-104.52
0.417	12.50	2.92	3522.40	10273.66	370.55	1017.11	-98.19	324.29	614.06	-95.05
0.433	13.00	2.95	3522.40	10379.34	395.84	1052.80	-98.64	328.29	608.61	-85.11
0.450	13.50	2.97	3522.40	10461.52	421.41	1085.42	-98.35	331.40	604.17	-74.47
0.467	14.00	2.99	3522.40	10520.23	447.18	1117.10	-97.42	333.63	600.90	-63.30
0.483	14.50	3.00	3522.40	10555.46	473.09	1146.30	-95.36	334.97	598.89	-52.35
0.500	15.00	3.00	3522.40	10567.20	499.08	1174.07	-92.19	335.42	598.22	-41.36
0.517	15.50	3.00	3522.40	10555.46	525.06	1200.02	-88.74	334.97	598.89	-52.35
0.533	16.00	2.99	3522.40	10520.23	550.97	1224.08	-84.03	333.63	600.90	-63.30
0.550	16.50	2.97	3522.40	10461.52	576.75	1247.01	-78.38	331.40	604.17	-74.47
0.567	17.00	2.95	3522.40	10379.34	602.31	1267.69	-72.50	328.29	608.61	-85.11
0.583	17.50	2.92	3522.40	10273.66	627.60	1287.89	-65.31	324.29	614.06	-95.05

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

0.600	18.00	2.88	3522.40	10144.51	652.55	1305.56	-58.17	319.43	620.35	-104.52
0.617	18.50	2.84	3522.40	9991.87	677.09	1323.34	-50.25	313.70	627.25	-112.81
0.633	19.00	2.79	3522.40	9815.75	701.15	1338.79	-42.19	307.14	634.50	-120.40
0.650	19.50	2.73	3522.40	9616.15	724.67	1354.10	-34.09	299.74	641.79	-126.71
0.667	20.00	2.67	3522.40	9393.06	747.59	1367.68	-26.12	291.53	648.80	-131.87
0.683	20.50	2.60	3522.40	9146.50	769.84	1380.87	-18.56	282.52	655.16	-135.97
0.700	21.00	2.52	3522.40	8876.45	791.35	1392.90	-11.99	272.74	660.47	-138.58
0.717	21.50	2.44	3522.40	8582.91	812.09	1404.33	-5.84	262.20	664.29	-140.03
0.733	22.00	2.35	3522.40	8265.90	831.98	1415.07	-2.29	250.95	666.17	-140.28
0.750	22.50	2.25	3522.40	7925.40	850.96	1424.99	0.00	238.99	665.64	-139.10
0.767	23.00	2.15	3522.40	7561.42	869.00	1434.68	0.00	226.36	662.18	-136.55
0.783	23.50	2.04	3522.40	7173.95	886.03	1443.24	0.00	213.09	655.27	-132.97
0.800	24.00	1.92	3522.40	6763.01	902.01	1452.03	0.00	199.21	644.38	-128.14
0.817	24.50	1.80	3522.40	6328.58	916.89	1459.58	0.00	184.76	628.94	-122.08
0.833	25.00	1.67	3522.40	5870.66	930.63	1467.18	0.00	169.78	608.41	-114.88
0.850	25.50	1.53	3522.40	5389.27	943.19	1474.00	0.00	154.30	582.21	-106.60
0.867	26.00	1.39	3522.40	4884.39	954.54	1479.91	0.00	138.36	549.76	-97.39
0.883	26.50	1.24	3522.40	4356.03	964.63	1485.91	0.00	122.01	510.51	-87.34
0.900	27.00	1.08	3522.40	3804.19	973.44	1490.93	0.00	105.30	463.89	-76.47
0.917	27.50	0.92	3522.40	3228.87	980.94	1495.03	0.00	88.25	409.36	-64.87
0.933	28.00	0.75	3522.40	2630.06	987.11	1498.67	0.00	70.94	346.37	-52.65
0.950	28.50	0.57	3522.40	2007.77	991.93	1501.71	0.00	53.41	274.41	-39.94
0.967	29.00	0.39	3522.40	1361.99	995.38	1503.85	0.00	35.70	193.00	-26.84
0.983	29.50	0.20	3522.40	692.74	997.46	1505.12	0.00	17.88	101.67	-13.49
1.000	30.00	0.00	3522.40	0.00	998.15	1505.54	0.00	0.00	0.00	0.00
		MAX:	3,522.40	10,567.20	998.15	1,505.54	-98.64	335.42	666.17	-140.28

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA
DISEÑO ESTRUCTURAL VIADUCTO L=30 M

CHEQUEO DE TENSION DE DISEÑO DE LOS CABLES:

CABLE PRINCIPAL
COMBINACIONES:

Combinacion:	Fuerza htal. H (KG)	Tension Maxima (Kg)	Tencion de Diseño (KG) mas factor de seguridad
Muerta+Agua+ Peatones	4,520.55	4,868.78	9,737.56
Muerta+Agua+ Puntual	3,857.82	4,155.00	8,310.00
Muerta+agua	3,522.40	3,793.74	11,381.22
Tension Total:			11,381.22
Tension por Cable:			5,690.61

Resistencia de un cable

CABLE PRINCIPAL GALVANIZADO IWRC (6*19) ALMA DE FIBRA DIAMETRO:	**9/16**	**PULG.**
LONGITUD TOTAL DE CADA CABLE PRINCIPAL	**57**	**M**

9882.53 FACTOR DE SEGURIDAD

5.21

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA
DISEÑO ESTRUCTURAL VIADUCTO L=30 M

CABLE LATERAL
COMBINACIONES:

Combinacion:	Fuerza htal. H (KG)	Tension Maxima (Kg)	Tencion de Diseño (KG) mas factor seguridad
Viento	606.34	653.05	979.57
			979.57

Tension por Cable:

Resistencia cable

Dos cables uno por cada lado

FACTOR DE SEGURIDAD

1979.44	**3.03**

CABLE LATERAL GALVANIZADO IWRC (6*19) ALMA DE FIBRA DIAMETRO:	**1/4**	**PULG.**

CHEQUEO DE ESFUERZOS EN LA VIGA DE RIGUIDEZ

Combinacion:	ESF. ADM. (Kg/cm2)	ESF. ACT. (Kg/cm2)	
Muerta+Agua+Peatones	1,271.00	383.16	OK//
Muerta+Agua+Puntual	1,271.00	169.54	OK//

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

DISEÑO DE LAS VARILLAS DE ANCLAJE

Numero de pernos por varilla	2	
Acero con Fy	4200	Kg/cm2
Area neta requerida An1	0.88	cm2
Area neta requerida An2	0.7	cm2
Area neta requerida total Ant	0.88	cm2
Area neta requerida por perno Ar	0.44	cm2

Diametro (cm) :	Area (cm2) :	
2.54	5.067	OK

DIAMETRO DE CADA VARILLA	**1 Pulg.**
FACTOR DE SEGURIDAD	11.5

DISEÑO DE PENDOLONES

Numero de Pendolas que asumen ca	2	
acero con Fy	4200	Kg/cm2
Distancia entre pendolones	3	m
Fuerza Axial asumida por Pendola	515.90	Kg
Area neta necesaria (An)	0.22	cm2

Diametro (cm) :	Area (cm2) :	
0.635	0.317	OK

CABLE GALVANIZADO IWRC (6*19) ALMA DE ACERO DIAMETRO:	**1/4 Pulg.**

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA
DISEÑO ESTRUCTURAL VIADUCTO L=30 M

DISEÑO MACIZO DE ANCLAJE

CARACTERISTICAS DEL SUELO

Esf admisible	5000	Kg/m2
Angulo de friccion (Φ) del suelo	30	grados
Coef de fricción tang(Φ)	0.58	
Angulo de inclinacion del empuje activo (δ	20.00	grados
Factor de resistencia pasiva del suelo Kp	2.23	
Factor de resistencia activa del suelo Ka	0.45	
Peso espesifico del suelo	1400	Kg/m3

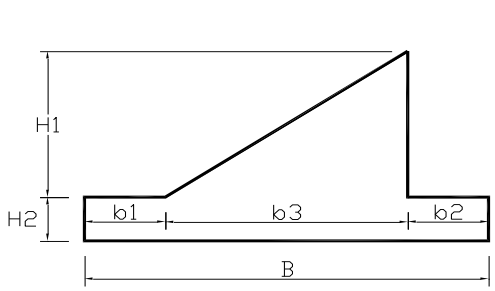
Tencion del cable en sentido horizontal H	4,520.6	KG	
angulo de inclinacion (β') del cable del	33.1713070382	grados	30
Tencion del cable en sentido vertical V	2,637.0	KG	

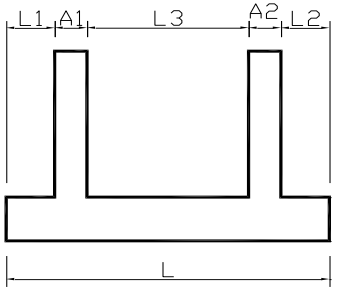
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MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

GEOMETRIA DEL MACIZO





B	2.6	M
b1	0.3	M
b2	0.3	M
b3	2	M
H1	1	M
H2	0.4	M
L	2.6	M
L1	0.2	M
L2	0.2	M
L3	1.6	M
A1	0.3	M
A2	0.3	M
PESO DEL MACIZO	7,929.6	KG
PESO DEL RELLEN	4,838.4	KG
PESO TOTAL	12,768.0	KG

ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA
DISEÑO ESTRUCTURAL VIADUCTO L=30 M

Fuerza normal de reaccion N	10,131.0	KG
Fuerza de Rozamiento Fr	5,849.1	KG
Empuje activo Ea	1,598.1	KG
Empuje pasivo Ep	7,954.9	KG

Factor de saguridad por deslizam 2.3

Fuerza normal de reaccion N1 por relleno	4,838.4	KG
Fuerza de Rozamiento Fr1	2,793.5	KG
Empuje pasivo Ep estructura	4,832.9	KG

Factor de saguridad por deslizamiento 2 3.0

Factor de saguridad por deslizamiento **2.3** OK//

DISEÑO MACIZO DE ANCLAJE CABLES LATERALES

CARACTERISTICAS DEL SUELO

Esf admisible	5000	Kg/m2
Angulo de friccion (Φ) del suelo	30	grados
Coef de fricción tang(Φ)	0.58	
Angulo de inclinacion del empuje activo (δ	20.00	grados
Factor de resistencia pasiva del suelo Kp	2.23	
Factor de resistencia activa del suelo Ka	0.45	
Peso espesifico del suelo	1400	Kg/m3

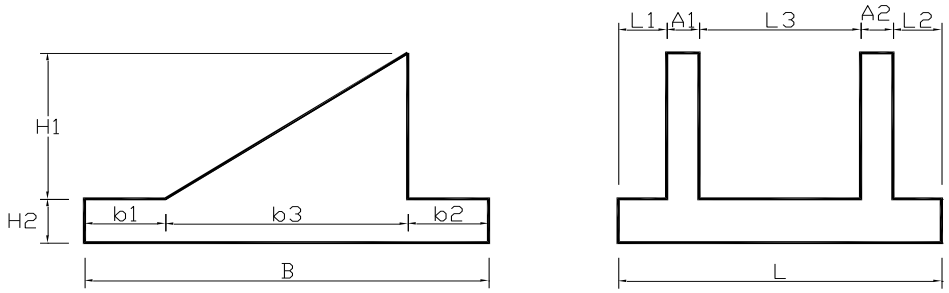
ESTUDIOS Y DISEÑOS DEL SISTEMA DE ACUEDUCTO DE LA LOCALIDAD EL RODEO, RESGUARDO DE BELELACAZAR

MUNICIPIO DE PAEZ- DEPARTAMENTO DEL CAUCA

DISEÑO ESTRUCTURAL VIADUCTO L=30 M

Tencion del cable en sentido horizontal H	606.3	KG
angulo de inclinacion (β') del cable del lado del anclaje en la torre mas k	33.1713	grados
Tencion del cable en sentido vertical V	396.3	KG

GEOMETRIA DEL MACIZO



B	1	M
b1	0.2	M
b2	0.2	M
b3	0.6	M
H1	0.6	M
H2	0.3	M
L	1	M
L1	0.2	M
L2	0.2	M
L3	0	M
A1	0.3	M
A2	0.3	M
PESO DEL MACIZO	979.2	KG
PESO DEL RELLENO	840.0	KG
PESO TOTAL	1,819.2	KG

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Fuerza normal de reaccion N	1,422.9	KG
Fuerza de Rozamiento Fr	821.5	KG
Empuje activo Ea	255.2	KG
Empuje pasivo Ep	1,264.4	KG
Factor de saguridad por deslizamiento 1	2.4	
Fuerza normal de reaccion N1 por relleno	840.0	KG
Fuerza de Rozamiento Fr1	485.0	KG
Empuje pasivo Ep estructura	1,039.6	KG
Factor de saguridad por deslizamiento 2	3.9	

Factor de saguridad por deslizamiento	2.4 OK//

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DISEÑO ESTRUCTURAL VIADUCTO L=30 M

DISEÑO DE TORRES DE SUSTENTACIÓN

CARGA AXIAL		
Peso propio de la torre	**250**	kg
P actuante =Wu *ln /2 +1.4*PP	4520.6	kg
P actuante	4771	Kg
Pu=0pn =O* fr *Ag por cada tubo, **fuerza resistente**	35085	Kg
Fcr (.658 `Yc ´2)*Fy para Yc menor 0 igual que 1.5	954.3	Kg / cm2
Fcr (.877/Yc ´2)*Fy para Yc mayor que 1.5	1271.9	Kg / cm2
Landa sub c Yc =kl/(pi*R min)	1.29	
Tubería de hierro 2400 kg Diametro=	**6**	
Diámetro interno en cm	**13.82**	
Diámetro externo en cm	**15.24**	
Área de corona de tubo A=pi(D`2-d`2)/4	32.45	
Para tubo de 6" espesor de pared de 7,11 mm Fy 2400	0.711	cm
Momento de Inercia I=pi *(D`4-d´4)/64	858.37	cm´4
Radio mínimo Rmin = raiz(I/A)	5.14	cm
Factor de seguridad = Pu/P actuante	**15.5**	

CHEQUEO POR MOMENTO

M actuante = 10% (P act)*ln/2	678	Kg-cm
O mn resistente =.9*Esf crit*1.4*Momento Inercia	275123	Kg-cm
	OK//	

CHEQUEO POR FLEXOCOMPRESION

Se debe cumplir que

PU/2*Opn+(Mux/ObMmnx+Muy/0bMny) menor que 1	0.020566324	OK//

LAS TORRES DE SUSTENTACIÓN ESTARÁN CONSTITUIDAS POR TUBOS DE ACERO AL CARBÓN DE DIÁMETRO 6" CON Fy DE 2400 Kg/cm`2. LONGITUD DE 3 MT Y ESPESOR DE 7,11 MM E= 2.000.000, CON CELOSÍA EN TUBO EN ACERO DE 3"

DISEÑO DE ZAPATA AISLADA CONCENTRICA SOMETIDA A FLEXION BIAXIAL

DATOS:

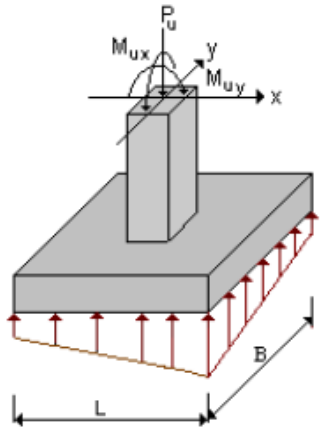
ancho cercha (m)=	0.40	diametro tubo torre(m)=	0.15				
L(m)=	1.5	l1(m)=	0.3	P(ton)=	4.77	P(Newt)=	46783.12
B(m)=	1.5	l2(m)=	0.3	Mx(ton-m)=	0.48		
l(m)=	0.9	b1(m)=	0.55	My(ton-m)=	0.48		
b(m)=	0.4	b2(m)=	0.55				
h(m)=	0.3	f´c (Mpa)=	21				
Df(m)=	1.5	fy (Mpa)=	420				

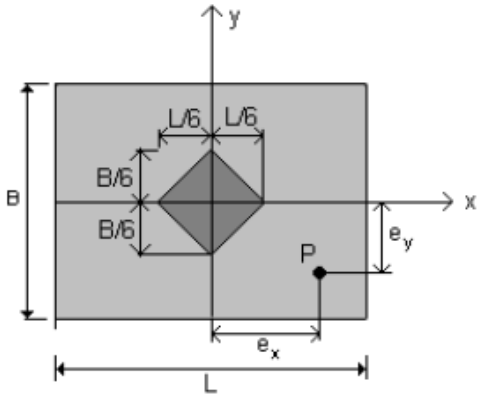
ESPESOR (h) DE LA ZAPATA

dmin > 150 mm para zapatas apoyadas sobre suelo (Articulo C.15.7 NSR-10)
recubrimiento minimo 75 mm (Articulo C.7.7.1(a) NSR-10)
De acuerdo con estos conceptos, el espesor minimo de una zapata sera 225 mm

h(m)= 0.3 > 0.25 m ok, el espesor cumple

DISTRIBUCION DE PRESIONES DEBAJO DE LA ZAPATA





ex=My/P	=	0.1 m			
ey=Mx/P	=	0.1 m			
ex=	0.1	≤	L/6 =	0.25	**ok, toda la superficie bajo la zapata esta sometida a compresion**
ey=	0.1	≤	L/6 =	0.25	**ok, toda la superficie bajo la zapata esta sometida a compresion**

DISTRIBUCION DE ESFUERZOS DE CONTACTO DE LA ZAPATA CON EL SUELO

Capacidad de carga del suelo:

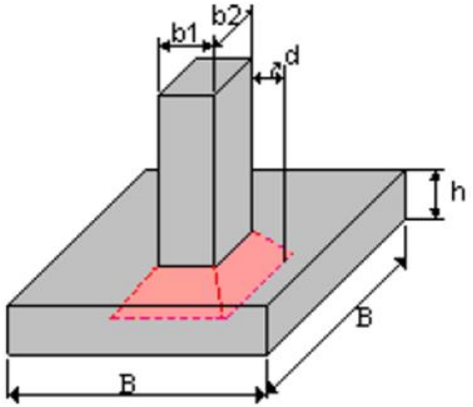
qa = 93.00 kpa estudio de suelos

$$q = \frac{P}{BL}\left(1 \pm \frac{6e_x}{L} \pm \frac{6e_y}{B}\right) < q_a$$

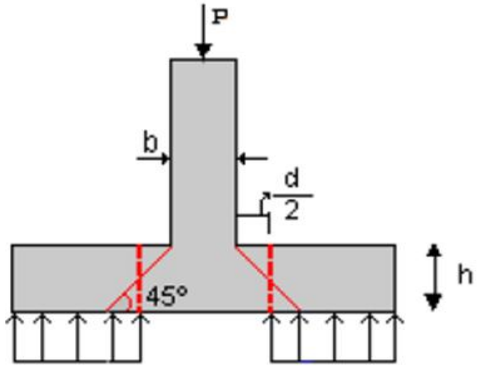
	Kpa	Kg/cm2			Kpa	Kg/cm2	
qmin=	4.225	0.04	<	qa=	93.00	0.95	**ok, el suelo resiste la carga**
q2=	21.126	0.22	<	qa=	93.00	0.95	**ok, el suelo resiste la carga**
qmax=	38.027	0.39	<	qa=	93.00	0.95	**ok, el suelo resiste la carga**
q3=	21.126	0.22	<	qa=	93.00	0.95	**ok, el suelo resiste la carga**

REVISION PUNZONAMIENTO

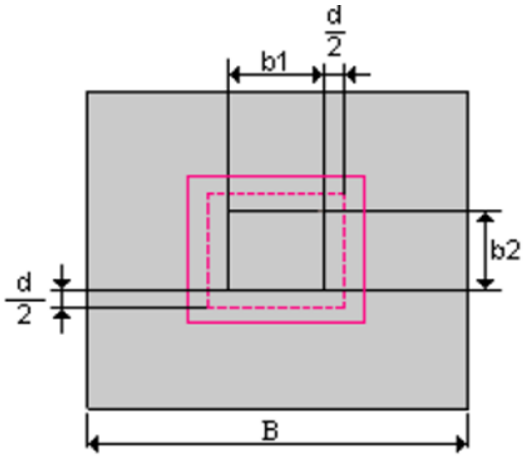
(Articulo C.11.11.1.2. de la NSR-10), Se refiere al efecto en que la zapata trata de fallar por una superficie piramidal, como respuesta a la carga vertical que le transfiere la columna.



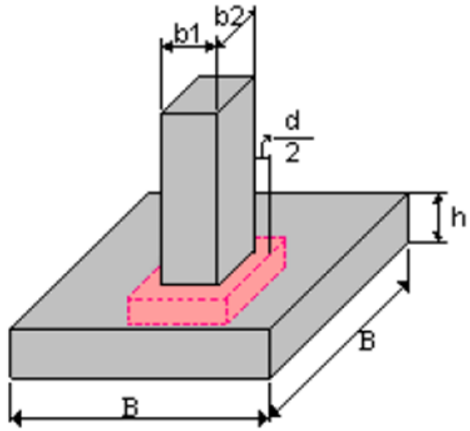
(a)



(b)



(c)



(d)

De acuerdo con el Articulo C.11.11.2.1 (NSR-10), se debe cumplir las siguientes relaciones:

$$V_{ubd} < \begin{cases} \phi_v 0.17\left(1+\frac{2}{\beta}\right)\lambda\sqrt{f'_c}\, b_0 d \\ \phi_v 0.083\left(\frac{\alpha_s d}{b_0}+2\right)\lambda\sqrt{f'_c}\, b_0 d \\ \phi_v 0.33\lambda\sqrt{f'_c}\, b_0 d \end{cases}$$

$$V_{ubd} = \frac{P_u}{B^2}\left[B^2-(b_1+d)(b_2+d)\right]$$

d (mm)=	225
b1(mm)=	900
b2(mm)=	400
B(mm)=	1500
bo(mm)=	3500

ϕ_v : Coeficiente de reducción de resistencia. Para esfuerzos de cortante, $\phi_v = 0.75$

$\sqrt{f'_c}$: Raíz cuadrada de la resistencia nominal del concreto a la compresión, Mpa.

α_s : Factor que depende de la posición de la columna o pedestal en la zapata (no de la posición de la columna o pedestal en el edificio); se considera igual a 40 cuando la columna o pedestal está al interior de la zapata, 30 cuando la columna o pedestal está al borde de la zapata y 20 cuando la columna o pedestal está en una de las esquinas de la zapata.

b_0 : Perímetro de la sección crítica, $b_0 = 2(b_1 + d + b_2 + d)$

β : b_2/b_1, Es la relación entre el lado largo y el lado corto de la columna o pedestal. Si la columna o pedestal es cuadrada, $\beta = 1$

λ : 1.0 para concretos de peso normal, y 0.75 para concretos livianos.

P_u : Carga última, que se transfiere a la zapata a través de la columna o pedestal, N.

B : Ancho de la zapata, mm.

d : Distancia desde la fibra extrema a compresión hasta el centroide del refuerzo a tracción ($d = h - recubrimiento$), mm.

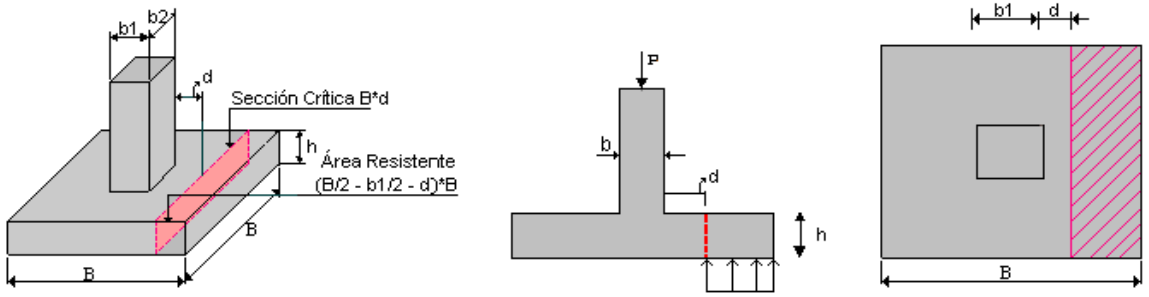
b_1 : Lado corto de la columna o pedestal, mm.

b_2 : Lado largo de la columna o pedestal, mm.

β =		1		1,380,357.72 Newt	**OK, no hay punzonamiento**
vubd =	32,163.40 N	<		1,026,955.21 Newt	**OK, no hay punzonamiento**
				893,172.64 Newt	**OK, no hay punzonamiento**

REVISAR CORTANTE UNIDIRECCIONAL

(Articulo C.11.11.1.1) Se refiere al efecto en el comportamiento de la zapata como elemento viga, con una seccion critica que se extiende en un plano a traves del ancho total y que esta localizada a una distancia d de la cara de la columna.



$$V_{uud} = \frac{P_u}{B^2} B\left(\frac{B}{2} - \frac{b_1}{2} - d\right) = \frac{P_u}{B}\left(\frac{B - b_1}{2} - d\right)$$

Vuud = 10,136.34 N **Cortante calculado actuante**

Dónde, de acuerdo a C.11.2.1.1:

$$V_c = 0.17\lambda\sqrt{f'_c}Bd$$

Con:

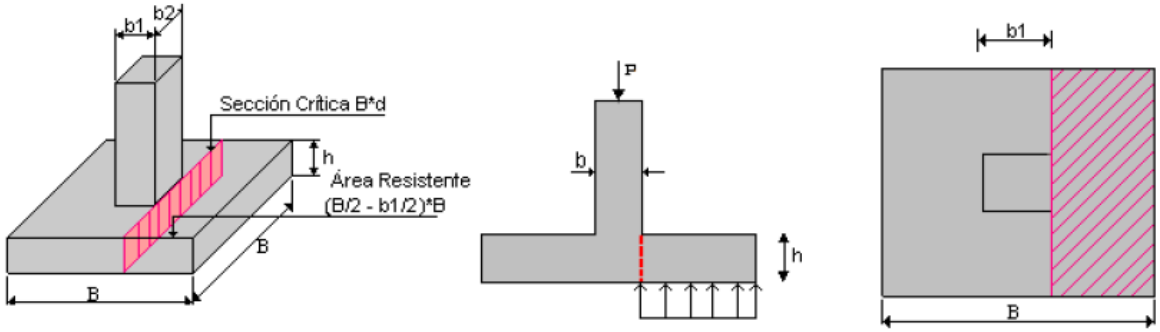
$$\phi_v = 0.75$$

ΦVc = 197,193.96 N **Cortante resistente del concreto**

Se debe cumplir que: $V_{uud} < \phi_v V_c$ **ok, el concreto resiste el cortante**

MOMENTO PARA CALCULAR EL ACERO DE REFUERZO

(C.15.4.2 NSR-10). La seccion critica en la cual se calcula el momento mayoradomaximo se determina pasando un plano vertical a traves de la zapata, justo en la cara de la columna.



$$M_u = \frac{P_u}{B^2}\frac{B}{2}\left(\frac{B}{2}-\frac{b_1}{2}\right)^2 = \frac{P_u}{2B}\left(\frac{B}{2}-\frac{b_1}{2}\right)^2$$

MU = 4717.30 N-m Momento actuante

ρmin = 0.003 (C.7.12.2.1 NSR-10)

ρ = 0.0001

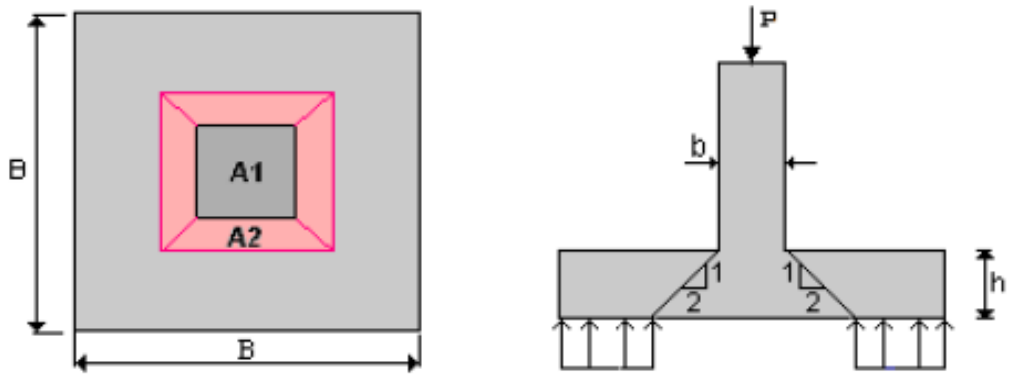
As = ρ*b*d = 10.125

Se propone usar una varilla # 4 Av = 1.27 cm2

separacion= 18.81

Usar varilla # 4 @ 18.00 cm

Aplastamiento



La capacidad de carga por aplastamiento (C.10.14.1 NSR-10) debe ser tal que:

$$P_u < \phi_a \, 0.85 \, f'_c \, A_1 \sqrt{\frac{A_1}{A_2}}$$ con: ϕa = 0.65

En esta expresion se debe cumplir que: $\sqrt{\frac{A_1}{A_2}} \leq 2$ $\sqrt{\frac{A_1}{A_2}}$ = 0.490 OK

A´=	600
A1 =	360000
A2 =	1500000

Pu (N) = 46783.12 < 2046254.741 N OK, no hay aplastamiento

PUENTE COLGANTE METALICO

30.00	43.26	50.67	213.93	0.60	0.00

DISEÑO DEL CABLE:

CARGA UNIFORME (CARGA VIVA)

k %	x	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.017	0.50	0.00	4.83	4.67	4.50	4.33	4.17	4.00	3.83	3.67	3.50	3.33	3.17	3.00	2.83	2.67	2.50	2.33	2.17	2.00	1.83	1.67	1.50	1.33	1.17	1.00	0.83	0.67	0.50	0.33	0.17	0.00
0.03	1.00	0.00	19.00	18.67	18.00	17.33	16.67	16.00	15.33	14.67	14.00	13.33	12.67	12.00	11.33	10.67	10.00	9.33	8.67	8.00	7.33	6.67	6.00	5.33	4.67	4.00	3.33	2.67	2.00	1.33	0.67	0.00
0.05	1.50	0.00	38.50	42.00	40.50	39.00	37.50	36.00	34.50	33.00	31.50	30.00	28.50	27.00	25.50	24.00	22.50	21.00	19.50	18.00	16.50	15.00	13.50	12.00	10.50	9.00	7.50	6.00	4.50	3.00	1.50	0.00
0.07	2.00	0.00	57.33	74.67	72.00	69.33	66.67	64.00	61.33	58.67	56.00	53.33	50.67	48.00	45.33	42.67	40.00	37.33	34.67	32.00	29.33	26.67	24.00	21.33	18.67	16.00	13.33	10.67	8.00	5.33	2.67	0.00
0.08	2.50	0.00	75.83	111.67	112.50	108.33	104.17	100.00	95.83	91.67	87.50	83.33	79.17	75.00	70.83	66.67	62.50	58.33	54.17	50.00	45.83	41.67	37.50	33.33	29.17	25.00	20.83	16.67	12.50	8.33	4.17	0.00
0.10	3.00	0.00	94.00	148.00	162.00	156.00	150.00	144.00	138.00	132.00	126.00	120.00	114.00	108.00	102.00	96.00	90.00	84.00	78.00	72.00	66.00	60.00	54.00	48.00	42.00	36.00	30.00	24.00	18.00	12.00	6.00	0.00
0.12	3.50	0.00	111.83	183.67	215.50	212.33	204.17	196.00	187.83	179.67	171.50	163.33	155.17	147.00	138.83	130.67	122.50	114.33	106.17	98.00	89.83	81.67	73.50	65.33	57.17	49.00	40.83	32.67	24.50	16.33	8.17	0.00
0.13	4.00	0.00	129.33	218.67	268.00	277.33	266.67	256.00	245.33	234.67	224.00	213.33	202.67	192.00	181.33	170.67	160.00	149.33	138.67	128.00	117.33	106.67	96.00	85.33	74.67	64.00	53.33	42.67	32.00	21.33	10.67	0.00
0.15	4.50	0.00	146.50	253.00	319.50	346.00	337.50	324.00	310.50	297.00	283.50	270.00	256.50	243.00	229.50	216.00	202.50	189.00	175.50	162.00	148.50	135.00	121.50	108.00	94.50	81.00	67.50	54.00	40.50	27.00	13.50	0.00
0.17	5.00	0.00	163.33	286.67	370.00	413.33	416.67	400.00	383.33	366.67	350.00	333.33	316.67	300.00	283.33	266.67	250.00	233.33	216.67	200.00	183.33	166.67	150.00	133.33	116.67	100.00	83.33	66.67	50.00	33.33	16.67	0.00
0.18	5.50	0.00	179.83	319.67	419.50	479.33	499.17	484.00	463.83	443.67	423.50	403.33	383.17	363.00	342.83	322.67	302.50	282.33	262.17	242.00	221.83	201.67	181.50	161.33	141.17	121.00	100.83	80.67	60.50	40.33	20.17	0.00
0.20	6.00	0.00	196.00	352.00	468.00	544.00	580.00	576.00	552.00	528.00	504.00	480.00	456.00	432.00	408.00	384.00	360.00	336.00	312.00	288.00	264.00	240.00	216.00	192.00	168.00	144.00	120.00	96.00	72.00	48.00	24.00	0.00
0.22	6.50	0.00	211.83	383.67	515.50	607.33	659.17	671.00	647.83	619.67	591.50	563.33	535.17	507.00	478.83	450.67	422.50	394.33	366.17	338.00	309.83	281.67	253.50	225.33	197.17	169.00	140.83	112.67	84.50	56.33	28.17	0.00
0.23	7.00	0.00	227.33	414.67	562.00	669.33	736.67	764.00	751.33	718.67	686.00	653.33	620.67	588.00	555.33	522.67	490.00	457.33	424.67	392.00	359.33	326.67	294.00	261.33	228.67	196.00	163.33	130.67	98.00	65.33	32.67	0.00
0.25	7.50	0.00	242.50	445.00	607.50	730.00	812.50	855.00	857.50	825.00	787.50	750.00	712.50	675.00	637.50	600.00	562.50	525.00	487.50	450.00	412.50	375.00	337.50	300.00	262.50	225.00	187.50	150.00	112.50	75.00	37.50	0.00
0.27	8.00	0.00	257.33	474.67	652.00	789.33	886.67	944.00	961.33	938.67	896.00	853.33	810.67	768.00	725.33	682.67	640.00	597.33	554.67	512.00	469.33	426.67	384.00	341.33	298.67	256.00	213.33	170.67	128.00	85.33	42.67	0.00
0.28	8.50	0.00	271.83	503.67	695.50	847.33	959.17	1031.00	1062.83	1054.67	1011.50	963.33	915.17	867.00	818.83	770.67	722.50	674.33	626.17	578.00	529.83	481.67	433.50	385.33	337.17	289.00	240.83	192.67	144.50	96.33	48.17	0.00
0.30	9.00	0.00	286.00	532.00	738.00	904.00	1030.00	1116.00	1162.00	1168.00	1134.00	1080.00	1026.00	972.00	918.00	864.00	810.00	756.00	702.00	648.00	594.00	540.00	486.00	432.00	378.00	324.00	270.00	216.00	162.00	108.00	54.00	0.00
0.32	9.50	0.00	299.83	559.67	779.50	959.33	1099.17	1199.00	1258.83	1278.67	1258.50	1203.33	1143.17	1083.00	1022.83	962.67	902.50	842.33	782.17	722.00	661.83	601.67	541.50	481.33	421.17	361.00	300.83	240.67	180.50	120.33	60.17	0.00
0.33	10.00	0.00	313.33	586.67	820.00	1013.33	1166.67	1280.00	1353.33	1386.67	1380.00	1333.33	1266.67	1200.00	1133.33	1066.67	1000.00	933.33	866.67	800.00	733.33	666.67	600.00	533.33	466.67	400.00	333.33	266.67	200.00	133.33	66.67	0.00
0.35	10.50	0.00	326.50	613.00	859.50	1066.00	1232.50	1359.00	1445.50	1492.00	1498.50	1465.00	1396.50	1323.00	1249.50	1176.00	1102.50	1029.00	955.50	882.00	808.50	735.00	661.50	588.00	514.50	441.00	367.50	294.00	220.50	147.00	73.50	0.00
0.37	11.00	0.00	339.33	638.67	898.00	1117.33	1296.67	1436.00	1535.33	1594.67	1614.00	1593.33	1532.67	1452.00	1371.33	1290.67	1210.00	1129.33	1048.67	968.00	887.33	806.67	726.00	645.33	564.67	484.00	403.33	322.67	242.00	161.33	80.67	0.00
0.38	11.50	0.00	351.83	663.67	935.50	1167.33	1359.17	1511.00	1622.83	1694.67	1726.50	1718.33	1670.17	1587.00	1498.83	1410.67	1322.50	1234.33	1146.17	1058.00	969.83	881.67	793.50	705.33	617.17	529.00	440.83	352.67	264.50	176.33	88.17	0.00
0.40	12.00	0.00	364.00	688.00	972.00	1216.00	1420.00	1584.00	1708.00	1792.00	1836.00	1840.00	1804.00	1728.00	1632.00	1536.00	1440.00	1344.00	1248.00	1152.00	1056.00	960.00	864.00	768.00	672.00	576.00	480.00	384.00	288.00	192.00	96.00	0.00
0.42	12.50	0.00	375.83	711.67	1007.50	1263.33	1479.17	1655.00	1790.83	1886.67	1942.50	1958.33	1934.17	1870.00	1770.83	1666.67	1562.50	1458.33	1354.17	1250.00	1145.83	1041.67	937.50	833.33	729.17	625.00	520.83	416.67	312.50	208.33	104.17	0.00
0.43	13.00	0.00	387.33	734.67	1042.00	1309.33	1536.67	1724.00	1871.33	1978.67	2046.00	2073.33	2060.67	2008.00	1915.33	1802.67	1690.00	1577.33	1464.67	1352.00	1239.33	1126.67	1014.00	901.33	788.67	676.00	563.33	450.67	338.00	225.33	112.67	0.00
0.45	13.50	0.00	398.50	757.00	1075.50	1354.00	1592.50	1791.00	1949.50	2068.00	2146.50	2185.00	2183.50	2142.00	2060.50	1944.00	1822.50	1701.00	1579.50	1458.00	1336.50	1215.00	1093.50	972.00	850.50	729.00	607.50	486.00	364.50	243.00	121.50	0.00
0.47	14.00	0.00	409.33	778.67	1108.00	1397.33	1646.67	1856.00	2025.33	2154.67	2244.00	2293.33	2302.67	2272.00	2201.33	2090.67	1960.00	1829.33	1698.67	1568.00	1437.33	1306.67	1176.00	1045.33	914.67	784.00	653.33	522.67	392.00	261.33	130.67	0.00
0.48	14.50	0.00	419.83	799.67	1139.50	1439.33	1699.17	1919.00	2098.83	2238.67	2338.50	2398.33	2418.17	2398.00	2337.83	2237.67	2102.50	1962.33	1822.17	1682.00	1541.83	1401.67	1261.50	1121.33	981.17	841.00	700.83	560.67	420.50	280.33	140.17	0.00
0.50	15.00	0.00	430.00	820.00	1170.00	1480.00	1750.00	1980.00	2170.00	2320.00	2430.00	2500.00	2530.00	2520.00	2470.00	2380.00	2250.00	2100.00	1950.00	1800.00	1650.00	1500.00	1350.00	1200.00	1050.00	900.00	750.00	600.00	450.00	300.00	150.00	0.00
0.52	15.50	0.00	439.83	839.67	1199.50	1519.33	1799.17	2039.00	2238.83	2398.67	2518.50	2598.33	2638.17	2638.00	2597.83	2517.67	2397.50	2242.33	2082.17	1922.00	1761.83	1601.67	1441.50	1281.33	1121.17	961.00	800.83	640.67	480.50	320.33	160.17	0.00
0.53	16.00	0.00	449.33	858.67	1228.00	1557.33	1846.67	2096.00	2305.33	2474.67	2604.00	2693.33	2742.67	2752.00	2721.33	2650.67	2540.00	2389.33	2218.67	2048.00	1877.33	1706.67	1536.00	1365.33	1194.67	1024.00	853.33	682.67	512.00	341.33	170.67	0.00
0.55	16.50	0.00	458.50	877.00	1255.50	1594.00	1892.50	2151.00	2369.50	2548.00	2686.50	2785.00	2843.50	2862.00	2840.50	2779.00	2677.50	2536.00	2359.50	2178.00	1996.50	1815.00	1633.50	1452.00	1270.50	1089.00	907.50	726.00	544.50	363.00	181.50	0.00
0.57	17.00	0.00	467.33	894.67	1282.00	1629.33	1936.67	2204.00	2431.33	2618.67	2766.00	2873.33	2940.67	2968.00	2955.33	2902.67	2810.00	2677.33	2504.67	2312.00	2119.33	1926.67	1734.00	1541.33	1348.67	1156.00	963.33	770.67	578.00	385.33	192.67	0.00
0.58	17.50	0.00	475.83	911.67	1307.50	1663.33	1979.17	2255.00	2490.83	2686.67	2842.50	2958.33	3034.17	3070.00	3065.83	3021.67	2937.50	2813.33	2649.17	2450.00	2245.83	2041.67	1837.50	1633.33	1429.17	1225.00	1020.83	816.67	612.50	408.33	204.17	0.00
0.60	18.00	0.00	484.00	928.00	1332.00	1696.00	2020.00	2304.00	2548.00	2752.00	2916.00	3040.00	3124.00	3168.00	3172.00	3136.00	3060.00	2944.00	2788.00	2592.00	2376.00	2160.00	1944.00	1728.00	1512.00	1296.00	1080.00	864.00	648.00	432.00	216.00	0.00
0.62	18.50	0.00	491.83	943.67	1355.50	1727.33	2059.17	2351.00	2602.83	2814.67	2986.50	3118.33	3210.17	3262.00	3273.83	3245.67	3177.50	3069.33	2921.17	2733.00	2509.83	2281.67	2053.50	1825.33	1597.17	1369.00	1140.83	912.67	684.50	456.33	228.17	0.00
0.63	19.00	0.00	499.33	958.67	1378.00	1757.33	2096.67	2396.00	2655.33	2874.67	3054.00	3193.33	3292.67	3352.00	3371.33	3350.67	3290.00	3189.33	3048.67	2868.00	2647.33	2406.67	2166.00	1925.33	1684.67	1444.00	1203.33	962.67	722.00	481.33	240.67	0.00
0.65	19.50	0.00	506.50	973.00	1399.50	1786.00	2132.50	2439.00	2705.50	2932.00	3118.50	3265.00	3371.50	3438.00	3464.50	3451.00	3397.50	3304.00	3170.50	2997.00	2783.50	2535.00	2281.50	2028.00	1774.50	1521.00	1267.50	1014.00	760.50	507.00	253.50	0.00
0.67	20.00	0.00	513.33	986.67	1420.00	1813.33	2166.67	2480.00	2753.33	2986.67	3180.00	3333.33	3446.67	3520.00	3553.33	3546.67	3500.00	3413.33	3286.67	3120.00	2913.33	2666.67	2400.00	2133.33	1866.67	1600.00	1333.33	1066.67	800.00	533.33	266.67	0.00
0.68	20.50	0.00	519.83	999.67	1439.50	1839.33	2199.17	2519.00	2798.83	3038.67	3238.50	3398.33	3518.17	3598.00	3637.83	3637.67	3597.50	3517.33	3397.17	3237.00	3036.83	2796.67	2521.50	2241.33	1961.17	1681.00	1400.83	1120.67	840.50	560.33	280.17	0.00
0.70	21.00	0.00	526.00	1012.00	1458.00	1864.00	2230.00	2556.00	2842.00	3088.00	3294.00	3460.00	3586.00	3672.00	3718.00	3724.00	3690.00	3616.00	3502.00	3348.00	3154.00	2920.00	2646.00	2352.00	2058.00	1764.00	1470.00	1176.00	882.00	588.00	294.00	0.00
0.72	21.50	0.00	531.83	1023.67	1475.50	1887.33	2259.17	2591.00	2882.83	3134.67	3346.50	3518.33	3650.17	3742.00	3793.83	3805.67	3777.50	3709.33	3601.17	3453.00	3264.83	3036.67	2768.50	2465.33	2157.17	1849.00	1540.83	1232.67	924.50	616.33	308.17	0.00
0.73	22.00	0.00	537.33	1034.67	1492.00	1909.33	2286.67	2624.00	2921.33	3178.67	3396.00	3573.33	3710.67	3808.00	3865.33	3882.67	3860.00	3797.33	3694.67	3552.00	3369.33	3146.67	2884.00	2581.33	2258.67	1936.00	1613.33	1290.67	968.00	645.33	322.67	0.00
0.75	22.50	0.00	542.50	1045.00	1507.50	1930.00	2312.50	2655.00	2957.50	3220.00	3442.50	3625.00	3767.50	3870.00	3932.50	3955.00	3937.50	3880.00	3782.50	3645.00	3467.50	3250.00	2992.50	2695.00	2362.50	2025.00	1687.50	1350.00	1012.50	675.00	337.50	0.00
0.77	23.00	0.00	547.33	1054.67	1522.00	1949.33	2336.67	2684.00	2991.33	3258.67	3486.00	3673.33	3820.67	3928.00	3995.33	4022.67	4010.00	3957.33	3864.67	3732.00	3559.33	3346.67	3094.00	2801.33	2468.67	2116.00	1763.33	1410.67	1058.00	705.33	352.67	0.00
0.78	23.50	0.00	551.83	1063.67	1535.50	1967.33	2359.17	2711.00	3022.83	3294.67	3526.50	3718.33	3870.17	3982.00	4053.83	4085.67	4077.50	4029.33	3941.17	3813.00	3644.83	3436.67	3188.50	2900.33	2572.17	2209.00	1840.83	1472.67	1104.50	736.33	368.17	0.00
0.80	24.00	0.00	556.00	1072.00	1548.00	1984.00	2380.00	2736.00	3052.00	3328.00	3564.00	3760.00	3916.00	4032.00	4108.00	4144.00	4140.00	4096.00	4012.00	3888.00	3724.00	3520.00	3276.00	2992.00	2668.00	2304.00	1920.00	1536.00	1152.00	768.00	384.00	0.00
0.82	24.50	0.00	559.83	1079.67	1559.50	1999.33	2399.17	2759.00	3078.83	3358.67	3598.50	3798.33	3958.17	4078.00	4157.83	4197.67	4197.50	4157.33	4077.17	3957.00	3796.83	3596.67	3356.50	3076.33	2756.17	2396.00	2000.83	1600.67	1200.50	800.33	400.17	0.00
0.83	25.00	0.00	563.33	1086.67	1570.00	2013.33	2416.67	2780.00	3103.33	3386.67	3630.00	3833.33	3996.67	4120.00	4203.33	4246.67	4250.00	4213.33	4136.67	4020.00	3863.33	3666.67	3430.00	3153.33	2836.67	2480.00	2083.33	1666.67	1250.00	833.33	416.67	0.00
0.85	25.50	0.00	566.50	1093.00	1579.50	2026.00	2432.50	2799.00	3125.50	3412.00	3658.50	3865.00	4031.50	4158.00	4244.50	4291.00	4297.50	4264.00	4190.50	4077.00	3923.50	3730.00	3496.50	3223.00	2909.50	2556.00	2162.50	1734.00	1300.50	867.00	433.50	0.00
0.87	26.00	0.00	569.33	1098.67	1588.00	2037.33	2446.67	2816.00	3145.33	3434.67	3684.00	3893.33	4062.67	4192.00	4281.33	4330.67	4340.00	4309.33	4238.67	4128.00	3977.33	3786.67	3556.00	3285.33	2974.67	2624.00	2233.33	1802.67	1352.00	901.33	450.67	0.00
0.88	26.50	0.00	571.83	1103.67	1595.50	2047.33	2459.17	2831.00	3162.83	3454.67	3706.50	3918.33	4090.17	4222.00	4313.83	4365.67	4377.50	4349.33	4281.17	4173.00	4024.83	3836.67	3608.50	3340.33	3032.17	2684.00	2295.83	1867.67	1404.50	936.33	468.17	0.00
0.90	27.00	0.00	574.00	1108.00	1602.00	2056.00	2470.00	2844.00	3178.00	3472.00	3726.00	3940.00	4114.00	4248.00	4342.00	4396.00	4410.00	4384.00	4318.00	4212.00	4066.00	3880.00	3654.00	3388.00	3082.00	2736.00	2350.00	1924.00	1458.00	972.00	486.00	0.00
0.92	27.50	0.00	575.83	1111.67	1607.50	2063.33	2479.17	2855.00	3190.83	3486.67	3742.50	3958.33	4134.17	4270.00	4365.83	4421.67	4437.50	4413.33	4349.17	4245.00	4100.83	3916.67	3692.50	3428.33	3124.17	2780.00	2395.83	1971.67	1507.50	1008.33	504.17	0.00
0.93	28.00	0.00	577.33	1114.67	1612.00	2069.33	2486.67	2864.00	3201.33	3498.67	3756.00	3973.33	4150.67	4288.00	4385.33	4442.67	4460.00	4437.33	4374.67	4272.00	4129.33	3946.67	3724.00	3461.33	3158.67	2816.00	2433.33	2010.67	1548.00	1045.33	522.67	0.00
0.95	28.50	0.00	578.50	1117.00	1615.50	2074.00	2492.50	2871.00	3209.50	3508.00	3766.50	3985.00	4163.50	4302.00	4400.50	4459.00	4477.50	4456.00	4394.50	4293.00	4151.50	3970.00	3748.50	3487.00	3185.50	2844.00	2462.50	2041.00	1579.50	1078.00	541.50	0.00
0.97	29.00	0.00	579.33	1118.67	1618.00	2077.33	2496.67	2876.00	3215.33	3514.67	3774.00	3993.33	4172.67	4312.00	4411.33	4470.67	4490.00	4469.33	4408.67	4308.00	4167.33	3986.67	3766.00	3505.33	3204.67	2864.00	2483.33	2062.67	1602.00	1101.33	560.67	0.00
0.98	29.50	0.00	579.83	1119.67	1619.50	2079.33	2499.17	2879.00	3218.83	3518.67	3778.50	3998.33	4178.17	4318.00	4417.83	4477.67	4497.50	4477.33	4417.17	4317.00	4176.83	3996.67	3776.50	3516.33	3216.17	2876.00	2495.83	2075.67	1615.50	1115.33	575.17	0.00
1.00	30.00	0.00	580.00	1120.00	1620.00	2080.00	2500.00	2880.00	3220.00	3520.00	3780.00	4000.00	4180.00	4320.00	4420.00	4480.00	4500.00	4480.00	4420.00	4320.00	4180.00	4000.00	3780.00	3520.00	3220.00	2880.00	2500.00	2080.00	1620.00	1120.00	580.00	0.00

30.00	0.00	50.67	213.93	0.60	0.00

DISEÑO DEL CABLE:

CARGA PUNTUAL

k %	x	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.50	0.00	103.40	99.83	96.27	92.70	89.14	85.57	82.01	78.44	74.88	71.31	67.74	64.18	60.61	57.05	53.48	49.92	46.35	42.79	39.22	35.66	32.09	28.52	24.96	21.39	17.83	14.26	10.70	7.13	3.57	0.00
0.03	1.00	0.00	206.80	199.67	192.54	185.41	178.28	171.14	164.01	156.88	149.75	142.62	135.49	128.36	121.23	114.10	106.97	99.83	92.70	85.57	78.44	71.31	64.18	57.05	49.92	42.79	35.66	28.52	21.39	14.26	7.13	0.00
0.05	1.50	0.00	203.23	299.50	288.81	278.11	267.41	256.72	246.02	235.32	224.63	213.93	203.23	192.54	181.84	171.14	160.45	149.75	139.05	128.36	117.66	106.97	96.27	85.57	74.88	64.18	53.48	42.79	32.09	21.39	10.70	0.00
0.07	2.00	0.00	199.67	399.34	385.08	370.81	356.55	342.29	328.03	313.76	299.50	285.24	270.98	256.72	242.45	228.19	213.93	199.67	185.41	171.14	156.88	142.62	128.36	114.10	99.83	85.57	71.31	57.05	42.79	28.52	14.26	0.00
0.08	2.50	0.00	196.10	392.21	481.34	463.52	445.69	427.86	410.03	392.21	374.38	356.55	338.72	320.90	303.07	285.24	267.41	249.59	231.76	213.93	196.10	178.28	160.45	142.62	124.79	106.97	89.14	71.31	53.48	35.66	17.83	0.00
0.10	3.00	0.00	192.54	385.08	577.61	556.22	534.83	513.43	492.04	470.65	449.25	427.86	406.47	385.08	363.68	342.29	320.90	299.50	278.11	256.72	235.32	213.93	192.54	171.14	149.75	128.36	106.97	85.57	64.18	42.79	21.39	0.00
0.12	3.50	0.00	188.97	377.94	566.92	648.92	623.96	599.01	574.05	549.09	524.13	499.17	474.21	449.25	424.30	399.34	374.38	349.42	324.46	299.50	274.54	249.59	224.63	199.67	174.71	149.75	124.79	99.83	74.88	49.92	24.96	0.00
0.13	4.00	0.00	185.41	370.81	556.22	741.63	713.10	684.58	656.05	627.53	599.01	570.48	541.96	513.43	484.91	456.39	427.86	399.34	370.81	342.29	313.76	285.24	256.72	228.19	199.67	171.14	142.62	114.10	85.57	57.05	28.52	0.00
0.15	4.50	0.00	181.84	363.68	545.52	727.36	802.24	770.15	738.06	705.97	673.88	641.79	609.70	577.61	545.52	513.43	481.34	449.25	417.16	385.08	352.99	320.90	288.81	256.72	224.63	192.54	160.45	128.36	96.27	64.18	32.09	0.00
0.17	5.00	0.00	178.28	356.55	534.83	713.10	891.38	855.72	820.07	784.41	748.76	713.10	677.45	641.79	606.14	570.48	534.83	499.17	463.52	427.86	392.21	356.55	320.90	285.24	249.59	213.93	178.28	142.62	106.97	71.31	35.66	0.00
0.18	5.50	0.00	174.71	349.42	524.13	698.84	873.55	941.29	902.07	862.85	823.63	784.41	745.19	705.97	666.75	627.53	588.31	549.09	509.87	470.65	431.43	392.21	352.99	313.76	274.54	235.32	196.10	156.88	117.66	78.44	39.22	0.00
0.20	6.00	0.00	171.14	342.29	513.43	684.58	855.72	1026.87	984.08	941.29	898.51	855.72	812.94	770.15	727.36	684.58	641.79	599.01	556.22	513.43	470.65	427.86	385.08	342.29	299.50	256.72	213.93	171.14	128.36	85.57	42.79	0.00
0.22	6.50	0.00	167.58	335.16	502.74	670.32	837.89	1005.47	1066.09	1019.74	973.38	927.03	880.68	834.33	787.98	741.63	695.27	648.92	602.57	556.22	509.87	463.52	417.16	370.81	324.46	278.11	231.76	185.41	139.05	92.70	46.35	0.00
0.23	7.00	0.00	164.01	328.03	492.04	656.05	820.07	984.08	1148.09	1098.18	1048.26	998.34	948.43	898.51	848.59	798.67	748.76	698.84	648.92	599.01	549.09	499.17	449.25	399.34	349.42	299.50	249.59	199.67	149.75	99.83	49.92	0.00
0.25	7.50	0.00	160.45	320.90	481.34	641.79	802.24	962.69	1123.14	1176.62	1123.14	1069.65	1016.17	962.69	909.21	855.72	802.24	748.76	695.27	641.79	588.31	534.83	481.34	427.86	374.38	320.90	267.41	213.93	160.45	106.97	53.48	0.00
0.27	8.00	0.00	156.88	313.76	470.65	627.53	784.41	941.29	1098.18	1255.06	1198.01	1140.96	1083.92	1026.87	969.82	912.77	855.72	798.67	741.63	684.58	627.53	570.48	513.43	456.39	399.34	342.29	285.24	228.19	171.14	114.10	57.05	0.00
0.28	8.50	0.00	153.32	306.63	459.95	613.27	766.58	919.90	1073.22	1226.54	1272.89	1212.27	1151.66	1091.05	1030.43	969.82	909.21	848.59	787.98	727.36	666.75	606.14	545.52	484.91	424.30	363.68	303.07	242.45	181.84	121.23	60.61	0.00
0.30	9.00	0.00	149.75	299.50	449.25	599.01	748.76	898.51	1048.26	1198.01	1347.76	1283.58	1219.40	1155.23	1091.05	1026.87	962.69	898.51	834.33	770.15	705.97	641.79	577.61	513.43	449.25	385.08	320.90	256.72	192.54	128.36	64.18	0.00
0.32	9.50	0.00	146.19	292.37	438.56	584.74	730.93	877.12	1023.30	1169.49	1315.67	1354.89	1287.15	1219.40	1151.66	1083.92	1016.17	948.43	880.68	812.94	745.19	677.45	609.70	541.96	474.21	406.47	338.72	270.98	203.23	135.49	67.74	0.00
0.33	10.00	0.00	142.62	285.24	427.86	570.48	713.10	855.72	998.34	1140.96	1283.58	1426.20	1354.89	1283.58	1212.27	1140.96	1069.65	998.34	927.03	855.72	784.41	713.10	641.79	570.48	499.17	427.86	356.55	285.24	213.93	142.62	71.31	0.00
0.35	10.50	0.00	139.05	278.11	417.16	556.22	695.27	834.33	973.38	1112.44	1251.49	1390.55	1422.64	1347.76	1272.89	1198.01	1123.14	1048.26	973.38	898.51	823.63	748.76	673.88	599.01	524.13	449.25	374.38	299.50	224.63	149.75	74.88	0.00
0.37	11.00	0.00	135.49	270.98	406.47	541.96	677.45	812.94	948.43	1083.92	1219.40	1354.89	1490.38	1411.94	1333.50	1255.06	1176.62	1098.18	1019.74	941.29	862.85	784.41	705.97	627.53	549.09	470.65	392.21	313.76	235.32	156.88	78.44	0.00
0.38	11.50	0.00	131.92	263.85	395.77	527.70	659.62	791.54	923.47	1055.39	1187.32	1319.24	1451.16	1476.12	1394.11	1312.11	1230.10	1148.09	1066.09	984.08	902.07	820.07	738.06	656.05	574.05	492.04	410.03	328.03	246.02	164.01	82.01	0.00
0.40	12.00	0.00	128.36	256.72	385.08	513.43	641.79	770.15	898.51	1026.87	1155.23	1283.58	1411.94	1540.30	1454.73	1369.16	1283.58	1198.01	1112.44	1026.87	941.29	855.72	770.15	684.58	599.01	513.43	427.86	342.29	256.72	171.14	85.57	0.00
0.42	12.50	0.00	124.79	249.59	374.38	499.17	623.96	748.76	873.55	998.34	1123.14	1247.93	1372.72	1497.51	1515.34	1426.20	1337.07	1247.93	1158.79	1069.65	980.52	891.38	802.24	713.10	623.96	534.83	445.69	356.55	267.41	178.28	89.14	0.00
0.43	13.00	0.00	121.23	242.45	363.68	484.91	606.14	727.36	848.59	969.82	1091.05	1212.27	1333.50	1454.73	1575.96	1483.25	1390.55	1297.85	1205.14	1112.44	1019.74	927.03	834.33	741.63	648.92	556.22	463.52	370.81	278.11	185.41	92.70	0.00
0.45	13.50	0.00	117.66	235.32	352.99	470.65	588.31	705.97	823.63	941.29	1058.96	1176.62	1294.28	1411.94	1529.60	1540.30	1444.03	1347.76	1251.49	1155.23	1058.96	962.69	866.42	770.15	673.88	577.61	481.34	385.08	288.81	192.54	96.27	0.00
0.47	14.00	0.00	114.10	228.19	342.29	456.39	570.48	684.58	798.67	912.77	1026.87	1140.96	1255.06	1369.16	1483.25	1597.35	1497.51	1397.68	1297.85	1198.01	1098.18	998.34	898.51	798.67	698.84	599.01	499.17	399.34	299.50	199.67	99.83	0.00
0.48	14.50	0.00	110.53	221.06	331.59	442.12	552.65	663.18	773.72	884.25	994.78	1105.31	1215.84	1326.37	1436.90	1547.43	1551.00	1447.60	1344.20	1240.80	1137.40	1034.00	930.60	827.20	723.80	620.40	517.00	413.60	310.20	206.80	103.40	0.00
0.50	15.00	0.00	106.97	213.93	320.90	427.86	534.83	641.79	748.76	855.72	962.69	1069.65	1176.62	1283.58	1390.55	1497.51	1604.48	1497.51	1390.55	1283.58	1176.62	1069.65	962.69	855.72	748.76	641.79	534.83	427.86	320.90	213.93	106.97	0.00
0.52	15.50	0.00	103.40	206.80	310.20	413.60	517.00	620.40	723.80	827.20	930.60	1034.00	1137.40	1240.80	1344.20	1447.60	1551.00	1547.43	1436.90	1326.37	1215.84	1105.31	994.78	884.25	773.72	663.18	552.65	442.12	331.59	221.06	110.53	0.00
0.53	16.00	0.00	99.83	199.67	299.50	399.34	499.17	599.01	698.84	798.67	898.51	998.34	1098.18	1198.01	1297.85	1397.68	1497.51	1597.35	1483.25	1369.16	1255.06	1140.96	1026.87	912.77	798.67	684.58	570.48	456.39	342.29	228.19	114.10	0.00
0.55	16.50	0.00	96.27	192.54	288.81	385.08	481.34	577.61	673.88	770.15	866.42	962.69	1058.96	1155.23	1251.49	1347.76	1444.03	1540.30	1529.60	1411.94	1294.28	1176.62	1058.96	941.29	823.63	705.97	588.31	470.65	352.99	235.32	117.66	0.00
0.57	17.00	0.00	92.70	185.41	278.11	370.81	463.52	556.22	648.92	741.63	834.33	927.03	1019.74	1112.44	1205.14	1297.85	1390.55	1483.25	1575.96	1454.73	1333.50	1212.27	1091.05	969.82	848.59	727.36	606.14	484.91	363.68	242.45	121.23	0.00
0.58	17.50	0.00	89.14	178.28	267.41	356.55	445.69	534.83	623.96	713.10	802.24	891.38	980.52	1069.65	1158.79	1247.93	1337.07	1426.20	1515.34	1497.51	1372.72	1247.93	1123.14	998.34	873.55	748.76	623.96	499.17	374.38	249.59	124.79	0.00
0.60	18.00	0.00	85.57	171.14	256.72	342.29	427.86	513.43	599.01	684.58	770.15	855.72	941.29	1026.87	1112.44	1198.01	1283.58	1369.16	1454.73	1540.30	1411.94	1283.58	1155.23	1026.87	898.51	770.15	641.79	513.43	385.08	256.72	128.36	0.00
0.62	18.50	0.00	82.01	164.01	246.02	328.03	410.03	492.04	574.05	656.05	738.06	820.07	902.07	984.08	1066.09	1148.09	1230.10	1312.11	1394.11	1476.12	1451.16	1319.24	1187.32	1055.39	923.47	791.54	659.62	527.70	395.77	263.85	131.92	0.00
0.63	19.00	0.00	78.44	156.88	235.32	313.76	392.21	470.65	549.09	627.53	705.97	784.41	862.85	941.29	1019.74	1098.18	1176.62	1255.06	1333.50	1411.94	1490.38	1354.89	1219.40	1083.92	948.43	812.94	677.45	541.96	406.47	270.98	135.49	0.00
0.65	19.50	0.00	74.88	149.75	224.63	299.50	374.38	449.25	524.13	599.01	673.88	748.76	823.63	898.51	973.38	1048.26	1123.14	1198.01	1272.89	1347.76	1422.64	1390.55	1251.49	1112.44	973.38	834.33	695.27	556.22	417.16	278.11	139.05	0.00
0.67	20.00	0.00	71.31	142.62	213.93	285.24	356.55	427.86	499.17	570.48	641.79	713.10	784.41	855.72	927.03	998.34	1069.65	1140.96	1212.27	1283.58	1354.89	1426.20	1283.58	1140.96	998.34	855.72	713.10	570.48	427.86	285.24	142.62	0.00
0.68	20.50	0.00	67.74	135.49	203.23	270.98	338.72	406.47	474.21	541.96	609.70	677.45	745.19	812.94	880.68	948.43	1016.17	1083.92	1151.66	1219.40	1287.15	1354.89	1315.67	1169.49	1023.30	877.12	730.93	584.74	438.56	292.37	146.19	0.00
0.70	21.00	0.00	64.18	128.36	192.54	256.72	320.90	385.08	449.25	513.43	577.61	641.79	705.97	770.15	834.33	898.51	962.69	1026.87	1091.05	1155.23	1219.40	1283.58	1347.76	1198.01	1048.26	898.51	748.76	599.01	449.25	299.50	149.75	0.00
0.72	21.50	0.00	60.61	121.23	181.84	242.45	303.07	363.68	424.30	484.91	545.52	606.14	666.75	727.36	787.98	848.59	909.21	969.82	1030.43	1091.05	1151.66	1212.27	1272.89	1226.54	1073.22	919.90	766.58	613.27	459.95	306.63	153.32	0.00
0.73	22.00	0.00	57.05	114.10	171.14	228.19	285.24	342.29	399.34	456.39	513.43	570.48	627.53	684.58	741.63	798.67	855.72	912.77	969.82	1026.87	1083.92	1140.96	1198.01	1255.06	1098.18	941.29	784.41	627.53	470.65	313.76	156.88	0.00
0.75	22.50	0.00	53.48	106.97	160.45	213.93	267.41	320.90	374.38	427.86	481.34	534.83	588.31	641.79	695.27	748.76	802.24	855.72	909.21	962.69	1016.17	1069.65	1123.14	1176.62	1123.14	962.69	802.24	641.79	481.34	320.90	160.45	0.00
0.77	23.00	0.00	49.92	99.83	149.75	199.67	249.59	299.50	349.42	399.34	449.25	499.17	549.09	599.01	648.92	698.84	748.76	798.67	848.59	898.51	948.43	998.34	1048.26	1098.18	1148.09	984.08	820.07	656.05	492.04	328.03	164.01	0.00
0.78	23.50	0.00	46.35	92.70	139.05	185.41	231.76	278.11	324.46	370.81	417.16	463.52	509.87	556.22	602.57	648.92	695.27	741.63	787.98	834.33	880.68	927.03	973.38	1019.74	1066.09	1005.47	837.89	670.32	502.74	335.16	167.58	0.00
0.80	24.00	0.00	42.79	85.57	128.36	171.14	213.93	256.72	299.50	342.29	385.08	427.86	470.65	513.43	556.22	599.01	641.79	684.58	727.36	770.15	812.94	855.72	898.51	941.29	984.08	1026.87	855.72	684.58	513.43	342.29	171.14	0.00
0.82	24.50	0.00	39.22	78.44	117.66	156.88	196.10	235.32	274.54	313.76	352.99	392.21	431.43	470.65	509.87	549.09	588.31	627.53	666.75	705.97	745.19	784.41	823.63	862.85	902.07	941.29	873.55	698.84	524.13	349.42	174.71	0.00
0.83	25.00	0.00	35.66	71.31	106.97	142.62	178.28	213.93	249.59	285.24	320.90	356.55	392.21	427.86	463.52	499.17	534.83	570.48	606.14	641.79	677.45	713.10	748.76	784.41	820.07	855.72	891.38	713.10	534.83	356.55	178.28	0.00
0.85	25.50	0.00	32.09	64.18	96.27	128.36	160.45	192.54	224.63	256.72	288.81	320.90	352.99	385.08	417.16	449.25	481.34	513.43	545.52	577.61	609.70	641.79	673.88	705.97	738.06	770.15	802.24	727.36	545.52	363.68	181.84	0.00
0.87	26.00	0.00	28.52	57.05	85.57	114.10	142.62	171.14	199.67	228.19	256.72	285.24	313.76	342.29	370.81	399.34	427.86	456.39	484.91	513.43	541.96	570.48	599.01	627.53	656.05	684.58	713.10	741.63	556.22	370.81	185.41	0.00
0.88	26.50	0.00	24.96	49.92	74.88	99.83	124.79	149.75	174.71	199.67	224.63	249.59	274.54	299.50	324.46	349.42	374.38	399.34	424.30	449.25	474.21	499.17	524.13	549.09	574.05	599.01	623.96	648.92	566.92	377.94	188.97	0.00
0.90	27.00	0.00	21.39	42.79	64.18	85.57	106.97	128.36	149.75	171.14	192.54	213.93	235.32	256.72	278.11	299.50	320.90	342.29	363.68	385.08	406.47	427.86	449.25	470.65	492.04	513.43	534.83	556.22	577.61	385.08	192.54	0.00
0.92	27.50	0.00	17.83	35.66	53.48	71.31	89.14	106.97	124.79	142.62	160.45	178.28	196.10	213.93	231.76	249.59	267.41	285.24	303.07	320.90	338.72	356.55	374.38	392.21	410.03	427.86	445.69	463.52	481.34	392.21	196.10	0.00
0.93	28.00	0.00	14.26	28.52	42.79	57.05	71.31	85.57	99.83	114.10	128.36	142.62	156.88	171.14	185.41	199.67	213.93	228.19	242.45	256.72	270.98	285.24	299.50	313.76	328.03	342.29	356.55	370.81	385.08	399.34	199.67	0.00
0.95	28.50	0.00	10.70	21.39	32.09	42.79	53.48	64.18	74.88	85.57	96.27	106.97	117.66	128.36	139.05	149.75	160.45	171.14	181.84	192.54	203.23	213.93	224.63	235.32	246.02	256.72	267.41	278.11	288.81	299.50	203.23	0.00
0.97	29.00	0.00	7.13	14.26	21.39	28.52	35.66	42.79	49.92	57.05	64.18	71.31	78.44	85.57	92.70	99.83	106.97	114.10	121.23	128.36	135.49	142.62	149.75	156.88	164.01	171.14	178.28	185.41	192.54	199.67	206.80	0.00
0.98	29.50	0.00	3.57	7.13	10.70	14.26	17.83	21.39	24.96	28.52	32.09	35.66	39.22	42.79	46.35	49.92	53.48	57.05	60.61	64.18	67.74	71.31	74.88	78.44	82.01	85.57	89.14	92.70	96.27	99.83	103.40	0.00
1.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PUENTE COLGANTE METALICO

30.00 43.26 50.67 213.93 0.60 0.00 2.40

DISEÑO DEL CABLE:

CARGA UNIFORME (CARGA VIVA) 1.15

k %	x	Y	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
			0.00	0.39	0.75	1.08	1.39	1.67	1.92	2.15	2.35	2.52	2.67	2.79	2.88	2.95	2.99	3.00	2.99	2.95	2.88	2.79	2.67	2.52	2.35	2.15	1.92	1.67	1.39	1.08	0.75	0.39	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.017	0.50	0.20	0.00	0.27	0.52	0.75	0.96	1.15	1.33	1.49	1.63	1.75	1.85	1.93	2.00	2.04	2.07	2.08	2.07	2.04	2.00	1.93	1.85	1.75	1.63	1.49	1.33	1.15	0.96	0.75	0.52	0.27	0.00
0.03	1.00	0.39	0.00	1.07	2.07	2.99	3.84	4.62	5.32	5.95	6.50	6.98	7.39	7.72	7.98	8.16	8.27	8.31	8.27	8.16	7.98	7.72	7.39	6.98	6.50	5.95	5.32	4.62	3.84	2.99	2.07	1.07	0.00
0.05	1.50	0.57	0.00	2.41	4.65	6.72	8.63	10.37	11.95	13.36	14.60	15.68	16.60	17.34	17.92	18.34	18.59	18.67	18.59	18.34	17.92	17.34	16.60	15.68	14.60	13.36	11.95	10.37	8.63	6.72	4.65	2.41	0.00
0.07	2.00	0.75	0.00	4.27	8.25	11.93	15.31	18.40	21.20	23.70	25.91	27.83	29.45	30.77	31.80	32.54	32.98	33.13	32.98	32.54	31.80	30.77	29.45	27.83	25.91	23.70	21.20	18.40	15.31	11.93	8.25	4.27	0.00
0.08	2.50	0.92	0.00	6.66	12.85	18.59	23.87	28.69	33.05	36.95	40.39	43.38	45.90	47.97	49.57	50.72	51.41	51.64	51.41	50.72	49.57	47.97	45.90	43.38	40.39	36.95	33.05	28.69	23.87	18.59	12.85	6.66	0.00
0.10	3.00	1.08	0.00	9.56	18.45	26.69	34.27	41.19	47.45	53.05	58.00	62.28	65.90	68.87	71.18	72.82	73.81	74.14	73.81	72.82	71.18	68.87	65.90	62.28	58.00	53.05	47.45	41.19	34.27	26.69	18.45	9.56	0.00
0.12	3.50	1.24	0.00	12.96	25.03	36.21	46.49	55.87	64.37	71.97	78.67	84.48	89.40	93.42	96.55	98.78	100.13	100.57	100.13	98.78	96.55	93.42	89.40	84.48	78.67	71.97	64.37	55.87	46.49	36.21	25.03	12.96	0.00
0.13	4.00	1.39	0.00	16.86	32.57	47.10	60.48	72.69	83.74	93.63	102.35	109.91	116.31	121.54	125.61	128.52	130.27	130.85	130.27	128.52	125.61	121.54	116.31	109.91	102.35	93.63	83.74	72.69	60.48	47.10	32.57	16.86	0.00
0.15	4.50	1.53	0.00	21.25	41.04	59.36	76.21	91.60	105.52	117.98	128.97	138.50	146.56	153.15	158.28	161.94	164.14	164.88	164.14	161.94	158.28	153.15	146.56	138.50	128.97	117.98	105.52	91.60	76.21	59.36	41.04	21.25	0.00
0.17	5.00	1.67	0.00	26.11	50.41	72.92	93.63	112.53	129.64	144.94	158.44	170.15	180.05	188.15	194.45	198.96	201.66	202.56	201.66	198.96	194.45	188.15	180.05	170.15	158.44	144.94	129.64	112.53	93.63	72.92	50.41	26.11	0.00
0.18	5.50	1.80	0.00	31.42	60.67	87.76	112.68	135.43	156.02	174.44	190.69	204.78	216.69	226.45	234.03	239.45	242.70	243.78	242.70	239.45	234.03	226.45	216.69	204.78	190.69	174.44	156.02	135.43	112.68	87.76	60.67	31.42	0.00
0.20	6.00	1.92	0.00	37.17	71.79	103.83	133.32	160.24	184.59	206.38	225.61	242.28	256.38	267.92	276.89	283.30	287.14	288.43	287.14	283.30	276.89	267.92	256.38	242.28	225.61	206.38	184.59	160.24	133.32	103.83	71.79	37.17	0.00
0.22	6.50	2.04	0.00	43.35	83.72	121.09	155.48	186.87	215.27	240.69	263.11	282.55	298.99	312.45	322.91	330.38	334.87	336.36	334.87	330.38	322.91	312.45	298.99	282.55	263.11	240.69	215.27	186.87	155.48	121.09	83.72	43.35	0.00
0.23	7.00	2.15	0.00	49.94	96.43	139.49	179.09	215.26	247.97	277.25	303.08	325.47	344.41	359.91	371.96	380.57	385.74	387.46	385.74	380.57	371.96	359.91	344.41	325.47	303.08	277.25	247.97	215.26	179.09	139.49	96.43	49.94	0.00
0.25	7.50	2.25	0.00	56.91	109.90	158.96	204.10	245.31	282.60	315.96	345.40	370.91	392.50	410.17	423.90	433.72	439.60	441.57	439.60	433.72	423.90	410.17	392.50	370.91	345.40	315.96	282.60	245.31	204.10	158.96	109.90	56.91	0.00
0.27	8.00	2.35	0.00	64.25	124.08	179.47	230.43	276.96	319.06	356.73	389.96	418.77	443.14	463.08	478.59	489.67	496.31	498.53	496.31	489.67	478.59	463.08	443.14	418.77	389.96	356.73	319.06	276.96	230.43	179.47	124.08	64.25	0.00
0.28	8.50	2.44	0.00	71.94	138.93	200.95	258.01	310.11	357.24	399.42	436.63	468.88	496.17	518.50	535.87	548.27	555.71	558.19	555.71	548.27	535.87	518.50	496.17	468.88	436.63	399.42	357.24	310.11	258.01	200.95	138.93	71.94	0.00
0.30	9.00	2.52	0.00	79.96	154.41	223.34	286.76	344.66	397.05	443.92	485.28	521.13	551.46	576.27	595.58	609.36	617.63	620.39	617.63	609.36	595.58	576.27	551.46	521.13	485.28	443.92	397.05	344.66	286.76	223.34	154.41	79.96	0.00
0.32	9.50	2.60	0.00	88.28	170.48	246.58	316.60	380.53	438.37	490.12	535.78	575.36	608.85	636.24	657.55	672.77	681.91	684.95	681.91	672.77	657.55	636.24	608.85	575.36	535.78	490.12	438.37	380.53	316.60	246.58	170.48	88.28	0.00
0.33	10.00	2.67	0.00	96.89	187.09	270.61	347.45	417.61	481.08	537.88	587.99	631.42	668.17	698.24	721.63	738.33	748.35	751.69	748.35	738.33	721.63	698.24	668.17	631.42	587.99	537.88	481.08	417.61	347.45	270.61	187.09	96.89	0.00
0.35	10.50	2.73	0.00	105.75	204.20	295.36	379.23	455.80	525.08	587.07	641.77	689.17	729.28	762.10	787.62	805.86	816.79	820.44	816.79	805.86	787.62	762.10	729.28	689.17	641.77	587.07	525.08	455.80	379.23	295.36	204.20	105.75	0.00
0.37	11.00	2.79	0.00	114.84	221.76	320.76	411.84	495.00	570.24	637.56	696.96	748.44	792.00	827.64	855.36	875.16	887.04	891.00	887.04	875.16	855.36	827.64	792.00	748.44	696.96	637.56	570.24	495.00	411.84	320.76	221.76	114.84	0.00
0.38	11.50	2.84	0.00	124.14	239.73	346.75	445.21	535.10	616.44	689.21	753.43	809.08	856.17	894.69	924.66	946.06	958.91	963.19	958.91	946.06	924.66	894.69	856.17	809.08	753.43	689.21	616.44	535.10	445.21	346.75	239.73	124.14	0.00
0.40	12.00	2.88	0.00	133.63	258.05	373.25	479.23	576.00	663.55	741.89	811.01	870.91	921.60	963.07	995.33	1018.37	1032.19	1036.80	1032.19	1018.37	995.33	963.07	921.60	870.91	811.01	741.89	663.55	576.00	479.23	373.25	258.05	133.63	0.00
0.42	12.50	2.92	0.00	143.28	276.68	400.19	513.83	617.58	711.45	795.44	869.55	933.78	988.13	1032.59	1067.18	1091.88	1106.70	1111.65	1106.70	1091.88	1067.18	1032.59	988.13	933.78	869.55	795.44	711.45	617.58	513.83	400.19	276.68	143.28	0.00
0.43	13.00	2.95	0.00	153.06	295.56	427.51	548.90	659.73	760.01	849.74	928.90	997.52	1055.57	1103.07	1140.02	1166.41	1182.24	1187.52	1182.24	1166.41	1140.02	1103.07	1055.57	997.52	928.90	849.74	760.01	659.73	548.90	427.51	295.56	153.06	0.00
0.45	13.50	2.97	0.00	162.94	314.65	455.12	584.35	702.35	809.10	904.62	988.90	1061.95	1123.75	1174.32	1213.65	1241.75	1258.60	1264.22	1258.60	1241.75	1213.65	1174.32	1123.75	1061.95	988.90	904.62	809.10	702.35	584.35	455.12	314.65	162.94	0.00
0.47	14.00	2.99	0.00	172.91	333.90	482.96	620.09	745.30	858.59	959.95	1049.39	1126.90	1192.48	1246.15	1287.88	1317.69	1335.58	1341.54	1335.58	1317.69	1287.88	1246.15	1192.48	1126.90	1049.39	959.95	858.59	745.30	620.09	482.96	333.90	172.91	0.00
0.48	14.50	3.00	0.00	182.93	353.24	510.94	656.02	788.49	908.34	1015.58	1110.19	1192.20	1261.58	1318.36	1362.51	1394.05	1412.97	1419.28	1412.97	1394.05	1362.51	1318.36	1261.58	1192.20	1110.19	1015.58	908.34	788.49	656.02	510.94	353.24	182.93	0.00
0.50	15.00	3.00	0.00	192.98	372.64	539.00	692.05	831.79	958.23	1071.35	1171.17	1257.67	1330.87	1390.76	1437.34	1470.61	1490.57	1497.23	1490.57	1470.61	1437.34	1390.76	1330.87	1257.67	1171.17	1071.35	958.23	831.79	692.05	539.00	372.64	192.98	0.00
0.52	15.50	3.00	0.00	203.02	392.04	567.06	728.08	875.10	1008.11	1127.12	1232.14	1323.15	1400.15	1463.16	1512.17	1547.17	1568.17	1575.17	1568.17	1547.17	1512.17	1463.16	1400.15	1323.15	1232.14	1127.12	1008.11	875.10	728.08	567.06	392.04	203.02	0.00
0.53	16.00	2.99	0.00	213.04	411.39	595.05	764.01	918.28	1057.86	1182.75	1292.94	1388.45	1469.26	1535.37	1586.80	1623.53	1645.57	1652.91	1645.57	1623.53	1586.80	1535.37	1469.26	1388.45	1292.94	1182.75	1057.86	918.28	764.01	595.05	411.39	213.04	0.00
0.55	16.50	2.97	0.00	223.01	430.64	622.88	799.75	961.24	1107.35	1238.08	1353.43	1453.40	1537.99	1607.20	1661.03	1699.48	1722.55	1730.24	1722.55	1699.48	1661.03	1607.20	1537.99	1453.40	1353.43	1238.08	1107.35	961.24	799.75	622.88	430.64	223.01	0.00
0.57	17.00	2.95	0.00	232.89	449.73	650.50	835.21	1003.85	1156.44	1292.96	1413.43	1517.83	1606.17	1678.44	1734.66	1774.81	1798.91	1806.94	1798.91	1774.81	1734.66	1678.44	1606.17	1517.83	1413.43	1292.96	1156.44	1003.85	835.21	650.50	449.73	232.89	0.00
0.58	17.50	2.92	0.00	242.67	468.61	677.81	870.28	1046.01	1205.00	1347.26	1472.78	1581.56	1673.61	1748.92	1807.50	1849.34	1874.44	1882.81	1874.44	1849.34	1807.50	1748.92	1673.61	1581.56	1472.78	1347.26	1205.00	1046.01	870.28	677.81	468.61	242.67	0.00
0.60	18.00	2.88	0.00	252.32	487.24	704.76	904.87	1087.59	1252.90	1400.81	1531.32	1644.43	1740.14	1818.44	1879.35	1922.85	1948.96	1957.66	1948.96	1922.85	1879.35	1818.44	1740.14	1644.43	1531.32	1400.81	1252.90	1087.59	904.87	704.76	487.24	252.32	0.00
0.62	18.50	2.84	0.00	261.81	505.56	731.26	938.90	1128.48	1300.01	1453.49	1588.90	1706.27	1805.57	1886.82	1950.02	1995.16	2022.24	2031.27	2022.24	1995.16	1950.02	1886.82	1805.57	1706.27	1588.90	1453.49	1300.01	1128.48	938.90	731.26	505.56	261.81	0.00
0.63	19.00	2.79	0.00	271.11	523.53	757.24	972.26	1168.59	1346.21	1505.14	1645.37	1766.90	1869.74	1953.88	2019.32	2066.06	2094.11	2103.45	2094.11	2066.06	2019.32	1953.88	1869.74	1766.90	1645.37	1505.14	1346.21	1168.59	972.26	757.24	523.53	271.11	0.00
0.65	19.50	2.73	0.00	280.21	541.09	782.65	1004.88	1207.79	1391.37	1555.63	1700.56	1826.17	1932.46	2019.42	2087.05	2135.37	2164.35	2174.02	2164.35	2135.37	2087.05	2019.42	1932.46	1826.17	1700.56	1555.63	1391.37	1207.79	1004.88	782.65	541.09	280.21	0.00
0.67	20.00	2.67	0.00	289.07	558.20	807.39	1036.65	1245.98	1435.37	1604.82	1754.34	1883.92	1993.57	2083.28	2153.05	2202.89	2232.79	2242.76	2232.79	2202.89	2153.05	2083.28	1993.57	1883.92	1754.34	1604.82	1435.37	1245.98	1036.65	807.39	558.20	289.07	0.00
0.68	20.50	2.60	0.00	297.67	574.81	831.42	1067.50	1283.06	1478.08	1652.58	1806.55	1939.98	2052.89	2145.27	2217.13	2268.45	2299.24	2309.51	2299.24	2268.45	2217.13	2145.27	2052.89	1939.98	1806.55	1652.58	1478.08	1283.06	1067.50	831.42	574.81	297.67	0.00
0.70	21.00	2.52	0.00	305.99	590.88	854.66	1097.35	1318.92	1519.40	1698.78	1857.05	1994.21	2110.28	2205.24	2279.10	2331.86	2363.51	2374.06	2363.51	2331.86	2279.10	2205.24	2110.28	1994.21	1857.05	1698.78	1519.40	1318.92	1097.35	854.66	590.88	305.99	0.00
0.72	21.50	2.44	0.00	314.01	606.36	877.05	1126.09	1353.48	1559.21	1743.28	1905.70	2046.46	2165.57	2263.02	2338.81	2392.95	2425.43	2436.26	2425.43	2392.95	2338.81	2263.02	2165.57	2046.46	1905.70	1743.28	1559.21	1353.48	1126.09	877.05	606.36	314.01	0.00
0.73	22.00	2.35	0.00	321.70	621.21	898.53	1153.67	1386.63	1597.39	1785.97	1952.37	2096.58	2218.60	2318.44	2396.09	2451.55	2484.83	2495.93	2484.83	2451.55	2396.09	2318.44	2218.60	2096.58	1952.37	1785.97	1597.39	1386.63	1153.67	898.53	621.21	321.70	0.00
0.75	22.50	2.25	0.00	329.04	635.39	919.04	1180.00	1418.27	1633.85	1826.74	1996.93	2144.43	2269.24	2371.35	2450.78	2507.51	2541.54	2552.89	2541.54	2507.51	2450.78	2371.35	2269.24	2144.43	1996.93	1826.74	1633.85	1418.27	1180.00	919.04	635.39	329.04	0.00
0.77	23.00	2.15	0.00	336.01	648.85	938.52	1205.01	1448.33	1668.48	1865.45	2039.25	2189.88	2317.33	2421.61	2502.72	2560.65	2595.41	2607.00	2595.41	2560.65	2502.72	2421.61	2317.33	2189.88	2039.25	1865.45	1668.48	1448.33	1205.01	938.52	648.85	336.01	0.00
0.78	23.50	2.04	0.00	342.60	661.57	956.91	1228.63	1476.72	1701.18	1902.01	2079.22	2232.80	2362.75	2469.07	2551.77	2610.84	2646.28	2658.09	2646.28	2610.84	2551.77	2469.07	2362.75	2232.80	2079.22	1902.01	1701.18	1476.72	1228.63	956.91	661.57	342.60	0.00
0.80	24.00	1.92	0.00	348.78	673.50	974.17	1250.79	1503.35	1731.86	1936.31	2116.72	2273.07	2405.36	2513.60	2597.79	2657.92	2694.00	2706.03	2694.00	2657.92	2597.79	2513.60	2405.36	2273.07	2116.72	1936.31	1731.86	1503.35	1250.79	974.17	673.50	348.78	0.00
0.82	24.50	1.80	0.00	354.53	684.61	990.24	1271.42	1528.15	1760.43	1968.26	2151.64	2310.57	2445.05	2555.07	2640.65	2701.77	2738.45	2750.68	2738.45	2701.77	2640.65	2555.07	2445.05	2310.57	2151.64	1968.26	1760.43	1528.15	1271.42	990.24	684.61	354.53	0.00
0.83	25.00	1.67	0.00	359.84	694.87	1005.08	1290.48	1551.06	1786.82	1997.76	2183.89	2345.20	2481.69	2593.36	2680.22	2742.27	2779.49	2791.90	2779.49	2742.27	2680.22	2593.36	2481.69	2345.20	2183.89	1997.76	1786.82	1551.06	1290.48	1005.08	694.87	359.84	0.00
0.85	25.50	1.53	0.00	364.70	704.25	1018.65	1307.90	1571.99	1810.93	2024.72	2213.36	2376.85	2515.18	2628.37	2716.40	2779.28	2817.00	2829.58	2817.00	2779.28	2716.40	2628.37	2515.18	2376.85	2213.36	2024.72	1810.93	1571.99	1307.90	1018.65	704.25	364.70	0.00
0.87	26.00	1.39	0.00	369.09	712.72	1030.90	1323.62	1590.89	1832.71	2049.07	2239.98	2405.43	2545.43	2659.97	2749.06	2812.70	2850.88	2863.61	2850.88	2812.70	2749.06	2659.97	2545.43	2405.43	2239.98	2049.07	1832.71	1590.89	1323.62	1030.90	712.72	369.09	0.00
0.88	26.50	1.24	0.00	372.99	720.26	1041.80	1337.62	1607.71	1852.09	2070.73	2263.66	2430.86	2572.34	2688.10	2778.13	2842.44	2881.02	2893.88	2881.02	2842.44	2778.13	2688.10	2572.34	2430.86	2263.66	2070.73	1852.09	1607.71	1337.62	1041.80	720.26	372.99	0.00
0.90	27.00	1.08	0.00	376.40	726.83	1051.31	1349.83	1622.40	1869.00	2089.65	2284.33	2453.06	2595.83	2712.65	2803.50	2868.40	2907.33	2920.31	2907.33	2868.40	2803.50	2712.65	2595.83	2453.06	2284.33	2089.65	1869.00	1622.40	1349.83	1051.31	726.83	376.40	0.00
0.92	27.50	0.92	0.00	379.30	732.43	1059.41	1360.24	1634.90	1883.40	2105.75	2301.94	2471.97	2615.84	2733.55	2825.11	2890.50	2929.74	2942.82	2929.74	2890.50	2825.11	2733.55	2615.84	2471.97	2301.94	2105.75	1883.40	1634.90	1360.24	1059.41	732.43	379.30	0.00
0.93	28.00	0.75	0.00	381.68	737.04	1066.08	1368.79	1645.18	1895.25	2119.00	2316.42	2487.52	2632.29	2750.75	2842.88	2908.68	2948.17	2961.33	2948.17	2908.68	2842.88	2750.75	2632.29	2487.52	2316.42	2119.00	1895.25	1645.18	1368.79	1066.08	737.04	381.68	0.00
0.95	28.50	0.57	0.00	383.55	740.64	1071.28	1375.47	1653.21	1904.50	2129.34	2327.73	2499.66	2645.14	2764.18	2856.76	2922.88	2962.56	2975.79	2962.56	2922.88	2856.76	2764.18	2645.14	2499.66	2327.73	2129.34	1904.50	1653.21	1375.47	1071.28	740.64	383.55	0.00
0.97	29.00	0.39	0.00	384.88	743.22	1075.01	1380.26	1658.97	1911.13	2136.75	2335.83	2508.36	2654.35	2773.80	2866.70	2933.06	2972.88	2986.15	2972.88	2933.06	2866.70	2773.80	2654.35	2508.36	2335.83	2136.75	1911.13	1658.97	1380.26	1075.01	743.22	384.88	0.00
0.98	29.50	0.20	0.00	385.68	744.77	1077.26	1383.14	1662.43	1915.12	2141.21	2340.70	2513.60	2659.89	2779.59	2872.68	2939.18	2979.08	2992.38	2979.08	2939.18	2872.68	2779.59	2659.89	2513.60	2340.70	2141.21	1915.12	1662.43	1383.14	1077.26	744.77	385.68	0.00
1.00	30.00	0.00	0.00	385.95	745.29	1078.00	1384.10	1663.59	1916.45	2142.70	2342.33	2515.34	2661.74	2781.52	2874.68	2941.22	2981.15	2994.46	2981.15	2941.22	2874.68	2781.52	2661.74	2515.34	2342.33	2142.70	1916.45	1663.59	1384.10	1078.00	745.29	385.95	0.00

30.00 0.00 50.67 213.93 0.60 0.00

DISEÑO DEL CABLE:

CARGA PUNTUAL

k %	x	Y	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
			0.00	0.39	0.75	1.08	1.39	1.67	1.92	2.15	2.35	2.52	2.67	2.79	2.88	2.95	2.99	3.00	2.99	2.95	2.88	2.79	2.67	2.52	2.35	2.15	1.92	1.67	1.39	1.08	0.75	0.39	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.50	0.20	0.00	6.91	13.35	19.31	24.79	29.80	34.33	38.38	41.96	45.06	47.68	49.82	51.49	52.68	53.40	53.64	53.40	52.68	51.49	49.82	47.68	45.06	41.96	38.38	34.33	29.80	24.79	19.31	13.35	6.91	0.00
0.03	1.00	0.39	0.00	13.80	26.66	38.56	49.50	59.50	68.54	76.64	83.78	89.96	95.20	99.48	102.82	105.20	106.62	107.10	106.62	105.20	102.82	99.48	95.20	89.96	83.78	76.64	68.54	59.50	49.50	38.56	26.66	13.80	0.00
0.05	1.50	0.57	0.00	20.65	39.88	57.68	74.06	89.01	102.54	114.64	125.33	134.58	142.41	148.82	153.81	157.37	159.50	160.22	159.50	157.37	153.81	148.82	142.41	134.58	125.33	114.64	102.54	89.01	74.06	57.68	39.88	20.65	0.00
0.07	2.00	0.75	0.00	27.43	52.97	76.62	98.37	118.24	136.21	152.29	166.48	178.77	189.18	197.69	204.31	209.04	211.88	212.82	211.88	209.04	204.31	197.69	189.18	178.77	166.48	152.29	136.21	118.24	98.37	76.62	52.97	27.43	0.00
0.08	2.50	0.92	0.00	34.13	65.90	95.32	122.38	147.09	169.45	189.45	207.10	222.40	235.35	245.94	254.17	260.06	263.59	264.76	263.59	260.06	254.17	245.94	235.35	222.40	207.10	189.45	169.45	147.09	122.38	95.32	65.90	34.13	0.00
0.10	3.00	1.08	0.00	40.71	78.62	113.72	146.01	175.49	202.17	226.03	247.09	265.34	280.79	293.42	303.25	310.27	314.48	315.89	314.48	310.27	303.25	293.42	280.79	265.34	247.09	226.03	202.17	175.49	146.01	113.72	78.62	40.71	0.00
0.12	3.50	1.24	0.00	47.18	91.10	131.77	169.19	203.36	234.27	261.92	286.33	307.47	325.37	340.01	351.40	359.53	364.41	366.04	364.41	359.53	351.40	340.01	325.37	307.47	286.33	261.92	234.27	203.36	169.19	131.77	91.10	47.18	0.00
0.13	4.00	1.39	0.00	53.50	103.31	149.43	191.86	230.61	265.66	297.02	324.69	348.68	368.97	385.57	398.49	407.71	413.25	415.09	413.25	407.71	398.49	385.57	368.97	348.68	324.69	297.02	265.66	230.61	191.86	149.43	103.31	53.50	0.00
0.15	4.50	1.53	0.00	59.66	115.21	166.64	213.96	257.17	296.26	331.23	362.09	388.84	411.47	429.98	444.38	454.67	460.84	462.90	460.84	454.67	444.38	429.98	411.47	388.84	362.09	331.23	296.26	257.17	213.96	166.64	115.21	59.66	0.00
0.17	5.00	1.67	0.00	65.65	126.77	183.36	235.43	282.97	325.98	364.46	398.42	427.85	452.75	473.12	488.97	500.29	507.08	509.34	507.08	500.29	488.97	473.12	452.75	427.85	398.42	364.46	325.98	282.97	235.43	183.36	126.77	65.65	0.00
0.18	5.50	1.80	0.00	71.44	137.96	199.55	256.21	307.94	354.75	396.63	433.58	465.61	492.71	514.88	532.12	544.44	551.83	554.29	551.83	544.44	532.12	514.88	492.71	465.61	433.58	396.63	354.75	307.94	256.21	199.55	137.96	71.44	0.00
0.20	6.00	1.92	0.00	77.03	148.75	215.15	276.24	332.02	382.49	427.64	467.49	502.02	531.23	555.14	573.73	587.01	594.98	597.64	594.98	587.01	573.73	555.14	531.23	502.02	467.49	427.64	382.49	332.02	276.24	215.15	148.75	77.03	0.00
0.22	6.50	2.04	0.00	82.39	159.11	230.14	295.48	355.15	409.13	457.43	500.05	536.98	568.24	593.81	613.70	627.90	636.43	639.27	636.43	627.90	613.70	593.81	568.24	536.98	500.05	457.43	409.13	355.15	295.48	230.14	159.11	82.39	0.00
0.23	7.00	2.15	0.00	87.53	169.01	244.47	313.88	377.26	434.61	485.91	531.19	570.42	603.62	630.78	651.91	667.00	676.06	679.07	676.06	667.00	651.91	630.78	603.62	570.42	531.19	485.91	434.61	377.26	313.88	244.47	169.01	87.53	0.00
0.25	7.50	2.25	0.00	92.41	178.44	258.11	331.40	398.31	458.85	513.03	560.82	602.25	637.30	665.98	688.28	704.21	713.77	716.96	713.77	704.21	688.28	665.98	637.30	602.25	560.82	513.03	458.85	398.31	331.40	258.11	178.44	92.41	0.00
0.27	8.00	2.35	0.00	97.03	187.37	271.02	347.98	418.24	481.82	538.70	588.89	632.38	669.19	699.30	722.72	739.45	749.49	752.84	749.49	739.45	722.72	699.30	669.19	632.38	588.89	538.70	481.82	418.24	347.98	271.02	187.37	97.03	0.00
0.28	8.50	2.44	0.00	101.39	195.78	283.18	363.59	437.01	503.43	562.87	615.31	660.75	699.21	730.68	755.15	772.63	783.12	786.61	783.12	772.63	755.15	730.68	699.21	660.75	615.31	562.87	503.43	437.01	363.59	283.18	195.78	101.39	0.00
0.30	9.00	2.52	0.00	105.46	203.64	294.56	378.20	454.56	523.65	585.48	640.02	687.30	727.30	760.03	785.48	803.66	814.57	818.21	814.57	803.66	785.48	760.03	727.30	687.30	640.02	585.48	523.65	454.56	378.20	294.56	203.64	105.46	0.00
0.32	9.50	2.60	0.00	109.24	210.95	305.12	391.76	470.86	542.44	606.47	662.98	711.95	753.38	787.28	813.65	832.49	843.79	847.56	843.79	832.49	813.65	787.28	753.38	711.95	662.98	606.47	542.44	470.86	391.76	305.12	210.95	109.24	0.00
0.33	10.00	2.67	0.00	112.72	217.67	314.85	404.25	485.88	559.73	625.81	684.11	734.64	777.40	812.39	839.59	859.03	870.69	874.58	870.69	859.03	839.59	812.39	777.40	734.64	684.11	625.81	559.73	485.88	404.25	314.85	217.67	112.72	0.00
0.35	10.50	2.73	0.00	115.90	223.80	323.72	415.64	499.56	575.50	643.44	703.39	755.34	799.30	835.27	863.25	883.23	895.22	899.21	895.22	883.23	863.25	835.27	799.30	755.34	703.39	643.44	575.50	499.56	415.64	323.72	223.80	115.90	0.00
0.37	11.00	2.79	0.00	118.76	229.33	331.71	425.90	511.89	589.70	659.32	720.75	773.99	819.03	855.89	884.55	905.03	917.32	921.41	917.32	905.03	884.55	855.89	819.03	773.99	720.75	659.32	589.70	511.89	425.90	331.71	229.33	118.76	0.00
0.38	11.50	2.84	0.00	121.30	234.23	338.80	435.00	522.84	602.31	673.42	736.16	790.54	836.55	874.19	903.47	924.38	936.93	941.11	936.93	924.38	903.47	874.19	836.55	790.54	736.16	673.42	602.31	522.84	435.00	338.80	234.23	121.30	0.00
0.40	12.00	2.88	0.00	123.51	238.51	344.98	442.94	532.38	613.30	685.70	749.59	804.96	851.81	890.14	919.95	941.25	954.02	958.28	954.02	941.25	919.95	890.14	851.81	804.96	749.59	685.70	613.30	532.38	442.94	344.98	238.51	123.51	0.00
0.42	12.50	2.92	0.00	125.39	242.14	350.23	449.68	540.49	622.64	696.15	761.00	817.21	864.78	903.69	933.96	955.58	968.55	972.87	968.55	955.58	933.96	903.69	864.78	817.21	761.00	696.15	622.64	540.49	449.68	350.23	242.14	125.39	0.00
0.43	13.00	2.95	0.00	126.94	245.12	354.55	455.22	547.14	630.31	704.72	770.38	827.28	875.43	914.82	945.46	967.35	980.48	984.86	980.48	967.35	945.46	914.82	875.43	827.28	770.38	704.72	630.31	547.14	455.22	354.55	245.12	126.94	0.00
0.45	13.50	2.97	0.00	128.14	247.45	357.91	459.54	552.34	636.29	711.41	777.69	835.13	883.74	923.51	954.44	976.53	989.79	994.21	989.79	976.53	954.44	923.51	883.74	835.13	777.69	711.41	636.29	552.34	459.54	357.91	247.45	128.14	0.00
0.47	14.00	2.99	0.00	129.00	249.11	360.32	462.64	556.05	640.57	716.20	782.92	840.75	889.69	929.72	960.86	983.10	996.45	1000.90	996.45	983.10	960.86	929.72	889.69	840.75	782.92	716.20	640.57	556.05	462.64	360.32	249.11	129.00	0.00
0.48	14.50	3.00	0.00	129.52	250.11	361.77	464.50	558.29	643.15	719.08	786.07	844.13	893.26	933.46	964.72	987.05	1000.45	1004.92	1000.45	987.05	964.72	933.46	893.26	844.13	786.07	719.08	643.15	558.29	464.50	361.77	250.11	129.52	0.00
0.50	15.00	3.00	0.00	129.70	250.45	362.25	465.12	559.03	644.01	720.04	787.12	845.26	894.45	934.70	966.01	988.37	1001.79	1006.26	1001.79	988.37	966.01	934.70	894.45	845.26	787.12	720.04	644.01	559.03	465.12	362.25	250.45	129.70	0.00
0.52	15.50	3.00	0.00	129.52	250.11	361.77	464.50	558.29	643.15	719.08	786.07	844.13	893.26	933.46	964.72	987.05	1000.45	1004.92	1000.45	987.05	964.72	933.46	893.26	844.13	786.07	719.08	643.15	558.29	464.50	361.77	250.11	129.52	0.00
0.53	16.00	2.99	0.00	129.00	249.11	360.32	462.64	556.05	640.57	716.20	782.92	840.75	889.69	929.72	960.86	983.10	996.45	1000.90	996.45	983.10	960.86	929.72	889.69	840.75	782.92	716.20	640.57	556.05	462.64	360.32	249.11	129.00	0.00
0.55	16.50	2.97	0.00	128.14	247.45	357.91	459.54	552.34	636.29	711.41	777.69	835.13	883.74	923.51	954.44	976.53	989.79	994.21	989.79	976.53	954.44	923.51	883.74	835.13	777.69	711.41	636.29	552.34	459.54	357.91	247.45	128.14	0.00
0.57	17.00	2.95	0.00	126.94	245.12	354.55	455.22	547.14	630.31	704.72	770.38	827.28	875.43	914.82	945.46	967.35	980.48	984.86	980.48	967.35	945.46	914.82	875.43	827.28	770.38	704.72	630.31	547.14	455.22	354.55	245.12	126.94	0.00
0.58	17.50	2.92	0.00	125.39	242.14	350.23	449.68	540.49	622.64	696.15	761.00	817.21	864.78	903.69	933.96	955.58	968.55	972.87	968.55	955.58	933.96	903.69	864.78	817.21	761.00	696.15	622.64	540.49	449.68	350.23	242.14	125.39	0.00
0.60	18.00	2.88	0.00	123.51	238.51	344.98	442.94	532.38	613.30	685.70	749.59	804.96	851.81	890.14	919.95	941.25	954.02	958.28	954.02	941.25	919.95	890.14	851.81	804.96	749.59	685.70	613.30	532.38	442.94	344.98	238.51	123.51	0.00
0.62	18.50	2.84	0.00	121.30	234.23	338.80	435.00	522.84	602.31	673.42	736.16	790.54	836.55	874.19	903.47	924.38	936.93	941.11	936.93	924.38	903.47	874.19	836.55	790.54	736.16	673.42	602.31	522.84	435.00	338.80	234.23	121.30	0.00
0.63	19.00	2.79	0.00	118.76	229.33	331.71	425.90	511.89	589.70	659.32	720.75	773.99	819.03	855.89	884.55	905.03	917.32	921.41	917.32	905.03	884.55	855.89	819.03	773.99	720.75	659.32	589.70	511.89	425.90	331.71	229.33	118.76	0.00
0.65	19.50	2.73	0.00	115.90	223.80	323.72	415.64	499.56	575.50	643.44	703.39	755.34	799.30	835.27	863.25	883.23	895.22	899.21	895.22	883.23	863.25	835.27	799.30	755.34	703.39	643.44	575.50	499.56	415.64	323.72	223.80	115.90	0.00
0.67	20.00	2.67	0.00	112.72	217.67	314.85	404.25	485.88	559.73	625.81	684.11	734.64	777.40	812.39	839.59	859.03	870.69	874.58	870.69	859.03	839.59	812.39	777.40	734.64	684.11	625.81	559.73	485.88	404.25	314.85	217.67	112.72	0.00
0.68	20.50	2.60	0.00	109.24	210.95	305.12	391.76	470.86	542.44	606.47	662.98	711.95	753.38	787.28	813.65	832.49	843.79	847.56	843.79	832.49	813.65	787.28	753.38	711.95	662.98	606.47	542.44	470.86	391.76	305.12	210.95	109.24	0.00
0.70	21.00	2.52	0.00	105.46	203.64	294.56	378.20	454.56	523.65	585.48	640.02	687.30	727.30	760.03	785.48	803.66	814.57	818.21	814.57	803.66	785.48	760.03	727.30	687.30	640.02	585.48	523.65	454.56	378.20	294.56	203.64	105.46	0.00
0.72	21.50	2.44	0.00	101.39	195.78	283.18	363.59	437.01	503.43	562.87	615.31	660.75	699.21	730.68	755.15	772.63	783.12	786.61	783.12	772.63	755.15	730.68	699.21	660.75	615.31	562.87	503.43	437.01	363.59	283.18	195.78	101.39	0.00
0.73	22.00	2.35	0.00	97.03	187.37	271.02	347.98	418.24	481.82	538.70	588.89	632.38	669.19	699.30	722.72	739.45	749.49	752.84	749.49	739.45	722.72	699.30	669.19	632.38	588.89	538.70	481.82	418.24	347.98	271.02	187.37	97.03	0.00
0.75	22.50	2.25	0.00	92.41	178.44	258.11	331.40	398.31	458.85	513.03	560.82	602.25	637.30	665.98	688.28	704.21	713.77	716.96	713.77	704.21	688.28	665.98	637.30	602.25	560.82	513.03	458.85	398.31	331.40	258.11	178.44	92.41	0.00
0.77	23.00	2.15	0.00	87.53	169.01	244.47	313.88	377.26	434.61	485.91	531.19	570.42	603.62	630.78	651.91	667.00	676.06	679.07	676.06	667.00	651.91	630.78	603.62	570.42	531.19	485.91	434.61	377.26	313.88	244.47	169.01	87.53	0.00
0.78	23.50	2.04	0.00	82.39	159.11	230.14	295.48	355.15	409.13	457.43	500.05	536.98	568.24	593.81	613.70	627.90	636.43	639.27	636.43	627.90	613.70	593.81	568.24	536.98	500.05	457.43	409.13	355.15	295.48	230.14	159.11	82.39	0.00
0.80	24.00	1.92	0.00	77.03	148.75	215.15	276.24	332.02	382.49	427.64	467.49	502.02	531.23	555.14	573.73	587.01	594.98	597.64	594.98	587.01	573.73	555.14	531.23	502.02	467.49	427.64	382.49	332.02	276.24	215.15	148.75	77.03	0.00
0.82	24.50	1.80	0.00	71.44	137.96	199.55	256.21	307.94	354.75	396.63	433.58	465.61	492.71	514.88	532.12	544.44	551.83	554.29	551.83	544.44	532.12	514.88	492.71	465.61	433.58	396.63	354.75	307.94	256.21	199.55	137.96	71.44	0.00
0.83	25.00	1.67	0.00	65.65	126.77	183.36	235.43	282.97	325.98	364.46	398.42	427.85	452.75	473.12	488.97	500.29	507.08	509.34	507.08	500.29	488.97	473.12	452.75	427.85	398.42	364.46	325.98	282.97	235.43	183.36	126.77	65.65	0.00
0.85	25.50	1.53	0.00	59.66	115.21	166.64	213.96	257.17	296.26	331.23	362.09	388.84	411.47	429.98	444.38	454.67	460.84	462.90	460.84	454.67	444.38	429.98	411.47	388.84	362.09	331.23	296.26	257.17	213.96	166.64	115.21	59.66	0.00
0.87	26.00	1.39	0.00	53.50	103.31	149.43	191.86	230.61	265.66	297.02	324.69	348.68	368.97	385.57	398.49	407.71	413.25	415.09	413.25	407.71	398.49	385.57	368.97	348.68	324.69	297.02	265.66	230.61	191.86	149.43	103.31	53.50	0.00
0.88	26.50	1.24	0.00	47.18	91.10	131.77	169.19	203.36	234.27	261.92	286.33	307.47	325.37	340.01	351.40	359.53	364.41	366.04	364.41	359.53	351.40	340.01	325.37	307.47	286.33	261.92	234.27	203.36	169.19	131.77	91.10	47.18	0.00
0.90	27.00	1.08	0.00	40.71	78.62	113.72	146.01	175.49	202.17	226.03	247.09	265.34	280.79	293.42	303.25	310.27	314.48	315.89	314.48	310.27	303.25	293.42	280.79	265.34	247.09	226.03	202.17	175.49	146.01	113.72	78.62	40.71	0.00
0.92	27.50	0.92	0.00	34.13	65.90	95.32	122.38	147.09	169.45	189.45	207.10	222.40	235.35	245.94	254.17	260.06	263.59	264.76	263.59	260.06	254.17	245.94	235.35	222.40	207.10	189.45	169.45	147.09	122.38	95.32	65.90	34.13	0.00
0.93	28.00	0.75	0.00	27.43	52.97	76.62	98.37	118.24	136.21	152.29	166.48	178.77	189.18	197.69	204.31	209.04	211.88	212.82	211.88	209.04	204.31	197.69	189.18	178.77	166.48	152.29	136.21	118.24	98.37	76.62	52.97	27.43	0.00
0.95	28.50	0.57	0.00	20.65	39.88	57.68	74.06	89.01	102.54	114.64	125.33	134.58	142.41	148.82	153.81	157.37	159.50	160.22	159.50	157.37	153.81	148.82	142.41	134.58	125.33	114.64	102.54	89.01	74.06	57.68	39.88	20.65	0.00
0.97	29.00	0.39	0.00	13.80	26.66	38.56	49.50	59.50	68.54	76.64	83.78	89.96	95.20	99.48	102.82	105.20	106.62	107.10	106.62	105.20	102.82	99.48	95.20	89.96	83.78	76.64	68.54	59.50	49.50	38.56	26.66	13.80	0.00
0.98	29.50	0.20	0.00	6.91	13.35	19.31	24.79	29.80	34.33	38.38	41.96	45.06	47.68	49.82	51.49	52.68	53.40	53.64	53.40	52.68	51.49	49.82	47.68	45.06	41.96	38.38	34.33	29.80	24.79	19.31	13.35	6.91	0.00
1.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PUENTE COLGANTE METALICO

30.00 43.26 50.67 213.93 0.60 0.00 2.40

DISEÑO DEL CABLE:

CARGA UNIFORME (CARGA VIVA) 4.78

k %	x	Y	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
			0.00	0.39	0.75	1.08	1.39	1.67	1.92	2.15	2.35	2.52	2.67
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.017	0.50	0.20	0.00	4.57	4.15	3.75	3.37	3.01	2.67	2.35	2.04	1.75	1.49
0.03	1.00	0.39	0.00	17.93	16.60	15.01	13.49	12.05	10.68	9.39	8.17	7.02	5.95
0.05	1.50	0.57	0.00	36.09	37.35	33.78	30.37	27.13	24.05	21.14	18.40	15.82	13.40
0.07	2.00	0.75	0.00	53.06	66.42	60.07	54.02	48.26	42.80	37.63	32.75	28.17	23.89
0.08	2.50	0.92	0.00	69.18	98.81	93.91	84.47	75.48	66.95	58.88	51.27	44.12	37.43
0.10	3.00	1.08	0.00	84.44	129.55	135.31	121.73	108.81	96.55	84.95	74.00	63.72	54.10
0.12	3.50	1.24	0.00	98.87	158.64	179.29	165.85	148.29	131.63	115.87	101.00	87.02	73.94
0.13	4.00	1.39	0.00	112.47	186.10	220.90	216.85	193.97	172.26	151.70	132.32	114.09	97.02
0.15	4.50	1.53	0.00	125.25	211.96	260.14	269.79	245.90	218.48	192.52	168.03	145.00	123.44
0.17	5.00	1.67	0.00	137.23	236.25	297.08	319.71	304.13	270.36	238.39	208.22	179.85	153.28
0.18	5.50	1.80	0.00	148.41	258.99	331.74	366.65	363.73	327.98	289.39	252.98	218.72	186.64
0.20	6.00	1.92	0.00	158.83	280.21	364.17	410.68	419.76	391.41	345.62	302.39	261.72	223.62
0.22	6.50	2.04	0.00	168.48	299.95	394.41	451.86	472.30	455.73	407.15	356.55	308.95	264.34
0.23	7.00	2.15	0.00	177.39	318.23	422.51	490.24	521.41	516.03	474.08	415.59	360.53	308.92
0.25	7.50	2.25	0.00	185.59	335.10	448.54	525.90	567.19	572.40	541.54	479.60	416.59	357.50
0.27	8.00	2.35	0.00	193.08	350.59	472.53	558.90	609.71	624.94	604.61	548.71	477.23	410.20
0.28	8.50	2.44	0.00	199.89	364.74	494.55	589.32	649.06	673.76	663.41	618.04	542.62	467.16
0.30	9.00	2.52	0.00	206.04	377.59	514.66	617.24	685.34	718.95	718.08	682.72	612.87	528.54
0.32	9.50	2.60	0.00	211.55	389.19	532.92	642.73	718.64	760.63	768.71	742.88	683.14	594.49
0.33	10.00	2.67	0.00	216.45	399.58	549.39	665.88	749.06	798.92	815.45	798.67	748.58	665.16
0.35	10.50	2.73	0.00	220.75	408.80	564.14	686.77	776.70	833.92	858.43	850.23	809.33	735.72
0.37	11.00	2.79	0.00	224.49	416.91	577.24	705.49	801.67	865.76	897.77	897.71	865.56	801.33
0.38	11.50	2.84	0.00	227.69	423.94	588.75	722.13	824.06	894.56	933.62	941.24	917.42	862.17
0.40	12.00	2.88	0.00	230.37	429.95	598.75	736.77	844.00	920.45	966.11	980.99	965.09	918.40
0.42	12.50	2.92	0.00	232.55	434.99	607.31	749.51	861.59	943.55	995.39	1017.11	1008.72	970.20
0.43	13.00	2.95	0.00	234.28	439.11	614.49	760.44	876.93	963.99	1021.60	1049.76	1048.48	1017.76
0.45	13.50	2.97	0.00	235.56	442.35	620.38	769.65	890.15	981.90	1044.88	1079.10	1084.55	1061.25
0.47	14.00	2.99	0.00	236.42	444.77	625.04	777.24	901.36	997.41	1065.38	1105.28	1117.10	1100.85
0.48	14.50	3.00	0.00	236.90	446.42	628.56	783.31	910.68	1010.66	1083.26	1128.47	1146.30	1136.75
0.50	15.00	3.00	0.00	237.02	447.36	631.00	787.95	918.21	1021.77	1098.65	1148.83	1172.33	1169.13
0.52	15.50	3.00	0.00	236.81	447.62	632.44	791.25	924.07	1030.89	1111.71	1166.53	1195.35	1198.18
0.53	16.00	2.99	0.00	236.29	447.28	632.95	793.32	928.38	1038.14	1122.58	1181.72	1215.55	1224.08
0.55	16.50	2.97	0.00	235.49	446.36	632.62	794.25	931.26	1043.65	1131.42	1194.57	1233.10	1247.01
0.57	17.00	2.95	0.00	234.44	444.94	631.50	794.13	932.81	1047.56	1138.37	1205.24	1248.17	1267.17
0.58	17.50	2.92	0.00	233.16	443.06	629.69	793.06	933.16	1050.00	1143.58	1213.89	1260.94	1284.72
0.60	18.00	2.88	0.00	231.68	440.76	627.24	791.13	932.41	1051.10	1147.19	1220.68	1271.57	1299.86
0.62	18.50	2.84	0.00	230.03	438.11	624.24	788.44	930.68	1050.99	1149.35	1225.76	1280.23	1312.76
0.63	19.00	2.79	0.00	228.22	435.14	620.76	785.07	928.08	1049.79	1150.19	1229.30	1287.10	1323.60
0.65	19.50	2.73	0.00	226.29	431.91	616.85	781.12	924.71	1047.63	1149.87	1231.44	1292.33	1332.54
0.67	20.00	2.67	0.00	224.27	428.47	612.61	776.68	920.69	1044.63	1148.51	1232.33	1296.08	1339.77
0.68	20.50	2.60	0.00	222.16	424.86	608.08	771.83	916.11	1040.92	1146.25	1232.12	1298.52	1345.44
0.70	21.00	2.52	0.00	220.01	421.12	603.34	766.65	911.08	1036.60	1143.22	1230.95	1299.79	1349.72
0.72	21.50	2.44	0.00	217.83	417.31	598.45	761.24	905.69	1031.79	1139.55	1228.97	1300.04	1352.77
0.73	22.00	2.35	0.00	215.64	413.46	593.47	755.66	900.04	1026.61	1135.36	1226.30	1299.42	1354.73
0.75	22.50	2.25	0.00	213.46	409.61	588.46	750.00	894.23	1021.15	1130.76	1223.07	1298.07	1355.76
0.77	23.00	2.15	0.00	211.32	405.81	583.48	744.32	888.34	1015.52	1125.88	1219.42	1296.12	1356.00
0.78	23.50	2.04	0.00	209.23	402.10	578.59	738.70	882.45	1009.82	1120.82	1215.45	1293.70	1355.59
0.80	24.00	1.92	0.00	207.22	398.50	573.83	733.21	876.65	1004.14	1115.69	1211.28	1290.93	1354.64
0.82	24.50	1.80	0.00	205.30	395.05	569.26	727.91	871.01	998.57	1110.57	1207.03	1287.93	1353.29
0.83	25.00	1.67	0.00	203.49	391.79	564.92	722.86	865.61	993.18	1105.57	1202.78	1284.80	1351.65
0.85	25.50	1.53	0.00	201.80	388.75	560.85	718.10	860.51	988.07	1100.78	1198.64	1281.65	1349.82
0.87	26.00	1.39	0.00	200.25	385.95	557.10	713.71	855.77	983.29	1096.26	1194.69	1278.57	1347.90
0.88	26.50	1.24	0.00	198.84	383.41	553.70	709.72	851.45	978.91	1092.10	1191.01	1275.64	1345.99
0.90	27.00	1.08	0.00	197.60	381.17	550.69	706.17	847.60	975.00	1088.35	1187.67	1272.94	1344.17
0.92	27.50	0.92	0.00	196.54	379.23	548.09	703.10	844.27	971.60	1085.08	1184.73	1270.53	1342.49
0.93	28.00	0.75	0.00	195.65	377.62	545.92	700.54	841.48	968.75	1082.34	1182.25	1268.48	1341.04
0.95	28.50	0.57	0.00	194.95	376.36	544.22	698.53	839.29	966.50	1080.16	1180.27	1266.84	1339.86
0.97	29.00	0.39	0.00	194.45	375.45	542.99	697.07	837.70	964.87	1078.58	1178.84	1265.64	1338.98
0.98	29.50	0.20	0.00	194.15	374.90	542.24	696.19	836.73	963.88	1077.62	1177.96	1264.90	1338.44
1.00	30.00	0.00	0.00	194.05	374.71	542.00	695.90	836.41	963.55	1077.30	1177.67	1264.66	1338.26

k %	x	Y	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00
			2.79	2.88	2.95	2.99	3.00	2.99	2.95	2.88	2.79	2.67
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.017	0.50	0.20	1.24	1.00	0.79	0.60	0.42	0.26	0.12	0.00	-0.10	-0.18
0.03	1.00	0.39	4.95	4.02	3.17	2.39	1.69	1.06	0.51	0.02	-0.38	-0.72
0.05	1.50	0.57	11.16	9.08	7.16	5.41	3.83	2.41	1.16	0.08	-0.84	-1.60
0.07	2.00	0.75	19.89	16.20	12.79	9.69	6.87	4.35	2.13	0.20	-1.44	-2.78
0.08	2.50	0.92	31.20	25.43	20.11	15.26	10.86	6.92	3.45	0.43	-2.13	-4.23
0.10	3.00	1.08	45.13	36.82	29.18	22.19	15.86	10.19	5.18	0.82	-2.87	-5.90
0.12	3.50	1.24	61.75	50.45	40.05	30.54	21.93	14.21	7.38	1.45	-3.59	-7.73
0.13	4.00	1.39	81.12	66.39	52.81	40.40	29.15	19.07	10.15	2.39	-4.21	-9.64
0.15	4.50	1.53	103.35	84.72	67.56	51.86	37.62	24.86	13.56	3.72	-4.65	-11.56
0.17	5.00	1.67	128.51	105.55	84.38	65.01	47.44	31.68	17.71	5.55	-4.82	-13.38
0.18	5.50	1.80	156.72	128.97	103.39	79.97	58.72	39.64	22.72	7.97	-4.61	-15.03
0.20	6.00	1.92	188.08	155.11	124.70	96.86	71.57	48.86	28.70	11.11	-3.92	-16.38
0.22	6.50	2.04	222.72	184.09	148.45	115.80	86.14	59.46	35.78	15.09	-2.61	-17.32
0.23	7.00	2.15	260.76	216.04	174.76	136.93	102.54	71.60	44.10	20.04	-0.57	-17.74
0.25	7.50	2.25	302.33	251.10	203.78	160.40	120.93	85.40	53.78	26.10	2.33	-17.50
0.27	8.00	2.35	347.59	289.41	235.67	186.35	141.47	101.02	65.00	33.41	6.25	-16.47
0.28	8.50	2.44	396.67	331.13	270.56	214.95	164.31	118.62	77.90	42.13	11.33	-14.51
0.30	9.00	2.52	449.73	376.42	308.64	246.37	189.61	138.37	92.64	52.42	17.73	-11.46
0.32	9.50	2.60	506.92	425.45	350.06	280.76	217.55	160.43	109.39	64.45	25.59	-7.18
0.33	10.00	2.67	568.43	478.37	395.00	318.31	248.31	184.98	128.34	78.37	35.09	-1.51
0.35	10.50	2.73	634.40	535.38	443.64	359.21	282.06	212.21	149.64	94.38	46.40	5.72
0.37	11.00	2.79	705.02	596.64	496.17	403.62	319.00	242.29	173.50	112.64	59.69	14.67
0.38	11.50	2.84	775.47	662.34	552.77	451.76	359.31	275.43	200.10	133.34	75.14	25.50
0.40	12.00	2.88	840.93	732.67	613.63	503.81	403.20	311.81	229.63	156.67	92.93	38.40
0.42	12.50	2.92	901.57	802.82	678.95	559.96	450.85	351.63	262.28	182.82	113.24	53.54
0.43	13.00	2.95	957.59	867.98	748.93	620.42	502.48	395.09	298.26	211.98	136.26	71.09
0.45	13.50	2.97	1009.18	928.35	818.75	685.40	558.28	442.40	337.75	244.35	162.18	91.25
0.47	14.00	2.99	1056.52	984.12	883.64	755.09	618.46	493.75	380.97	280.12	191.19	114.18
0.48	14.50	3.00	1099.81	1035.49	943.78	824.69	683.22	549.36	428.12	319.49	223.48	140.08
0.50	15.00	3.00	1139.24	1082.66	999.39	889.43	752.77	609.43	479.39	362.66	259.24	169.13
0.52	15.50	3.00	1175.00	1125.83	1050.66	949.49	822.33	674.16	535.00	409.83	298.67	201.51
0.53	16.00	2.99	1207.29	1165.20	1097.81	1005.10	887.09	743.77	595.14	461.20	341.96	237.41
0.55	16.50	2.97	1236.30	1200.97	1141.02	1056.45	947.26	813.45	660.02	516.97	389.30	277.01
0.57	17.00	2.95	1262.22	1233.34	1180.52	1103.76	1003.06	878.43	729.85	577.34	440.89	320.50
0.58	17.50	2.92	1285.24	1262.50	1216.49	1147.22	1054.69	938.89	799.83	642.50	496.91	368.06
0.60	18.00	2.88	1305.56	1288.65	1249.15	1187.04	1102.34	995.04	865.15	712.65	557.56	419.86
0.62	18.50	2.84	1323.34	1311.98	1278.68	1223.42	1146.23	1047.09	926.01	782.98	623.01	476.09
0.63	19.00	2.79	1338.79	1332.68	1305.27	1256.56	1186.55	1095.23	982.61	848.68	693.46	536.93
0.65	19.50	2.73	1352.08	1350.95	1329.13	1286.65	1223.48	1139.65	1035.13	909.95	764.08	602.54
0.67	20.00	2.67	1363.39	1366.95	1350.44	1313.87	1257.24	1180.54	1083.78	966.95	830.06	673.10
0.68	20.50	2.60	1372.89	1380.87	1369.39	1338.43	1287.99	1218.09	1128.72	1019.87	891.56	743.77
0.70	21.00	2.52	1380.76	1392.90	1386.14	1360.49	1315.94	1252.49	1170.14	1068.90	948.76	809.72
0.72	21.50	2.44	1387.15	1403.19	1400.88	1380.23	1341.24	1283.90	1208.22	1114.19	1001.82	871.10
0.73	22.00	2.35	1392.23	1411.91	1413.78	1397.83	1364.07	1312.50	1243.11	1155.91	1050.90	928.07
0.75	22.50	2.25	1396.15	1419.22	1424.99	1413.46	1384.61	1338.46	1274.99	1194.22	1096.15	980.76
0.77	23.00	2.15	1399.06	1425.28	1434.68	1427.26	1403.00	1361.92	1304.02	1229.28	1137.72	1029.34
0.78	23.50	2.04	1401.09	1430.23	1443.00	1439.39	1419.41	1383.06	1330.33	1261.23	1175.76	1073.92
0.80	24.00	1.92	1402.40	1434.21	1450.08	1450.00	1433.97	1402.00	1354.08	1290.21	1210.40	1114.64
0.82	24.50	1.80	1403.09	1437.35	1456.06	1459.22	1446.82	1418.88	1375.39	1316.35	1241.76	1151.62
0.83	25.00	1.67	1403.30	1439.78	1461.07	1467.18	1458.10	1433.84	1394.40	1339.78	1269.97	1184.98
0.85	25.50	1.53	1403.13	1441.60	1465.22	1474.00	1467.92	1447.00	1411.22	1360.60	1295.13	1214.82
0.87	26.00	1.39	1402.69	1442.94	1468.63	1479.78	1476.39	1458.45	1425.97	1378.94	1317.36	1241.24
0.88	26.50	1.24	1402.07	1443.87	1471.40	1484.64	1483.62	1468.31	1438.73	1394.87	1336.74	1264.33
0.90	27.00	1.08	1401.35	1444.50	1473.60	1488.67	1489.69	1476.67	1449.60	1408.50	1353.35	1284.17
0.92	27.50	0.92	1400.62	1444.89	1475.33	1491.93	1494.68	1483.59	1458.67	1419.89	1367.28	1300.83
0.93	28.00	0.75	1399.92	1445.12	1476.65	1494.50	1498.67	1489.17	1465.98	1429.12	1378.59	1314.37
0.95	28.50	0.57	1399.32	1445.24	1477.62	1496.44	1501.71	1493.44	1471.62	1436.24	1387.32	1324.86
0.97	29.00	0.39	1398.87	1445.30	1478.27	1497.79	1503.85	1496.46	1475.61	1441.30	1393.53	1332.31
0.98	29.50	0.20	1398.58	1445.32	1478.65	1498.59	1505.12	1498.26	1477.99	1444.32	1397.25	1336.78
1.00	30.00	0.00	1398.48	1445.32	1478.78	1498.85	1505.54	1498.85	1478.78	1445.32	1398.48	1338.26

k %	x	Y	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
			2.52	2.35	2.15	1.92	1.67	1.39	1.08	0.75	0.39	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.017	0.50	0.20	-0.25	-0.29	-0.32	-0.33	-0.32	-0.29	-0.25	-0.18	-0.10	0.00
0.03	1.00	0.39	-0.98	-1.17	-1.28	-1.32	-1.28	-1.17	-0.99	-0.73	-0.40	0.00
0.05	1.50	0.57	-2.18	-2.60	-2.86	-2.95	-2.87	-2.63	-2.22	-1.65	-0.91	0.00
0.07	2.00	0.75	-3.83	-4.58	-5.04	-5.20	-5.07	-4.65	-3.93	-2.91	-1.60	0.00
0.08	2.50	0.92	-5.88	-7.06	-7.78	-8.05	-7.85	-7.20	-6.09	-4.52	-2.49	0.00
0.10	3.00	1.08	-8.28	-10.00	-11.05	-11.45	-11.19	-10.27	-8.69	-6.45	-3.56	0.00
0.12	3.50	1.24	-10.98	-13.34	-14.80	-15.37	-15.04	-13.82	-11.71	-8.70	-4.80	0.00
0.13	4.00	1.39	-13.91	-17.02	-18.96	-19.74	-19.36	-17.81	-15.10	-11.23	-6.20	0.00
0.15	4.50	1.53	-17.00	-20.97	-23.48	-24.52	-24.10	-22.21	-18.86	-14.04	-7.75	0.00
0.17	5.00	1.67	-20.15	-25.11	-28.27	-29.64	-29.20	-26.96	-22.92	-17.08	-9.44	0.00
0.18	5.50	1.80	-23.28	-29.36	-33.27	-35.02	-34.60	-32.01	-27.26	-20.34	-11.25	0.00
0.20	6.00	1.92	-26.28	-33.61	-38.38	-40.59	-40.24	-37.32	-31.83	-23.79	-13.17	0.00
0.22	6.50	2.04	-29.05	-37.78	-43.52	-46.27	-46.04	-42.81	-36.59	-27.38	-15.19	0.00
0.23	7.00	2.15	-31.47	-41.75	-48.58	-51.97	-51.92	-48.43	-41.49	-31.10	-17.27	0.00
0.25	7.50	2.25	-33.41	-45.40	-53.46	-57.60	-57.81	-54.10	-46.46	-34.90	-19.41	0.00
0.27	8.00	2.35	-34.77	-48.63	-58.06	-63.06	-63.63	-59.76	-51.47	-38.75	-21.59	0.00
0.28	8.50	2.44	-35.38	-51.30	-62.25	-68.24	-69.27	-65.34	-56.45	-42.59	-23.78	0.00
0.30	9.00	2.52	-35.13	-53.28	-65.92	-73.05	-74.66	-70.76	-61.34	-46.41	-25.96	0.00
0.32	9.50	2.60	-33.86	-54.45	-68.95	-77.37	-79.69	-75.93	-66.08	-50.14	-28.12	0.00
0.33	10.00	2.67	-31.42	-54.66	-71.21	-81.08	-84.27	-80.78	-70.61	-53.76	-30.22	0.00
0.35	10.50	2.73	-27.67	-53.77	-72.57	-84.08	-88.30	-85.23	-74.86	-57.20	-32.25	0.00
0.37	11.00	2.79	-22.44	-51.63	-72.89	-86.24	-91.67	-89.17	-78.76	-60.43	-34.17	0.00
0.38	11.50	2.84	-15.58	-48.09	-72.05	-87.44	-94.27	-92.54	-82.25	-63.39	-35.98	0.00
0.40	12.00	2.88	-6.91	-43.01	-69.89	-87.55	-96.00	-95.23	-85.25	-66.05	-37.63	0.00
0.42	12.50	2.92	3.72	-36.22	-66.28	-86.45	-96.75	-97.16	-87.69	-68.34	-39.11	0.00
0.43	13.00	2.95	16.48	-27.57	-61.07	-84.01	-96.40	-98.23	-89.51	-70.23	-40.39	0.00
0.45	13.50	2.97	31.55	-16.90	-54.12	-80.10	-94.85	-98.35	-90.62	-71.65	-41.44	0.00
0.47	14.00	2.99	49.10	-4.05	-45.28	-74.59	-91.97	-97.42	-90.96	-72.56	-42.24	0.00
0.48	14.50	3.00	69.30	11.14	-34.41	-67.34	-87.66	-95.36	-90.44	-72.91	-42.76	0.00
0.50	15.00	3.00	92.33	28.83	-21.35	-58.23	-81.79	-92.05	-89.00	-72.64	-42.98	0.00
0.52	15.50	3.00	118.35	49.20	-5.96	-47.11	-74.26	-87.41	-86.56	-71.71	-42.86	0.00
0.53	16.00	2.99	147.55	72.39	11.92	-33.86	-64.95	-81.35	-83.05	-70.06	-42.38	0.00
0.55	16.50	2.97	180.10	98.57	32.42	-18.35	-53.74	-73.75	-78.38	-67.64	-41.51	0.00
0.57	17.00	2.95	216.17	127.91	55.70	-0.44	-40.52	-64.54	-72.50	-64.39	-40.23	0.00
0.58	17.50	2.92	255.94	160.56	81.91	20.00	-25.17	-53.61	-65.31	-60.28	-38.51	0.00
0.60	18.00	2.88	299.57	196.68	111.19	43.10	-7.59	-40.87	-56.76	-55.24	-36.32	0.00
0.62	18.50	2.84	347.23	236.43	143.68	68.99	12.35	-26.23	-46.76	-49.23	-33.64	0.00
0.63	19.00	2.79	399.10	279.96	179.53	97.79	34.75	-9.60	-35.24	-42.19	-30.45	0.00
0.65	19.50	2.73	455.33	327.44	218.87	129.63	59.71	9.12	-22.15	-34.09	-26.71	0.00
0.67	20.00	2.67	516.08	379.00	261.85	164.63	87.35	30.01	-7.39	-24.87	-22.40	0.00
0.68	20.50	2.60	581.52	434.79	308.59	202.92	117.77	53.16	9.08	-14.48	-17.50	0.00
0.70	21.00	2.52	651.79	494.95	359.22	244.60	151.08	78.65	27.34	-2.88	-11.99	0.00
0.72	21.50	2.44	722.04	559.63	413.89	289.79	187.35	106.57	47.45	9.97	-5.84	0.00
0.73	22.00	2.35	787.42	628.96	472.69	338.61	226.71	136.99	69.47	24.12	0.97	0.00
0.75	22.50	2.25	848.07	698.07	535.76	391.15	269.23	170.00	93.46	39.61	8.46	0.00
0.77	23.00	2.15	904.12	762.08	603.22	447.52	315.00	205.65	119.48	56.48	16.65	0.00
0.78	23.50	2.04	955.70	821.12	670.15	507.82	364.12	244.04	147.59	74.76	25.57	0.00
0.80	24.00	1.92	1002.93	875.28	731.69	572.14	416.65	285.21	177.83	94.50	35.22	0.00
0.82	24.50	1.80	1045.93	924.69	787.91	635.57	472.68	329.24	210.26	115.72	45.64	0.00
0.83	25.00	1.67	1084.80	969.45	838.91	693.18	532.28	376.19	244.92	138.46	56.82	0.00
0.85	25.50	1.53	1119.65	1009.64	884.78	745.07	590.51	426.10	281.85	162.75	68.80	0.00
0.87	26.00	1.39	1150.57	1045.35	925.60	791.29	642.44	479.04	321.10	188.61	81.58	0.00
0.88	26.50	1.24	1177.64	1076.67	961.43	831.91	688.12	530.05	362.70	216.08	95.18	0.00
0.90	27.00	1.08	1200.94	1103.67	992.35	867.00	727.60	574.17	406.69	245.17	109.60	0.00
0.92	27.50	0.92	1220.53	1126.40	1018.42	896.60	760.93	611.43	448.09	275.90	124.87	0.00
0.93	28.00	0.75	1236.48	1144.92	1039.67	920.75	788.15	641.87	481.92	308.29	140.98	0.00
0.95	28.50	0.57	1248.84	1159.27	1056.16	939.50	809.29	665.53	508.22	337.36	157.95	0.00
0.97	29.00	0.39	1257.64	1169.50	1067.91	952.87	824.36	682.40	526.99	358.11	175.79	0.00
0.98	29.50	0.20	1262.90	1175.63	1074.95	960.88	833.40	692.52	538.24	370.56	189.48	0.00
1.00	30.00	0.00	1264.66	1177.67	1077.30	963.55	836.41	695.90	542.00	374.71	194.05	0.00

30.00 0.00 50.67 213.93 0.60 0.00

DISEÑO DEL CABLE:

CARGA PUNTUAL

k %	x	Y	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
			0.00	0.39	0.75	1.08	1.39	1.67	1.92	2.15	2.35	2.52	2.67
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.50	0.20	0.00	96.49	86.48	76.96	67.91	59.34	51.24	43.63	36.48	29.82	23.63
0.03	1.00	0.39	0.00	193.00	173.01	153.98	135.90	118.78	102.60	87.38	73.11	59.79	47.42
0.05	1.50	0.57	0.00	182.58	259.63	231.13	204.05	178.40	154.18	131.38	110.00	90.05	71.52
0.07	2.00	0.75	0.00	172.24	346.37	308.46	272.44	238.32	206.08	175.74	147.29	120.73	96.06
0.08	2.50	0.92	0.00	161.98	326.31	386.03	341.14	298.60	258.41	220.58	185.10	151.98	121.20
0.10	3.00	1.08	0.00	151.82	306.45	463.89	410.21	359.33	311.27	266.01	223.55	183.91	147.07
0.12	3.50	1.24	0.00	141.79	286.84	435.14	479.73	420.61	364.74	312.12	262.76	216.66	173.80
0.13	4.00	1.39	0.00	131.91	267.50	406.79	549.76	482.50	418.92	359.03	302.84	250.33	201.51
0.15	4.50	1.53	0.00	122.18	248.47	378.88	513.40	545.07	473.89	406.83	343.88	285.05	230.33
0.17	5.00	1.67	0.00	112.63	229.78	351.46	477.67	608.41	529.74	455.61	385.99	320.91	260.35
0.18	5.50	1.80	0.00	103.27	211.46	324.58	442.63	565.61	586.55	505.45	429.27	358.03	291.71
0.20	6.00	1.92	0.00	94.12	193.54	298.28	408.34	523.70	644.38	556.44	473.81	396.49	324.49
0.22	6.50	2.04	0.00	85.18	176.05	272.60	374.83	482.75	596.34	608.66	519.69	436.40	358.80
0.23	7.00	2.15	0.00	76.49	159.01	247.57	342.17	442.80	549.47	662.18	566.99	477.84	394.72
0.25	7.50	2.25	0.00	68.04	142.45	223.24	310.40	403.93	503.83	610.11	615.80	520.89	432.35
0.27	8.00	2.35	0.00	59.85	126.39	199.63	279.55	366.17	459.48	559.48	666.17	565.63	471.78
0.28	8.50	2.44	0.00	51.93	110.85	176.77	249.68	329.58	416.47	510.35	611.23	612.13	513.06
0.30	9.00	2.52	0.00	44.29	95.86	154.70	220.81	294.20	374.85	462.78	557.99	660.47	556.29
0.32	9.50	2.60	0.00	36.95	81.42	133.44	192.98	260.07	334.68	416.83	506.51	603.73	601.51
0.33	10.00	2.67	0.00	29.90	67.57	113.01	166.23	227.23	295.99	372.53	456.85	548.94	648.80
0.35	10.50	2.73	0.00	23.16	54.31	93.45	140.58	195.71	258.83	329.95	409.05	496.15	591.25
0.37	11.00	2.79	0.00	16.73	41.65	74.76	116.06	165.55	223.23	289.11	363.17	445.42	535.86
0.38	11.50	2.84	0.00	10.62	29.61	56.97	92.69	136.78	189.23	250.05	319.23	396.78	482.69
0.40	12.00	2.88	0.00	4.85	18.21	40.09	70.49	109.41	156.85	212.80	277.28	350.27	431.78
0.42	12.50	2.92	0.00	-0.60	7.45	24.14	49.49	83.48	126.12	177.40	237.34	305.92	383.15
0.43	13.00	2.95	0.00	-5.71	-2.67	9.13	29.69	58.99	97.06	143.87	199.44	263.77	336.84
0.45	13.50	2.97	0.00	-10.48	-12.12	-4.93	11.10	35.97	69.68	112.22	163.60	223.82	292.88
0.47	14.00	2.99	0.00	-14.91	-20.92	-18.03	-6.25	14.43	44.00	82.48	129.85	186.11	251.28
0.48	14.50	3.00	0.00	-18.99	-29.05	-30.18	-22.37	-5.63	20.04	54.64	98.18	150.65	212.05
0.50	15.00	3.00	0.00	-22.73	-36.52	-41.36	-37.25	-24.21	-2.22	28.72	68.60	117.43	175.20
0.52	15.50	3.00	0.00	-26.12	-43.31	-51.57	-50.90	-41.29	-22.75	4.72	41.13	86.47	140.74
0.53	16.00	2.99	0.00	-29.17	-49.44	-60.82	-63.30	-56.88	-41.57	-17.36	15.75	57.75	108.66
0.55	16.50	2.97	0.00	-31.87	-54.91	-69.11	-74.47	-70.99	-58.68	-37.53	-7.54	31.29	78.95
0.57	17.00	2.95	0.00	-34.23	-59.71	-76.44	-84.41	-83.63	-74.09	-55.80	-28.75	7.05	51.60
0.58	17.50	2.92	0.00	-36.25	-63.86	-82.82	-93.13	-94.80	-87.81	-72.18	-47.90	-14.97	26.60
0.60	18.00	2.88	0.00	-37.94	-67.36	-88.26	-100.65	-104.52	-99.87	-86.70	-65.01	-34.81	3.92
0.62	18.50	2.84	0.00	-39.29	-70.22	-92.78	-106.98	-112.81	-110.27	-99.37	-80.11	-52.48	-16.48
0.63	19.00	2.79	0.00	-40.32	-72.45	-96.38	-112.13	-119.69	-119.06	-110.23	-93.22	-68.01	-34.62
0.65	19.50	2.73	0.00	-41.02	-74.05	-99.09	-116.13	-125.19	-126.24	-119.31	-104.38	-81.46	-50.54
0.67	20.00	2.67	0.00	-41.41	-75.05	-100.92	-119.01	-129.33	-131.87	-126.64	-113.63	-92.85	-64.30
0.68	20.50	2.60	0.00	-41.50	-75.46	-101.89	-120.78	-132.14	-135.97	-132.26	-121.02	-102.24	-75.94
0.70	21.00	2.52	0.00	-41.28	-75.29	-102.02	-121.48	-133.67	-138.58	-136.22	-126.59	-109.68	-85.51
0.72	21.50	2.44	0.00	-40.77	-74.55	-101.34	-121.14	-133.94	-139.75	-138.57	-130.40	-115.23	-93.07
0.73	22.00	2.35	0.00	-39.98	-73.28	-99.88	-119.78	-133.00	-139.53	-139.36	-132.50	-118.95	-98.71
0.75	22.50	2.25	0.00	-38.93	-71.48	-97.66	-117.46	-130.90	-137.96	-138.65	-132.96	-120.90	-102.47
0.77	23.00	2.15	0.00	-37.61	-69.18	-94.72	-114.21	-127.68	-135.10	-136.49	-131.85	-121.17	-104.45
0.78	23.50	2.04	0.00	-36.04	-66.40	-91.08	-110.08	-123.39	-131.02	-132.97	-129.24	-119.82	-104.72
0.80	24.00	1.92	0.00	-34.24	-63.17	-86.79	-105.10	-118.09	-125.77	-128.14	-125.20	-116.94	-103.37
0.82	24.50	1.80	0.00	-32.22	-59.52	-81.88	-99.32	-111.84	-119.42	-122.08	-119.82	-112.62	-100.50
0.83	25.00	1.67	0.00	-29.99	-55.46	-76.40	-92.81	-104.69	-112.05	-114.88	-113.18	-106.95	-96.20
0.85	25.50	1.53	0.00	-27.57	-51.03	-70.38	-85.60	-96.72	-103.72	-106.60	-105.37	-100.03	-90.57
0.87	26.00	1.39	0.00	-24.98	-46.26	-63.86	-77.77	-87.99	-94.51	-97.35	-96.50	-91.96	-83.73
0.88	26.50	1.24	0.00	-22.22	-41.19	-56.90	-69.36	-78.56	-84.51	-87.21	-86.66	-82.85	-75.78
0.90	27.00	1.08	0.00	-19.32	-35.83	-49.54	-60.44	-68.53	-73.81	-76.28	-75.95	-72.81	-66.86
0.92	27.50	0.92	0.00	-16.30	-30.24	-41.83	-51.07	-57.95	-62.48	-64.66	-64.48	-61.95	-57.07
0.93	28.00	0.75	0.00	-13.17	-24.45	-33.83	-41.32	-46.93	-50.64	-52.45	-52.38	-50.41	-46.56
0.95	28.50	0.57	0.00	-9.95	-18.48	-25.59	-31.27	-35.53	-38.36	-39.77	-39.75	-38.31	-35.45
0.97	29.00	0.39	0.00	-6.67	-12.39	-17.16	-20.98	-23.84	-25.76	-26.72	-26.73	-25.78	-23.89
0.98	29.50	0.20	0.00	-3.35	-6.22	-8.61	-10.53	-11.97	-12.94	-13.42	-13.43	-12.97	-12.02
1.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

k %	x	Y	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00
			2.79	2.88	2.95	2.99	3.00	2.99	2.95	2.88	2.79	2.67
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.50	0.20	17.92	12.69	7.93	3.65	-0.16	-3.48	-6.33	-8.71	-10.60	-12.02
0.03	1.00	0.39	36.01	25.54	16.03	7.47	-0.13	-6.79	-12.49	-17.24	-21.04	-23.89
0.05	1.50	0.57	54.41	38.73	24.47	11.64	0.23	-9.75	-18.31	-25.45	-31.16	-35.45
0.07	2.00	0.75	73.29	52.41	33.41	16.31	1.11	-12.21	-23.63	-33.17	-40.81	-46.56
0.08	2.50	0.92	92.79	66.72	43.01	21.65	2.65	-14.00	-28.30	-40.24	-49.83	-57.07
0.10	3.00	1.08	113.05	81.83	53.41	27.81	5.01	-14.98	-32.16	-46.53	-58.10	-66.86
0.12	3.50	1.24	134.20	97.86	64.76	34.92	8.34	-14.99	-35.07	-51.90	-65.47	-75.78
0.13	4.00	1.39	156.38	114.95	77.20	43.14	12.77	-13.91	-36.90	-56.20	-71.81	-83.73
0.15	4.50	1.53	179.72	133.23	90.85	52.59	18.44	-11.59	-37.51	-59.31	-77.00	-90.57
0.17	5.00	1.67	204.32	152.82	105.85	63.40	25.48	-7.91	-36.77	-61.11	-80.92	-96.20
0.18	5.50	1.80	230.31	173.85	122.31	75.70	34.02	-2.74	-34.57	-61.47	-83.45	-100.50
0.20	6.00	1.92	257.80	196.42	140.35	89.60	44.15	4.02	-30.79	-60.30	-84.49	-103.37
0.22	6.50	2.04	286.87	220.63	160.08	105.20	56.01	12.50	-25.33	-57.48	-83.94	-104.72
0.23	7.00	2.15	317.64	246.60	181.59	122.62	69.68	22.78	-18.08	-52.90	-81.70	-104.45
0.25	7.50	2.25	350.19	274.41	204.99	141.95	85.28	34.98	-8.94	-46.49	-77.67	-102.47
0.27	8.00	2.35	384.61	304.14	230.37	163.28	102.89	49.18	2.17	-38.14	-71.77	-98.71
0.28	8.50	2.44	420.98	335.90	257.80	186.70	122.59	65.47	15.35	-27.78	-63.93	-93.07
0.30	9.00	2.52	459.38	369.74	287.38	212.29	144.48	83.93	30.66	-15.33	-54.06	-85.51
0.32	9.50	2.60	499.86	405.75	319.17	240.13	168.62	104.64	48.19	-0.72	-42.09	-75.94
0.33	10.00	2.67	542.51	443.99	353.24	270.27	195.08	127.65	68.00	16.13	-27.97	-64.30
0.35	10.50	2.73	587.37	484.52	389.66	302.79	223.92	153.04	90.16	35.26	-11.64	-50.54
0.37	11.00	2.79	634.50	527.39	428.47	337.74	255.21	180.86	114.71	56.74	6.97	-34.62
0.38	11.50	2.84	576.97	572.65	469.73	375.18	288.99	211.16	141.70	80.61	27.88	-16.48
0.40	12.00	2.88	521.80	620.35	513.48	415.13	325.30	243.99	171.19	106.92	51.16	3.92
0.42	12.50	2.92	469.03	563.56	559.76	457.65	364.19	279.38	203.21	135.69	76.82	26.60
0.43	13.00	2.95	418.68	509.27	608.61	502.77	405.69	317.37	237.79	166.98	104.91	51.60
0.45	13.50	2.97	370.77	457.50	553.07	550.51	449.83	357.98	274.96	200.79	135.45	78.95
0.47	14.00	2.99	325.34	408.29	500.15	600.90	496.62	401.23	314.74	237.15	168.45	108.66
0.48	14.50	3.00	282.38	361.65	449.85	546.98	546.08	447.14	357.14	276.08	203.94	140.74
0.50	15.00	3.00	241.91	317.57	402.18	495.73	598.22	495.73	402.18	317.57	241.91	175.20
0.52	15.50	3.00	203.94	276.08	357.14	447.14	546.08	546.98	449.85	361.65	282.38	212.05
0.53	16.00	2.99	168.45	237.15	314.74	401.23	496.62	600.90	500.15	408.29	325.34	251.28
0.55	16.50	2.97	135.45	200.79	274.96	357.98	449.83	550.51	553.07	457.50	370.77	292.88
0.57	17.00	2.95	104.91	166.98	237.79	317.37	405.69	502.77	608.61	509.27	418.68	336.84
0.58	17.50	2.92	76.82	135.69	203.21	279.38	364.19	457.65	559.76	563.56	469.03	383.15
0.60	18.00	2.88	51.16	106.92	171.19	243.99	325.30	415.13	513.48	620.35	521.80	431.78
0.62	18.50	2.84	27.88	80.61	141.70	211.16	288.99	375.18	469.73	572.65	576.97	482.69
0.63	19.00	2.79	6.97	56.74	114.71	180.86	255.21	337.74	428.47	527.39	634.50	535.86
0.65	19.50	2.73	-11.64	35.26	90.16	153.04	223.92	302.79	389.66	484.52	587.37	591.25
0.67	20.00	2.67	-27.97	16.13	68.00	127.65	195.08	270.27	353.24	443.99	542.51	648.80
0.68	20.50	2.60	-42.09	-0.72	48.19	104.64	168.62	240.13	319.17	405.75	499.86	601.51
0.70	21.00	2.52	-54.06	-15.33	30.66	83.93	144.48	212.29	287.38	369.74	459.38	556.29
0.72	21.50	2.44	-63.93	-27.78	15.35	65.47	122.59	186.70	257.80	335.90	420.98	513.06
0.73	22.00	2.35	-71.77	-38.14	2.17	49.18	102.89	163.28	230.37	304.14	384.61	471.78
0.75	22.50	2.25	-77.67	-46.49	-8.94	34.98	85.28	141.95	204.99	274.41	350.19	432.35
0.77	23.00	2.15	-81.70	-52.90	-18.08	22.78	69.68	122.62	181.59	246.60	317.64	394.72
0.78	23.50	2.04	-83.94	-57.48	-25.33	12.50	56.01	105.20	160.08	220.63	286.87	358.80
0.80	24.00	1.92	-84.49	-60.30	-30.79	4.02	44.15	89.60	140.35	196.42	257.80	324.49
0.82	24.50	1.80	-83.45	-61.47	-34.57	-2.74	34.02	75.70	122.31	173.85	230.31	291.71
0.83	25.00	1.67	-80.92	-61.11	-36.77	-7.91	25.48	63.40	105.85	152.82	204.32	260.35
0.85	25.50	1.53	-77.00	-59.31	-37.51	-11.59	18.44	52.59	90.85	133.23	179.72	230.33
0.87	26.00	1.39	-71.81	-56.20	-36.90	-13.91	12.77	43.14	77.20	114.95	156.38	201.51
0.88	26.50	1.24	-65.47	-51.90	-35.07	-14.99	8.34	34.92	64.76	97.86	134.20	173.80
0.90	27.00	1.08	-58.10	-46.53	-32.16	-14.98	5.01	27.81	53.41	81.83	113.05	147.07
0.92	27.50	0.92	-49.83	-40.24	-28.30	-14.00	2.65	21.65	43.01	66.72	92.79	121.20
0.93	28.00	0.75	-40.81	-33.17	-23.63	-12.21	1.11	16.31	33.41	52.41	73.29	96.06
0.95	28.50	0.57	-31.16	-25.45	-18.31	-9.75	0.23	11.64	24.47	38.73	54.41	71.52
0.97	29.00	0.39	-21.04	-17.24	-12.49	-6.79	-0.13	7.47	16.03	25.54	36.01	47.42
0.98	29.50	0.20	-10.60	-8.71	-6.33	-3.48	-0.16	3.65	7.93	12.69	17.92	23.63
1.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

k %	x	Y	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
			2.52	2.35	2.15	1.92	1.67	1.39	1.08	0.75	0.39	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.02	0.50	0.20	-12.97	-13.43	-13.42	-12.94	-11.97	-10.53	-8.61	-6.22	-3.35	0.00
0.03	1.00	0.39	-25.78	-26.73	-26.72	-25.76	-23.84	-20.98	-17.16	-12.39	-6.67	0.00
0.05	1.50	0.57	-38.31	-39.75	-39.77	-38.36	-35.53	-31.27	-25.59	-18.48	-9.95	0.00
0.07	2.00	0.75	-50.41	-52.38	-52.45	-50.64	-46.93	-41.32	-33.83	-24.45	-13.17	0.00
0.08	2.50	0.92	-61.95	-64.48	-64.66	-62.48	-57.95	-51.07	-41.83	-30.24	-16.30	0.00
0.10	3.00	1.08	-72.81	-75.95	-76.28	-73.81	-68.53	-60.44	-49.54	-35.83	-19.32	0.00
0.12	3.50	1.24	-82.85	-86.66	-87.21	-84.51	-78.56	-69.36	-56.90	-41.19	-22.22	0.00
0.13	4.00	1.39	-91.96	-96.50	-97.35	-94.51	-87.99	-77.77	-63.86	-46.26	-24.98	0.00
0.15	4.50	1.53	-100.03	-105.37	-106.60	-103.72	-96.72	-85.60	-70.38	-51.03	-27.57	0.00
0.17	5.00	1.67	-106.95	-113.18	-114.88	-112.05	-104.69	-92.81	-76.40	-55.46	-29.99	0.00
0.18	5.50	1.80	-112.62	-119.82	-122.08	-119.42	-111.84	-99.32	-81.88	-59.52	-32.22	0.00
0.20	6.00	1.92	-116.94	-125.20	-128.14	-125.77	-118.09	-105.10	-86.79	-63.17	-34.24	0.00
0.22	6.50	2.04	-119.82	-129.24	-132.97	-131.02	-123.39	-110.08	-91.08	-66.40	-36.04	0.00
0.23	7.00	2.15	-121.17	-131.85	-136.49	-135.10	-127.68	-114.21	-94.72	-69.18	-37.61	0.00
0.25	7.50	2.25	-120.90	-132.96	-138.65	-137.96	-130.90	-117.46	-97.66	-71.48	-38.93	0.00
0.27	8.00	2.35	-118.95	-132.50	-139.36	-139.53	-133.00	-119.78	-99.88	-73.28	-39.98	0.00
0.28	8.50	2.44	-115.23	-130.40	-138.57	-139.75	-133.94	-121.14	-101.34	-74.55	-40.77	0.00
0.30	9.00	2.52	-109.68	-126.59	-136.22	-138.58	-133.67	-121.48	-102.02	-75.29	-41.28	0.00
0.32	9.50	2.60	-102.24	-121.02	-132.26	-135.97	-132.14	-120.78	-101.89	-75.46	-41.50	0.00
0.33	10.00	2.67	-92.85	-113.63	-126.64	-131.87	-129.33	-119.01	-100.92	-75.05	-41.41	0.00
0.35	10.50	2.73	-81.46	-104.38	-119.31	-126.24	-125.19	-116.13	-99.09	-74.05	-41.02	0.00
0.37	11.00	2.79	-68.01	-93.22	-110.23	-119.06	-119.69	-112.13	-96.38	-72.45	-40.32	0.00
0.38	11.50	2.84	-52.48	-80.11	-99.37	-110.27	-112.81	-106.98	-92.78	-70.22	-39.29	0.00
0.40	12.00	2.88	-34.81	-65.01	-86.70	-99.87	-104.52	-100.65	-88.26	-67.36	-37.94	0.00
0.42	12.50	2.92	-14.97	-47.90	-72.18	-87.81	-94.80	-93.13	-82.82	-63.86	-36.25	0.00
0.43	13.00	2.95	7.05	-28.75	-55.80	-74.09	-83.63	-84.41	-76.44	-59.71	-34.23	0.00
0.45	13.50	2.97	31.29	-7.54	-37.53	-58.68	-70.99	-74.47	-69.11	-54.91	-31.87	0.00
0.47	14.00	2.99	57.75	15.75	-17.36	-41.57	-56.88	-63.30	-60.82	-49.44	-29.17	0.00
0.48	14.50	3.00	86.47	41.13	4.72	-22.75	-41.29	-50.90	-51.57	-43.31	-26.12	0.00
0.50	15.00	3.00	117.43	68.60	28.72	-2.22	-24.21	-37.25	-41.36	-36.52	-22.73	0.00
0.52	15.50	3.00	150.65	98.18	54.64	20.04	-5.63	-22.37	-30.18	-29.05	-18.99	0.00
0.53	16.00	2.99	186.11	129.85	82.48	44.00	14.43	-6.25	-18.03	-20.92	-14.91	0.00
0.55	16.50	2.97	223.82	163.60	112.22	69.68	35.97	11.10	-4.93	-12.12	-10.48	0.00
0.57	17.00	2.95	263.77	199.44	143.87	97.06	58.99	29.69	9.13	-2.67	-5.71	0.00
0.58	17.50	2.92	305.92	237.34	177.40	126.12	83.48	49.49	24.14	7.45	-0.60	0.00
0.60	18.00	2.88	350.27	277.28	212.80	156.85	109.41	70.49	40.09	18.21	4.85	0.00
0.62	18.50	2.84	396.78	319.23	250.05	189.23	136.78	92.69	56.97	29.61	10.62	0.00
0.63	19.00	2.79	445.42	363.17	289.11	223.23	165.55	116.06	74.76	41.65	16.73	0.00
0.65	19.50	2.73	496.15	409.05	329.95	258.83	195.71	140.58	93.45	54.31	23.16	0.00
0.67	20.00	2.67	548.94	456.85	372.53	295.99	227.23	166.23	113.01	67.57	29.90	0.00
0.68	20.50	2.60	603.73	506.51	416.83	334.68	260.07	192.98	133.44	81.42	36.95	0.00
0.70	21.00	2.52	660.47	557.99	462.78	374.85	294.20	220.81	154.70	95.86	44.29	0.00
0.72	21.50	2.44	612.13	611.23	510.35	416.47	329.58	249.68	176.77	110.85	51.93	0.00
0.73	22.00	2.35	565.63	666.17	559.48	459.48	366.17	279.55	199.63	126.39	59.85	0.00
0.75	22.50	2.25	520.89	615.80	610.11	503.83	403.93	310.40	223.24	142.45	68.04	0.00
0.77	23.00	2.15	477.84	566.99	662.18	549.47	442.80	342.17	247.57	159.01	76.49	0.00
0.78	23.50	2.04	436.40	519.69	608.66	596.34	482.75	374.83	272.60	176.05	85.18	0.00
0.80	24.00	1.92	396.49	473.81	556.44	644.38	523.70	408.34	298.28	193.54	94.12	0.00
0.82	24.50	1.80	358.03	429.27	505.45	586.55	565.61	442.63	324.58	211.46	103.27	0.00
0.83	25.00	1.67	320.91	385.99	455.61	529.74	608.41	477.67	351.46	229.78	112.63	0.00
0.85	25.50	1.53	285.05	343.88	406.83	473.89	545.07	513.40	378.88	248.47	122.18	0.00
0.87	26.00	1.39	250.33	302.84	359.03	418.92	482.50	549.76	406.79	267.50	131.91	0.00
0.88	26.50	1.24	216.66	262.76	312.12	364.74	420.61	479.73	435.14	286.84	141.79	0.00
0.90	27.00	1.08	183.91	223.55	266.01	311.27	359.33	410.21	463.89	306.45	151.82	0.00
0.92	27.50	0.92	151.98	185.10	220.58	258.41	298.60	341.14	386.03	326.31	161.98	0.00
0.93	28.00	0.75	120.73	147.29	175.74	206.08	238.32	272.44	308.46	346.37	172.24	0.00
0.95	28.50	0.57	90.05	110.00	131.38	154.18	178.40	204.05	231.13	259.63	182.58	0.00
0.97	29.00	0.39	59.79	73.11	87.38	102.60	118.78	135.90	153.98	173.01	193.00	0.00
0.98	29.50	0.20	29.82	36.48	43.63	51.24	59.34	67.91	76.96	86.48	96.49	0.00
1.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00