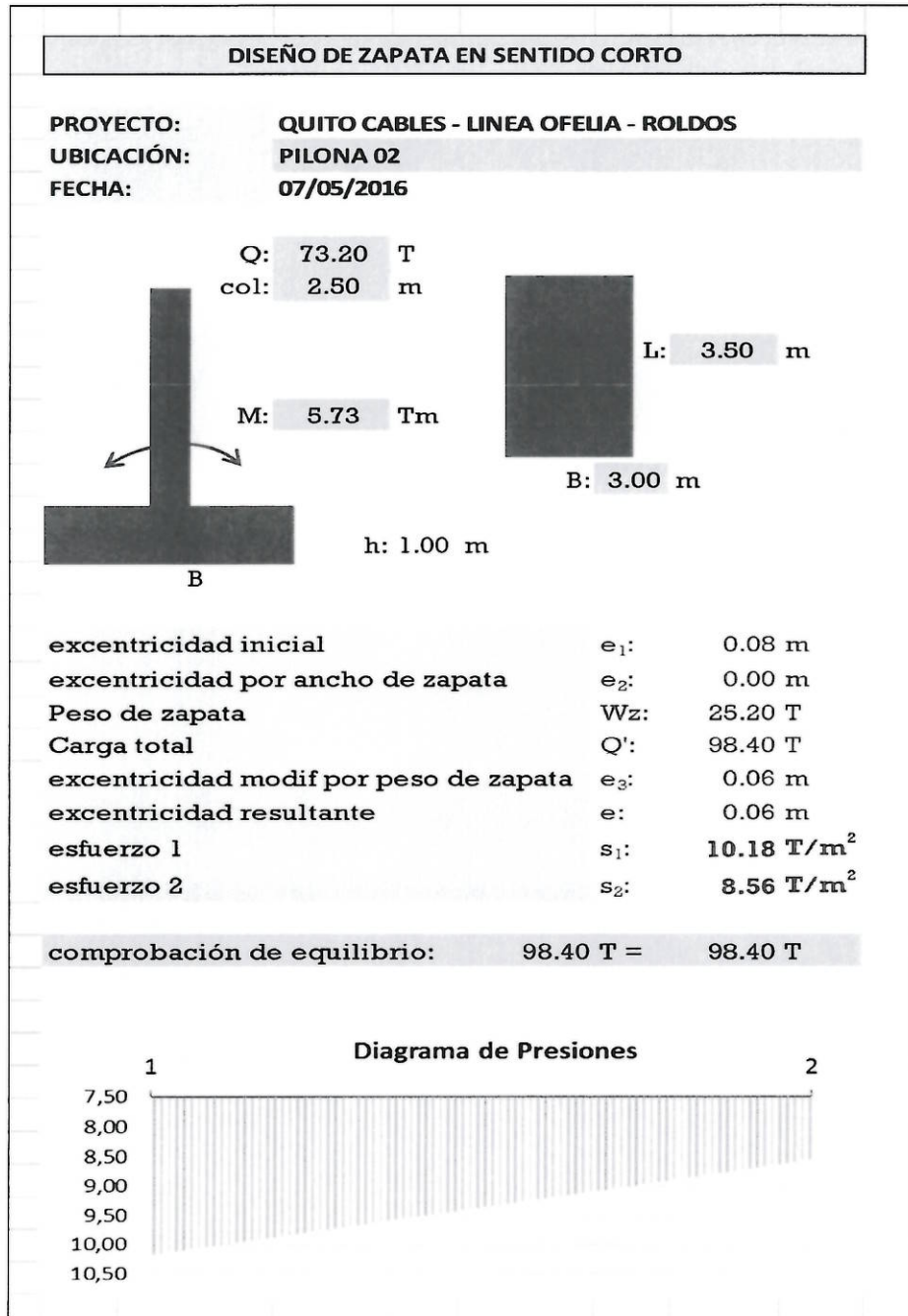
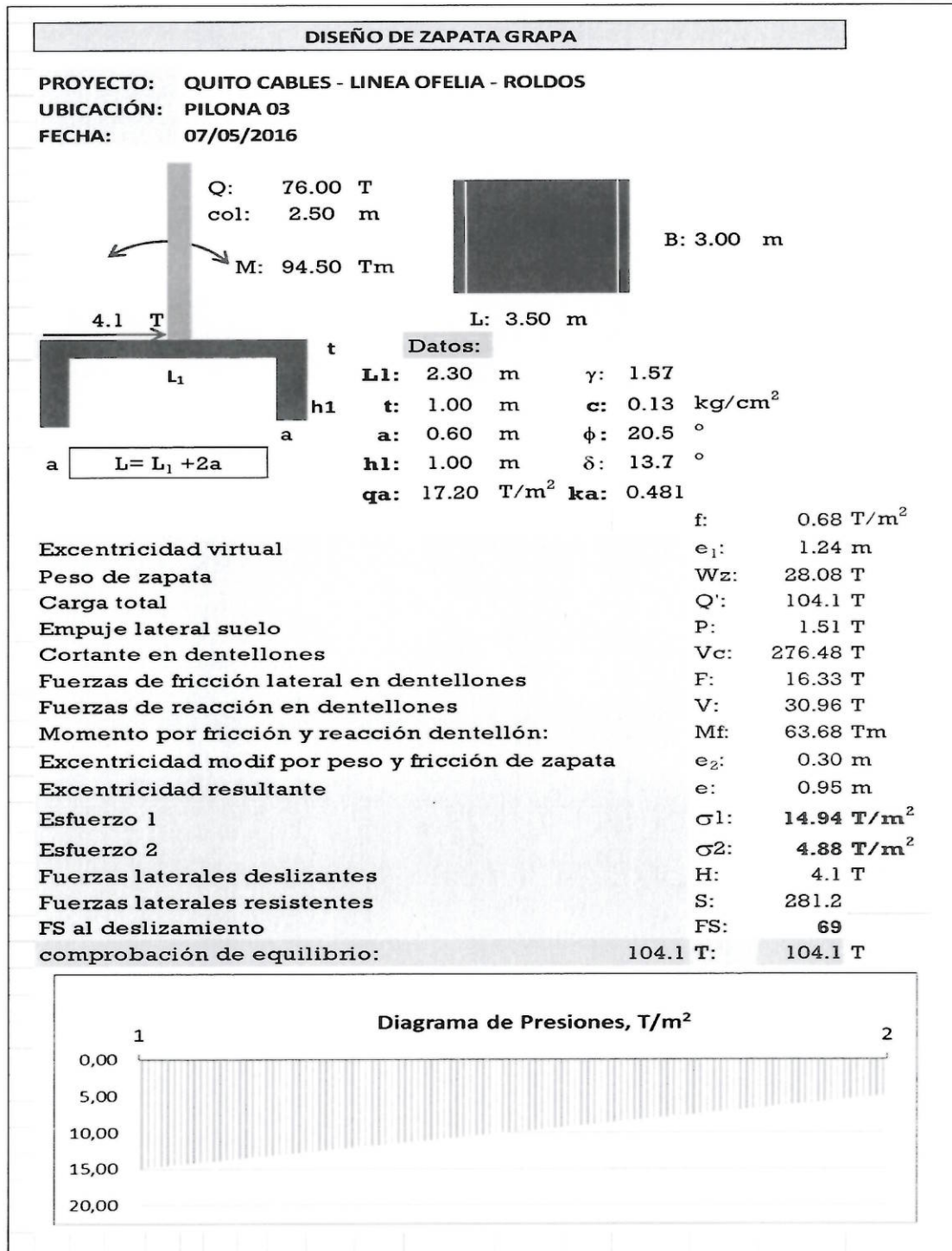


DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



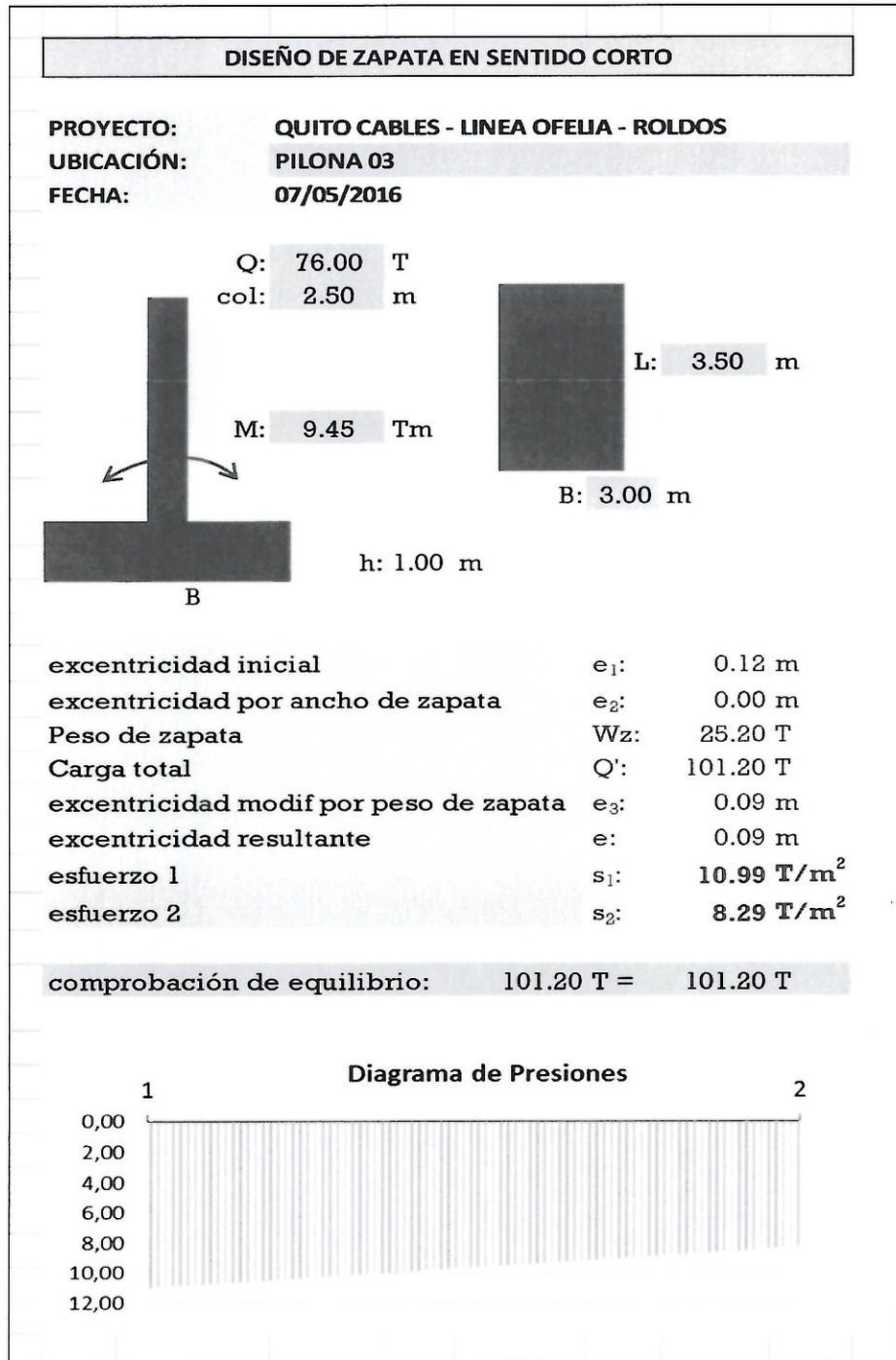
28/7/3
QBL

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X

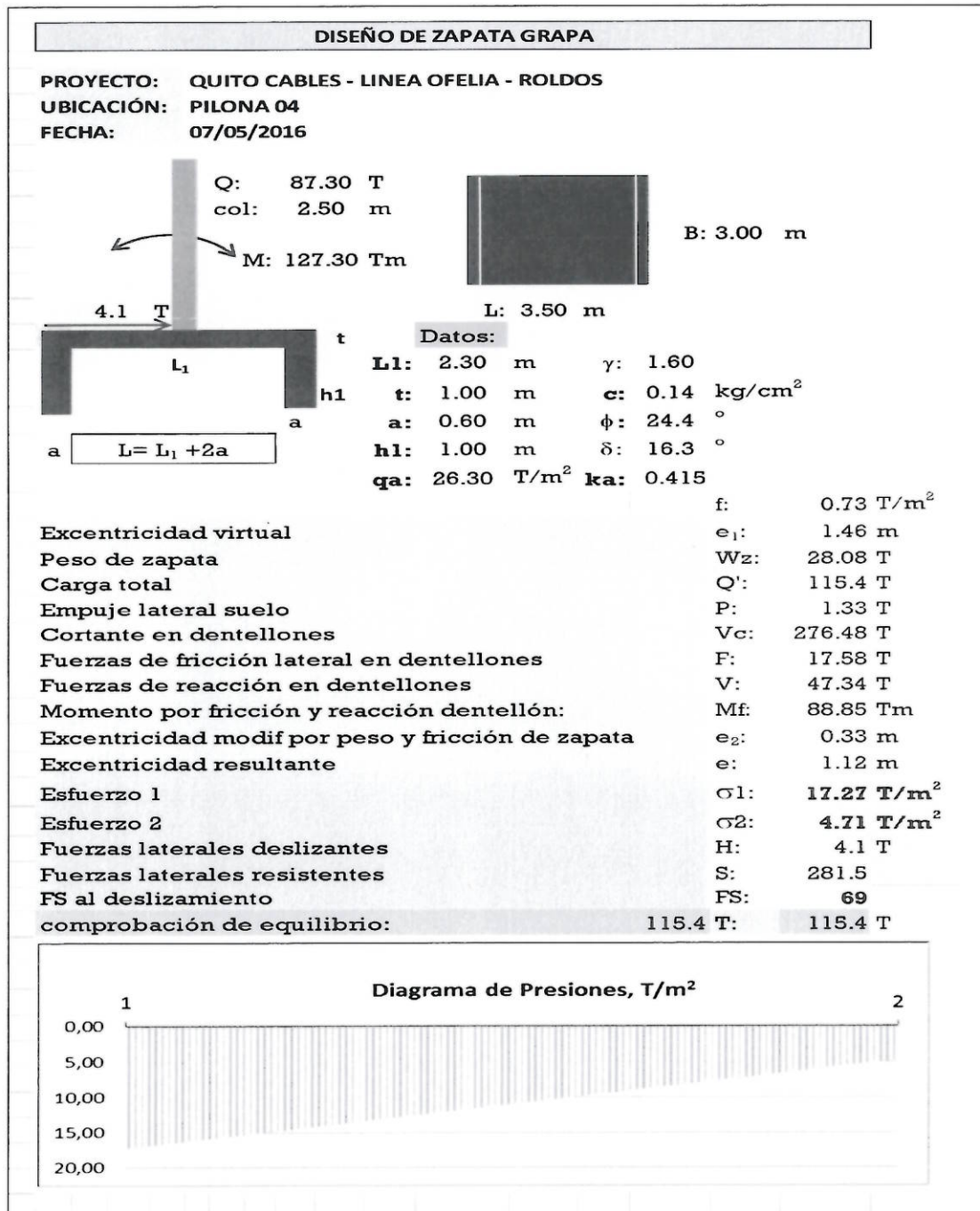


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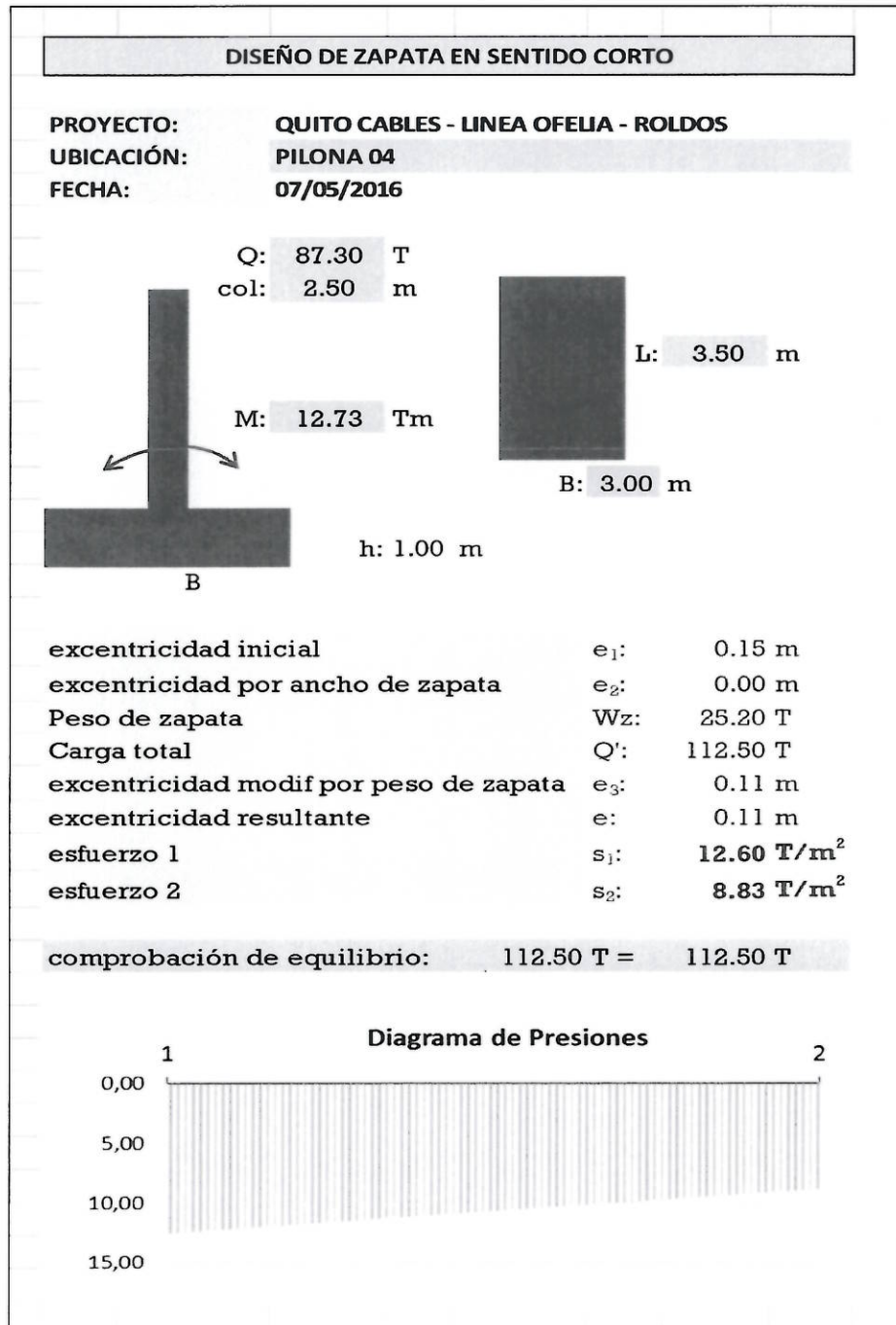
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



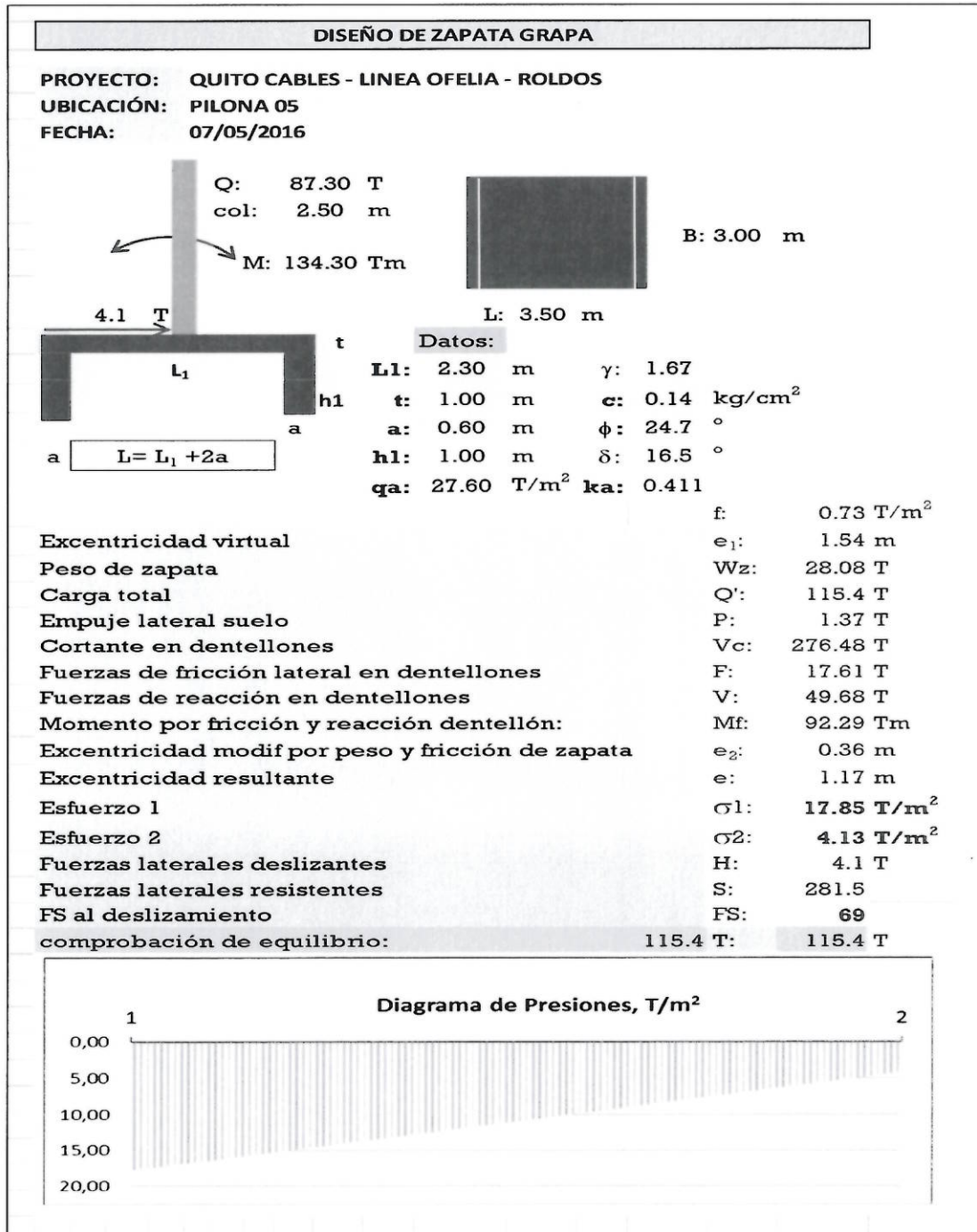
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



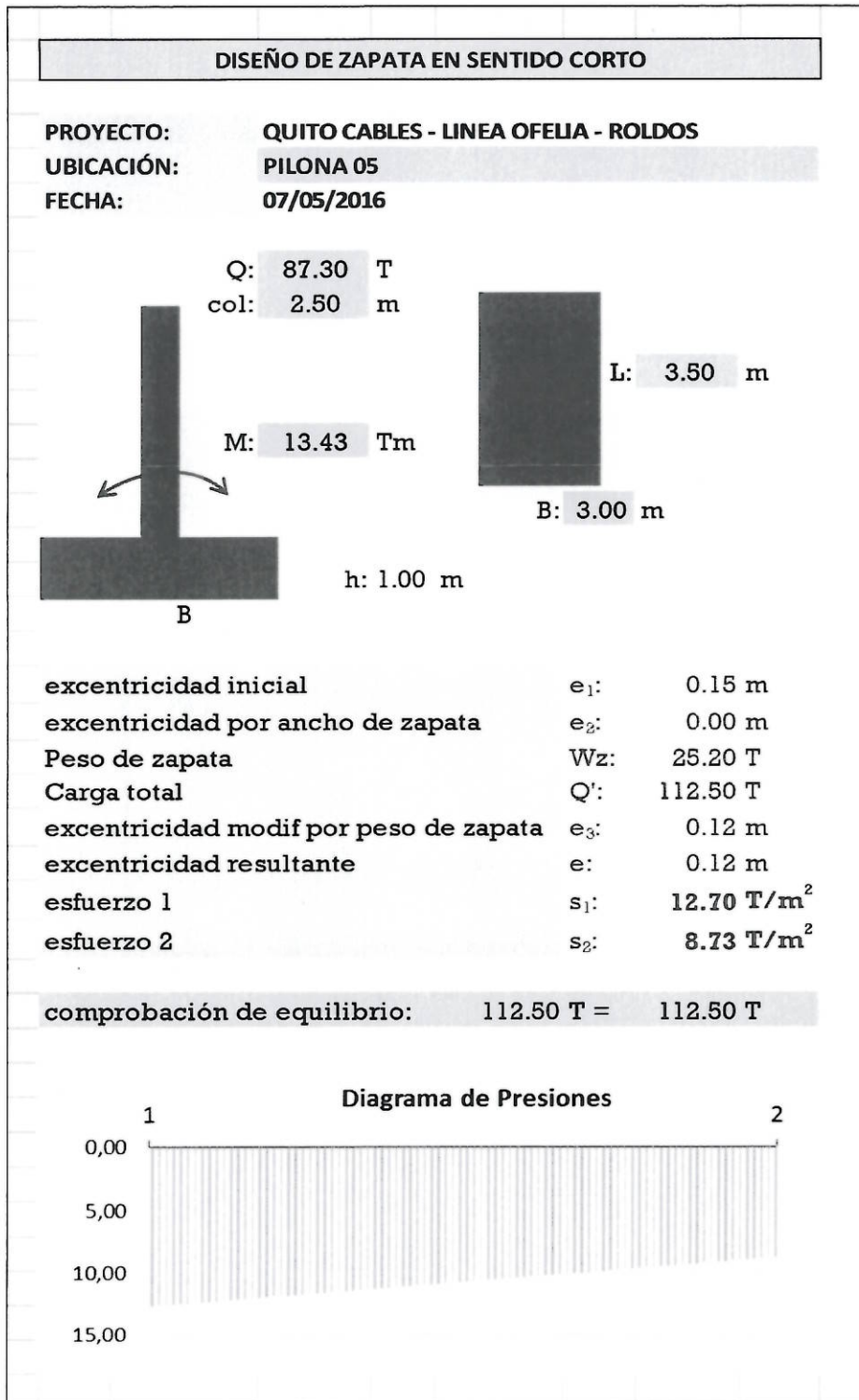
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



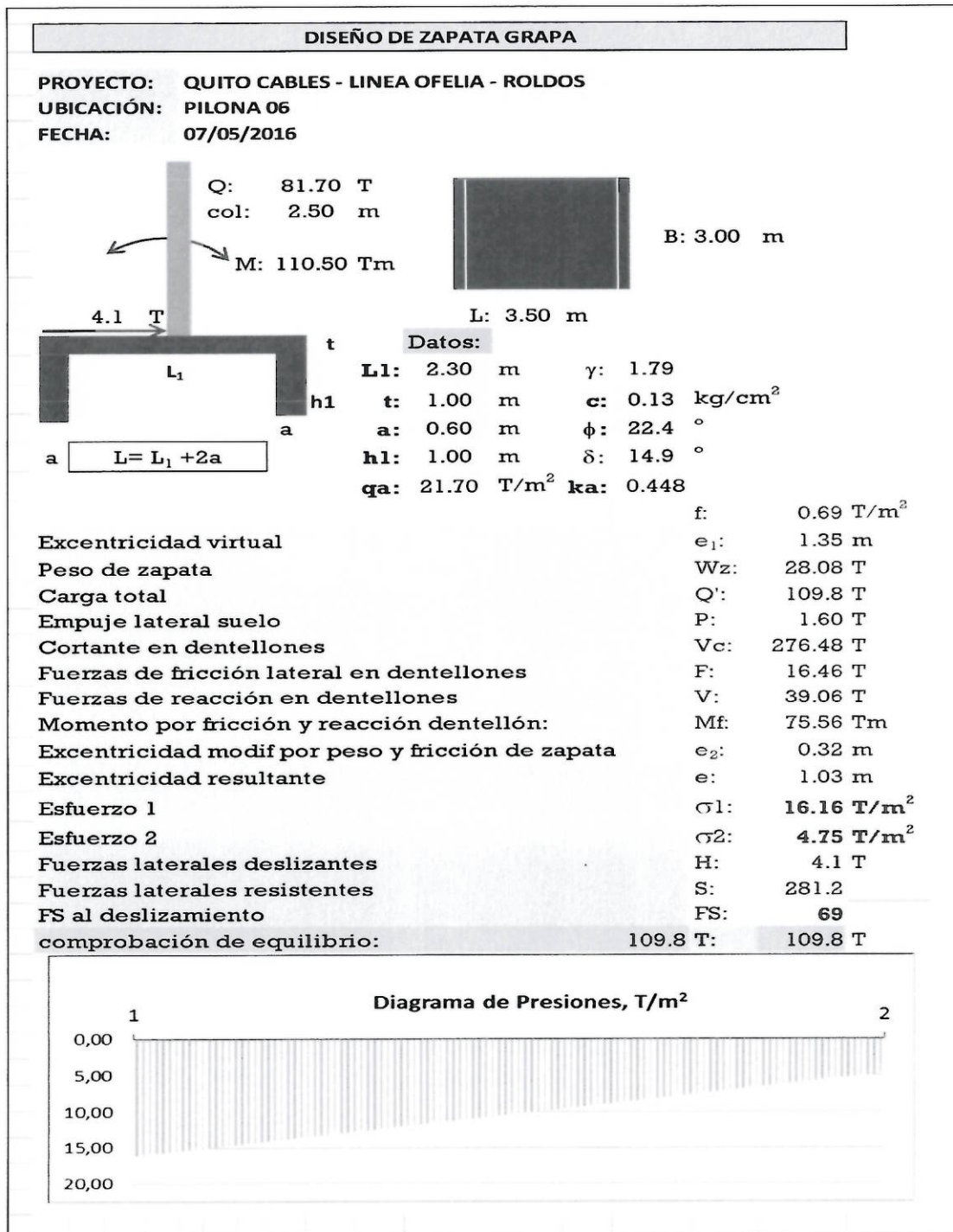
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



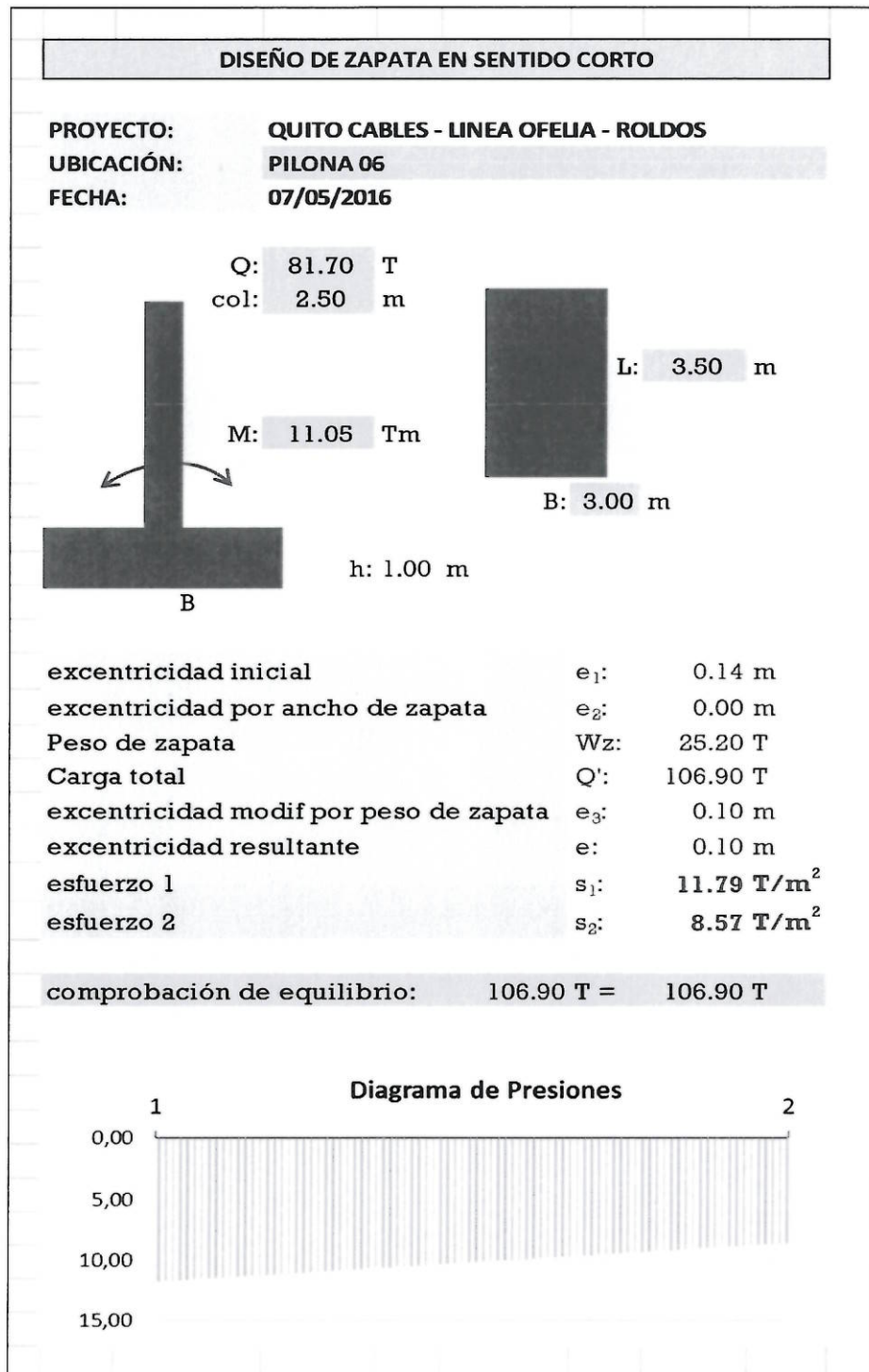
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



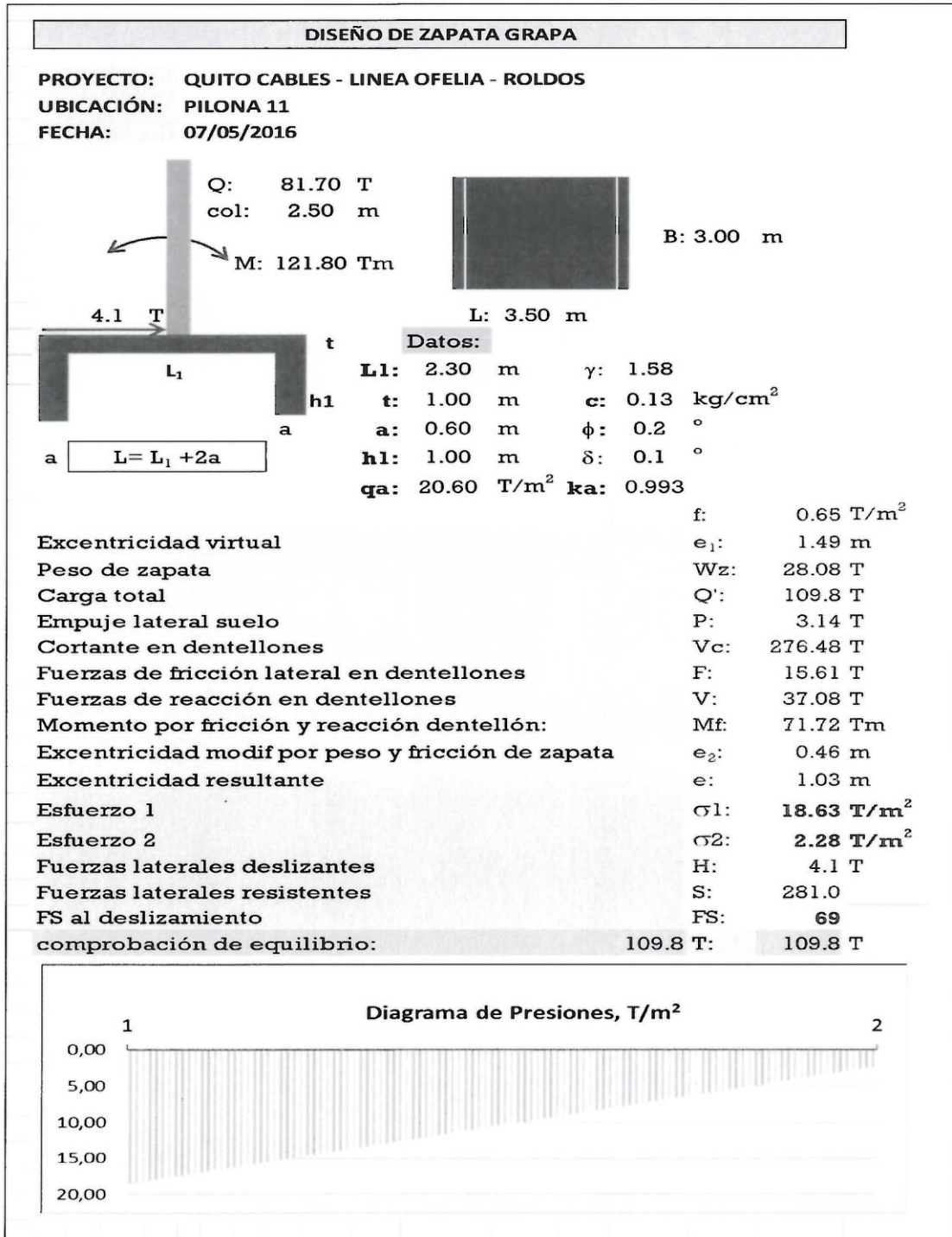
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



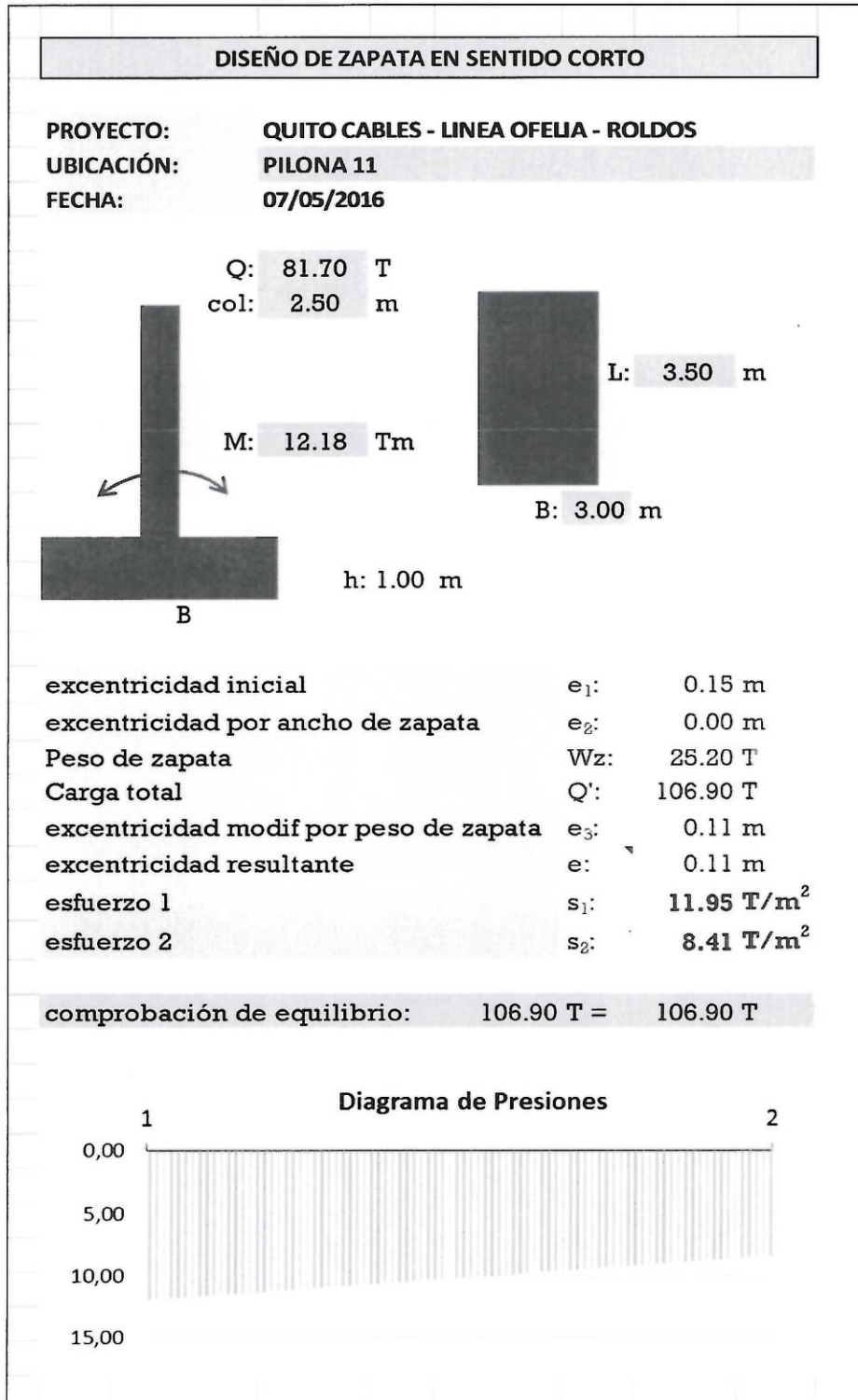
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



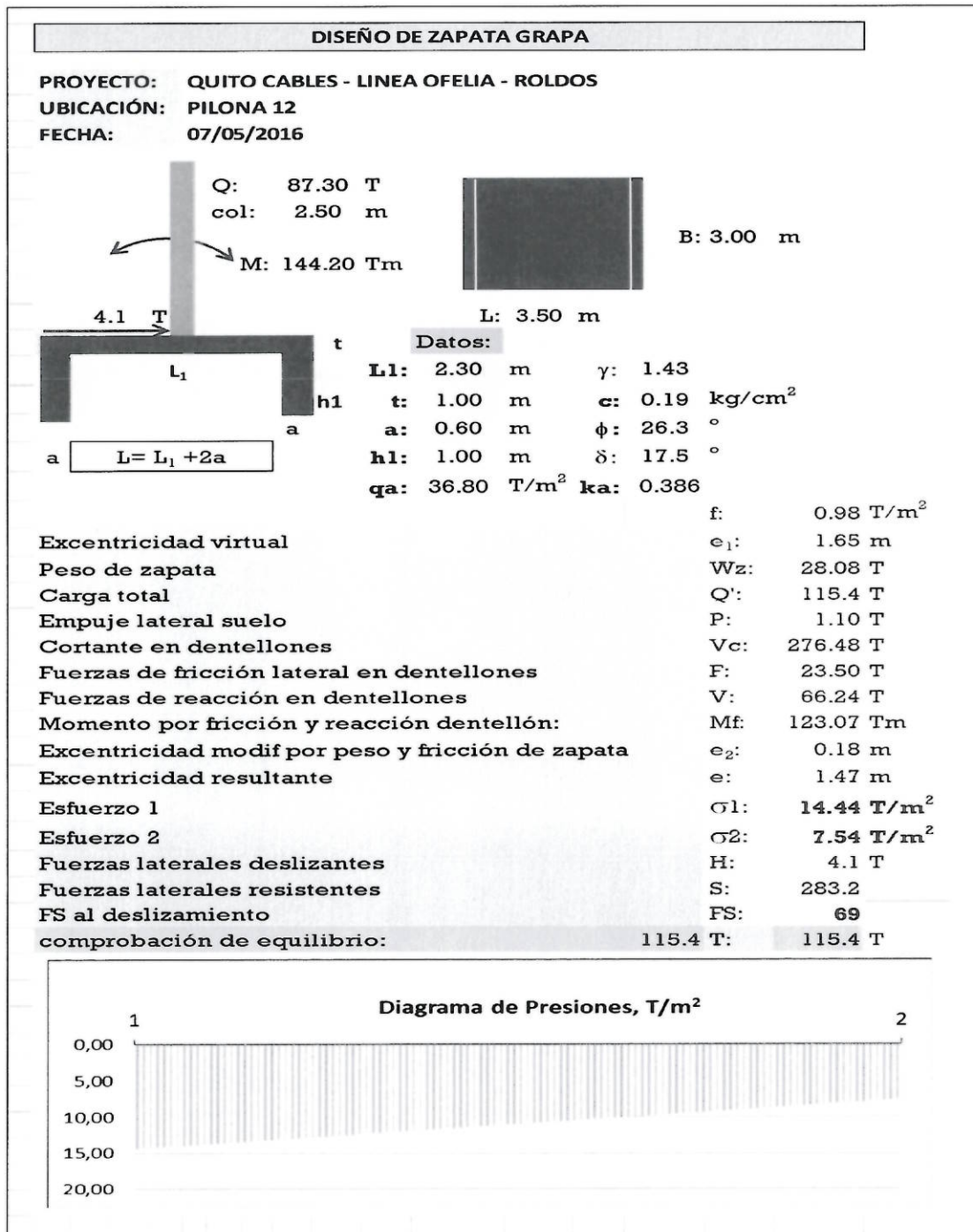
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y

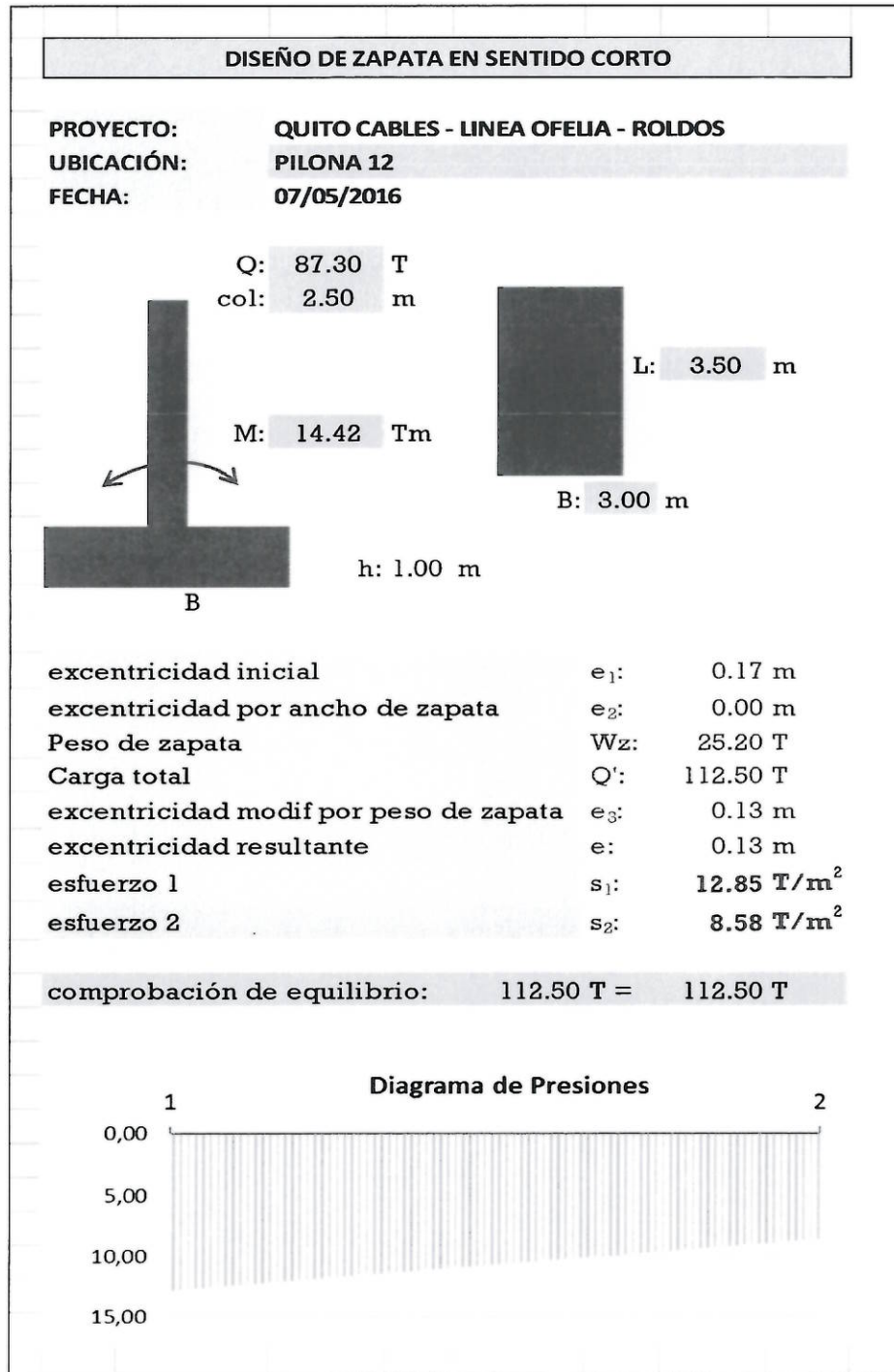


DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



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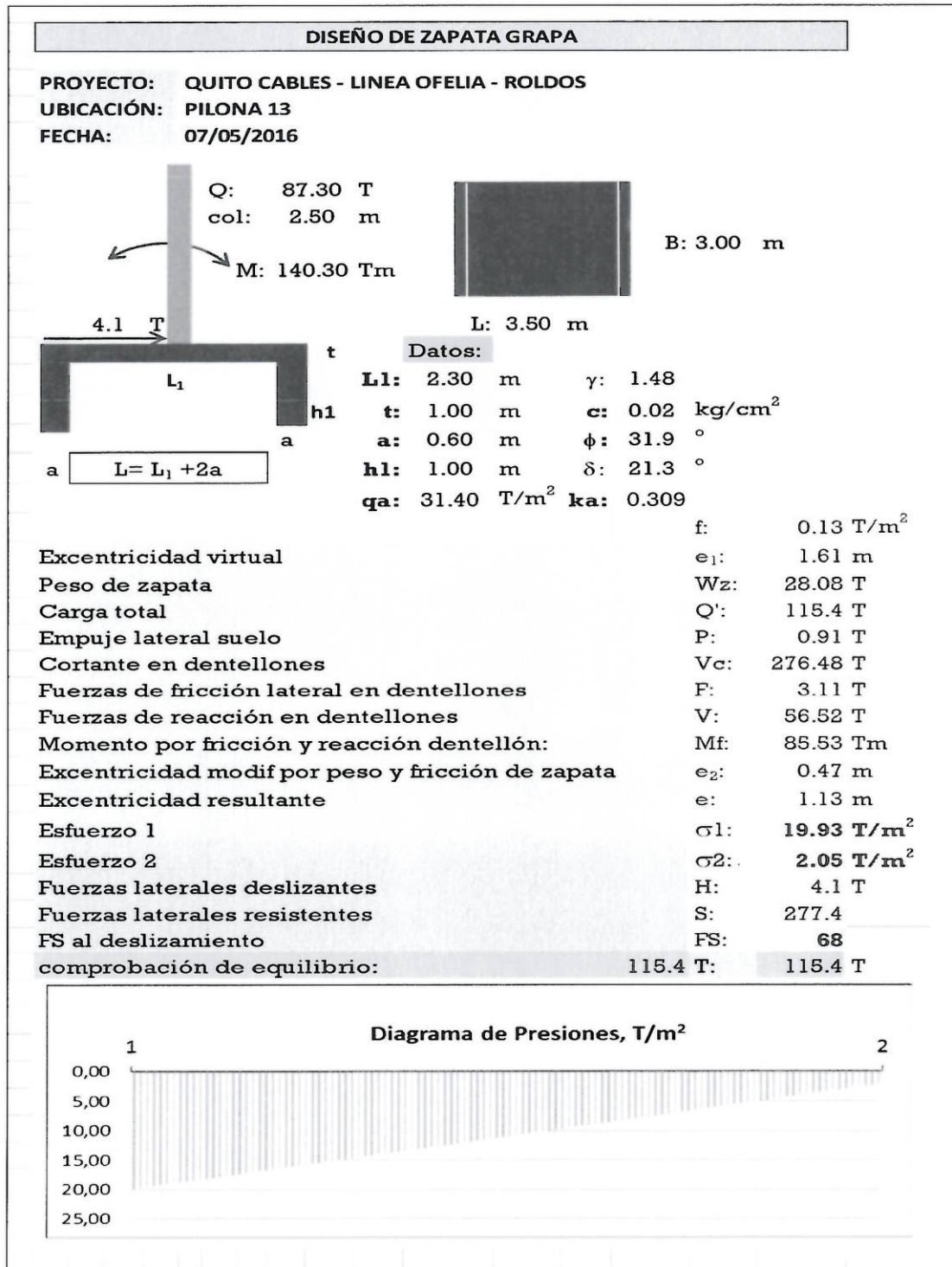
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



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OP4

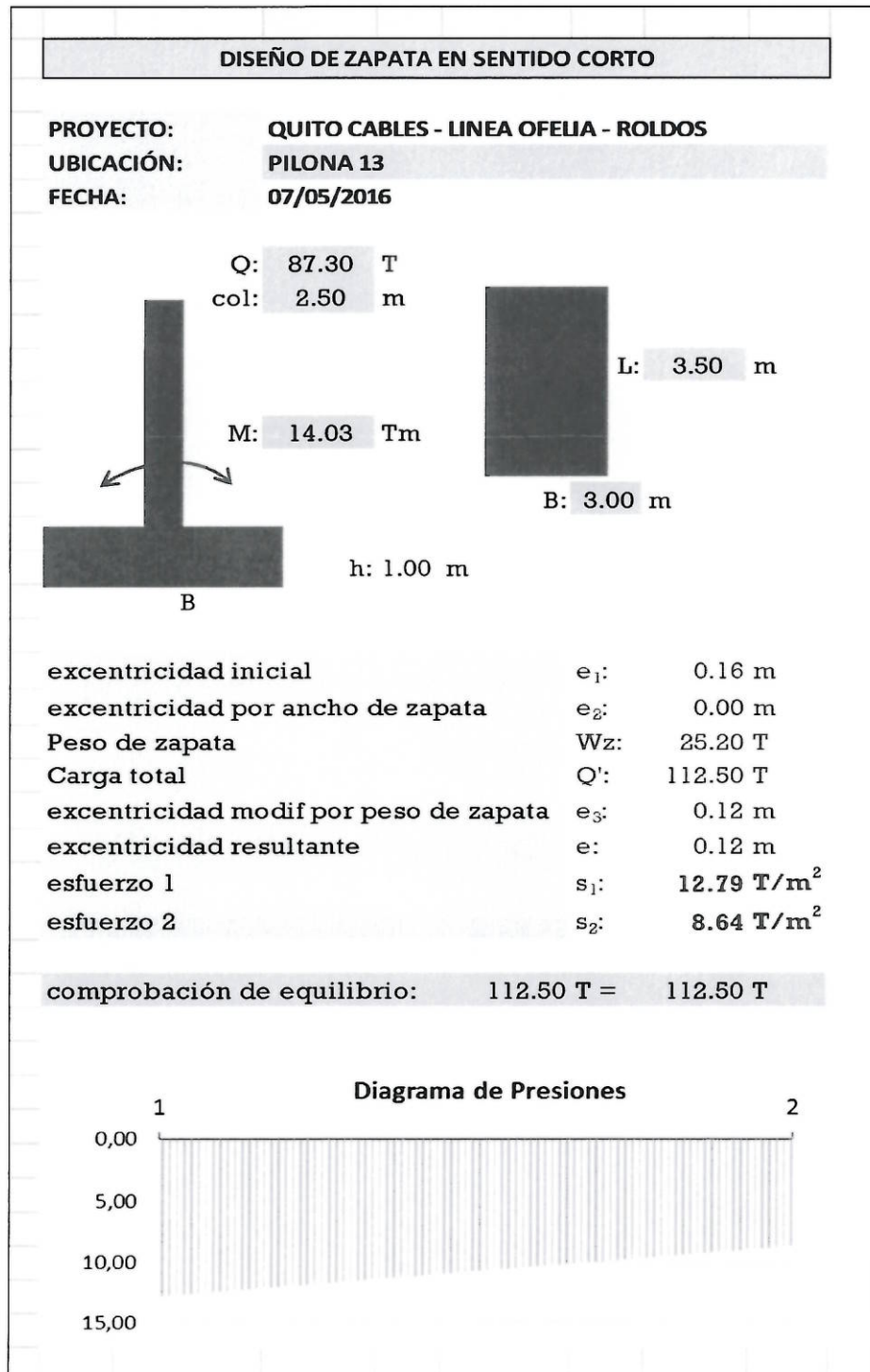


DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



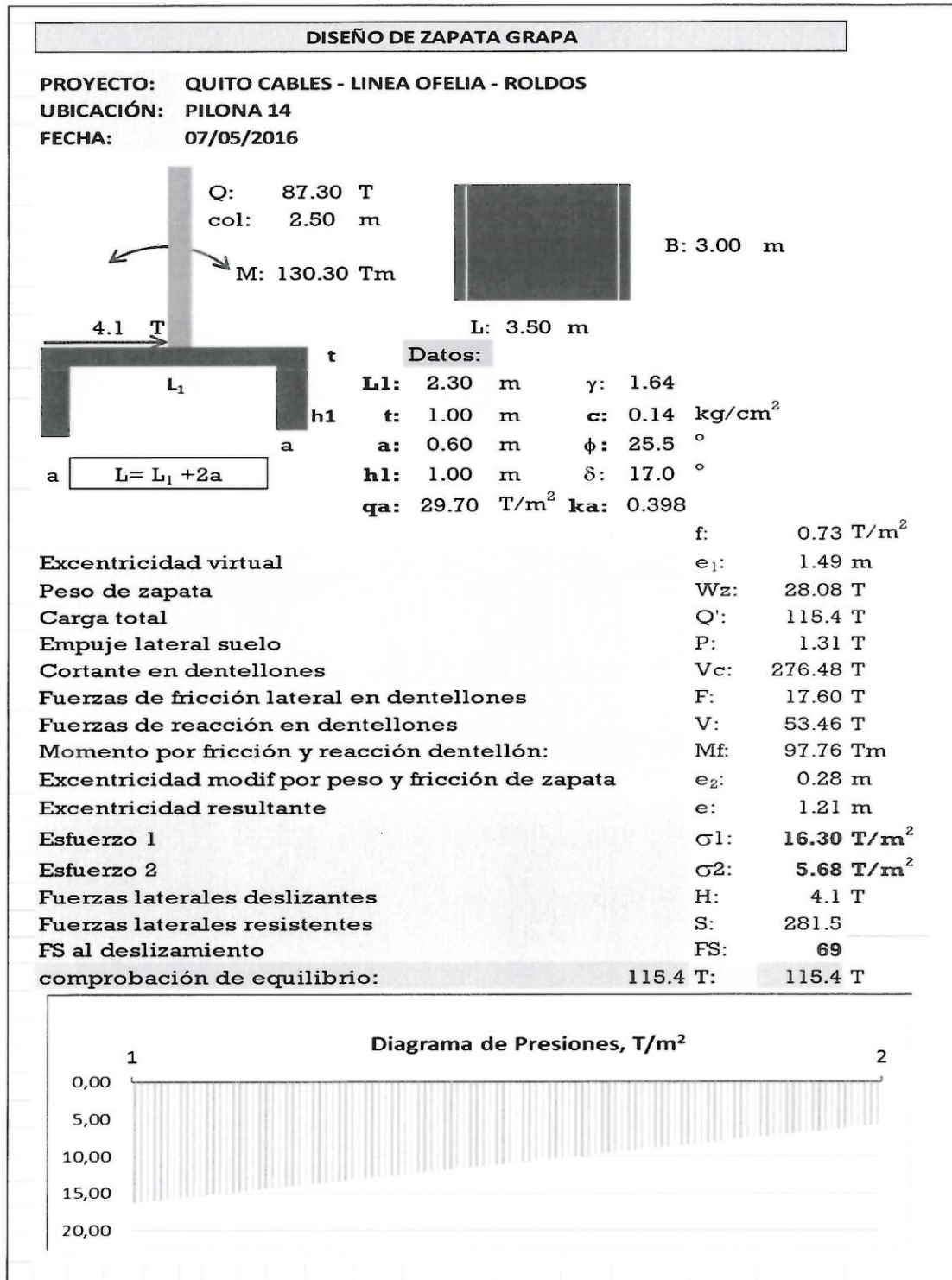
41/73
G/24

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



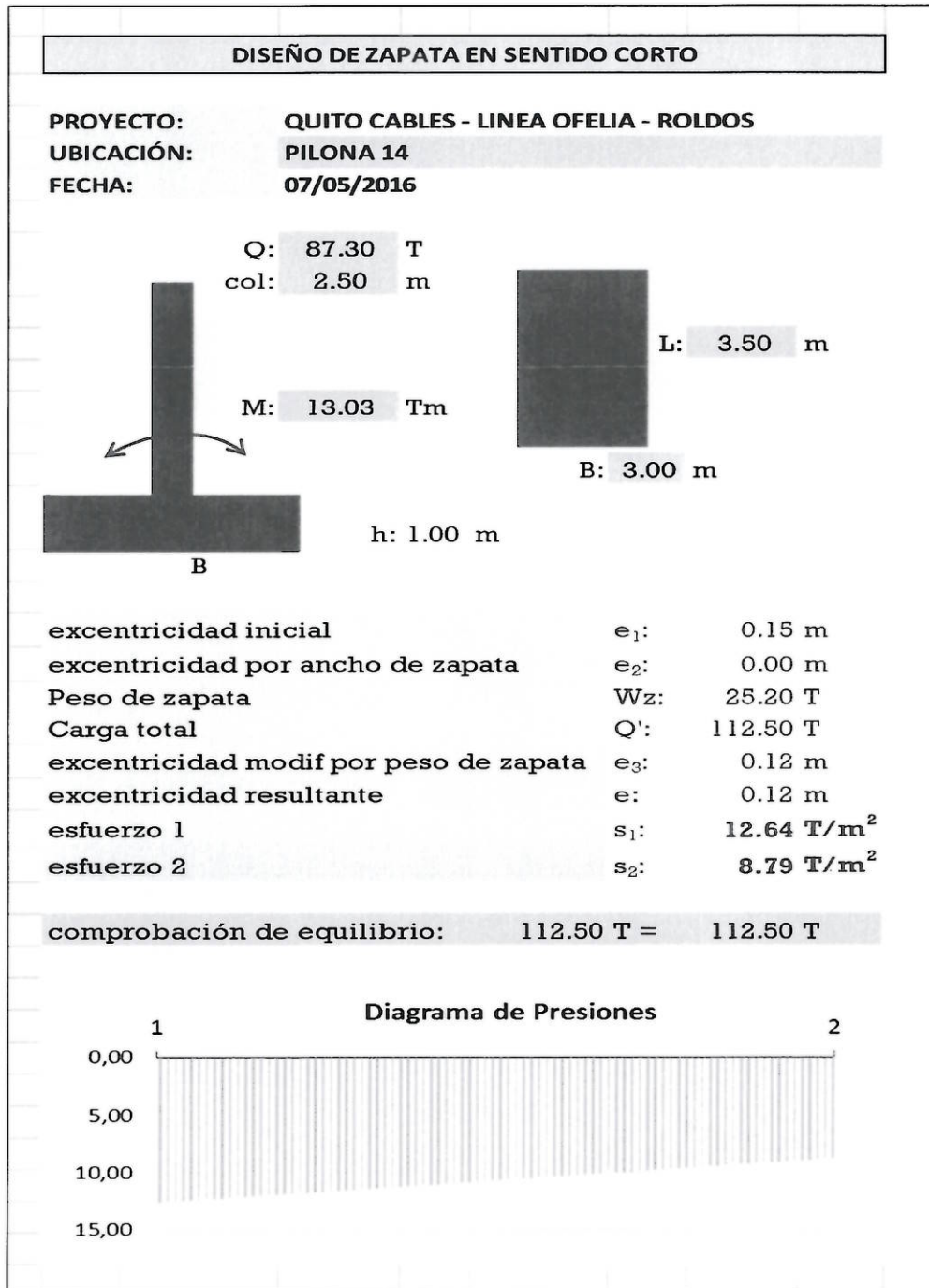
42/73
GBU

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X

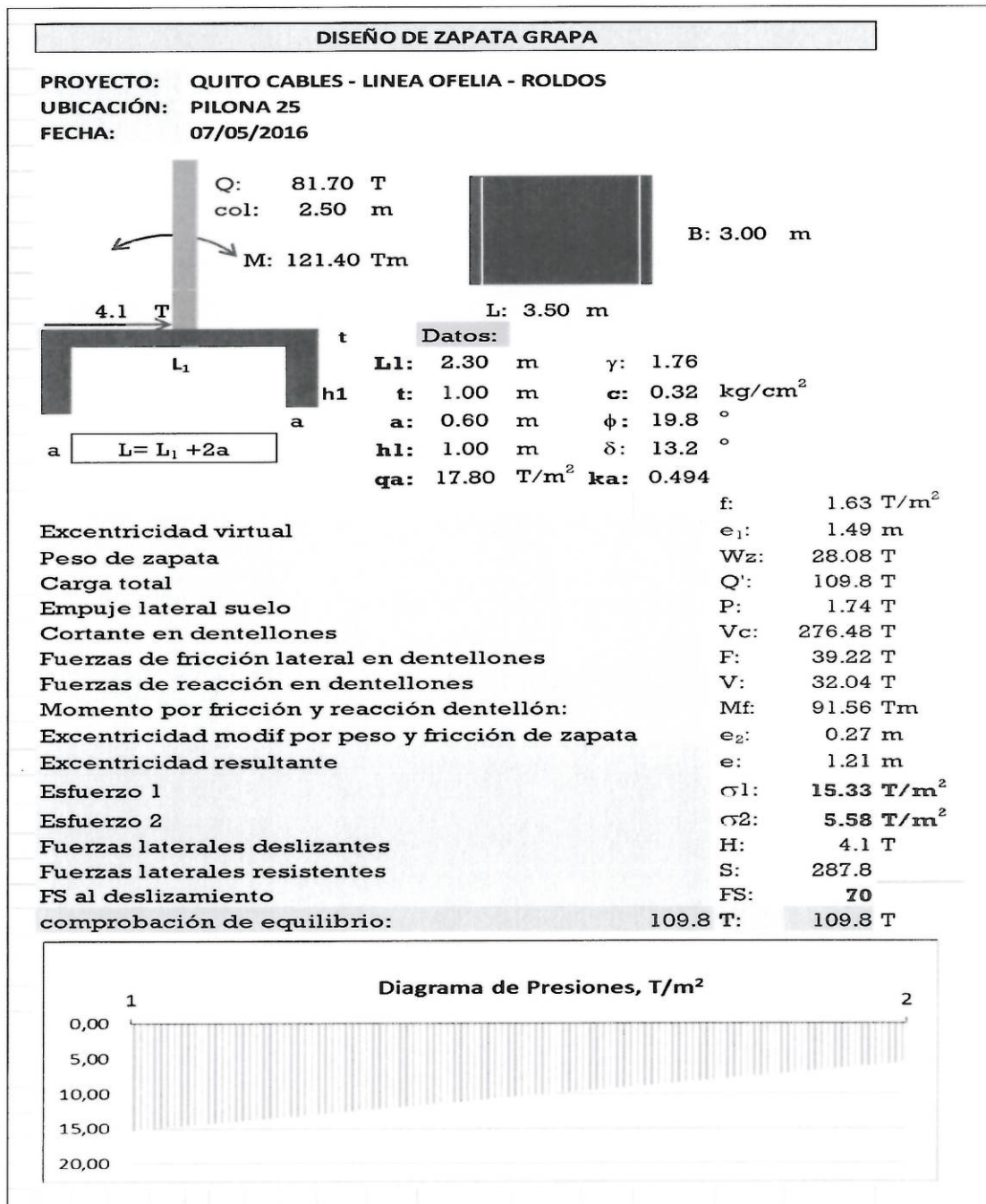


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6/64

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y

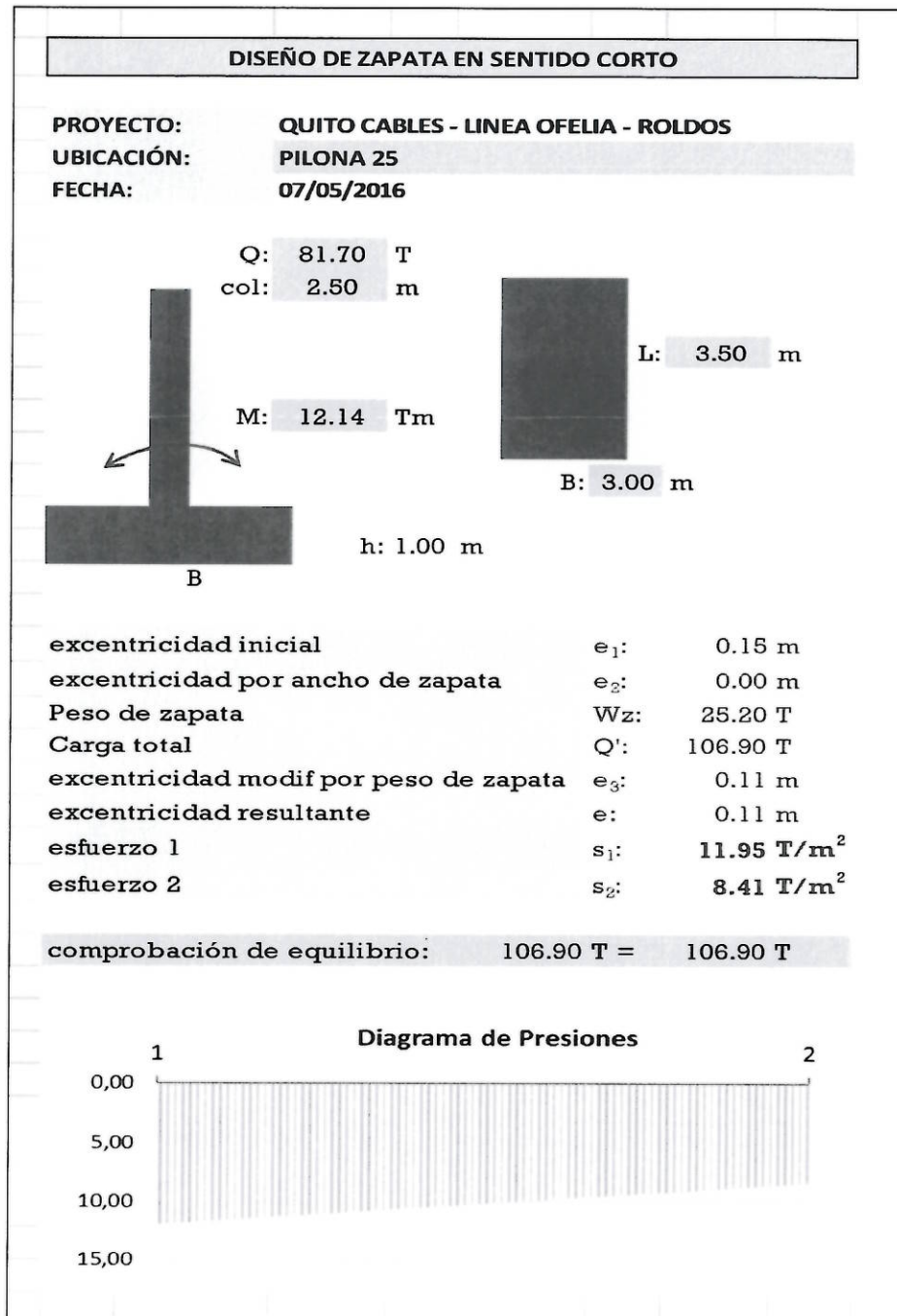


DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



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GBU

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



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GBU

CÁLCULO DEL ACERO DE REFUERZO

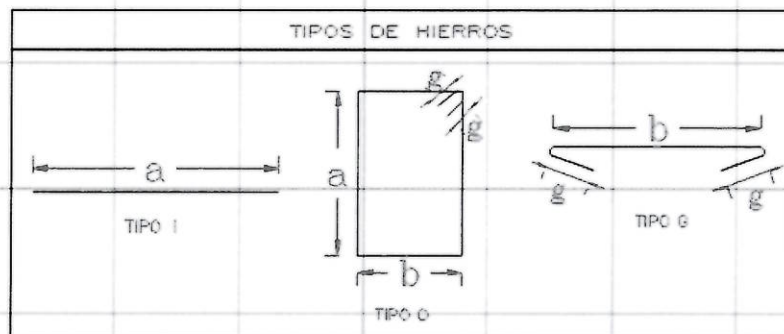
Proyecto: Quito Cables
Ubicación: Línea Ofelia - Roldós
Estructura: Pilonas
Fecha: 12/05/2016

Zapata tipo B

Diseño estructural de las cimentaciones											
Zapata				Dentellones				Micropilotes			
Largo:	3.50	m		3.00	m						
Ancho:	3.00	m		0.60	m						
Espesor:	1.00	m		1.00	m						
Momento, M:	0.00	Tm/m		Momento, M:	0.00	Tm/m		Lp	0.00	m	
Mu:	0.00	Tm/m		Mu:	0.00	Tm/m		#p/ml=	0.00		
ρ calc :	0.0000			ρ calc :	0.0000			Aspil=	0	mm	
ρ min :	0.0033			ρ min :	0.0033			Fp	0.0	T	
As :	29.70	cm ² /m		As :	29.70	cm ² /m		x'	0.00	m	
ϕ 18mm :	8.55	@ cm		ϕ 18mm :	8.55	@ cm		Mrp =	0.0	Tm	
ϕ 20mm :	10.57	@ cm		ϕ 20mm :	10.57	@ cm		Vrp	0.0	T	
ϕ 22mm :	12.79	@ cm		ϕ 22mm :	12.79	@ cm					
ϕ 25mm :	16.53	@ cm		ϕ 25mm :	16.53	@ cm					
ϕ 28mm :	20.74	@ cm		ϕ 28mm :	20.74	@ cm					
ϕ 32mm :	27.07	@ cm		ϕ 32mm :	27.07	@ cm					

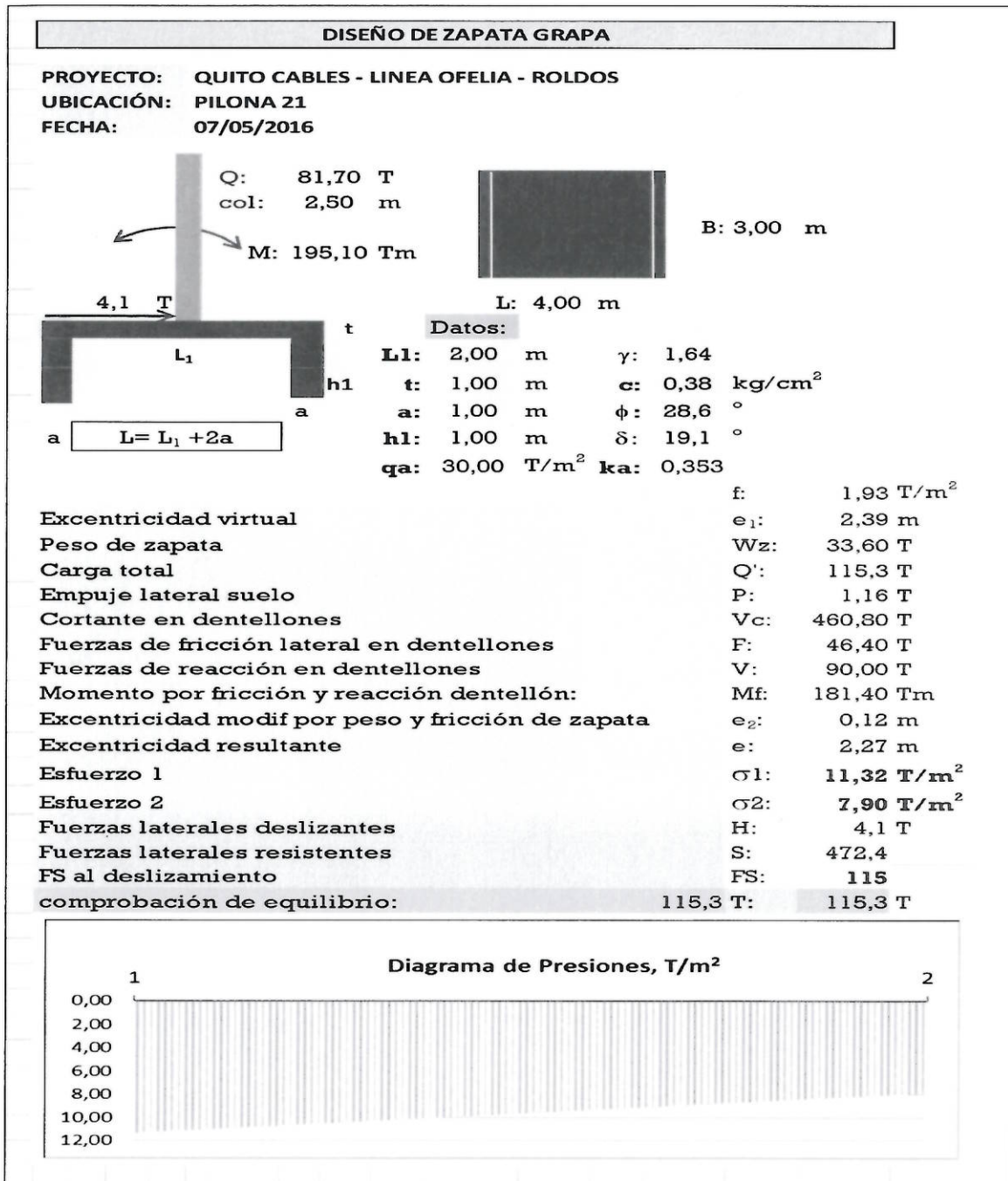
PLANILLA DE HIERROS CIMENTACIÓN TIPO B

Marca	ϕ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	g (m)	L desarrollad a (m)	N varillas por Pilonas (u)	L por Pilonas (m)	Peso por Pilonas (Kg)	N Pilonas	L Total (m)	Peso Total (Kg)
Mc 104	28	4.834	I	2.85			2.85	46	131.10	633.74	11	1442.10	6971.11
Mc 105	28	4.834	I	3.35			3.35	19	63.65	307.68	11	700.15	3384.53
Mc 106	18	1.998	O	0.85	0.45	0.15	2.90	20	58.00	115.88	11	638.00	1274.72
Mc 107	18	1.998	O	0.45	0.45	0.15	2.10	20	42.00	83.92	11	462.00	923.08
Mc 108	18	1.998	G	0.45		0.15	0.75	20	15.00	29.97	11	165.00	329.67
TOTAL									309.75	1171.19	TOTAL	3407.25	12883.11



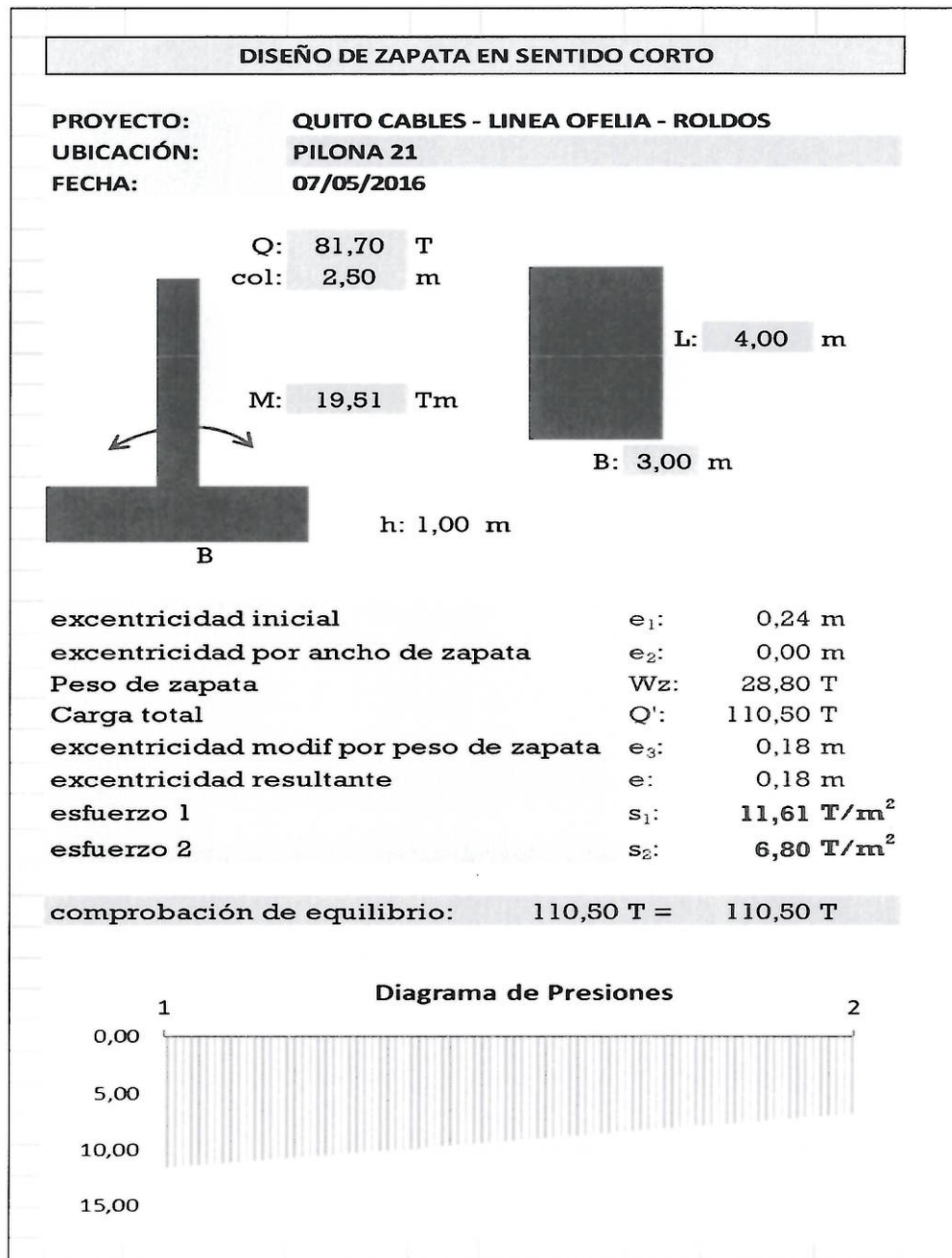
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JBY

ZAPATAS TIPO C DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



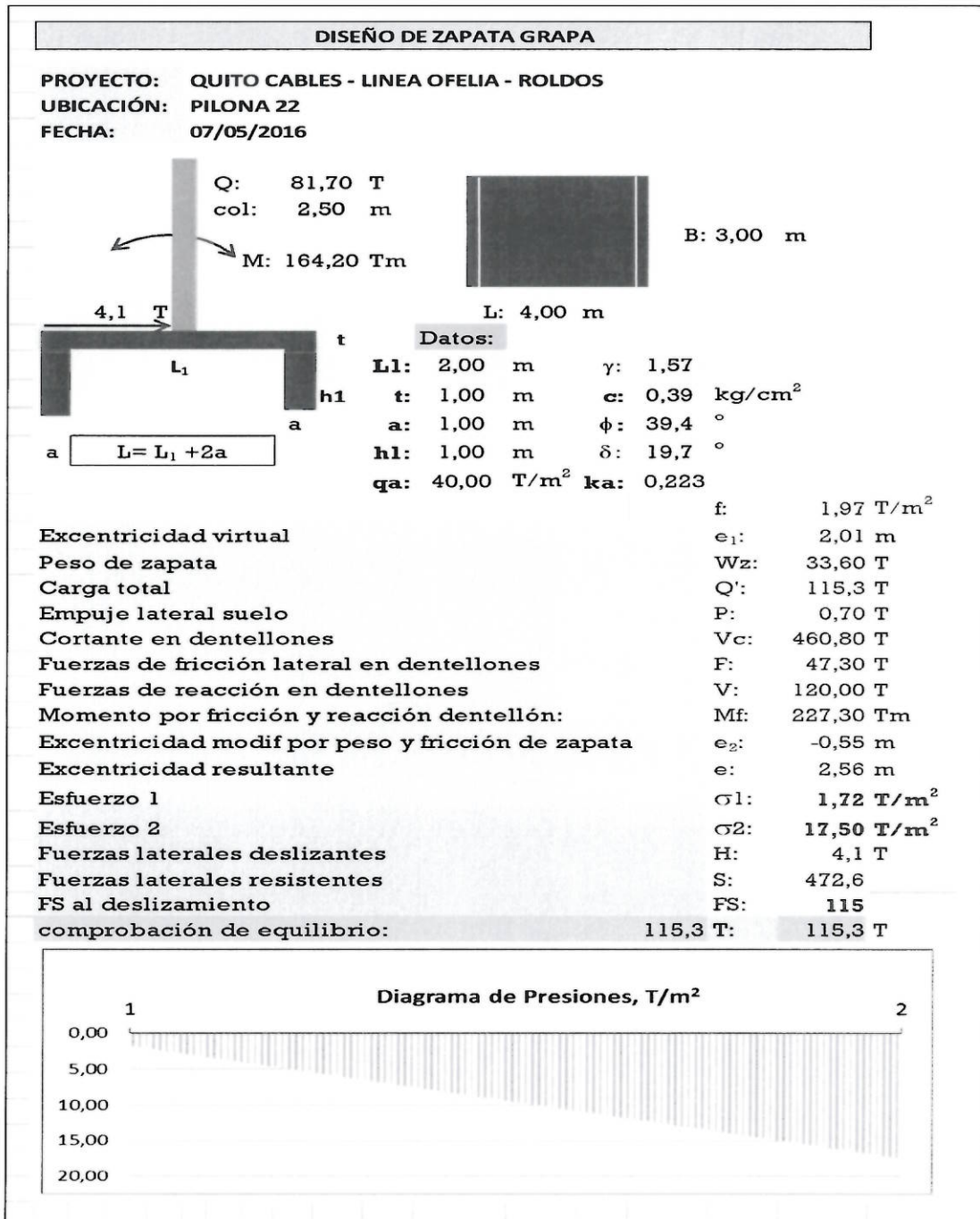
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GB4

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



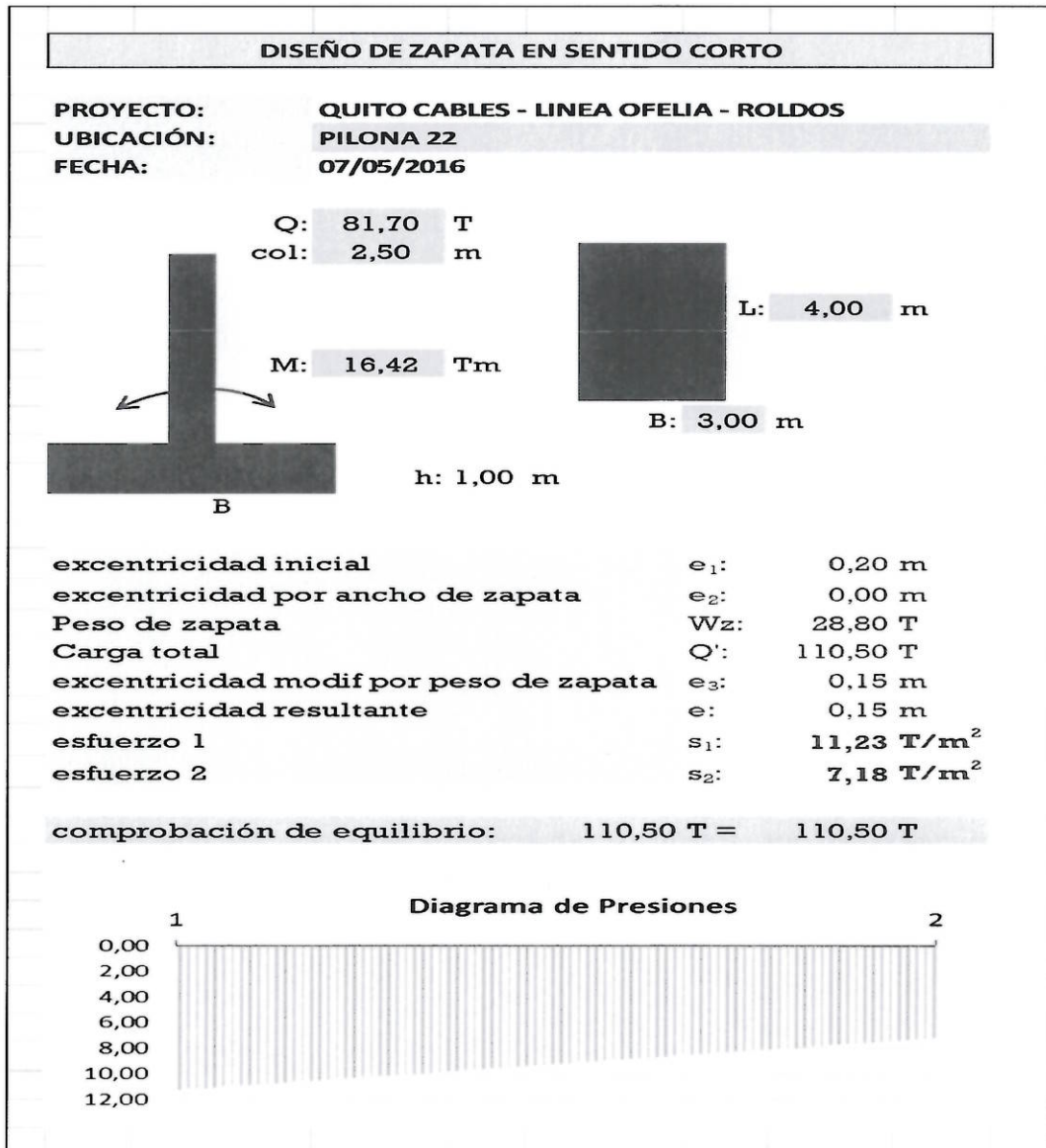
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G/34

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



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DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



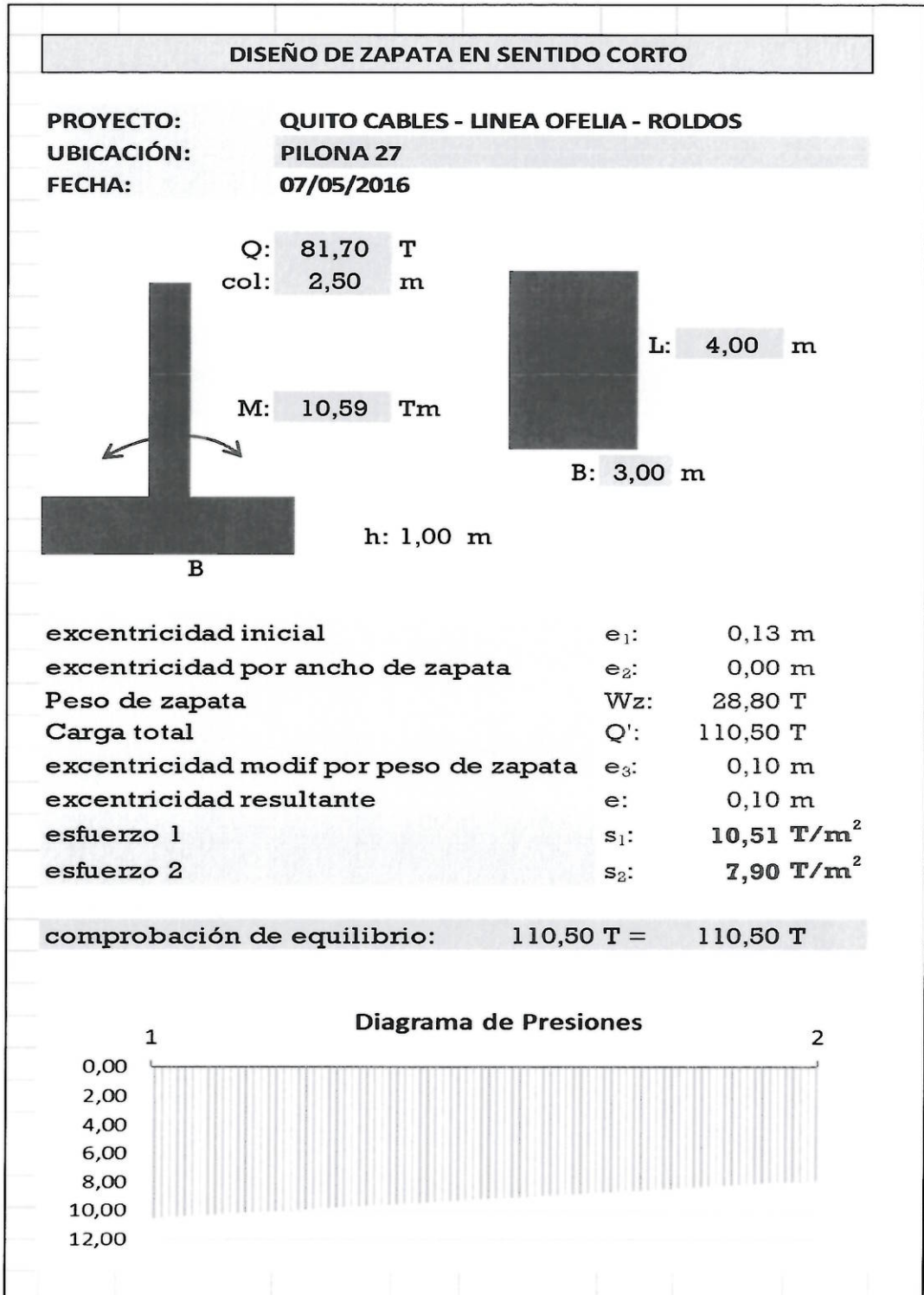
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G/24

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



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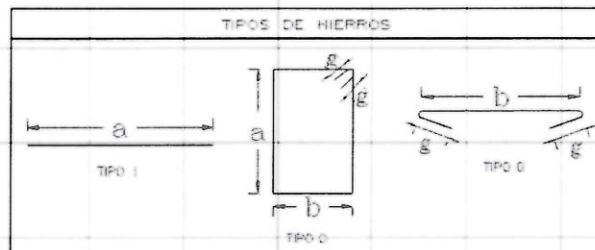
DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



CÁLCULO DEL ACERO DE REFUERZO

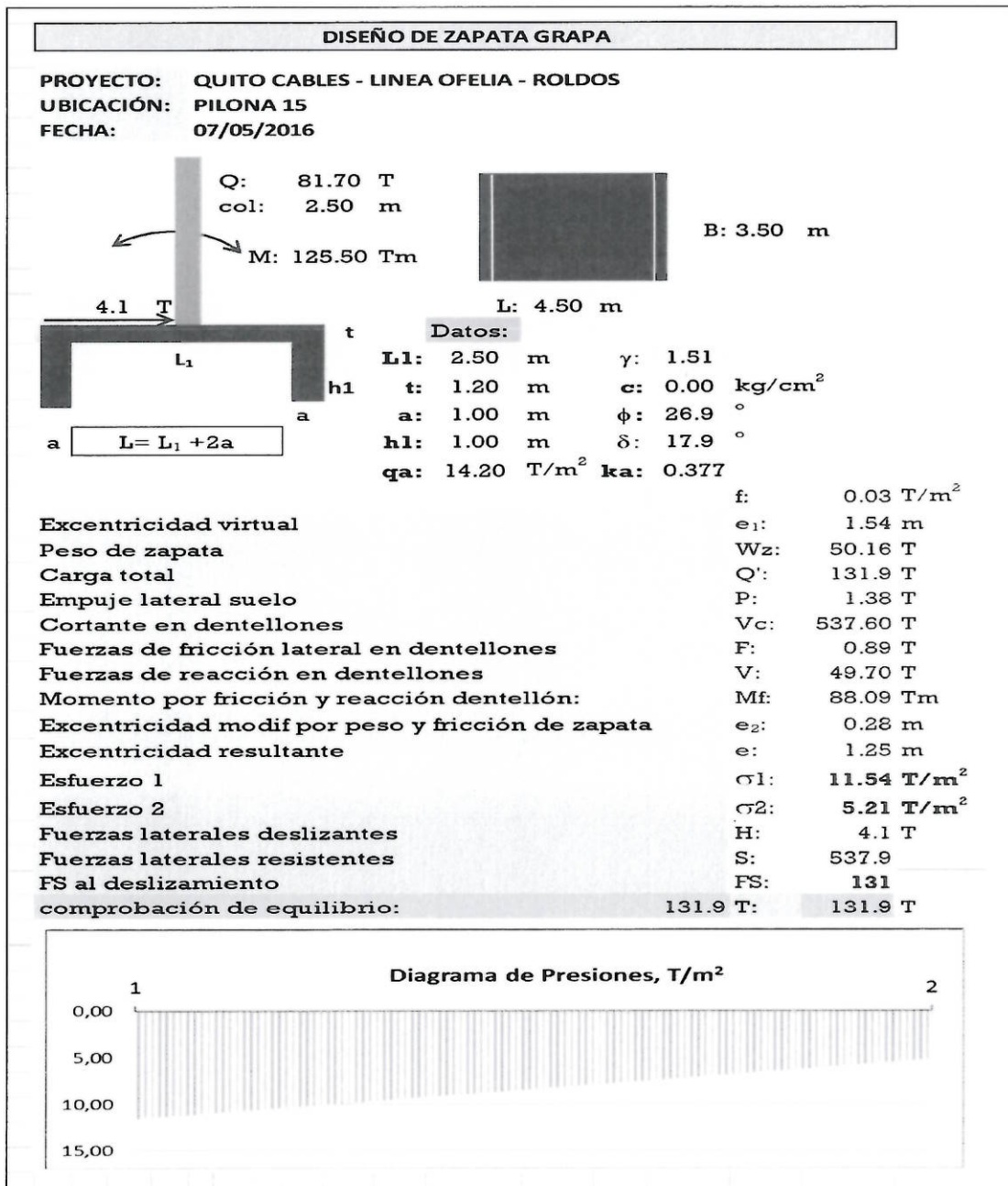
Zapata tipo C					
Diseño estructural de las cimentaciones					
Zapata		Dentellones		Micropilotes	
Largo:	3,50 m	3,00	m		
Ancho:	3,00 m	1,00	m		
Espesor:	1,00 m	1,00	m		
Momento, M:	0,00 Tm/m	Momento, M:	0,00 Tm/m	Lp	0,00 m
Mu:	0,00 Tm/m	Mu:	0,00 Tm/m	#p/ml=	0,00
ρ calc :	0,0000	ρ calc :	0,0000	Aspil=	0 mm
ρ min :	0,0033	ρ min :	0,0033	Fp	0,0 T
As :	29,70 cm ² /m	As :	29,70 cm ² /m	x'	0,00 m
ϕ 18mm :	8,55 @ cm	ϕ 18mm :	8,55 @ cm	Mrp =	0,0 Tm
ϕ 20mm :	10,57 @ cm	ϕ 20mm :	10,57 @ cm	Vrp	0,0 T
ϕ 22mm :	12,79 @ cm	ϕ 22mm :	12,79 @ cm		
ϕ 25mm :	16,53 @ cm	ϕ 25mm :	16,53 @ cm		
ϕ 28mm :	20,74 @ cm	ϕ 28mm :	20,74 @ cm		
ϕ 32mm :	27,07 @ cm	ϕ 32mm :	27,07 @ cm		

PLANILLA DE HIERROS CIMENTACIÓN TIPO C													
Marca	ϕ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	g (m)	L desarrollada (m)	N varillas por Pizona (u)	L por Pizona (m)	Peso por Pizona (Kg)	N Pilonas	L Total (m)	Peso Total (Kg)
Mc 109	28	4,834	I	2,85			2,85	57	162,45	785,28	3	487,35	2355,85
Mc 110	28	4,834	I	3,85			3,85	19	73,15	353,61	3	219,45	1060,82
Mc 111	18	1,998	0	0,85	0,85	0,15	3,70	20	74,00	147,85	3	222,00	443,56
Mc 112	18	1,998	0	0,85	0,45	0,15	2,90	20	58,00	115,88	3	174,00	347,65
Mc 113	18	1,998	6	0,85		0,15	1,15	20	23,00	45,95	3	69,00	137,86
TOTAL									390,60	1448,58	TOTAL	1171,80	4345,74

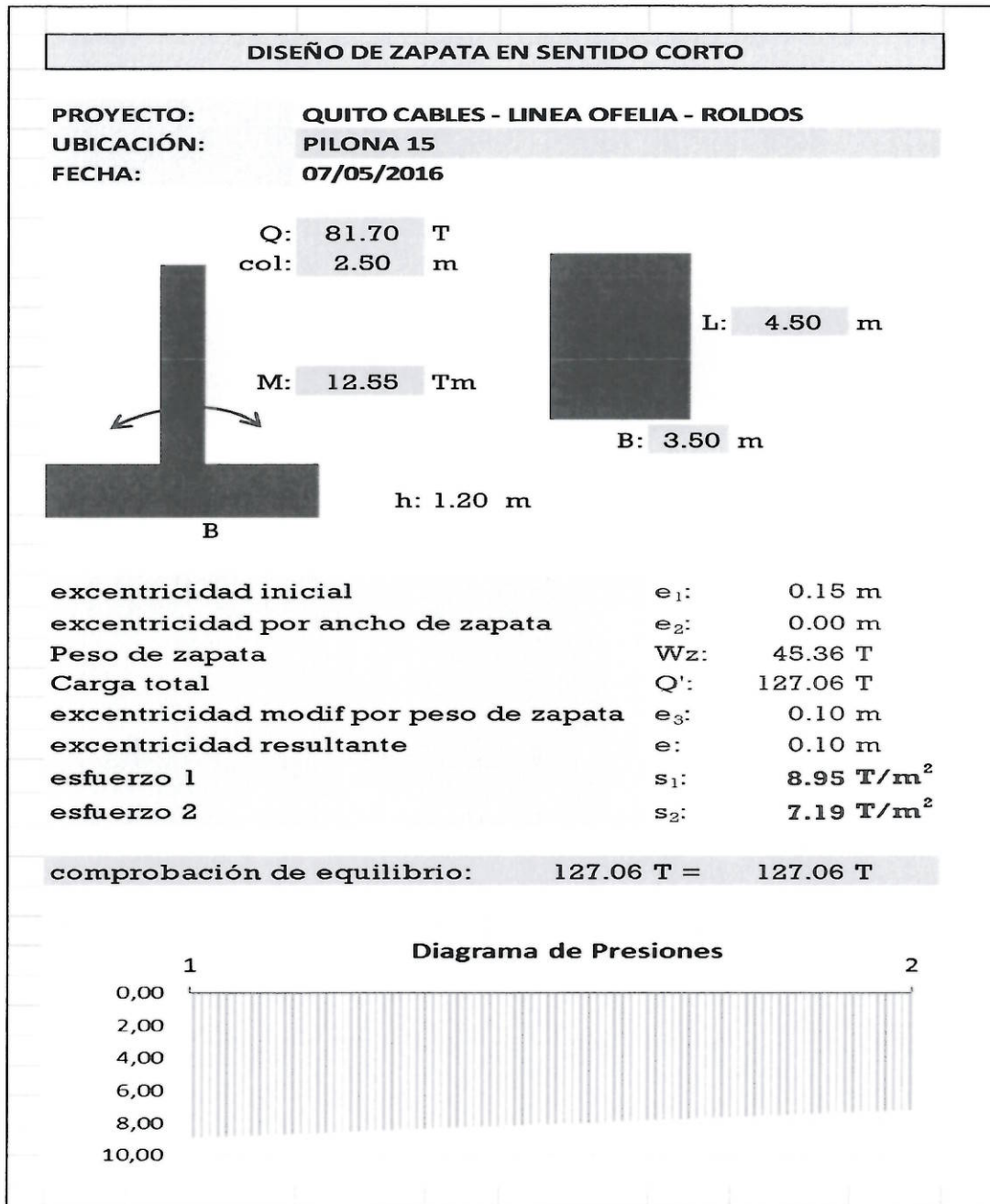


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GBU

ZAPATAS TIPO D DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X

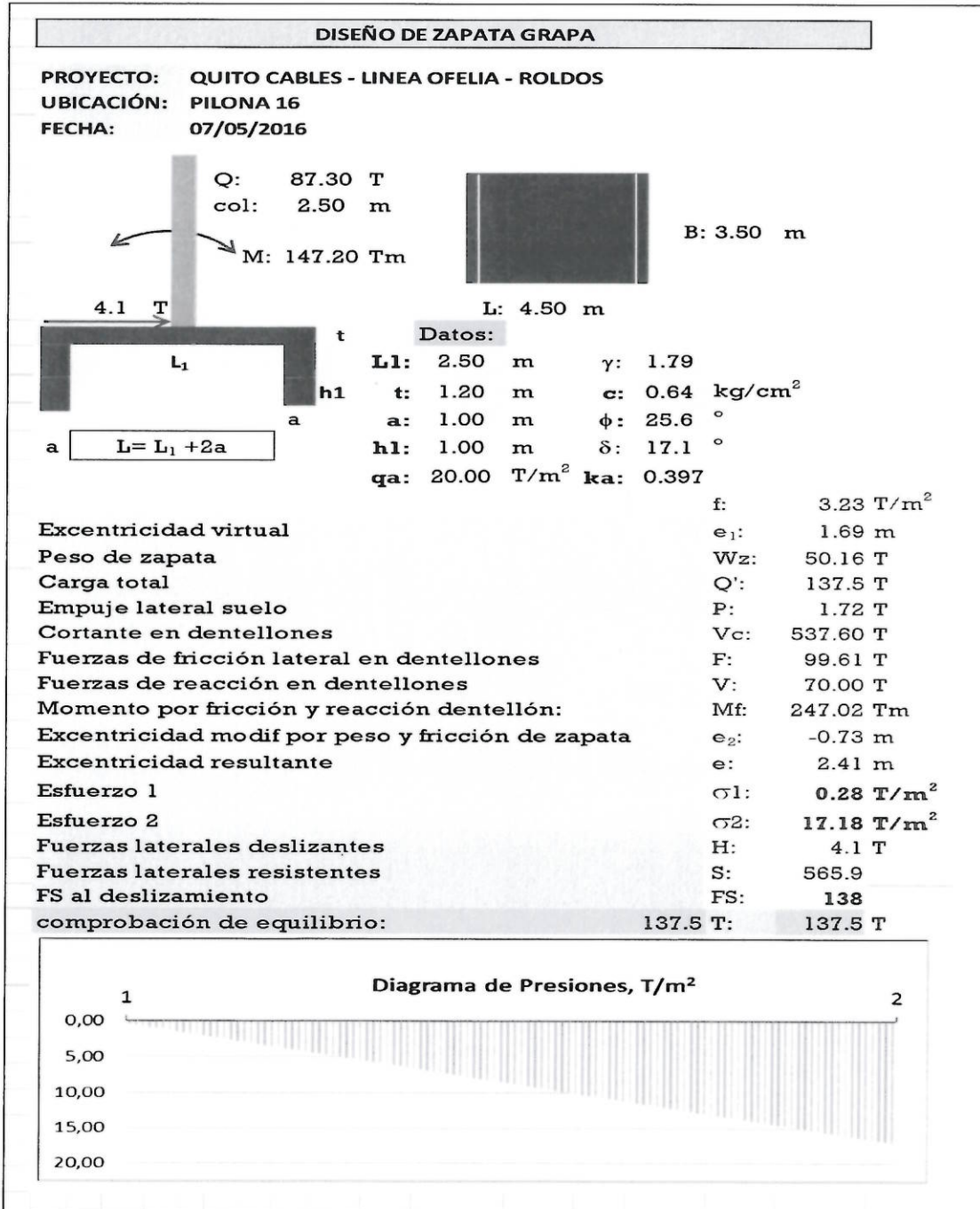


DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



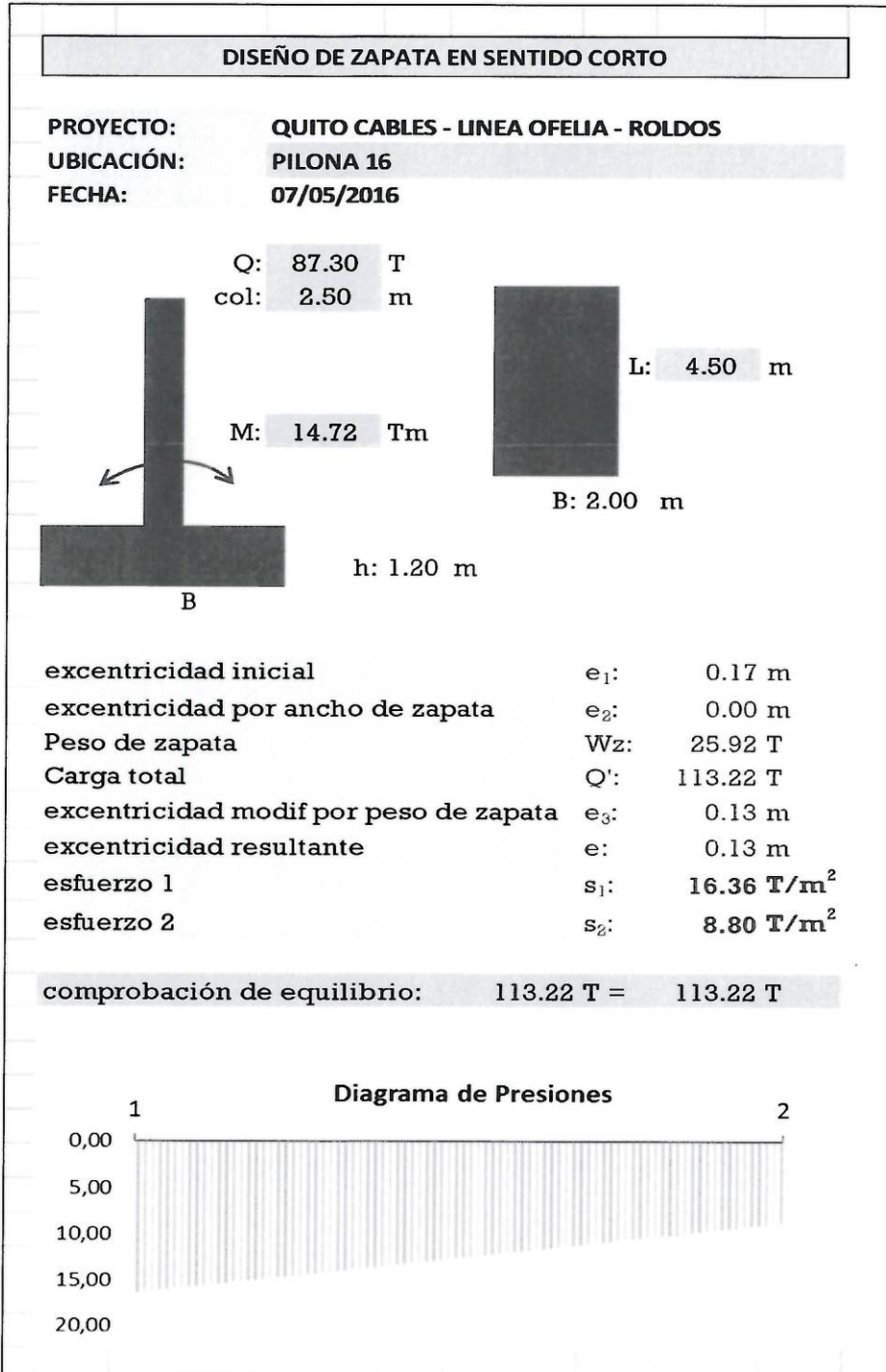
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 JBU

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN X



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G/B

DIMENSIONAMIENTO CON MOMENTO EN DIRECCIÓN Y



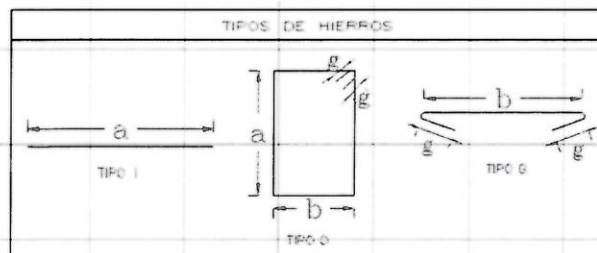
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GPY

CÁLCULO DEL ACERO DE REFUERZO

Zapata tipo D					
Diseño estructural de las cimentaciones					
Zapata		Dentellones		Micropilotes	
Largo:	4,50 m		3,50 m		
Ancho:	3,50 m		1,00 m		
Espesor:	1,20 m		1,00 m		
Momento, M:	0,00 Tm/m	Momento, M:	0,00 Tm/m	Lp	0,00 m
Mu:	0,00 Tm/m	Mu:	0,00 Tm/m	#p/ml=	0,00
ρ calc :	0,0000	ρ calc :	0,0000	Aspil=	0 mm
ρ min :	0,0033	ρ min :	0,0033	Fp	0,0 T
As :	36,30 cm ² /m	As :	29,70 cm ² /m	x'	0,00 m
ϕ 18mm :	7,00 @ cm	ϕ 18mm :	7,00 @ cm	Mrp =	0,0 Tm
ϕ 20mm :	8,65 @ cm	ϕ 20mm :	8,65 @ cm	Vrp	0,0 T
ϕ 22mm :	10,47 @ cm	ϕ 22mm :	10,47 @ cm		
ϕ 25mm :	13,53 @ cm	ϕ 25mm :	13,53 @ cm		
ϕ 28mm :	16,97 @ cm	ϕ 28mm :	16,97 @ cm		
ϕ 32mm :	22,15 @ cm	ϕ 32mm :	22,15 @ cm		

PLANILLA DE HIERROS CIMENTACIÓN TIPO C													
Marca	ϕ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	g (m)	L desarrollada (m)	N varillas por Pilona (u)	L por Pilona (m)	Peso por Pilona (Kg)	N Pilonas	L Total (m)	Peso Total (Kg)
Mc 114	28	4,834	I	3,35			3,35	61	204,35	987,83	2	408,70	1975,66
Mc 115	28	4,834	I	4,35			4,35	23	100,05	483,64	2	200,10	967,28
Mc 116	18	1,998	O	0,85	0,85	0,15	3,70	24	88,80	177,42	2	177,60	354,84
Mc 117	18	1,998	O	0,85	0,45	0,15	2,90	24	69,60	139,06	2	139,20	278,12
Mc 118	18	1,998	G	0,85		0,15	1,15	24	27,60	55,14	2	55,20	110,29
TOTAL									490,40	1843,10	TOTAL	980,80	3686,20



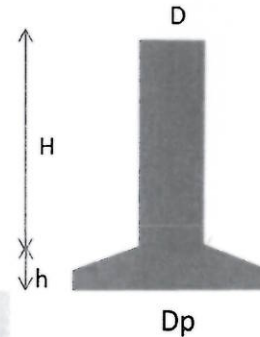
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GPA

DISEÑO DE PILAS PREBARRENADAS

PROYECTO: QUITO CABLES - LINEA OFELIA - ROLDOS

UBICACIÓN: PILONA 18

FECHA: 14/05/2016



Pilas Circulares en arena

Datos:

Longitud de fuste, H	6.00	m
Angulo de fricción, ϕ	30.60	o
Peso Unitario, γ	16.00	kN/m ³
FS	4.00	

Cálculos:

k_o	0.40	
$\tan \delta$	0.37	
σ	96.00	kN/m ²
N_q	19.70	

Fuste			Punta o Campana			Subtotal	
diam (m)	As(m ²)	Qs(KN)	diam (m)	Ap(m ²)	Qp(KN)	Qa(KN)	Qa(T)
1.000	18.850	269.19	1.000	0.785	1,485.62	438.70	44.72
1.200	22.619	323.02	1.200	1.131	2,139.29	615.58	62.75
1.300	24.504	349.94	1.300	1.327	2,510.70	715.16	72.90
1.400	26.389	376.86	1.400	1.539	2,911.81	822.17	83.81
1.500	28.274	403.78	1.500	1.767	3,342.64	936.61	95.47

Pilas Circulares en arcilla

Datos:

Longitud de fuste, H	6.00	m
Cohesion	39.00	kPa
Peso Unitario, γ	16.00	kN/m ³

Cálculos:

N_c	9.00	
f	0.30	ok


Fuste			Punta o Campana			Subtotal	
diam (m)	As(m ²)	Qs(KN)	diam (m)	Ap(m ²)	Qp(KN)	Qa(KN)	Qa(T)
1.000	18.850	220.54	1.000	0.785	275.67	289.46	29.51
1.200	22.619	264.65	1.200	1.131	396.97	363.89	37.09
1.300	24.504	286.70	1.300	1.327	465.89	403.17	41.10
1.400	26.389	308.76	1.400	1.539	540.32	443.84	45.24
1.500	28.274	330.81	1.500	1.767	620.27	485.88	49.53

Total		
diam (m)	Qa(KN)	Qa(T)
1.00	728.16	74.23
1.20	979.47	99.84
1.30	1,118.33	114.00
1.40	1,266.01	129.05
1.50	1,422.48	145.00

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G/BH

ACERO

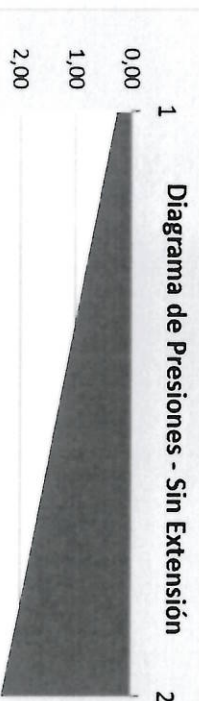
Marca	Φ (mm)	Tipo de	a (m)	d (m)	g(m)	L	N (u)	L Total (m)	Peso
Mc 100	28	I	2.85			2.85	38	108.30	523.52
Mc 101	20	L	10.15		0.20	10.35	72	745.20	1837.66
Mc 102	12	O		1.00	0.15	3.44	100	344.16	305.61
Peso Total (Kg)									2666.80

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ANEXOS DE SIMULACIONES DE CIMENTACIONES DE MECANISMOS EN ESTACIONES DIMENSIONAMIENTO ESTACIONES LA OFELIA Y LA ROLDÓS

		Elementos Mecánicos									
Ancho columna	m	2,4	2,0	0	0,0	0,0	0,0	0,0	0,0	2,0	Total
Columna		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	0	53,35
Carga	T	18,75	34,6	0	0	0	0	0	0	0	14,5
Factor 1D o 2D	1,00										14,50
Distancia	m	14,5	0	0	0	0	0	0	0	0	14,50
Dist acumulada	m										501,7
Momento (en Q1)	Tm	501,7	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	26,6
Momento externo	Tm	48,7	-22,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	

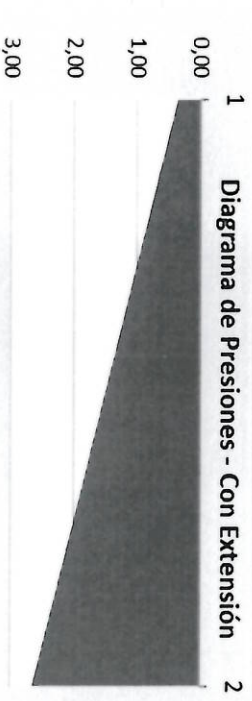
Longitud Inicial		Ancho	
Posición Resultante, x'	m	B (m)	$\sigma 1$ (T/m ²)
Posición Resultante, x''	m		$\sigma 2$ (T/m ²)
Longitud de zapata	m	0,60	0,87
Excentricidad	m	0,80	0,65
Momento Resultante	Tm	1,00	0,52
Extensión a c/lado zapata	m	1,50	0,35
Longitud final	m	2,00	0,26



Iteraciones para extender longitud de zapata

Extensión a un lado de zap	
Nueva Longitud de zapata	m
Nueva Excentricidad	m
Momento corregido	Tm

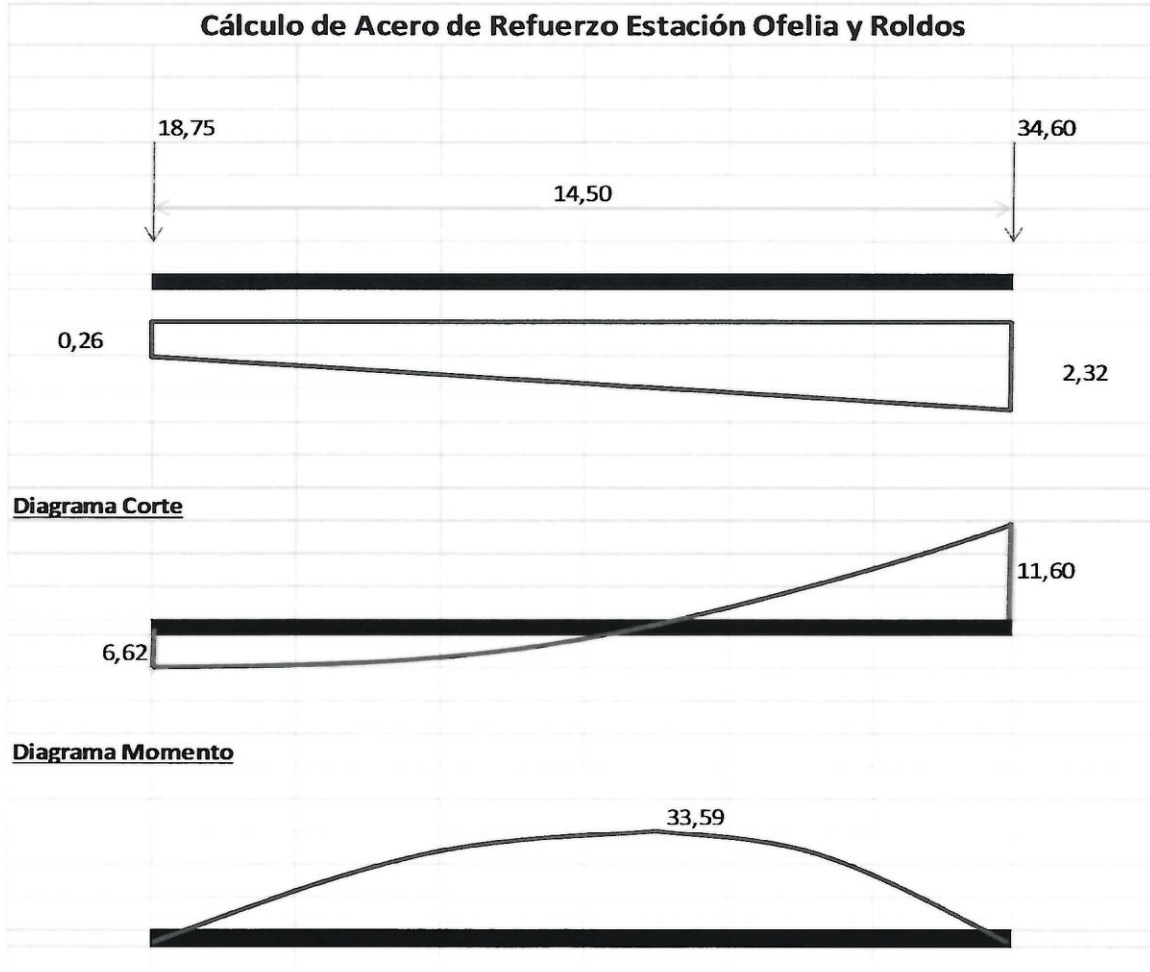
Ancho	
B (m)	$\sigma 1$ (T/m ²)
	$\sigma 2$ (T/m ²)
0,60	1,19
0,80	0,89
1,00	0,71
1,50	0,48
2,00	0,36



L sin excentricidad	
Ancho, B	m
Esfuerzo	T/m ²
	9,19
	2,80
	2,07

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9/84

Cálculo de Acero de Refuerzo Estación Ofelia y Roldos



Mu =	33,59	t-m
Mn =	37,32	t-m
b =	100	m
d =	43,00	m
K =	0,096	
ρ =	0,0051	
ρ_{min} =	0,0033	
As =	21,99	[cm ²]
ϕ_{var} =	25	[mm]
A var =	4,91	[cm ²]
N var =	5,00	[u]
Esp =	20,00	[cm]

bcol	0,50	m
Bcim	2,00	m
Hcim	0,50	m
f'c	210	kg/cm ²
fy	4200,00	kg/cm ²

63/73
GPM

6473
EPM

PLANILLA DE HIERROS CIMENTACIÓN ESTACIÓN LA OFELIA

1	φ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	g (m)	L desarrollada (m)	N varillas	L Total (m)	Peso Total (kg)
Mc 200	25	3,853	I	1,90			1,9	80	152,00	585,66
Mc 201	25	3,853	L	11,50	0,45		11,95	10	119,50	460,43
Mc 202	25	3,853	L	5,70	0,45		6,15	10	61,50	236,96
Mc 203	25	3,853	I	8,50		0,45	8,95	10	89,50	344,84
Mc 204	25	3,853	I	8,70		0,45	9,15	10	91,50	352,55
							TOTAL	120	514,00	1980,44

PLANILLA DE HIERROS CIMENTACIÓN ESTACIÓN LA ROLDÓS

Marca	φ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	g (m)	L desarrollada (m)	N varillas	L Total (m)	Peso Total (kg)
Mc 230	25	3,853	I	1,90			1,90	80	152,00	585,66
Mc 231	25	3,853	L	11,50	0,45		11,95	10	119,50	460,43
Mc 232	25	3,853	L	5,70	0,45		6,15	10	61,50	236,96
Mc 233	25	3,853	I	8,50		0,45	8,95	10	89,50	344,84
Mc 234	25	3,853	I	8,70		0,45	9,15	10	91,50	352,55
							TOTAL	120	514,00	1980,44

DIMENSIONAMIENTO ESTACIÓN LA MARISCAL

		Elementos Mecánicos									
Ancho columna	m	2,0	2,4	1,5	2,4	2,0	0,0	0,0	0,0	2,0	Total
Columna		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	0	136,7
Carga	T	22,5	34,6	22,5	34,6	22,5	0	0	0	0	42,8
Factor 1D o 2D	1,00										42,8
Distancia	m	14,5	6,9	6,9	14,5	0	0	0	0	0	42,80
Dist acumulada	m		6,9	13,8	28,30	28,30	28,30	28,30	28,30	28,30	42,80
Momento (en Q1)	Tm	501,7	481,5	979,2	963,0	963,0	963,0	963,0	963,0	963,0	2925,4
Momento externo	Tm	22,1	22,1	0,5	22,1	22,1	0,0	0,0	0,0	0,0	88,9

Longitud Inicial											
Posición Resultante, x'	m	22,05									
Posición Resultante, x''	m	20,75									
Longitud de zapata	m	44,80									
Excentricidad	m	-0,65	hacia								
Momento Resultante	Tm	-88,89	col 2								
Extensión a c/lado zapata	m	1,00	1,50	2,68	3,16						
Longitud final	m	46,80	2,00	1,78	2,11						
			1,34	1,58							

Iteraciones para extender longitud de zapata

Extensión a un lado de zap	m	1,00									
Nueva Longitud de zapata	m	45,80									
Nueva Excentricidad	m	-0,15									
Momento corregido	Tm	-20,54									

L sin excentricidad	m	41,50									
Ancho, B	m	2,80									
Esfuerzo	T/m ²	1,18									

Ancho B (m)	σ_1 (T/m ²)	σ_2 (T/m ²)
0,60	4,46	5,27
0,80	3,35	3,96
1,00	2,68	3,16
1,50	1,78	2,11
2,00	1,34	1,58

Diagrama de Presiones - Sin Extensión

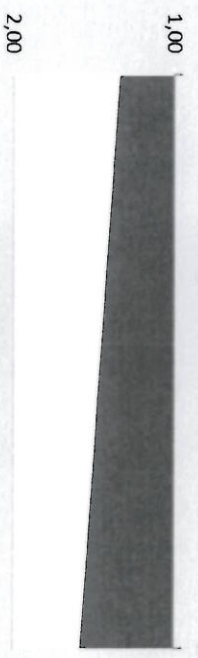
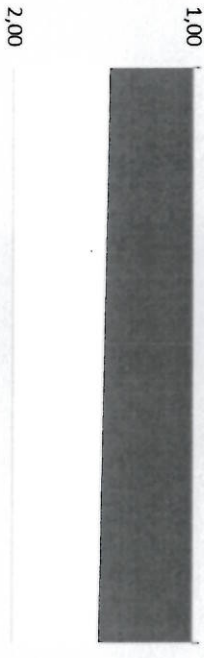


Diagrama de Presiones - Con Extensión



Cálculo Acero de Refuerzo Estación La Mariscal

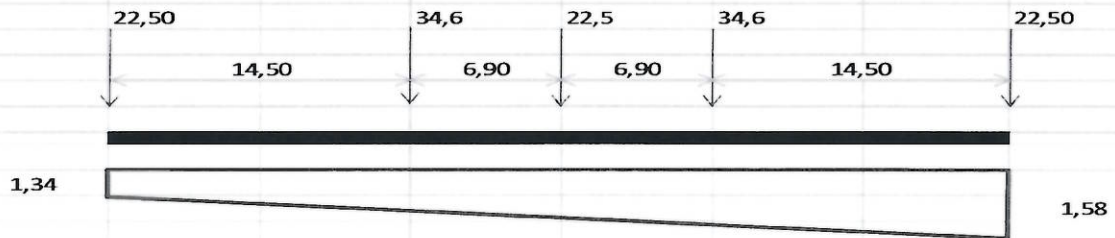


Diagrama Corte

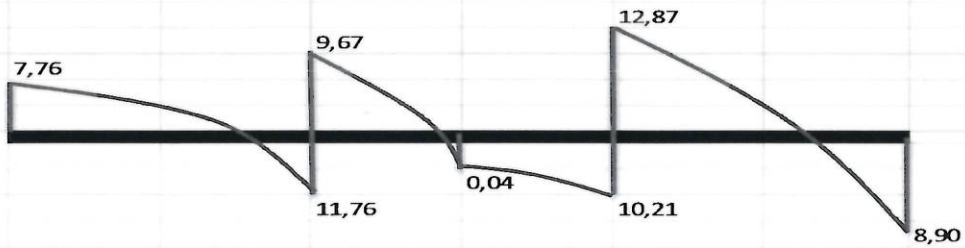
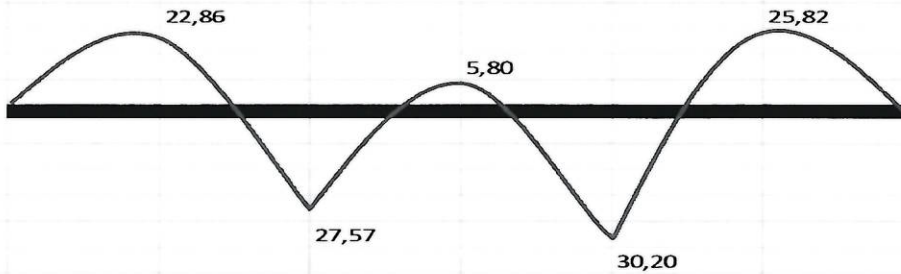


Diagrama Momento



Positivo	
Mu =	25,82 t-m
Mn =	28,69 t-m
b =	100 m
d =	43,00 m
K =	0,074
ρ =	0,0039
ρmin =	0,0033
As =	16,65 [cm ²]
φ var =	25 [mm]
A var =	4,91 [cm ²]
N var =	4,00 [u]
Esp =	25,00 [cm]

Negativo	
Mu =	30,20 t-m
Mn =	33,56 t-m
b =	100 m
d =	43,00 m
K =	0,086
ρ =	0,0046
ρmin =	0,0033
As =	19,64 [cm ²]
φ var =	25 [mm]
A var =	4,91 [cm ²]
N var =	5,00 [u]
Esp =	25,00 [cm]

bcol	0,50	m
Bcim	2,00	m
Hcim	0,50	m
f'c	210	kg/cm ²
fy	4200,00	kg/cm ²



67/73
GPH

PLANILLA DE HIERROS CIMENTACIÓN ESTACIÓN LA MARISCAL

Marca	φ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	c (m)	g (m)	L desarrollada (m)	N varillas	L Total (m)	Peso Total (Kg)
Mc 210	25	3,853	I	1,90				1,90	178	338,20	1303,08
Mc 211	25	3,853	C	5,60	0,45	0,45		6,50	16	104,00	400,71
Mc 212	25	3,853	C	7,10	0,45	0,45		8,00	16	128,00	493,18
Mc 213	25	3,853	C	4,10	0,45	0,45		5,00	8	40,00	154,12
Mc 214	25	3,853	I	12,00			0,45	12,45	32	398,40	1535,04
								TOTAL	250	1008,60	3886,14

Cálculo del Acero de Refuerzo Estación Colinas

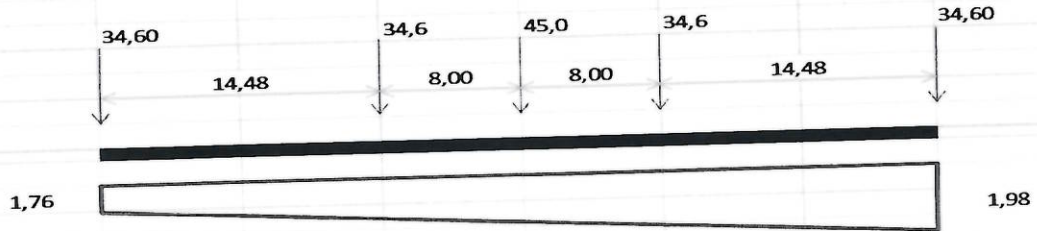


Diagrama Corte

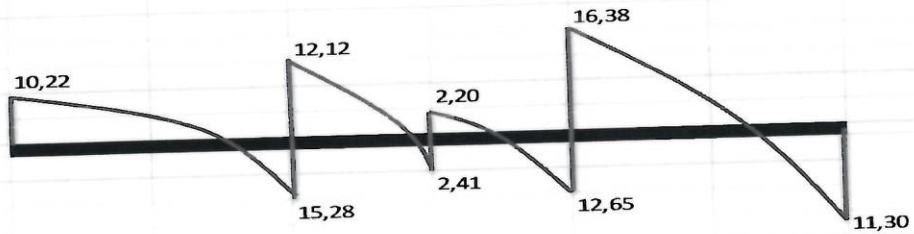
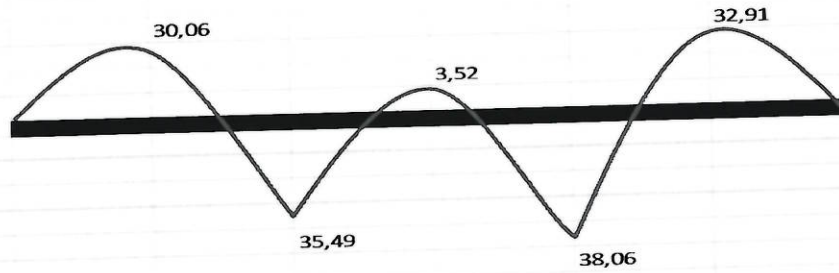


Diagrama Momento



Positivo	
Mu =	32,91 t-m
Mn =	36,57 t-m
b =	100 m
d =	43,00 m
K =	0,094
ρ =	0,0050
ρmin =	0,0033
As =	21,52 [cm ²]
φ var =	25 [mm]
A var =	4,91 [cm ²]
N var =	5,00 [u]
Esp =	20,00 [cm]

Negativo	
Mu =	38,06 t-m
Mn =	42,29 t-m
b =	100 m
d =	43,00 m
K =	0,109
ρ =	0,0058
ρmin =	0,0033
As =	25,15 [cm ²]
φ var =	25 [mm]
A var =	4,91 [cm ²]
N var =	6,00 [u]
Esp =	20,00 [cm]

bcol	0,50 m
Bcim	2,00 m
Hcim	0,50 m
f'c	210 kg/cm ²
fy	4200,00 kg/cm ²



70/73
GPA

PLANILLA DE HIERROS CIMENTACIÓN ESTACIÓN COLINAS DEL NORTE

Marca	φ (mm)	Peso (kg/m)	Tipo de Acero	a (m)	b (m)	c (m)	g (m)	L desarrollada (m)	N varillas	L Total (m)	Peso Total (Kg)
Mc 220	25	3,853	I	1,90				1,90	230	437,00	1683,76
Mc 221	25	3,853	C	5,60	0,45	0,45		6,50	20	130,00	500,89
Mc 222	25	3,853	C	7,60	0,45	0,45		8,50	20	170,00	655,01
Mc 223	25	3,853	C	5,10	0,45	0,45		6,00	10	60,00	231,18
Mc 224	25	3,853	I	12,00			0,45	12,45	40	498,00	1918,79
Mc 225	25	3,853	I	3,10			0,45	3,55	10	35,50	136,78
Mc 226	20	2,466	L	10,20			0,20	10,40	180	1872,00	4616,35
Mc 227	12	0,888	O	5,00			0,90	5,90	255	1504,50	1336,00
								TOTAL	765	4707,00	11078,76

CARGAS DE DISEÑO DE CIMENTACIONES DE PILONAS

CARGAS DE DISEÑO CIMENTACIONES PILONAS LÍNEA 1.					
No	Tipo	Carga vertical (T)	Momento (T*m)	Carga de Sismo (T)	Momento Y (T*m)
1	B	73.20	52.30	4.10	5.23
2	B	73.20	57.30	4.10	5.73
3	B	76.00	94.50	4.10	9.45
4	B	87.30	127.30	4.10	12.73
5	B	87.30	134.30	4.10	13.43
6	B	81.70	110.50	4.10	11.05
7	A	81.70	99.60	4.10	9.96
8	A	70.40	37.60	4.10	3.76
9	A	73.20	58.50	4.10	5.85
10	A	76.00	79.70	4.10	7.97
11	B	81.70	121.80	4.10	12.18
12	B	87.30	144.20	4.10	14.42
13	B	87.30	140.30	4.10	14.03
14	B	87.30	130.30	4.10	13.03
15	D	81.70	125.50	4.10	12.55
16	D	87.30	147.20	4.10	14.72
17	A	81.70	112.60	4.10	11.26
18	PREBARRENADA				
19	A	73.20	47.20	4.10	4.72
20	A	73.20	72.10	4.10	7.21
21	C	81.70	195.10	4.10	19.51
22	C	81.70	164.20	4.10	16.42
23	A	76.00	97.30	4.10	9.73
24	A	76.00	97.30	4.10	9.73
25	B	81.70	121.40	4.10	12.14
26	A	81.70	105.90	4.10	10.59
27	C	81.70	105.90	4.10	10.59
28	A	73.20	50.00	4.10	5.00

7/1/73
G/BLJ

ESFUERZOS ADMISIBLES PARA EL DISEÑO DE CIMENTACIÓN DE PILONAS

ESFUERZOS ADMISIBLES DEL SUELO			
Pilona	q adm (T/m ²)	Pilona	q adm (T/m ²)
P-01	17.20	P-15	14.20
P-02	14.90	P-16	20.00
P-03	17.20	P-17	52.30
P-04	26.30	P-18	Pila prebarrenada (Qa=99,84T)
P-05	27.60	P-19	32.00
P-06	21.70	P-20	28.00
P-07	28.50	P-21	30.00
P-08	12.40	P-22	40.00
P-09	36.50	P-23	21.10
P-10	36.80	P-24	30.00
P-11	20.60	P-25	17.80
P-12	36.80	P-26	30.00
P-13	31.40	P-27	18.60
P-14	29.70	P-28	20.00

72/73
G/64

ESFUERZOS ADMISIBLES PARA EL DISEÑO DE CIMENTACIÓN DE ESTACIONES

ESFUERZOS ADMISIBLES EN CIMENTACION DE MECANISMOS EN ESTACIONES	
Estación	q adm (T/m ²)
OFELIA	13.51
MARISCAL SUCRE	31.30
COLINAS DEL NORTE	Pila prebarrenada (Qa=99,8T)
ROLDOS	22.73



ANEXO H.B.

Vigas Principales Estación Colinas



JG

PROJECT SUMMARY

INPUT PROPERTIES	Count	INPUT GEOMETRY	Count	Load Cases	Count
Universal Restraints	NONE	Joints	10	Load Cases	1
Materials	1	Members	9	Combination Cases	NONE
Sections	1	Plates	NONE	Construction Stages	NONE
User Coordinate System	NONE	Springs	NONE	Linked Databases	1
Spring Curves	NONE	Isolaters	NONE		
Isolater Property	NONE	Mass Elements	NONE		
Creep Definitions	NONE	Slave / Masters	NONE		
		Tendons	NONE		

TABLE OF CONTENTS

INPUTS	Page#	Results	Page#
- INPUT : Material Properties	Page 5	- RESULT : Joint Displacements	Page 5
- INPUT : Sections	Page 5	- RESULT : Joint Reactions	Page 6
- INPUT : Section Dimensions	Page 5	- RESULT : Member Stresses	Page 6
- INPUT : Joints	Page 5	- RESULT : Member End Forces (Global)	Page 8
- INPUT : Members	Page 5		

Graphics View 1

Zoom: 1.25X
Member Forces - Maxwell My - Load Case 1



Handwritten signature or initials

INPUT : Material Properties

Name	Modulus of Elasticity (N/mm ²)	Poisson Ratio	Shear Modulus (N/mm ²)	Unit Weight (N/mm ³)	Thermal Expansion (1/°C * 10 ⁻⁶)	Assigned
A572-G50	199,947.16	0.2946	77,220.97	0.0001	11.700000	Yes

INPUT : Sections

Name	Section Area (mm ²)	Shear Area in yy (mm ²)	Shear Area in zz (mm ²)	Torsion Constant (mm ⁴)	Inertia Izz (mm ⁴)	Inertia Iyy (mm ⁴)	Plastic Modulus Zyy	Plastic Modulus Zzz	Perimeter (mm)	Material Time-Effect	Ductility	Residual Strength (%)	Assigned
New	###	###	###	0.0000	###	###	0.0000	0.0000	###	(NONE)	0.	0.	Yes

INPUT : Section Dimensions

Name	Shape	Dimension D1	Dimension D2	Dimension D3	Dimension D4	Dimension D5	Dimension D6
New Parametric	Parametric						

INPUT : Joints

ID	X (mm)	Y (mm)	Z (mm)	Translation DOF	Rotation DOF	Displacement UCS	Assignment
1	0.0000	0.0000	0.0000	all free	all free	Global	Yes
3	2,498.4100	1,749.4100	0.0000	all fixed	all free	Global	Yes
4	14,376.1200	10,066.2700	0.0000	all fixed	all free	Global	Yes
5	18,266.6300	12,790.4100	0.0000	all free	all free	Global	Yes
6	20,495.6800	13,493.2400	0.0000	all free	all free	Global	Yes
7	22,724.7400	14,196.0600	0.0000	all free	all free	Global	Yes
8	24,953.7900	14,898.9000	0.0000	all free	all free	Global	Yes
9	29,703.2200	14,898.9000	0.0000	all fixed	all free	Global	Yes
10	44,203.2200	14,898.9000	0.0000	z fixed	all free	Global	Yes
11	45,988.7200	14,898.9000	0.0000	all free	all free	Global	Yes

INPUT : Members

ID	I-Joint	J-Joint	Span	Type	Section at Start	Section at End	Material	Prestress Force	Length (mm)	Rigid Zone from	Rigid Zone from	Orientation Angle	Casting (day)	Structure Group
1	1	3	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
2	3	4	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
3	4	5	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
4	5	6	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
5	6	7	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
6	7	8	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
7	8	9	-	Beam	New	(same as	A572-G50	0.0000	###	0.0000	0.0000	0.0000	0	(none)
8	9	10	-	Beam	New	(same as	A572-G50	0.0000	14500	0.0000	0.0000	0.0000	0	(none)
9	10	11	-	Beam	New	(same as	A572-G50	0.0000	1,785.5	0.0000	0.0000	0.0000	0	(none)

Result Cases Summary

Load Cases: Load Case 1
Solved: 06/08/2016

Load Class: None

RESULT : Joint Displacements

Joint	Result Case	Translation X (mm)	Translation Y (mm)	Translation Z (mm)	Rotation X (deg)	Rotation Y (deg)	Rotation Z (deg)
1	Load Case 1	0.0000	0.0000	-26.1748	-2.8987	-2.6299	0.0000
3	Load Case 1	0.0000	0.0000	0.0000	-2.8987	-2.6299	0.0000



RESULT : Joint Displacements

Joint	Result Case	Translation X (mm)		Translation Y (mm)		Translation Z (mm)		Rotation X (deg)	Rotation Y (deg)	Rotation Z (deg)
4	Load Case 1	0.0000	0.0000	0.0000	-3.7466	-1.4190	0.0000			
5	Load Case 1	0.0000	0.0000	-108.8097	-4.0260	-1.0235	0.0000			
6	Load Case 1	0.0000	0.0000	-116.9157	-3.9908	-1.1353	0.0000			
7	Load Case 1	0.0000	0.0000	-116.9159	-3.9197	-1.3588	0.0000			
8	Load Case 1	0.0000	0.0000	-108.8125	-3.8850	-1.4708	0.0000			
9	Load Case 1	0.0000	0.0000	0.0000	-3.8850	-0.9866	0.0000			
10	Load Case 1	0.0000	0.0000	0.0000	-3.8850	0.4917	0.0000			
11	Load Case 1	0.0000	0.0000	-15.3234	-3.8850	0.4917	0.0000			

RESULT : Joint Reactions

Joint	Result Case	Force X (kN)	Force Y (kN)	Force Z (kN)	Moment X (kN-m)	Moment Y (kN-m)	Moment Z (kN-m)
3	Load Case 1	0.0000	0.0000	-27.4185	0.0000	0.0000	0.0000
4	Load Case 1	0.0000	0.0000	111.1282	0.0000	0.0000	0.0000
9	Load Case 1	0.0000	0.0000	111.1291	0.0000	0.0000	0.0000
10	Load Case 1	0.0000	0.0000	-27.4188	0.0000	0.0000	0.0000

RESULT : Member Stresses

Member	Station	Result Case	(P/A) @ Centroid (N/mm ²)	Normal Stress @ Point 1	Normal Stress @ Point 2	Normal Stress @ Point 3	Normal Stress @ Point 4	Normal Stress @ Point 5 (N/mm ²)	Normal Stress @ Point 6 (N/mm ²)	Max ABS Total Stress (N/mm ²)	Shear Stress Y (N/mm ²)	Shear Stress Z (N/mm ²)
1	0	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	1	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	2	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	3	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	4	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	5	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	6	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	7	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	8	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	9	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	10	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-1.4316
2	1	Load	0.0000	-14.2316	-14.2316	14.2316	14.2316	0.0000	0.0000	14.2316	0.0000	-1.4316
2	2	Load	0.0000	-28.4633	-28.4633	28.4633	28.4633	0.0000	0.0000	28.4633	0.0000	-1.4316
2	3	Load	0.0000	-42.6949	-42.6949	42.6949	42.6949	0.0000	0.0000	42.6949	0.0000	-1.4316
2	4	Load	0.0000	-56.9265	-56.9265	56.9265	56.9265	0.0000	0.0000	56.9265	0.0000	-1.4316
2	5	Load	0.0000	-71.1581	-71.1581	71.1581	71.1581	0.0000	0.0000	71.1581	0.0000	-1.4316
2	6	Load	0.0000	-85.3898	-85.3898	85.3898	85.3898	0.0000	0.0000	85.3898	0.0000	-1.4316
2	7	Load	0.0000	-99.6214	-99.6214	99.6214	99.6214	0.0000	0.0000	99.6214	0.0000	-1.4316
2	8	Load	0.0000	-113.8530	-113.8530	113.8530	113.8530	0.0000	0.0000	113.8530	0.0000	-1.4316
2	9	Load	0.0000	-128.0846	-128.0846	128.0846	128.0846	0.0000	0.0000	128.0846	0.0000	-1.4316
2	10	Load	0.0000	-142.3163	-142.3163	142.3163	142.3163	0.0000	0.0000	142.3163	0.0000	-1.4316
3	0	Load	0.0000	-142.3163	-142.3163	142.3163	142.3163	0.0000	0.0000	142.3163	0.0000	4.3708
3	1	Load	0.0000	-128.0845	-128.0845	128.0845	128.0845	0.0000	0.0000	128.0845	0.0000	4.3708
3	2	Load	0.0000	-113.8527	-113.8527	113.8527	113.8527	0.0000	0.0000	113.8527	0.0000	4.3708
3	3	Load	0.0000	-99.6209	-99.6209	99.6209	99.6209	0.0000	0.0000	99.6209	0.0000	4.3708
3	4	Load	0.0000	-85.3891	-85.3891	85.3891	85.3891	0.0000	0.0000	85.3891	0.0000	4.3708
3	5	Load	0.0000	-71.1573	-71.1573	71.1573	71.1573	0.0000	0.0000	71.1573	0.0000	4.3708
3	6	Load	0.0000	-56.9255	-56.9255	56.9255	56.9255	0.0000	0.0000	56.9255	0.0000	4.3708
3	7	Load	0.0000	-42.6937	-42.6937	42.6937	42.6937	0.0000	0.0000	42.6937	0.0000	4.3708
3	8	Load	0.0000	-28.4619	-28.4619	28.4619	28.4619	0.0000	0.0000	28.4619	0.0000	4.3708
3	9	Load	0.0000	-14.2301	-14.2301	14.2301	14.2301	0.0000	0.0000	14.2301	0.0000	4.3708
3	10	Load	0.0000	0.0017	0.0017	-0.0017	-0.0017	0.0000	0.0000	-0.0017	0.0000	4.3708
4	0	Load	0.0000	0.0018	0.0018	-0.0018	-0.0018	0.0000	0.0000	-0.0018	0.0000	4.3708



RESULT : Member Stresses

Member	Station	Result Case	(P/A) @ Centroid (N/mm ²)	Normal Stress @ Point 1 (N/mm ²)	Normal Stress @ Point 2 (N/mm ²)	Normal Stress @ Point 3 (N/mm ²)	Normal Stress @ Point 4 (N/mm ²)	Normal Stress @ Point 5 (N/mm ²)	Normal Stress @ Point 6 (N/mm ²)	Max ABS Total Stress	Shear Stress Y (N/mm ²)	Shear Stress Z (N/mm ²)
4	1	Load	0.0000	7.0054	7.0054	-7.0054	-7.0054	0.0000	0.0000	-7.0054	0.0000	4.3708
4	2	Load	0.0000	14.0089	14.0089	-14.0089	-14.0089	0.0000	0.0000	-14.0089	0.0000	4.3708
4	3	Load	0.0000	21.0125	21.0125	-21.0125	-21.0125	0.0000	0.0000	-21.0125	0.0000	4.3708
4	4	Load	0.0000	28.0161	28.0161	-28.0161	-28.0161	0.0000	0.0000	-28.0161	0.0000	4.3708
4	5	Load	0.0000	35.0197	35.0197	-35.0197	-35.0197	0.0000	0.0000	-35.0197	0.0000	4.3708
4	6	Load	0.0000	42.0233	42.0233	-42.0233	-42.0233	0.0000	0.0000	-42.0233	0.0000	4.3708
4	7	Load	0.0000	49.0268	49.0268	-49.0268	-49.0268	0.0000	0.0000	-49.0268	0.0000	4.3708
4	8	Load	0.0000	56.0304	56.0304	-56.0304	-56.0304	0.0000	0.0000	-56.0304	0.0000	4.3708
4	9	Load	0.0000	63.0340	63.0340	-63.0340	-63.0340	0.0000	0.0000	-63.0340	0.0000	4.3708
4	10	Load	0.0000	70.0376	70.0376	-70.0376	-70.0376	0.0000	0.0000	-70.0376	0.0000	4.3708
5	0	Load	0.0000	70.0376	70.0376	-70.0376	-70.0376	0.0000	0.0000	-70.0376	0.0000	0.0000
5	1	Load	0.0000	70.0376	70.0376	-70.0376	-70.0376	0.0000	0.0000	-70.0376	0.0000	0.0000
5	2	Load	0.0000	70.0375	70.0375	-70.0375	-70.0375	0.0000	0.0000	-70.0375	0.0000	0.0000
5	3	Load	0.0000	70.0375	70.0375	-70.0375	-70.0375	0.0000	0.0000	-70.0375	0.0000	0.0000
5	4	Load	0.0000	70.0375	70.0375	-70.0375	-70.0375	0.0000	0.0000	-70.0375	0.0000	0.0000
5	5	Load	0.0000	70.0375	70.0375	-70.0375	-70.0375	0.0000	0.0000	-70.0375	0.0000	0.0000
5	6	Load	0.0000	70.0374	70.0374	-70.0374	-70.0374	0.0000	0.0000	-70.0374	0.0000	0.0000
5	7	Load	0.0000	70.0374	70.0374	-70.0374	-70.0374	0.0000	0.0000	-70.0374	0.0000	0.0000
5	8	Load	0.0000	70.0374	70.0374	-70.0374	-70.0374	0.0000	0.0000	-70.0374	0.0000	0.0000
5	9	Load	0.0000	70.0374	70.0374	-70.0374	-70.0374	0.0000	0.0000	-70.0374	0.0000	0.0000
5	10	Load	0.0000	70.0374	70.0374	-70.0374	-70.0374	0.0000	0.0000	-70.0374	0.0000	0.0000
6	0	Load	0.0000	70.0374	70.0374	-70.0374	-70.0374	0.0000	0.0000	-70.0374	0.0000	-4.3708
6	1	Load	0.0000	63.0337	63.0337	-63.0337	-63.0337	0.0000	0.0000	-63.0337	0.0000	-4.3708
6	2	Load	0.0000	56.0301	56.0301	-56.0301	-56.0301	0.0000	0.0000	-56.0301	0.0000	-4.3708
6	3	Load	0.0000	49.0265	49.0265	-49.0265	-49.0265	0.0000	0.0000	-49.0265	0.0000	-4.3708
6	4	Load	0.0000	42.0228	42.0228	-42.0228	-42.0228	0.0000	0.0000	-42.0228	0.0000	-4.3708
6	5	Load	0.0000	35.0192	35.0192	-35.0192	-35.0192	0.0000	0.0000	-35.0192	0.0000	-4.3708
6	6	Load	0.0000	28.0156	28.0156	-28.0156	-28.0156	0.0000	0.0000	-28.0156	0.0000	-4.3708
6	7	Load	0.0000	21.0119	21.0119	-21.0119	-21.0119	0.0000	0.0000	-21.0119	0.0000	-4.3708
6	8	Load	0.0000	14.0083	14.0083	-14.0083	-14.0083	0.0000	0.0000	-14.0083	0.0000	-4.3708
6	9	Load	0.0000	7.0047	7.0047	-7.0047	-7.0047	0.0000	0.0000	-7.0047	0.0000	-4.3708
6	10	Load	0.0000	0.0011	0.0011	-0.0011	-0.0011	0.0000	0.0000	-0.0011	0.0000	-4.3708
7	0	Load	0.0000	0.0011	0.0011	-0.0011	-0.0011	0.0000	0.0000	-0.0011	0.0000	-4.3708
7	1	Load	0.0000	-14.2308	-14.2308	14.2308	14.2308	0.0000	0.0000	14.2308	0.0000	-4.3708
7	2	Load	0.0000	-28.4627	-28.4627	28.4627	28.4627	0.0000	0.0000	28.4627	0.0000	-4.3708
7	3	Load	0.0000	-42.6946	-42.6946	42.6946	42.6946	0.0000	0.0000	42.6946	0.0000	-4.3708
7	4	Load	0.0000	-56.9265	-56.9265	56.9265	56.9265	0.0000	0.0000	56.9265	0.0000	-4.3708
7	5	Load	0.0000	-71.1584	-71.1584	71.1584	71.1584	0.0000	0.0000	71.1584	0.0000	-4.3708
7	6	Load	0.0000	-85.3903	-85.3903	85.3903	85.3903	0.0000	0.0000	85.3903	0.0000	-4.3708
7	7	Load	0.0000	-99.6222	-99.6222	99.6222	99.6222	0.0000	0.0000	99.6222	0.0000	-4.3708
7	8	Load	0.0000	-113.8541	-113.8541	113.8541	113.8541	0.0000	0.0000	113.8541	0.0000	-4.3708
7	9	Load	0.0000	-128.0860	-128.0860	128.0860	128.0860	0.0000	0.0000	128.0860	0.0000	-4.3708
7	10	Load	0.0000	-142.3180	-142.3180	142.3180	142.3180	0.0000	0.0000	142.3180	0.0000	-4.3708
8	0	Load	0.0000	-142.3180	-142.3180	142.3180	142.3180	0.0000	0.0000	142.3180	0.0000	1.4316
8	1	Load	0.0000	-128.0862	-128.0862	128.0862	128.0862	0.0000	0.0000	128.0862	0.0000	1.4316
8	2	Load	0.0000	-113.8544	-113.8544	113.8544	113.8544	0.0000	0.0000	113.8544	0.0000	1.4316
8	3	Load	0.0000	-99.6226	-99.6226	99.6226	99.6226	0.0000	0.0000	99.6226	0.0000	1.4316
8	4	Load	0.0000	-85.3908	-85.3908	85.3908	85.3908	0.0000	0.0000	85.3908	0.0000	1.4316
8	5	Load	0.0000	-71.1590	-71.1590	71.1590	71.1590	0.0000	0.0000	71.1590	0.0000	1.4316
8	6	Load	0.0000	-56.9272	-56.9272	56.9272	56.9272	0.0000	0.0000	56.9272	0.0000	1.4316
8	7	Load	0.0000	-42.6954	-42.6954	42.6954	42.6954	0.0000	0.0000	42.6954	0.0000	1.4316
8	8	Load	0.0000	-28.4636	-28.4636	28.4636	28.4636	0.0000	0.0000	28.4636	0.0000	1.4316
8	9	Load	0.0000	-14.2318	-14.2318	14.2318	14.2318	0.0000	0.0000	14.2318	0.0000	1.4316



RESULT : Member Stresses

Member	Station	Result Case	(P/A) @ Centroid (N/mm ²)	Normal Stress @ Point 1 (N/mm ²)	Normal Stress @ Point 2 (N/mm ²)	Normal Stress @ Point 3 (N/mm ²)	Normal Stress @ Point 4	Normal Stress @ Point 5	Normal Stress @ Point 6	Max ABS Total Stress	Shear Stress Y (N/mm ²)	Shear Stress Z (N/mm ²)
8	10	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.4316		
9	0	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	1	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	2	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	3	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	4	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	5	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	6	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	7	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	8	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	9	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
9	10	Load	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		

RESULT : Member End Forces (Global)

Member	Joint	Result Case	Force X (kN)	Force Y (kN)	Force Z (kN)	Moment X (kN-m)	Moment Y (kN-m)	Moment Z (kN-m)
1	1	Load Cases:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	3	Load Cases:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	3	Load Cases:	0.0000	0.0000	-27.4185	0.0000	0.0000	0.0000
2	4	Load Cases:	0.0000	0.0000	27.4185	-228.0357	325.6688	0.0000
3	4	Load Cases:	0.0000	0.0000	83.7097	228.0357	-325.6688	0.0000
3	5	Load Cases:	0.0000	0.0000	-83.7097	0.0014	-0.0048	0.0000
4	5	Load Cases:	0.0000	0.0000	83.7097	-0.0014	0.0048	0.0000
4	6	Load Cases:	0.0000	0.0000	-83.7097	58.8351	-186.5980	0.0000
5	6	Load Cases:	0.0000	0.0000	-0.0003	-58.8351	186.5980	0.0000
5	7	Load Cases:	0.0000	0.0000	0.0003	58.8349	-186.5974	0.0000
6	7	Load Cases:	0.0000	0.0000	-83.7103	-58.8349	186.5974	0.0000
6	8	Load Cases:	0.0000	0.0000	83.7103	0.0000	-0.0031	0.0000
7	8	Load Cases:	0.0000	0.0000	-83.7103	0.0000	0.0031	0.0000
7	9	Load Cases:	0.0000	0.0000	83.7103	0.0000	397.5729	0.0000
8	9	Load Cases:	0.0000	0.0000	27.4188	0.0000	-397.5729	0.0000
8	10	Load Cases:	0.0000	0.0000	-27.4188	0.0000	0.0000	0.0000
9	10	Load Cases:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
9	11	Load Cases:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

