



***MEMORIA DE CÁLCULO
EVALUACION ESTRUCTURAL.
TORRE CUADRADA SECCION
VARIABLE $H=155.0m$.
ANCHO DE PATA = $13.0m$
ESTACION: CERRÓ MUNCHIQUE.
Municipio de El Tambo.
Departamento del Cauca.***

Abril 2016.

Rev. 1 – Junio 2016.

INFORME TECNICO.

Para la Condición Actual y Nueva (Futura), No se requiere refuerzo.

Eficiencia General Condición Nueva (Futura): Montantes 94.5%, Diagonales 70.7%, Horizontales 86.6% y Tornillos 90.5%. Deflexión Máxima = $315.01\text{ mm} < 775\text{ mm}$. oK.

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INTRODUCCION

1.1 OBJETO

El objeto de este documento es la verificación del diseño estructural de la torre metálica cuadrada de sección variable de 155.0 metros de altura. Ubicada en la estación: **CERRÓ MUNCHIQUE, Municipio de El Tambo, Departamento del Cauca**. Que soporta antenas de TV y MW.

La torre es de sección cuadrada, montantes, diagonales y horizontales a base de ángulos de lados iguales, el ancho de la pata es de 13.0 m. Esta medida es variable hasta llegar a una altura de 100.0 m, donde es 2.80 m. Continuando en sección constante hasta el nivel 115.0 m, donde es 2.80 m, hace transición hasta el nivel 118.0m donde es 1.0 m. Continuando en sección constante hasta el nivel 142.0 m, hace transición, hasta el nivel 143 m, donde es 0.65 m. Continuando en sección constante hasta los 155.0 m.

CONDICION ACTUAL (Antenas existentes):

1 CARGA POR MANTENIMIENTO (4 personas) – NIVEL 155.0 m 24
ANTENAS GRILLA TV (0.15x0.60m) – NIVEL 142.0 AL 137.0m
– CARAS A, B, C y D.
24 ANTENAS GRILLA TV (0.15x0.60m) – NIVEL 131.0 AL 126.0m
– CARAS A, B, C y D.
15 ANTENAS GRILLA TV (0.30x1.20m) – NIVEL 113.0 AL 108.0m
– CARAS A, B y C.
12 ANTENAS GRILLA TV (0.30x1.20m) – NIVEL 106.0 AL 101.0m
– CARAS A, B y C.
12 ANTENAS GRILLA TV (0.30x1.20m) – NIVEL 95.0 AL 90.0m
– MONTANTE A y CARA D.
6 ANTENAS GRILLA TV (0.30x1.20m) – NIVEL 88.0 AL 83.0m
– CARA B.
1 ANTENA MW Ø 2.40m – NIVEL 74.0m, MONTANTE B
1 ANTENA MW Ø 3.70m – NIVEL 66.5m, MONTANTE D
1 ANTENA MW Ø 3.70m – NIVEL 54.0m, MONTANTE D
1 ANTENA MW Ø 1.80m – NIVEL 24.5m, MONTANTE D
1 ANTENA MW Ø 1.80m – NIVEL 24.5m, MONTANTE B

CONDICION NUEVA (FUTURA): 6:6:4.

2 ANTENAS PANEL (1.0x0.50x0.19m) – NIVEL 154.5m
3 ANTENAS PANEL (1.0x0.50x0.19m) – NIVEL 153.5m
3 ANTENAS PANEL (1.0x0.50x0.19m) – NIVEL 152.5m
3 ANTENAS PANEL (1.0x0.50x0.19m) – NIVEL 151.5m
3 ANTENAS PANEL (1.0x0.50x0.19m) – NIVEL 150.5m
2 ANTENAS PANEL (1.0x0.50x0.19m) – NIVEL 149.5m
4 CABLES Ø3" PARA ANTENAS PANEL.



NOTA:

A CONTINUACION SE MUESTRAN LOS AZIMUT DE LAS CARAS DE LA TORRE:

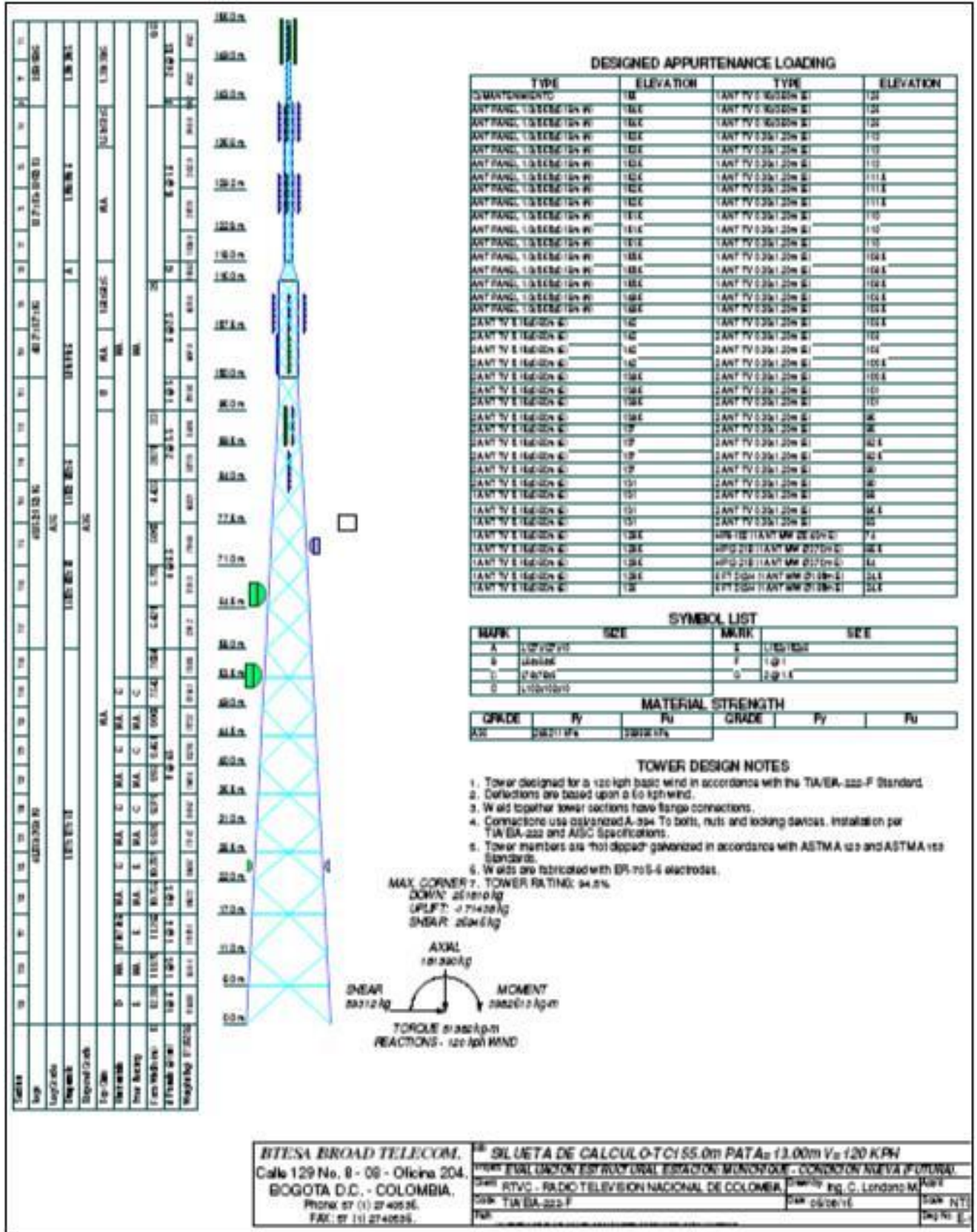
*AZIMUT DE LA CARA A: 63°
AZIMUT DE LA CARA B: 153°
AZIMUT DE LA CARA C: 243°
AZIMUT DE LA CARA D: 333°*

PANORAMICA TC155m – ESTADO ACTUAL.



13 03 2016

SILUETA DE CALCULO CONDICION NUEVA.



1.2 CODIGOS Y NORMAS:

NSR-10
 AISC
 TIA/EIA 222-F
 ASCE, Report 52
 ANSI/ASCE 10-90
 ANDREWS, Bulletin 1015F
 ASTM (normas aplicables)
 ACI 318 última edición
 AWS

1.3 MATERIALES ESTRUCTURALES:

Perfiles estructurales de montantes:	ASTM A-36.
Perfiles estructurales de diagonales, horizontales redundantes y laminas:	ASTM A –36.
Tornillos:	ASTM A-394 T0.
Anclajes:	Angulo de espera.
Soldadura:	AWS.

1.4 DOCUMENTOS DE REFERENCIA

Esquemas de diseño del levantamiento de la estructura de la torre.

1.5 CARGAS

Las siguientes cargas serán consideradas en el análisis estructural.

-Cargas muertas, CM, correspondientes a los pesos propios de la estructura, plataformas de operación, revestimientos y accesorios.

-Cargas vivas, 4 personas de 80 Kg. Cada una por mantenimiento, CV.

-Cargas de viento, CW.

Las combinaciones de estas cargas para incluirlas en los análisis y diseños Estructurales estarán de acuerdo con la Norma TIA/EIA-222-F.

1.6 SISTEMAS DE MEDIDA

Longitud	m, mm
Coordenadas	m
Áreas	m ² , cm ²
Fuerza	Kg.
Presión	kgm
Esfuerzo	kPa
Momentos	Kg-m
Modulo	kPa
Propiedades	mm
Deflexiones	mm

En caso contrario se indicara el tipo de unidad utilizado. De todas maneras las unidades empleadas para un evento determinado serán compatibles entre sí.

1.0 CARGAS MUERTAS, CM

Las cargas muertas corresponderán a los pesos propios de los elementos estructurales, revestimiento, escaleras de acceso y guía de ondas, soportes de antenas y demás accesorios.



El cálculo de los pesos de los elementos estructurales los realiza internamente el programa, incluyendo un factor de 1.50, de sobre peso por elementos redundantes, platinas, tornillos y galvanizado, y lo distribuye sobre los nudos correspondientes.

2.0 CARGAS VIVAS

La carga viva considerada consistirá en 4 personas de 80 Kg. Cada una por mantenimiento.

3.0 CARGAS DE VIENTO

Las cargas de viento se calcularan de acuerdo a la norma TIA/EIA 222 F-1996.

Velocidad básica de viento,

V = 120 KPH (Zona 4)

Deflexiones se calculan con Velocidad de viento,

V = 60 KPH.



5.0 ANALISIS Y DISEÑOS ESTRUCTURALES

5.1 ANALISIS ESTRUCTURAL

En la Fig. 1 del Anexo se presenta la silueta del análisis y diseño estructural de la torre de sección cuadrada de 155.0 m. De altura, objeto de este documento.

Se consideran siete hipótesis de carga:

- 1- Carga Muerta*
- 2- Viento (120 KPH) Carga Muerta + Viento en dirección normal de una cara de la torre, dirección Z, ángulo de incidencia 0°.*
- 3- Viento (120 KPH) Carga Muerta + Viento en dirección diagonal, sobre un vértice de la torre, ángulo de incidencia de 45°.*
- 4- Viento (120 KPH) Carga Muerta + Viento en dirección normal de una cara de la torre, dirección Z, ángulo de incidencia 90°.*
- 5- Viento (60 KPH) Carga Muerta + Viento en dirección normal de una cara de la torre, dirección Z, ángulo de incidencia 0°, con cargas de operación.*
- 6- Viento (60 KPH) Carga Muerta + Viento en dirección diagonal, sobre un vértice de la torre, ángulo de incidencia de 45°, con cargas de operación.*
- 7- Viento (60 KPH) Carga Muerta + Viento en dirección normal de una cara de la torre, dirección Z, ángulo de incidencia 90°, con cargas de operación.*

Igualmente en el ANEXO A se presentan los datos de entrada y los resultados del análisis estructural para los diferentes elementos que conforman la torre de sección cuadrada, realizado por el programa para diseño de torres RISATower, Versión 5.4.1.8 – 8 de Abril de 2010, de RISA TECHNOLOGIES.

También se incluye un control de deflexiones en la parte superior de la torre (Nivel 155.0 m) de tal manera que cumpla con el requisito de que, la deflexión en este punto, a 60 KPH, sea menor o igual a $h/200$.



5.2 DISEÑOS ESTRUCTURALES

Con base en el dimensionamiento y en los resultados de modelo, se evalúan las cargas máximas actuantes y admisibles en cada tramo, considerando los efectos simultáneos de Axial y de Flexión. Para una mayor precisión, se consideran también los efectos de segundo orden (P-Delta)

En la fase, para el caso de cargas de diseño, se verifica que en los elementos estructurales no se sobrepasen sus capacidades admisibles de compresión y tracción establecidas por la norma.

También se verifica que en las conexiones propuestas tampoco se sobrepasen sus capacidades admisibles de corte y aplastamiento establecidas por la norma.

Anexos:

Siluetas del levantamiento.

Ver salida 1 – Condición Actual.

Ver salida 2 – Condición Nueva (Futura), datos de entrada y salida de los resultados del análisis y los diseños.

6.0 CONCLUSIONES:

En la **CONDICION ACTUAL**, con las antenas relacionadas y las características estructurales de la torre para una velocidad de viento de 120 Kph. Después del análisis y verificación de esfuerzos de los materiales de la estructura de la torre de 155.0m, de la **ESTACION: CERRÓ MUNCHIQUE** – Ubicada en Municipio de El Tambo, Departamento del Cauca, tenemos: **LA TORRE CUMPLE**. Porcentaje máximo de utilización Montante (T29) 73.4% < 100%. **Ok. Cumple.**

PORCENTAJE DE USO DE ELEMENTOS CONDICION ACTUAL.

Section Capacity Table								
Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass/Fail
T1	155 - 149	Leg	L89x89x6	3	-2037.87	19784.02	10.3	Pass
		Diagonal	L38x38x5	9	-3097.6	4336.44	7.1	Pass
		Top Girt	L38x38x5	6	-4.83	5060.06	0.1	Pass
T2	149 - 143	Leg	L89x89x6	59	-8045.14	19784.02	40.7	Pass
		Diagonal	L38x38x5	65	-648.49	4336.44	15.0	Pass
		Top Girt	L38x38x5	63	21.67	6780.90	0.3	Pass
T3	143 - 142	Leg	L89x89x6	115	-6774.54	17962.43	37.7	Pass
		Diagonal	L38x38x5	126	-1192.00	4252.04	28.0	Pass
		Top Girt	L38x38x5	119	-412.55	5060.06	8.2	Pass
T4	142 - 135.6	Leg	L127x13+L102x13	131	-14797.37	101737.12	14.5	Pass
		Diagonal	L89x89x6	138	-995.05	19041.95	5.2	Pass
		Top Girt	L51x51x5	136	-848.12	6087.26	13.9	Pass
T5	135.6 - 129.2	Leg	L127x13+L102x13	171	-28503.98	101737.12	28.0	Pass
		Diagonal	L89x89x6	174	-1452.09	19041.95	7.6	Pass
T6	129.2 - 122.8	Leg	L127x13+L102x13	207	-46394.80	101737.12	45.6	Pass
		Diagonal	L89x89x6	210	-1993.12	19041.95	10.5	Pass
T7	122.8 - 118	Leg	L127x13+L102x13	243	-57816.26	101737.12	56.8	Pass
		Diagonal	L89x89x6	248	-3838.65	19041.95	20.2	Pass
T8	118 - 115	Leg	L127x13+L102x13	271	-46073.20	86927.10	53.0	Pass
		Diagonal	L127x127x10	290	-15149.58	39543.68	38.3	Pass
		Top Girt	L64x64x5	274	-2104.59	8992.85	23.4	Pass
T9	115 - 107.5	Leg	4L127x127x16	295	-45054.66	259679.05	17.4	Pass
		Diagonal	L89x89x6	302	-2518.61	13047.74	19.3	Pass
		Top Girt	L64x64x5	300	-2166.34	4451.25	48.7	Pass
T10	107.5 - 100	Leg	4L127x127x16	327	-64391.08	259679.05	24.8	Pass
		Diagonal	L89x89x6	332	-3443.69	13047.74	26.4	Pass
T11	100 - 95	Leg	4L152x152x16	355	-70943.23	327474.78	21.7	Pass
		Diagonal	L89x89x6	364	-2020.44	18314.15	11.0	Pass
		Top Girt	L64x64x5	358	-1129.63	4451.25	25.4	Pass
T12	95 - 89.5	Leg	4L152x152x16	371	-77814.70	321507.60	24.2	Pass
		Diagonal	L89x89x6	374	-2332.08	17662.59	13.2	Pass
T13	89.5 - 84	Leg	4L152x152x16	383	-83889.66	321507.60	26.1	Pass
		Diagonal	L102x102x6	386	-2768.49	20282.61	13.6	Pass
T14	84 - 77.5	Leg	4L152x152x16	395	-92243.48	308823.49	29.9	Pass
		Diagonal	L102x102x6	398	-3520.64	19222.56	18.3	Pass
T15	77.5 - 71	Leg	4L152x152x16	407	-101531.69	308823.49	32.9	Pass
		Diagonal	L102x102x10	410	-4092.79	28402.91	14.4	Pass
T16	71 - 64.5	Leg	4L152x152x16	419	-112095.86	308823.49	36.3	Pass
		Diagonal	L102x102x10	422	-4716.50	27790.17	17.0	Pass
T17	64.5 - 58	Leg	4L152x152x16	431	-123472.87	308823.49	40.0	Pass
		Diagonal	L102x102x10	434	-5598.42	27116.54	20.6	Pass
T18	58 - 53.5	Leg	4L203x203x19	443	-137854.92	535355.03	25.8	Pass
		Diagonal	L127x127x10	446	-6618.69	35036.76	18.9	Pass
T19	53.5 - 49	Leg	4L203x203x19	459	-139381.26	535355.03	26.0	Pass

Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass/Fail
T20	49 - 44.5	Diagonal	L127x127x10	462	-7864.52	34219.90	23.0	Pass
		Horizontal	L76x76x6	445	-1009.50	13592.40	7.4	Pass
		Inner Bracing	L76x76x6	469	-153.63	4133.54	3.7	Pass
		Leg	4L203x203x19	475	-157614.77	535355.03	29.4	Pass
T21	44.5 - 40	Diagonal	L127x127x10	478	-7525.87	34219.90	22.0	Pass
		Leg	4L203x203x19	491	-159168.33	535355.03	29.7	Pass
		Diagonal	L127x127x10	494	-8282.51	33197.15	24.9	Pass
		Horizontal	L76x76x6	477	-682.14	12634.83	5.4	Pass
T22	40 - 35.5	Inner Bracing	L76x76x6	501	-46.73	3285.24	1.4	Pass
		Leg	4L203x203x19	507	-177771.06	535355.03	33.2	Pass
		Diagonal	L127x127x10	510	-7881.53	33197.15	23.7	Pass
		Leg	4L203x203x19	523	-179329.15	535355.03	33.5	Pass
T23	35.5 - 31	Diagonal	L127x127x10	526	-867.151	32095.68	27.0	Pass
		Horizontal	L76x76x6	509	-669.75	11614.87	5.8	Pass
		Inner Bracing	L76x76x6	533	-31.26	2673.60	1.2	Pass
		Leg	4L203x203x19	539	-197478.75	535355.03	36.9	Pass
T24	31 - 26.5	Diagonal	L127x127x10	542	-8249.26	32095.68	25.7	Pass
		Leg	4L203x203x19	555	-199076.76	535355.03	37.2	Pass
		Diagonal	L127x127x10	558	-9185.38	30917.36	29.7	Pass
		Horizontal	L76x76x6	541	-725.68	10530.75	6.9	Pass
T25	26.5 - 22	Inner Bracing	L102x102x6	566	-19.94	4042.86	0.8	Pass
		Leg	4L203x203x19	571	-218869.27	526387.63	41.6	Pass
		Diagonal	L127x127x10	574	-9054.89	29792.18	30.4	Pass
							35.1 (b)	
T27	17 - 11	Leg	4L203x203x19	587	-220949.90	534556.91	41.3	Pass
		Diagonal	L127x127x10	590	-10781.76	32890.96	32.8	Pass
		Horizontal	L76x76x6	573	-723.22	9313.31	7.8	Pass
		Inner Bracing	L102x102x6	597	-43.44	4501.95	1.0	Pass
T28	11 - 6	Leg	4L203x203x19	603	-242579.00	526387.63	46.1	Pass
		Diagonal	L127x127x10	606	-9373.90	28272.61	33.2	Pass
		Horizontal	L76x76x6	573	-723.22	9313.31	7.8	Pass
		Inner Bracing	L102x102x6	597	-43.44	4501.95	1.0	Pass
T29	6 - 0	Leg	4L203x203x19	619	-244718.60	534556.91	45.8	Pass
		Diagonal	L127x127x10	622	-11203.19	31871.23	35.2	Pass
		Horizontal	L102x102x10	605	-762.86	22983.95	3.3	Pass
		Inner Bracing	L102x102x6	629	-39.41	3723.39	1.1	Pass
							Summary	
							Leg (T29)	Pass
							Diagonal (T29)	Pass
							Horizontal (T27)	Pass
							Top Girt (T9)	Pass
							Inner Bracing (T19)	Pass
							Bot Checks	Pass
							RATING =	Pass

Ver Salida 1 – Condición Actual.

En la **CONDICION NUEVA**, con las antenas relacionadas (Existentes) más dos (2) antenas panel (1.0x0.50x0.19m), en el nivel 154.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 153.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 152.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 151.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 150.5m, dos (2) antenas panel (1.0x0.50x0.19m), en el nivel 149.5m, y las características estructurales de la torre para una velocidad de viento de 120 Kph. Después del análisis y verificación de esfuerzos de los materiales de la estructura de la torre de 155.0m, de la **ESTACION: CERRÓ MUNCHIQUE** – Ubicada en Municipio de El Tambo, Departamento del Cauca, tenemos: **LA TORRE CUMPLE**. Porcentaje máximo de utilización Montante (T2) 94.5% < 100%. **Ok. Cumple.**

PORCENTAJE DE USO DE ELEMENTOS CONDICION NUEVA.

Section Capacity Table								
Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass/Fail
T1	155 - 149	Leg	L89x89x6	3	-4812.34	19784.02	24.3	Pass
		Diagonal	L38x38x5	9	-1309.23	4336.44	30.2	Pass
		Top Girt	L38x38x5	6	-10.85	5060.06	0.2	Pass
T2	149 - 143	Leg	L89x89x6	59	-18694.32	19784.02	94.5	Pass
		Diagonal	L38x38x5	65	-1853.51	4336.44	42.7	Pass
		Top Girt	L38x38x5	61	-50.86	5060.06	1.0	Pass
T3	143 - 142	Leg	L89x89x6	115	-15737.44	17962.43	87.6	Pass
		Diagonal	L38x38x5	126	-3004.77	4252.04	70.7	Pass
		Top Girt	L38x38x5	117	1326.67	6780.90	19.6	Pass
T4	142 - 135.6	Leg	L127x13+L102x13	131	-29962.10	101737.12	29.5	Pass
		Diagonal	L89x89x6	138	-1882.45	19041.95	9.9	Pass
		Top Girt	L51x51x5	133	-2397.49	6087.26	39.4	Pass
T5	135.6 - 129.2	Leg	L127x13+L102x13	171	-51687.32	101737.12	50.8	Pass
		Diagonal	L89x89x6	174	-2399.48	19041.95	12.6	Pass
		Top Girt	L51x51x5	171	-2399.48	6087.26	39.4	Pass
T6	129.2 - 122.8	Leg	L127x13+L102x13	207	-76814.98	101737.12	75.5	Pass
		Diagonal	L89x89x6	212	-3039.33	19041.95	16.0	Pass
		Top Girt	L51x51x5	207	-76814.98	6087.26	39.4	Pass
T7	122.8 - 118	Leg	L127x13+L102x13	243	-91696.90	101737.12	90.1	Pass
		Diagonal	L89x89x6	248	-5720.35	19041.95	30.0	Pass
		Top Girt	L51x51x5	243	-91696.90	6087.26	39.4	Pass
T8	118 - 115	Leg	L127x13+L102x13	271	-70620.27	86927.10	81.2	Pass
		Diagonal	L127x127x10	290	-23811.16	39543.68	60.2	Pass
		Top Girt	L64x64x5	275	-3501.69	8992.85	38.9	Pass
T9	115 - 107.5	Leg	4L127x127x16	295	-64185.15	259679.05	24.7	Pass
		Diagonal	L89x89x6	304	-3207.23	13047.74	24.6	Pass
		Top Girt	L64x64x5	297	-3855.65	4451.25	86.6	Pass
T10	107.5 - 100	Leg	4L127x127x16	327	-87431.77	259679.05	33.7	Pass
		Diagonal	L89x89x6	332	-4274.38	13047.74	32.8	Pass
		Top Girt	L64x64x5	327	-87431.77	4451.25	86.6	Pass
T11	100 - 95	Leg	4L152x152x16	355	-93903.17	327474.78	28.7	Pass
		Diagonal	L89x89x6	364	-1871.61	18314.15	10.2	Pass
		Top Girt	L64x64x5	359	-1563.94	4451.25	35.1	Pass
T12	95 - 89.5	Leg	4L152x152x16	371	-99652.91	321507.60	31.0	Pass
		Diagonal	L89x89x6	374	-1981.33	17662.59	11.2	Pass
		Top Girt	L64x64x5	371	-99652.91	4451.25	86.6	Pass
T13	89.5 - 84	Leg	4L152x152x16	383	-104135.31	321507.60	32.4	Pass
		Diagonal	L102x102x6	388	-2231.42	20282.61	11.0	Pass
		Top Girt	L64x64x5	383	-104135.31	4451.25	86.6	Pass
T14	84 - 77.5	Leg	4L152x152x16	395	-111274.40	308823.49	36.0	Pass
		Diagonal	L102x102x6	398	-2819.32	19222.56	14.7	Pass
		Top Girt	L64x64x5	395	-111274.40	4451.25	86.6	Pass
T15	77.5 - 71	Leg	4L152x152x16	407	-119213.63	308823.49	38.6	Pass
		Diagonal	L102x102x6	410	-3391.47	28402.91	11.9	Pass
		Top Girt	L64x64x5	407	-119213.63	4451.25	86.6	Pass
T16	71 - 64.5	Leg	4L152x152x16	419	-128594.83	308823.49	41.6	Pass
		Diagonal	L102x102x6	422	-4011.09	27790.17	14.4	Pass
		Top Girt	L64x64x5	419	-128594.83	4451.25	86.6	Pass
T17	64.5 - 58	Leg	4L152x152x16	431	-138790.23	308823.49	44.9	Pass
		Diagonal	L102x102x6	434	-4877.03	27116.54	18.0	Pass
		Top Girt	L64x64x5	431	-138790.23	4451.25	86.6	Pass
T18	58 - 53.5	Leg	4L203x203x19	443	-151802.44	535355.03	28.4	Pass
		Diagonal	L127x127x10	446	-5743.21	35036.76	16.4	Pass
		Top Girt	L64x64x5	443	-151802.44	4451.25	86.6	Pass
T19	53.5 - 49	Leg	4L203x203x19	459	-153352.37	535355.03	28.6	Pass
		Diagonal	L127x127x10	462	-6984.64	34219.90	20.4	Pass
		Top Girt	L64x64x5	459	-153352.37	4451.25	86.6	Pass
T20	49 - 44.5	Horizontal	L76x76x6	445	-970.95	13592.40	7.1	Pass
		Inner Bracing	L76x76x6	469	-204.97	4133.54	5.0	Pass
		Leg	4L203x203x19	475	-170225.10	535355.03	31.8	Pass
T21	44.5 - 40	Diagonal	L127x127x10	478	-6648.40	34219.90	19.4	Pass
		Leg	4L203x203x19	491	-171801.79	535355.03	32.1	Pass
		Top Girt	L64x64x5	491	-171801.79	4451.25	86.6	Pass
T22	40 - 35.5	Diagonal	L127x127x10	494	-7391.24	33197.15	22.3	Pass
		Leg	4L203x203x19	501	-55.21	3285.24	1.7	Pass
		Top Girt	L64x64x5	507	-189101.81	535355.03	35.3	Pass

Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass Fail
T23	35.5 - 31	Diagonal	L127x127x10	510	-6994.40	33197.15	56.7 (b)	Pass
		Leg	4L203x203x19	523	-190683.48	535355.03	21.1	Pass
		Diagonal	L127x127x10	526	-7766.50	32095.68	26.8 (b)	Pass
T24	31 - 26.5	Horizontal	L76x76x6	509	-666.43	11614.87	57.2 (b)	Pass
		Inner Bracing	L76x76x6	533	-31.53	2673.60	24.2	Pass
		Leg	4L203x203x19	539	-207564.38	535355.03	29.2 (b)	Pass
T25	26.5 - 22	Diagonal	L127x127x10	542	-7350.83	32095.68	62.2 (b)	Pass
		Leg	4L203x203x19	555	-209185.97	535355.03	22.9	Pass
		Diagonal	L127x127x10	558	-8269.63	30917.36	28.2 (b)	Pass
T26	22 - 17	Horizontal	L76x76x6	541	-721.05	10530.75	39.1	Pass
		Inner Bracing	L102x102x6	566	-19.95	4042.86	62.7 (b)	Pass
		Leg	4L203x203x19	571	-227671.68	526387.63	26.7	Pass
T27	17 - 11	Diagonal	L127x127x10	574	-8110.01	29792.18	31.1 (b)	Pass
		Leg	4L203x203x19	587	-229784.52	534556.91	6.8	Pass
		Diagonal	L127x127x10	590	-9725.07	32890.96	0.8	Pass
T28	11 - 6	Horizontal	L76x76x6	573	-712.13	9313.31	43.3	Pass
		Inner Bracing	L102x102x6	597	-43.01	4501.95	68.3 (b)	Pass
		Leg	4L203x203x19	603	-249973.01	526387.63	27.2	Pass
T29	6 - 0	Diagonal	L127x127x10	606	-8426.07	28272.61	31.6 (b)	Pass
		Leg	4L203x203x19	619	-252144.81	534556.91	43.0	Pass
		Diagonal	L127x127x10	622	-10149.77	31871.23	68.9 (b)	Pass
		Horizontal	L102x102x10	605	-733.43	22983.95	29.6	Pass
		Inner Bracing	L102x102x6	629	-39.36	3723.39	36.6 (b)	Pass
							75.0 (b)	Pass
							29.8	Pass
							32.0 (b)	Pass
							47.2	Pass
							75.6 (b)	Pass
							31.8	Pass
							38.2 (b)	Pass
							3.2	Pass
							3.7 (b)	Pass
							1.1	Pass
							Summary	
							Leg (T2)	Pass
							Diagonal (T3)	Pass
							Horizontal (T27)	Pass
							Top Girt (T9)	Pass
							Inner Bracing (T19)	Pass
							Block Checks	Pass
							RATING =	Pass
							94.5	Pass

Program Version 5.4.1.8 - 4/8/2010 File: D:\EVALUACION ESTRUCTURAL TORRE CUADRADA H=155m C. NUEVA E. C. MUNCHIQUE.eri

Ver Salida 2 – Condición Nueva.

7.0 RECOMENDACIONES:

-La torre para la Condición Actual y Nueva (Futura) Cumple.

Se puede proceder con la instalación de las nuevas antenas: Dos (2) antenas panel (1.0x0.50x0.19m), en el nivel 154.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 153.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 152.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 151.5m, tres (3) antenas panel (1.0x0.50x0.19m), en el nivel 150.5m, dos (2) antenas panel (1.0x0.50x0.19m), en el nivel 149.5m

RESUMEN DE PORCENTAJE DE USO DE LOS ELEMENTOS DE LA TORRE			
ELEMENTO:	C. ACTUAL	C. NUEVA	C. NUEVA+REF
MONTANTE	(T29) 73.4%	(T2) 94.5%	-
DIAGONAL	(T29) 42.1%	(T3) 70.7%	-
HORIZONTAL	(T9) 48.7%	(T9) 86.6%	-
TORNILLOS	73.4%	90.5%	-

8.0 CIMENTACION:/

Tipo zapata aislada.

De acuerdo a las excavaciones se determinaron zapatas de 4.0x4.0x0.80m de espesor, a una profundidad de 4.30m, pedestales de 1.5x1.5x3.70m, los cuales sobresalen 0.20m

Con las reacciones para la condición Nueva (Futura), la cimentación cumple para los chequeos de arrancamiento y capacidad.

Anexo memoria de la verificación de la cimentación.

Anclajes con Stub (Angulo de espera).

9.0 INSPECCION TECNICA.

PINTURA: En un 80% se encuentra en mal estado, se recomienda limpieza, lavado y pintura de toda la estructura.

ESCALERA DE ACCESO: Por una de las caras de la torre y con guarda cuerpo.

LINEA DE VIDA: Se tiene línea de vida pero convencional. Se recomienda la instalación de una línea de vida que cumpla con los sistemas de seguridad.

ESCALERA DE CABLES: Una (1) por una de las caras de la torre en un 70% de uso.

LUCES DE OBSTRUCCION Y BALIZAJE: En mal estado. Se recomienda el cabio y mantenimiento del sistema.



SISTEMA DE TIERRAS: *En mal estado, cables sulfatados. Se recomienda la construcción de un sistema nuevo.*

PARARRAYOS: *En mal estado. Se recomienda el mantenimiento de todo el sistema.*

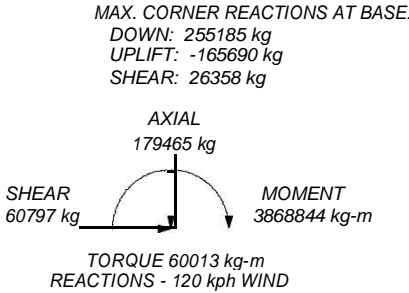
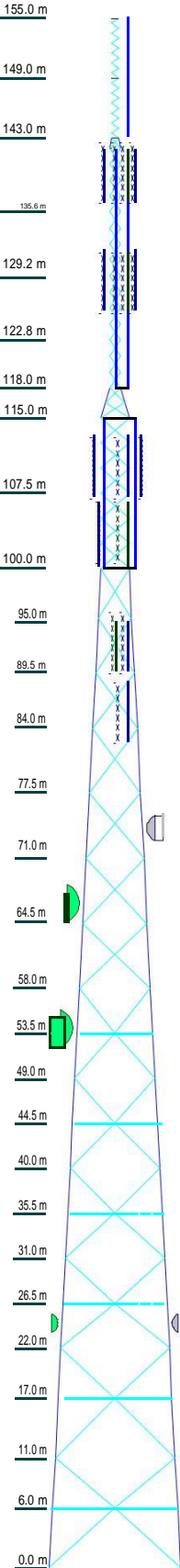
TORNILLOS: *En buen estado, se recomienda torque general de la tornillería.*

Anexos:

Registro Fotográfico.

CONDICION ACTUAL.
ESTACION: CERRÓ MUNCHIQUE.

Section	T29	T28	T27	T26	T25	T24	T23	T22	T21	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	4L203x203x19																												
Leg Grade	L127x127x10																												
Diagonals	L127x127x16																												
Diagonal Grade	A36																												
Top Girts	A36																												
Horizontals	L127x127x10																												
Inner Bracing	L89x89x6																												
13	A																												
# Panels @ (m)	L89x89x6																												
Weight (kg)	L38x38x5																												



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
CxMANTENIMIENTO	155	1 ANT TV 0.30x1.20m (E)	111.5
2 ANT TV 0.15x0.60m (E)	142	1 ANT TV 0.30x1.20m (E)	110
2 ANT TV 0.15x0.60m (E)	142	1 ANT TV 0.30x1.20m (E)	110
2 ANT TV 0.15x0.60m (E)	142	1 ANT TV 0.30x1.20m (E)	110
2 ANT TV 0.15x0.60m (E)	142	1 ANT TV 0.30x1.20m (E)	108.5
2 ANT TV 0.15x0.60m (E)	139.5	1 ANT TV 0.30x1.20m (E)	108.5
2 ANT TV 0.15x0.60m (E)	139.5	1 ANT TV 0.30x1.20m (E)	108.5
2 ANT TV 0.15x0.60m (E)	139.5	1 ANT TV 0.30x1.20m (E)	106.5
2 ANT TV 0.15x0.60m (E)	139.5	1 ANT TV 0.30x1.20m (E)	106.5
2 ANT TV 0.15x0.60m (E)	137	1 ANT TV 0.30x1.20m (E)	106.5
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	106
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	106
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	103.5
2 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	103.5
1 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	101
1 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	101
1 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	95
1 ANT TV 0.15x0.60m (E)	128.5	2 ANT TV 0.30x1.20m (E)	95
1 ANT TV 0.15x0.60m (E)	128.5	2 ANT TV 0.30x1.20m (E)	92.5
1 ANT TV 0.15x0.60m (E)	128.5	2 ANT TV 0.30x1.20m (E)	92.5
1 ANT TV 0.15x0.60m (E)	126	2 ANT TV 0.30x1.20m (E)	90
1 ANT TV 0.15x0.60m (E)	126	2 ANT TV 0.30x1.20m (E)	88
1 ANT TV 0.15x0.60m (E)	126	2 ANT TV 0.30x1.20m (E)	85.5
1 ANT TV 0.15x0.60m (E)	126	2 ANT TV 0.30x1.20m (E)	83
1 ANT TV 0.30x1.20m (E)	113	HP8-102 (1 ANT MW Ø2.40m E)	74
1 ANT TV 0.30x1.20m (E)	113	HP12-21B (1 ANT MW Ø3.70m E)	66.5
1 ANT TV 0.30x1.20m (E)	113	HP12-21B (1 ANT MW Ø3.70m E)	54
1 ANT TV 0.30x1.20m (E)	111.5	6 FT DISH (1 ANT MW Ø1.80m E)	24.5
1 ANT TV 0.30x1.20m (E)	111.5	6 FT DISH (1 ANT MW Ø1.80m E)	24.5

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L127x127x10	E	L102x102x6
B	L64x64x5	F	1 @ 1
C	L76x76x6	G	2 @ 1.5
D	L102x102x10		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	248211 kPa	399896 kPa			

TOWER DESIGN NOTES

1. Tower designed for a 120 kph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Deflections are based upon a 60 kph wind.
3. Weld together tower sections have flange connections.
4. Connections use galvanized A-394 T0 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
5. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
6. Welds are fabricated with ER-70S-6 electrodes.
7. TOWER RATING: 73.4%

BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.				Job: SILUETA DE CALCULO-TC155.0m PATA=13.00m V=120 KPH Project: EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL. Client: RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA. Code: TIA/EIA-222-F Plan:				Drawn by: Ing. C. Londoño M. Date: 06/07/16 Scale: NTS Dwg No. E-1	
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<i>RISATower</i> BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 1 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

SALIDA 1 – CONDICION ACTUAL.

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 155.0000 m above the ground line.

The base of the tower is set at an elevation of 0.0000 m above the ground line.

The face width of the tower is 0.6500 m at the top and 13.0000 m at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Basic wind speed of 120 kph.

Deflections calculated using a wind speed of 60 kph.

Weld together tower sections have flange connections.

Connections use galvanized A-394 T0 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.

Welds are fabricated with ER-70S-6 electrodes.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

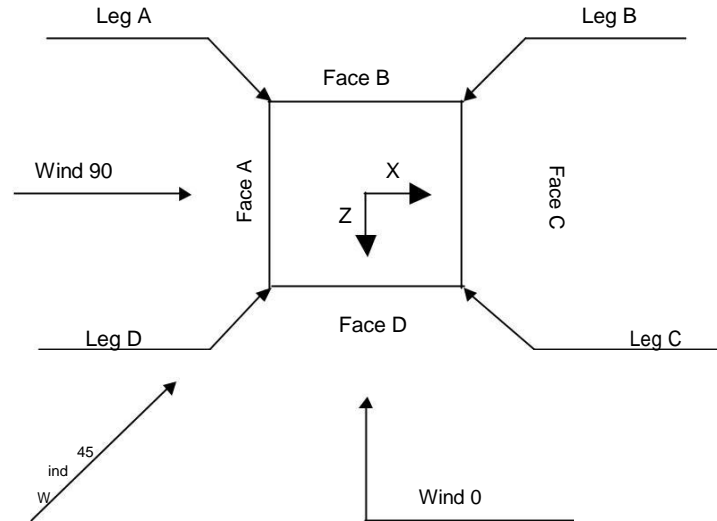
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	√ Distribute Leg Loads As Uniform	√ Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
Use Code Safety Factors - Guys	Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	√ Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 2 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.



Square To wer

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	m			m		m
T1	155.0000-149.0000			0.6500	1	6.0000
T2	149.0000-143.0000			0.6500	1	6.0000
T3	143.0000-142.0000			0.6500	1	1.0000
T4	142.0000-135.6000			1.0000	1	6.4000
T5	135.6000-129.2000			1.0000	1	6.4000
T6	129.2000-122.8000			1.0000	1	6.4000
T7	122.8000-118.0000			1.0000	1	4.8000
T8	118.0000-115.0000			1.0000	1	3.0000
T9	115.0000-107.5000			2.8000	1	7.5000
T10	107.5000-100.0000			2.8000	1	7.5000
T11	100.0000-95.0000			2.8000	1	5.0000
T12	95.0000-89.5000			3.3100	1	5.5000
T13	89.5000-84.0000			3.8710	1	5.5000
T14	84.0000-77.5000			4.4320	1	6.5000
T15	77.5000-71.0000			5.0950	1	6.5000
T16	71.0000-64.5000			5.7580	1	6.5000
T17	64.5000-58.0000			6.4210	1	6.5000
T18	58.0000-53.5000			7.0840	1	4.5000
T19	53.5000-49.0000			7.5430	1	4.5000

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	m			m		m
T20	49.0000-44.5000			8.0020	1	4.5000
T21	44.5000-40.0000			8.4610	1	4.5000
T22	40.0000-35.5000			8.9200	1	4.5000
T23	35.5000-31.0000			9.3790	1	4.5000
T24	31.0000-26.5000			9.8380	1	4.5000
T25	26.5000-22.0000			10.2970	1	4.5000
T26	22.0000-17.0000			10.7560	1	5.0000
T27	17.0000-11.0000			11.2660	1	6.0000
T28	11.0000-6.0000			11.8780	1	5.0000
T29	6.0000-0.0000			12.3880	1	6.0000

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	m	m				mm	mm
T1	155.0000-149.0000	0.5000	K Brace Right	No	No	0	0
T2	149.0000-143.0000	0.5000	K Brace Right	No	No	0	0
T3	143.0000-142.0000	1.0000	X Brace	No	No	0	0
T4	142.0000-135.6000	1.6000	X Brace	No	No	0	0
T5	135.6000-129.2000	1.6000	X Brace	No	No	0	0
T6	129.2000-122.8000	1.6000	X Brace	No	No	0	0
T7	122.8000-118.0000	1.6000	X Brace	No	No	0	0
T8	118.0000-115.0000	1.5000	X Brace	No	No	0	0
T9	115.0000-107.5000	2.5000	X Brace	No	No	0	0
T10	107.5000-100.0000	2.5000	X Brace	No	No	0	0
T11	100.0000-95.0000	5.0000	X Brace	No	No	0	0
T12	95.0000-89.5000	5.5000	X Brace	No	No	0	0
T13	89.5000-84.0000	5.5000	X Brace	No	No	0	0
T14	84.0000-77.5000	6.5000	X Brace	No	No	0	0
T15	77.5000-71.0000	6.5000	X Brace	No	No	0	0
T16	71.0000-64.5000	6.5000	X Brace	No	No	0	0
T17	64.5000-58.0000	6.5000	X Brace	No	No	0	0
T18	58.0000-53.5000	4.5000	K Brace Up	No	Yes	0	0
T19	53.5000-49.0000	4.5000	K Brace Down	No	Yes	0	0
T20	49.0000-44.5000	4.5000	K Brace Up	No	Yes	0	0
T21	44.5000-40.0000	4.5000	K Brace Down	No	Yes	0	0
T22	40.0000-35.5000	4.5000	K Brace Up	No	Yes	0	0
T23	35.5000-31.0000	4.5000	K Brace Down	No	Yes	0	0
T24	31.0000-26.5000	4.5000	K Brace Up	No	Yes	0	0
T25	26.5000-22.0000	4.5000	K Brace Down	No	Yes	0	0
T26	22.0000-17.0000	5.0000	K Brace Up	No	Yes	0	0
T27	17.0000-11.0000	6.0000	K Brace Down	No	Yes	0	0

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	m	m				mm	mm
T28	11.0000-6.0000	5.0000	K Brace Up	No	Yes	0	0
T29	6.0000-0.0000	6.0000	K Brace Down	No	Yes	0	0

Tower Section Geometry (cont'd)

Tower Elevation m	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 155.0000-149.0000	Equal Angle	L89x89x6	A36 (248211 kPa)	Equal Angle	L38x38x5	A36 (248211 kPa)
T2 149.0000-143.0000	Equal Angle	L89x89x6	A36 (248211 kPa)	Equal Angle	L38x38x5	A36 (248211 kPa)
T3 143.0000-142.0000	Equal Angle	L89x89x6	A36 (248211 kPa)	Equal Angle	L38x38x5	A36 (248211 kPa)
T4 142.0000-135.6000	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T5 135.6000-129.2000	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T6 129.2000-122.8000	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T7 122.8000-118.0000	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T8 118.0000-115.0000	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T9 115.0000-107.5000	Arbitrary Shape	4L127x127x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T10 107.5000-100.0000	Arbitrary Shape	4L127x127x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T11 100.0000-95.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T12 95.0000-89.5000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T13 89.5000-84.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T14 84.0000-77.5000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T15 77.5000-71.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)
T16 71.0000-64.5000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)
T17 64.5000-58.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)
T18 58.0000-53.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T19 53.5000-49.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)

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<i>Tower Elevation m</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
T20 49.0000-44.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T21 44.5000-40.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T22 40.0000-35.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T23 35.5000-31.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T24 31.0000-26.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T25 26.5000-22.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T26 22.0000-17.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T27 17.0000-11.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T28 11.0000-6.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T29 6.0000-0.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)

Tower Section Geometry (cont'd)

<i>Tower Elevation m</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
T1 155.0000-149.0000	Equal Angle	L38x38x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T2 149.0000-143.0000	Equal Angle	L38x38x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T3 143.0000-142.0000	Equal Angle	L38x38x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T4 142.0000-135.6000	Equal Angle	L51x51x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T8 118.0000-115.0000	Equal Angle	L64x64x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T9 115.0000-107.5000	Equal Angle	L64x64x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T11 100.0000-95.0000 0	Equal Angle	L64x64x5	A36 (248211 kPa)	Single Angle		A36 (248211 kPa)

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Tower Section Geometry (cont'd)

Tower Elevation m	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T18 58.0000-53.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T19 53.5000-49.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T20 49.0000-44.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T21 44.5000-40.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T22 40.0000-35.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T23 35.5000-31.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T24 31.0000-26.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T25 26.5000-22.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T26 22.0000-17.0000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T27 17.0000-11.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T28 11.0000-6.0000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T29 6.0000-0.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)

Tower Section Geometry (cont'd)

Tower Elevation m	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T19 53.5000-49.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T21 44.5000-40.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T23 35.5000-31.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T25 26.5000-22.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T27 17.0000-11.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T29 6.0000-0.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)

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Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
m	m ²	mm					mm	mm
T1 155.0000-149. 0000	0.0000	0	A36 (248211 kPa)	1	1	1.5	0	0
T2 149.0000-143. 0000	0.0000	0	A36 (248211 kPa)	1	1	1.5	0	0
T3 143.0000-142. 0000	0.0000	0	A36 (248211 kPa)	1	1	1.5	0	0
T4 142.0000-135. 6000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T5 135.6000-129. 2000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T6 129.2000-122. 8000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T7 122.8000-118. 0000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T8 118.0000-115. 0000	0.0000	0	A36 (248211 kPa)	1.1	1	1.5	0	0
T9 115.0000-107. 5000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T10 107.5000-100. 0000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T11 100.0000-95.0 000	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T12 95.0000-89.50 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T13 89.5000-84.00 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T14 84.0000-77.50 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T15 77.5000-71.00 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T16 71.0000-64.50 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T17 64.5000-58.00 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T18 58.0000-53.50 00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
T19 53.5000-49.00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals mm	Double Angle Stitch Bolt Spacing Horizontals mm
m	m ²	mm						
00 T20 49.0000-44.50	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
00 T21 44.5000-40.00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
00 T22 40.0000-35.50	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
00 T23 35.5000-31.00	0.0000	0	A36 (248211 kPa)	1.4	1	1.5	0	0
00 T24 31.0000-26.50	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
00 T25 26.5000-22.00	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
00 T26 22.0000-17.00	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
00 T27 17.0000-11.00	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
00 T28 11.0000-6.000	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
0 T29 6.0000-0.0000	0.0000	0	A36 (248211 kPa)	1.6	1	1.5	0	0

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors'							
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 155.0000-149. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 149.0000-143. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 143.0000-142. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 142.0000-135. 6000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 135.6000-129. 2000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6	No	No	0.5	1	1	1	1	1	1	1

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Tower Elevation m	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U
T11 100.0000-95.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T12 95.0000-89.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T13 89.5000-84.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T14 84.0000-77.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T15 77.5000-71.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T16 71.0000-64.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T17 64.5000-58.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T18 58.0000-53.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T19 53.5000-49.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T20 49.0000-44.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T21 44.5000-40.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T22 40.0000-35.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T23 35.5000-31.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T24 31.0000-26.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T25 26.5000-22.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T26 22.0000-17.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T27 17.0000-11.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T28 11.0000-6.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T29 6.0000-0.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75

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Tower Section Geometry (cont'd)

Tower Elevation m	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.
T1 155.0000-149. 0000	Sleeve SS	16 A394T0	4	16 A394T0	2	16 A394T0	1	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T2 149.0000-143. 0000	Sleeve SS	16 A394T0	8	16 A394T0	2	16 A394T0	1	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T3 143.0000-142. 0000	Sleeve SS	16 A394T0	8	16 A394T0	2	16 A394T0	1	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T4 142.0000-135. 6000	Sleeve SS	16 A394T0	12	16 A394T0	2	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T5 135.6000-129. 2000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T6 129.2000-122. 8000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T7 122.8000-118. 0000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T8 118.0000-115. 0000	Sleeve SS	19 A394T0	12	16 A394T0	4	16 A394T0	3	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T9 115.0000-107. 5000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	3	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T10 107.5000-100. 0000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T11 100.0000-95.0 000	Sleeve SS	19 A394T0	16	16 A394T0	2	16 A394T0	3	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T12 95.0000-89.50 00	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T13 89.5000-84.00 00	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T14 84.0000-77.50 00	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T15 77.5000-71.00 00	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T16 71.0000-64.50 00	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T17 64.5000-58.00 00	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 13 of 85
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Tower Elevation m	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.
T18 58.0000-53.50 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T19 53.5000-49.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T20 49.0000-44.50 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T21 44.5000-40.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T22 40.0000-35.50 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T23 35.5000-31.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T24 31.0000-26.50 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T25 26.5000-22.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T26 22.0000-17.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T27 17.0000-11.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T28 11.0000-6.000 0	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T29 6.0000-0.0000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement m	Total Number	Number Per Row	Clear Spacing mm	Width or Diameter mm	Perimeter mm	Weight kg/m
1 (8 ANT TV E)	D	No	Ar (CfAe)	142.0000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	D	No	Ar (CfAe)	139.5000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	D	No	Ar (CfAe)	137.0000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	113.0000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	111.5000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	110.0000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	108.5000 - 0.0000	2	2	32	32		0.86

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Description	Face or Leg	Allow Shield	Component Type	Placement m	Total Number	Number Per Row	Clear Spacing mm	Width or Diameter mm	Perimeter mm	Weight kg/m
1 (3 ANT TV E)	D	No	Ar (CfAe)	106.5000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	106.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	103.5000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	101.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	95.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	92.5000 - 0.0000	2	2	32	32		0.86
1 (4 ANT MW E)	D	No	Ar (CfAe)	90.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT MW E)	D	No	Ar (CfAe)	88.0000 - 0.0000	1	1	32	32		0.86
1 (2 ANT MW E)	D	No	Ar (CfAe)	85.5000 - 0.0000	1	1	32	32		0.86
1 (2 ANT MW E)	D	No	Ar (CfAe)	83.0000 - 0.0000	1	1	32	32		0.86
7/8 (1 ANT MW E)	D	No	Ar (CfAe)	74.0000 - 0.0000	1	1	28	28		0.80
7/8 (1 ANT MW E)	D	No	Ar (CfAe)	66.5000 - 0.0000	1	1	28	28		0.80
7/8 (1 ANT MW E)	D	No	Ar (CfAe)	54.0000 - 0.0000	1	1	28	28		0.80
7/8 (2 ANT MW E)	D	No	Ar (CfAe)	24.5000 - 0.0000	2	2	28	28		0.80
1 (8 ANT TV E)	D	No	Ar (CfAe)	131.0000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	D	No	Ar (CfAe)	128.5000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	D	No	Ar (CfAe)	126.0000 - 0.0000	2	2	32	32		0.86

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation m	Face	A _R m ²	A _F m ²	C _A A _A In Face m ²	C _A A _A Out Face m ²	Weight kg
T1	155.0000-149.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T2	149.0000-143.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T3	143.0000-142.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T4	142.0000-135.600 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.743	0.000	0.000	0.000	20.20
T5	135.6000-129.200 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation m	Face	A _R m ²	A _F m ²	C _A A _A In Face m ²	C _A A _A Out Face m ²	Weight kg
T6	129.2000-122.800 0	C	0.000	0.000	0.000	0.000	0.00
		D	1.333	0.000	0.000	0.000	36.25
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T7	122.8000-118.000 0	D	2.191	0.000	0.000	0.000	59.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T8	118.0000-115.000 0	D	1.829	0.000	0.000	0.000	49.72
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T9	115.0000-107.500 0	D	1.143	0.000	0.000	0.000	31.07
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T10	107.5000-100.000 0	D	3.683	0.000	0.000	0.000	100.12
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T11	100.0000-95.0000	D	5.842	0.000	0.000	0.000	158.82
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T12	95.0000-89.5000	D	4.445	0.000	0.000	0.000	120.84
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T13	89.5000-84.0000	D	5.461	0.000	0.000	0.000	148.46
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T14	84.0000-77.5000	D	6.112	0.000	0.000	0.000	166.15
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T15	77.5000-71.0000	D	7.604	0.000	0.000	0.000	206.72
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T16	71.0000-64.5000	D	7.720	0.000	0.000	0.000	209.99
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T17	64.5000-58.0000	D	7.876	0.000	0.000	0.000	214.41
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T18	58.0000-53.5000	D	8.002	0.000	0.000	0.000	218.03
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T19	53.5000-49.0000	D	5.554	0.000	0.000	0.000	151.35
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T20	49.0000-44.5000	D	5.667	0.000	0.000	0.000	154.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation m	Face	A_R m^2	A_F m^2	$C_A A_A$ In Face m^2	$C_A A_A$ Out Face m^2	Weight kg
T21	44.5000-40.0000	D	5.667	0.000	0.000	0.000	154.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T22	40.0000-35.5000	D	5.667	0.000	0.000	0.000	154.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T23	35.5000-31.0000	D	5.667	0.000	0.000	0.000	154.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T24	31.0000-26.5000	D	5.667	0.000	0.000	0.000	154.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T25	26.5000-22.0000	D	5.667	0.000	0.000	0.000	154.56
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T26	22.0000-17.0000	D	5.808	0.000	0.000	0.000	158.58
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T27	17.0000-11.0000	D	6.579	0.000	0.000	0.000	179.77
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T28	11.0000-6.0000	D	7.894	0.000	0.000	0.000	215.72
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T29	6.0000-0.0000	D	6.579	0.000	0.000	0.000	179.77
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	7.894	0.000	0.000	0.000	215.72

Feed Line Center of Pressure

Section	Elevation m	CP_X mm	CP_Z mm	CP_X Ice mm	CP_Z Ice mm
T1	155.0000-149.0000	0	0	0	0
T2	149.0000-143.0000	0	0	0	0
T3	143.0000-142.0000	0	0	0	0
T4	142.0000-135.6000	0	58	0	58
T5	135.6000-129.2000	0	99	0	99
T6	129.2000-122.8000	0	145	0	145
T7	122.8000-118.0000	0	156	0	156
T8	118.0000-115.0000	0	168	0	168
T9	115.0000-107.5000	0	381	0	381
T10	107.5000-100.0000	0	551	0	551
T11	100.0000-95.0000	0	625	0	625
T12	95.0000-89.5000	0	845	0	845
T13	89.5000-84.0000	0	936	0	936
T14	84.0000-77.5000	0	1106	0	1106
T15	77.5000-71.0000	0	1233	0	1233

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Section	Elevation	CP _X	CP _Z	CP _X Ice	CP _Z Ice
	m	mm	mm	mm	mm
T16	71.0000-64.5000	0	1357	0	1357
T17	64.5000-58.0000	0	1472	0	1472
T18	58.0000-53.5000	0	1508	0	1508
T19	53.5000-49.0000	0	1289	0	1289
T20	49.0000-44.5000	0	1670	0	1670
T21	44.5000-40.0000	0	1373	0	1373
T22	40.0000-35.5000	0	1797	0	1797
T23	35.5000-31.0000	0	1447	0	1447
T24	31.0000-26.5000	0	1832	0	1832
T25	26.5000-22.0000	0	1466	0	1466
T26	22.0000-17.0000	0	2068	0	2068
T27	17.0000-11.0000	0	1789	0	1789
T28	11.0000-6.0000	0	2197	0	2197
T29	6.0000-0.0000	0	1675	0	1675

User Defined Loads

Description	Elevation	Offset From Centroid	Azimuth Angle	Weight	F _x	F _z	Wind Force	C _A A _C
	m	m	°	kg	kg	kg	kg	m ²
CxMANTENIMIENTO	155.0000	0.0000	0.0000	No Ice	320.00	0.00	0.00	0.0000
				Service	320.00	0.00	0.00	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C _A A _A Front	C _A A _A Side	Weight
			m m m	°	m		m ²	m ²	kg
2 ANT TV 0.15x0.60m (E)	A	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	C	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	A	From Face	1.0000 0.0000 0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m	C	From Face	1.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _{AA} Front m ²	C _{AA} Side m ²	Weight kg
(E)			0.0000						
2 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	A	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	B	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	C	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
1 ANT TV 0.30x1.20m (E)	A	From Face	0.0000	0.0000	113.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	113.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	0.0000	0.0000	113.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	0.0000	0.0000	111.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	111.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	0.0000	0.0000	111.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	1.0000	0.0000	110.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	110.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	1.0000	0.0000	110.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	1.0000	0.0000	108.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	108.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	1.0000	0.0000	108.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	1.0000	0.0000	106.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m	B	From Face	0.0000	0.0000	106.5000	No Ice	0.1500	0.0400	12.00

<i>RISA Tower</i> BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 19 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _{AA} Front m ²	C _{AA} Side m ²	Weight kg
(E)			0.0000						
1 ANT TV 0.30x1.20m (E)	C	From Face	0.0000 1.0000 0.0000	0.0000	106.5000	No Ice	0.1500	0.0400	12.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	106.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	A	From Leg	0.6000 0.0000 0.0000	0.0000	106.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	103.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	A	From Leg	0.6000 0.0000 0.0000	0.0000	103.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	101.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	A	From Leg	0.6000 0.0000 0.0000	0.0000	101.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	95.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.5000 0.0000	0.0000	95.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	92.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.6000 0.5000 0.0000	0.0000	92.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	90.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.6000 0.5000 0.0000	0.0000	90.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	88.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	85.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	83.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.15x0.60m (E)	A	From Face	1.0000 0.0000 0.0000	0.0000	131.0000	No Ice	0.1800	0.0400	16.00
1 ANT TV 0.15x0.60m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	131.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m	C	From Face	1.0000	0.0000	131.0000	No Ice	0.0900	0.0200	8.00

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _A A _A Front m ²	C _A A _A Side m ²	Weight kg
(E)			0.0000						
1 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	131.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	A	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	B	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	C	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	A	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	B	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	C	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	3 dB Beam Width °	Elevation m	Outside Diameter m	No Ice	Aperture Area m ²	Weight kg
HP8-102 (1 ANT MW Ø2.40m E)	B	Paraboloid w/Shroud (HP)	From Leg	0.6000 0.0000 0.0000	Worst		74.0000	2.4384	No Ice	4.6693	113.85
HP12-21B (1 ANT MW Ø3.70m E)	D	Paraboloid w/Shroud (HP)	From Leg	0.6000 0.0000 0.0000	Worst		66.5000	3.6576	No Ice	10.5064	385.55
HP12-21B (1 ANT MW Ø3.70m E)	D	Paraboloid w/Shroud (HP)	From Leg	0.6000 0.0000 0.0000	Worst		54.0000	3.6576	No Ice	10.5064	385.55
6 FT DISH (1 ANT MW Ø1.80m E)	D	Paraboloid w/o Radome	From Leg	0.6000 0.0000 0.0000	Worst		24.5000	1.8288	No Ice	2.6264	64.86
6 FT DISH (1 ANT MW Ø1.80m E)	B	Paraboloid w/o Radome	From Leg	0.6000 0.0000 0.0000	Worst		24.5000	1.8288	No Ice	2.6264	64.86

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Tower Pressures - No Ice

$$G_H = 1.056$$

Section Elevation m	z m	K _z	q _z kPa	A _G m ²	F a c e	A _F m ²	A _R m ²	A _{leg} m ²	Leg %	C _A A _A In Face m ²	C _A A _A Out Face m ²
T1 155.0000-149. 0000	152.0000	2.172	1.33	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	0.000		75.56	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T2 149.0000-143. 0000	146.0000	2.148	1.46	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	0.000		75.56	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T3 143.0000-142. 0000	142.5000	2.133	1.45	0.875	A	0.294	0.000	0.183	62.36	0.000	0.000
					B	0.294	0.000		62.36	0.000	0.000
					C	0.294	0.000		62.36	0.000	0.000
					D	0.294	0.000		62.36	0.000	0.000
T4 142.0000-135. 6000	138.8000	2.117	1.44	7.213	A	1.469	0.000	0.000	0.00	0.000	0.000
					B	1.469	0.000		0.00	0.000	0.000
					C	1.469	0.000		0.00	0.000	0.000
					D	1.469	0.743		0.00	0.000	0.000
T5 135.6000-129. 2000	132.4000	2.088	1.42	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	0.000		0.00	0.000	0.000
					D	1.406	1.333		0.00	0.000	0.000
T6 129.2000-122. 8000	126.0000	2.059	1.40	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	0.000		0.00	0.000	0.000
					D	1.406	2.191		0.00	0.000	0.000
T7 122.8000-118. 0000	120.4000	2.032	1.39	5.410	A	1.054	0.000	0.000	0.00	0.000	0.000
					B	1.054	0.000		0.00	0.000	0.000
					C	1.054	0.000		0.00	0.000	0.000
					D	1.054	1.829		0.00	0.000	0.000
T8 118.0000-115. 0000	116.5000	2.013	1.37	6.098	A	1.355	0.000	0.000	0.00	0.000	0.000
					B	1.355	0.000		0.00	0.000	0.000
					C	1.355	0.000		0.00	0.000	0.000
					D	1.355	1.143		0.00	0.000	0.000
T9 115.0000-107. 5000	111.2500	1.987	1.35	21.952	A	2.497	0.000	0.000	0.00	0.000	0.000
					B	2.497	0.000		0.00	0.000	0.000
					C	2.497	0.000		0.00	0.000	0.000
					D	2.497	3.683		0.00	0.000	0.000
T10 107.5000-100. 0000	103.7500	1.948	1.33	21.952	A	2.294	0.000	0.000	0.00	0.000	0.000
					B	2.294	0.000		0.00	0.000	0.000
					C	2.294	0.000		0.00	0.000	0.000
					D	2.294	5.842		0.00	0.000	0.000
T11 100.0000-95.0 000	97.5000	1.914	1.30	16.036	A	1.631	0.000	0.000	0.00	0.000	0.000
					B	1.631	0.000		0.00	0.000	0.000
					C	1.631	0.000		0.00	0.000	0.000
					D	1.631	4.445		0.00	0.000	0.000
T12 95.0000-89.50 00	92.2500	1.884	1.28	20.585	A	1.567	0.000	0.000	0.00	0.000	0.000
					B	1.567	0.000		0.00	0.000	0.000
					C	1.567	0.000		0.00	0.000	0.000
					D	1.567	5.461		0.00	0.000	0.000
T13 89.5000-84.00 00	86.7500	1.851	1.26	23.670	A	1.890	0.000	0.000	0.00	0.000	0.000
					B	1.890	0.000		0.00	0.000	0.000
					C	1.890	0.000		0.00	0.000	0.000
					D	1.890	6.112		0.00	0.000	0.000
T14	80.7500	1.813	1.24	31.952	A	2.221	0.000	0.000	0.00	0.000	0.000

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Section Elevation m	z m	K _Z	q _Z kPa	A _G m ²	F a c e	A _F m ²	A _R m ²	A _{leg} m ²	Leg %	C _A A _A In Face m ²	C _A A _A Out Face m ²
84.0000-77.5000					B	2.221	0.000		0.00	0.000	0.000
					C	2.221	0.000		0.00	0.000	0.000
					D	2.221	7.604		0.00	0.000	0.000
T15	74.2500	1.77	1.21	36.262	A	2.343	0.000	0.000	0.00	0.000	0.000
77.5000-71.0000					B	2.343	0.000		0.00	0.000	0.000
					C	2.343	0.000		0.00	0.000	0.000
					D	2.343	7.720		0.00	0.000	0.000
T16	67.7500	1.725	1.18	40.571	A	2.472	0.000	0.000	0.00	0.000	0.000
71.0000-64.5000					B	2.472	0.000		0.00	0.000	0.000
					C	2.472	0.000		0.00	0.000	0.000
					D	2.472	7.876		0.00	0.000	0.000
T17	61.2500	1.676	1.14	44.881	A	2.608	0.000	0.000	0.00	0.000	0.000
64.5000-58.0000					B	2.608	0.000		0.00	0.000	0.000
					C	2.608	0.000		0.00	0.000	0.000
					D	2.608	8.002		0.00	0.000	0.000
T18	55.7500	1.631	1.11	33.825	A	1.994	0.000	0.000	0.00	0.000	0.000
58.0000-53.5000					B	1.994	0.000		0.00	0.000	0.000
					C	1.994	0.000		0.00	0.000	0.000
					D	1.994	5.554		0.00	0.000	0.000
T19	51.2500	1.592	1.09	35.891	A	2.872	0.000	0.000	0.00	0.000	0.000
53.5000-49.0000					B	2.872	0.000		0.00	0.000	0.000
					C	2.872	0.000		0.00	0.000	0.000
					D	2.872	5.667		0.00	0.000	0.000
T20	46.7500	1.551	1.06	37.956	A	2.089	0.000	0.000	0.00	0.000	0.000
49.0000-44.5000					B	2.089	0.000		0.00	0.000	0.000
					C	2.089	0.000		0.00	0.000	0.000
					D	2.089	5.667		0.00	0.000	0.000
T21	42.2500	1.507	1.03	40.022	A	3.084	0.000	0.000	0.00	0.000	0.000
44.5000-40.0000					B	3.084	0.000		0.00	0.000	0.000
					C	3.084	0.000		0.00	0.000	0.000
					D	3.084	5.667		0.00	0.000	0.000
T22	37.7500	1.459	0.99	42.087	A	2.203	0.000	0.000	0.00	0.000	0.000
40.0000-35.5000					B	2.203	0.000		0.00	0.000	0.000
					C	2.203	0.000		0.00	0.000	0.000
					D	2.203	5.667		0.00	0.000	0.000
T23	33.2500	1.407	0.96	44.153	A	3.302	0.000	0.000	0.00	0.000	0.000
35.5000-31.0000					B	3.302	0.000		0.00	0.000	0.000
					C	3.302	0.000		0.00	0.000	0.000
					D	3.302	5.667		0.00	0.000	0.000
T24	28.7500	1.35	0.92	46.218	A	2.489	0.000	0.000	0.00	0.000	0.000
31.0000-26.5000					B	2.489	0.000		0.00	0.000	0.000
					C	2.489	0.000		0.00	0.000	0.000
					D	2.489	5.667		0.00	0.000	0.000
T25	24.2500	1.286	0.88	48.284	A	3.776	0.000	0.000	0.00	0.000	0.000
26.5000-22.0000					B	3.776	0.000		0.00	0.000	0.000
					C	3.776	0.000		0.00	0.000	0.000
					D	3.776	5.808		0.00	0.000	0.000
T26	19.5000	1.208	0.82	56.071	A	2.747	0.000	0.000	0.00	0.000	0.000
22.0000-17.0000					B	2.747	0.000		0.00	0.000	0.000
					C	2.747	0.000		0.00	0.000	0.000
					D	2.747	6.579		0.00	0.000	0.000
T27	14.0000	1.099	0.75	70.652	A	4.428	0.000	0.000	0.00	0.000	0.000
17.0000-11.0000					B	4.428	0.000		0.00	0.000	0.000
					C	4.428	0.000		0.00	0.000	0.000
					D	4.428	7.894		0.00	0.000	0.000
T28	8.5000	1	0.68	61.681	A	2.909	0.000	0.000	0.00	0.000	0.000
11.0000-6.0000					B	2.909	0.000		0.00	0.000	0.000
					C	2.909	0.000		0.00	0.000	0.000
					D	2.909	6.579		0.00	0.000	0.000
T29	3.0000	1	0.68	77.384	A	5.522	0.000	0.000	0.00	0.000	0.000

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Section Elevation	z	K _Z	q _Z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
m	m		kPa	m ²		m ²	m ²	m ²		m ²	m ²
6.0000-0.0000					B	5.522	0.000		0.00	0.000	0.000
					C	5.522	0.000		0.00	0.000	0.000
					D	5.522	7.894		0.00	0.000	0.000

Tower Pressure - Service

$$G_H = 1.056$$

Section Elevation	z	K _Z	q _Z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
m	m		kPa	m ²		m ²	m ²	m ²		m ²	m ²
T1 155.0000-149.0000	152.0000	2.172	0.33	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	0.000		75.56	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T2 149.0000-143.0000	146.0000	2.148	0.37	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	0.000		75.56	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T3 143.0000-142.0000	142.5000	2.133	0.36	0.875	A	0.294	0.000	0.183	62.36	0.000	0.000
					B	0.294	0.000		62.36	0.000	0.000
					C	0.294	0.000		62.36	0.000	0.000
					D	0.294	0.000		62.36	0.000	0.000
T4 142.0000-135.6000	138.8000	2.117	0.36	7.213	A	1.469	0.000	0.000	0.00	0.000	0.000
					B	1.469	0.000		0.00	0.000	0.000
					C	1.469	0.000		0.00	0.000	0.000
					D	1.469	0.743		0.00	0.000	0.000
T5 135.6000-129.2000	132.4000	2.088	0.36	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	0.000		0.00	0.000	0.000
					D	1.406	1.333		0.00	0.000	0.000
T6 129.2000-122.8000	126.0000	2.059	0.35	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	0.000		0.00	0.000	0.000
					D	1.406	2.191		0.00	0.000	0.000
T7 122.8000-118.0000	120.4000	2.032	0.35	5.410	A	1.054	0.000	0.000	0.00	0.000	0.000
					B	1.054	0.000		0.00	0.000	0.000
					C	1.054	0.000		0.00	0.000	0.000
					D	1.054	1.829		0.00	0.000	0.000
T8 118.0000-115.0000	116.5000	2.013	0.34	6.098	A	1.355	0.000	0.000	0.00	0.000	0.000
					B	1.355	0.000		0.00	0.000	0.000
					C	1.355	0.000		0.00	0.000	0.000
					D	1.355	1.143		0.00	0.000	0.000
T9 115.0000-107.5000	111.2500	1.987	0.34	21.952	A	2.497	0.000	0.000	0.00	0.000	0.000
					B	2.497	0.000		0.00	0.000	0.000
					C	2.497	0.000		0.00	0.000	0.000
					D	2.497	3.683		0.00	0.000	0.000
T10 107.5000-100.0000	103.7500	1.948	0.33	21.952	A	2.294	0.000	0.000	0.00	0.000	0.000
					B	2.294	0.000		0.00	0.000	0.000
					C	2.294	0.000		0.00	0.000	0.000
					D	2.294	5.842		0.00	0.000	0.000
T11 100.0000-95.0000	97.5000	1.914	0.33	16.036	A	1.631	0.000	0.000	0.00	0.000	0.000
					B	1.631	0.000		0.00	0.000	0.000
					C	1.631	0.000		0.00	0.000	0.000
					D	1.631	4.445		0.00	0.000	0.000

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 24 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	z m	K _Z	q _Z kPa	A _G m ²	F a c e	A _F m ²	A _R m ²	A _{leg} m ²	Leg %	C _A A _A In Face m ²	C _A A _A Out Face m ²
T12 95.0000-89.50 00	92.2500	1.884	0.32	20.585	A	1.567	0.000	0.000	0.00	0.000	0.000
					B	1.567	0.000		0.00	0.000	0.000
					C	1.567	0.000		0.00	0.000	0.000
					D	1.567	5.461		0.00	0.000	0.000
T13 89.5000-84.00 00	86.7500	1.851	0.32	23.670	A	1.890	0.000	0.000	0.00	0.000	0.000
					B	1.890	0.000		0.00	0.000	0.000
					C	1.890	0.000		0.00	0.000	0.000
					D	1.890	6.112		0.00	0.000	0.000
T14 84.0000-77.50 00	80.7500	1.813	0.31	31.952	A	2.221	0.000	0.000	0.00	0.000	0.000
					B	2.221	0.000		0.00	0.000	0.000
					C	2.221	0.000		0.00	0.000	0.000
					D	2.221	7.604		0.00	0.000	0.000
T15 77.5000-71.00 00	74.2500	1.77	0.30	36.262	A	2.343	0.000	0.000	0.00	0.000	0.000
					B	2.343	0.000		0.00	0.000	0.000
					C	2.343	0.000		0.00	0.000	0.000
					D	2.343	7.720		0.00	0.000	0.000
T16 71.0000-64.50 00	67.7500	1.725	0.29	40.571	A	2.472	0.000	0.000	0.00	0.000	0.000
					B	2.472	0.000		0.00	0.000	0.000
					C	2.472	0.000		0.00	0.000	0.000
					D	2.472	7.876		0.00	0.000	0.000
T17 64.5000-58.00 00	61.2500	1.676	0.29	44.881	A	2.608	0.000	0.000	0.00	0.000	0.000
					B	2.608	0.000		0.00	0.000	0.000
					C	2.608	0.000		0.00	0.000	0.000
					D	2.608	8.002		0.00	0.000	0.000
T18 58.0000-53.50 00	55.7500	1.631	0.28	33.825	A	1.994	0.000	0.000	0.00	0.000	0.000
					B	1.994	0.000		0.00	0.000	0.000
					C	1.994	0.000		0.00	0.000	0.000
					D	1.994	5.554		0.00	0.000	0.000
T19 53.5000-49.00 00	51.2500	1.592	0.27	35.891	A	2.872	0.000	0.000	0.00	0.000	0.000
					B	2.872	0.000		0.00	0.000	0.000
					C	2.872	0.000		0.00	0.000	0.000
					D	2.872	5.667		0.00	0.000	0.000
T20 49.0000-44.50 00	46.7500	1.551	0.26	37.956	A	2.089	0.000	0.000	0.00	0.000	0.000
					B	2.089	0.000		0.00	0.000	0.000
					C	2.089	0.000		0.00	0.000	0.000
					D	2.089	5.667		0.00	0.000	0.000
T21 44.5000-40.00 00	42.2500	1.507	0.26	40.022	A	3.084	0.000	0.000	0.00	0.000	0.000
					B	3.084	0.000		0.00	0.000	0.000
					C	3.084	0.000		0.00	0.000	0.000
					D	3.084	5.667		0.00	0.000	0.000
T22 40.0000-35.50 00	37.7500	1.459	0.25	42.087	A	2.203	0.000	0.000	0.00	0.000	0.000
					B	2.203	0.000		0.00	0.000	0.000
					C	2.203	0.000		0.00	0.000	0.000
					D	2.203	5.667		0.00	0.000	0.000
T23 35.5000-31.00 00	33.2500	1.407	0.24	44.153	A	3.302	0.000	0.000	0.00	0.000	0.000
					B	3.302	0.000		0.00	0.000	0.000
					C	3.302	0.000		0.00	0.000	0.000
					D	3.302	5.667		0.00	0.000	0.000
T24 31.0000-26.50 00	28.7500	1.35	0.23	46.218	A	2.489	0.000	0.000	0.00	0.000	0.000
					B	2.489	0.000		0.00	0.000	0.000
					C	2.489	0.000		0.00	0.000	0.000
					D	2.489	5.667		0.00	0.000	0.000
T25 26.5000-22.00 00	24.2500	1.286	0.22	48.284	A	3.776	0.000	0.000	0.00	0.000	0.000
					B	3.776	0.000		0.00	0.000	0.000
					C	3.776	0.000		0.00	0.000	0.000
					D	3.776	5.808		0.00	0.000	0.000
T26 22.0000-17.00 00	19.5000	1.208	0.21	56.071	A	2.747	0.000	0.000	0.00	0.000	0.000
					B	2.747	0.000		0.00	0.000	0.000
					C	2.747	0.000		0.00	0.000	0.000
					D	2.747	6.579		0.00	0.000	0.000

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	z m	K _Z	q _Z kPa	A _G m ²	F a c e m ²	A _F m ²	A _R m ²	A _{leg} m ²	Leg % %	C _A A _A In Face m ²	C _A A _A Out Face m ²
T27 17.0000-11.00 00	14.0000	1.099	0.19	70.652	A	4.428	0.000	0.000	0.00	0.000	0.000
					B	4.428	0.000		0.00	0.000	0.000
					C	4.428	0.000		0.00	0.000	0.000
					D	4.428	7.894		0.00	0.000	0.000
T28 11.0000-6.000 0	8.5000	1	0.17	61.681	A	2.909	0.000	0.000	0.00	0.000	0.000
					B	2.909	0.000		0.00	0.000	0.000
					C	2.909	0.000		0.00	0.000	0.000
					D	2.909	6.579		0.00	0.000	0.000
T29 6.0000-0.0000	3.0000	1	0.17	77.384	A	5.522	0.000	0.000	0.00	0.000	0.000
					B	5.522	0.000		0.00	0.000	0.000
					C	5.522	0.000		0.00	0.000	0.000
					D	5.522	7.894		0.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation m	Add Weight kg	Self Weight kg	F a c e m ²	e m	C _F	R _R	D _F	D _R	A _E m ²	F kg	w kg/m	Ctrl. Face
T1 155.0000-149. 0000	0.00	476.17	A	0.337	2.467	0.628	1	1	1.412	499.81	83.30	D
			B	0.337	2.467	0.628	1	1	1.412			
			C	0.337	2.467	0.628	1	1	1.412			
			D	0.337	2.467	0.628	1	1	1.412			
T2 149.0000-143. 0000	0.00	476.17	A	0.337	2.467	0.628	1	1	1.412	548.99	91.50	D
			B	0.337	2.467	0.628	1	1	1.412			
			C	0.337	2.467	0.628	1	1	1.412			
			D	0.337	2.467	0.628	1	1	1.412			
T3 143.0000-142. 0000	0.00	105.23	A	0.336	2.47	0.627	1	1	0.294	113.55	113.55	D
			B	0.336	2.47	0.627	1	1	0.294			
			C	0.336	2.47	0.627	1	1	0.294			
			D	0.336	2.47	0.627	1	1	0.294			
T4 142.0000-135. 6000	20.20	2449.64	A	0.204	2.964	0.591	1	1	1.469	768.74	120.12	D
			B	0.204	2.964	0.591	1	1	1.469			
			C	0.204	2.964	0.591	1	1	1.469			
			D	0.307	2.567	0.618	1	1	1.928			
T5 135.6000-129. 2000	36.25	2427.92	A	0.195	3.002	0.589	1	1	1.406	810.55	126.65	D
			B	0.195	3.002	0.589	1	1	1.406			
			C	0.195	3.002	0.589	1	1	1.406			
			D	0.38	2.336	0.644	1	1	2.264			
T6 129.2000-122. 8000	59.56	2427.92	A	0.195	3.002	0.589	1	1	1.406	909.42	142.10	D
			B	0.195	3.002	0.589	1	1	1.406			
			C	0.195	3.002	0.589	1	1	1.406			
			D	0.499	2.053	0.697	1	1	2.932			
T7 122.8000-118. 0000	49.72	1820.94	A	0.195	3.002	0.589	1	1	1.054	701.54	146.16	D
			B	0.195	3.002	0.589	1	1	1.054			
			C	0.195	3.002	0.589	1	1	1.054			
			D	0.533	1.992	0.715	1	1	2.362			
T8 118.0000-115. 0000	31.07	1956.71	A	0.222	2.887	0.595	1	1	1.355	700.79	233.60	D
			B	0.222	2.887	0.595	1	1	1.355			
			C	0.222	2.887	0.595	1	1	1.355			
			D	0.41	2.254	0.656	1	1	2.104			
T9 115.0000-107. 5000	100.12	6574.59	A	0.114	3.381	0.577	1	1	2.497	1837.87	245.05	D
			B	0.114	3.381	0.577	1	1	2.497			
			C	0.114	3.381	0.577	1	1	2.497			
			D	0.282	2.656	0.61	1	1	4.746			
T10 107.5000-100.	158.82	6497.85	A	0.104	3.427	0.576	1	1	2.294	2037.48	271.66	D
			B	0.104	3.427	0.576	1	1	2.294			

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	Add Weight kg	Self Weight kg	F a c e	e	C _F	R _R	D _F	D _R	A _E m ²	F kg	w kg/m	Ctrl. Face
0000			C	0.104	3.427	0.576	1	1	2.294			
			D	0.371	2.363	0.64	1	1	6.033			
T11	120.84	5010.78	A	0.102	3.441	0.575	1	1	1.631	1474.62	294.92	D
100.0000-95.0000			B	0.102	3.441	0.575	1	1	1.631			
			C	0.102	3.441	0.575	1	1	1.631			
			D	0.379	2.339	0.643	1	1	4.490			
T12	148.46	5440.05	A	0.076	3.574	0.573	1	1	1.567	1696.08	308.38	D
95.0000-89.5000			B	0.076	3.574	0.573	1	1	1.567			
			C	0.076	3.574	0.573	1	1	1.567			
			D	0.341	2.452	0.629	1	1	5.005			
T13	166.15	5577.94	A	0.08	3.554	0.573	1	1	1.890	1916.46	348.45	D
89.5000-84.0000			B	0.08	3.554	0.573	1	1	1.890			
			C	0.08	3.554	0.573	1	1	1.890			
			D	0.338	2.463	0.628	1	1	5.730			
T14	206.72	6582.07	A	0.07	3.609	0.572	1	1	2.221	2361.63	363.33	D
84.0000-77.5000			B	0.07	3.609	0.572	1	1	2.221			
			C	0.07	3.609	0.572	1	1	2.221			
			D	0.308	2.564	0.618	1	1	6.922			
T15	209.99	7103.96	A	0.065	3.635	0.572	1	1	2.343	2444.91	376.14	D
77.5000-71.0000			B	0.065	3.635	0.572	1	1	2.343			
			C	0.065	3.635	0.572	1	1	2.343			
			D	0.278	2.671	0.609	1	1	7.047			
T16	214.41	7180.28	A	0.061	3.655	0.572	1	1	2.472	2518.51	387.46	D
71.0000-64.5000			B	0.061	3.655	0.572	1	1	2.472			
			C	0.061	3.655	0.572	1	1	2.472			
			D	0.255	2.755	0.603	1	1	7.223			
T17	218.03	7261.17	A	0.058	3.671	0.572	1	1	2.608	2572.88	395.83	D
64.5000-58.0000			B	0.058	3.671	0.572	1	1	2.608			
			C	0.058	3.671	0.572	1	1	2.608			
			D	0.236	2.829	0.599	1	1	7.397			
T18	151.35	7508.13	A	0.059	3.666	0.572	1	1	1.994	1829.10	406.47	D
58.0000-53.5000			B	0.059	3.666	0.572	1	1	1.994			
			C	0.059	3.666	0.572	1	1	1.994			
			D	0.223	2.883	0.595	1	1	5.301			
T19	154.56	8136.12	A	0.08	3.554	0.573	1	1	2.872	2066.55	459.23	D
53.5000-49.0000			B	0.08	3.554	0.573	1	1	2.872			
			C	0.08	3.554	0.573	1	1	2.872			
			D	0.238	2.823	0.599	1	1	6.265			
T20	154.56	7572.73	A	0.055	3.687	0.572	1	1	2.089	1833.50	407.44	D
49.0000-44.5000			B	0.055	3.687	0.572	1	1	2.089			
			C	0.055	3.687	0.572	1	1	2.089			
			D	0.204	2.961	0.591	1	1	5.439			
T21	154.56	8273.58	A	0.077	3.569	0.573	1	1	3.084	2070.00	460.00	D
44.5000-40.0000			B	0.077	3.569	0.573	1	1	3.084			
			C	0.077	3.569	0.573	1	1	3.084			
			D	0.219	2.901	0.594	1	1	6.453			
T22	154.56	7641.63	A	0.052	3.702	0.571	1	1	2.203	1799.51	399.89	D
40.0000-35.5000			B	0.052	3.702	0.571	1	1	2.203			
			C	0.052	3.702	0.571	1	1	2.203			
			D	0.187	3.037	0.588	1	1	5.534			
T23	154.56	8414.73	A	0.075	3.581	0.573	1	1	3.302	2037.60	452.80	D
35.5000-31.0000			B	0.075	3.581	0.573	1	1	3.302			
			C	0.075	3.581	0.573	1	1	3.302			
			D	0.203	2.967	0.591	1	1	6.652			
T24	154.56	7714.21	A	0.054	3.694	0.571	1	1	2.489	1774.42	394.32	D
31.0000-26.5000			B	0.054	3.694	0.571	1	1	2.489			
			C	0.054	3.694	0.571	1	1	2.489			
			D	0.176	3.083	0.586	1	1	5.809			
T25	158.58	8669.65	A	0.078	3.563	0.573	1	1	3.776	2029.97	451.10	D
26.5000-22.0000			B	0.078	3.563	0.573	1	1	3.776			

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
00			C	0.078	3.563	0.573	1	1	3.776			
			D	0.199	2.986	0.59	1	1	7.204			
T26	179.77	8557.24	A	0.049	3.721	0.571	1	1	2.747	1828.21	365.64	D
22.0000-17.00			B	0.049	3.721	0.571	1	1	2.747			
00			C	0.049	3.721	0.571	1	1	2.747			
			D	0.166	3.129	0.584	1	1	6.589			
T27	215.72	11150.13	A	0.063	3.646	0.572	1	1	4.428	2257.40	376.23	D
17.0000-11.00			B	0.063	3.646	0.572	1	1	4.428			
00			C	0.063	3.646	0.572	1	1	4.428			
			D	0.174	3.093	0.586	1	1	9.050			
T28	179.77	8649.38	A	0.047	3.731	0.571	1	1	2.909	1575.87	315.17	D
11.0000-6.000			B	0.047	3.731	0.571	1	1	2.909			
0			C	0.047	3.731	0.571	1	1	2.909			
			D	0.154	3.187	0.582	1	1	6.738			
T29	215.72	11868.95	A	0.071	3.599	0.573	1	1	5.522	2305.25	384.21	D
6.0000-0.0000			B	0.071	3.599	0.573	1	1	5.522			
			C	0.071	3.599	0.573	1	1	5.522			
			D	0.173	3.097	0.585	1	1	10.143			
Sum Weight:	3768.63	173525.86						OTM	2954359	47321.21		
									kg-m			

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T1	0.00	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	599.77	99.96	D
155.0000-149.0000			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.337	2.467	0.628	1.2	1.2	1.694			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T2	0.00	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	658.79	109.80	D
149.0000-143.0000			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.337	2.467	0.628	1.2	1.2	1.694			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T3	0.00	105.23	A	0.336	2.47	0.627	1.2	1.2	0.352	136.26	136.26	D
143.0000-142.0000			B	0.336	2.47	0.627	1.2	1.2	0.352			
			C	0.336	2.47	0.627	1.2	1.2	0.352			
			D	0.336	2.47	0.627	1.2	1.2	0.352			
T4	20.20	2449.64	A	0.204	2.964	0.591	1.153	1.153	1.693	922.49	144.14	D
142.0000-135.6000			B	0.204	2.964	0.591	1.153	1.153	1.693			
			C	0.204	2.964	0.591	1.153	1.153	1.693			
			D	0.307	2.567	0.618	1.2	1.2	2.314			
T5	36.25	2427.92	A	0.195	3.002	0.589	1.146	1.146	1.611	972.66	151.98	D
135.6000-129.2000			B	0.195	3.002	0.589	1.146	1.146	1.611			
			C	0.195	3.002	0.589	1.146	1.146	1.611			
			D	0.38	2.336	0.644	1.2	1.2	2.717			
T6	59.56	2427.92	A	0.195	3.002	0.589	1.146	1.146	1.611	1091.30	170.52	D
129.2000-122.8000			B	0.195	3.002	0.589	1.146	1.146	1.611			
			C	0.195	3.002	0.589	1.146	1.146	1.611			
			D	0.499	2.053	0.697	1.2	1.2	3.519			
T7	49.72	1820.94	A	0.195	3.002	0.589	1.146	1.146	1.208	841.85	175.39	D
122.8000-118.0000			B	0.195	3.002	0.589	1.146	1.146	1.208			
			C	0.195	3.002	0.589	1.146	1.146	1.208			
			D	0.533	1.992	0.715	1.2	1.2	2.834			
T8	31.07	1956.71	A	0.222	2.887	0.595	1.167	1.167	1.580	840.95	280.32	D

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 28 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
118.0000-115.0000			B	0.222	2.887	0.595	1.167	1.167	1.580			
			C	0.222	2.887	0.595	1.167	1.167	1.580			
			D	0.41	2.254	0.656	1.2	1.2	2.525			
T9	100.12	6574.59	A	0.114	3.381	0.577	1.085	1.085	2.710	2205.44	294.06	D
115.0000-107.5000			B	0.114	3.381	0.577	1.085	1.085	2.710			
			C	0.114	3.381	0.577	1.085	1.085	2.710			
			D	0.282	2.656	0.61	1.2	1.2	5.695			
T10	158.82	6497.85	A	0.104	3.427	0.576	1.078	1.078	2.473	2444.98	326.00	D
107.5000-100.0000			B	0.104	3.427	0.576	1.078	1.078	2.473			
			C	0.104	3.427	0.576	1.078	1.078	2.473			
			D	0.371	2.363	0.64	1.2	1.2	7.239			
T11	120.84	5010.78	A	0.102	3.441	0.575	1.076	1.076	1.756	1769.55	353.91	D
100.0000-95.0000			B	0.102	3.441	0.575	1.076	1.076	1.756			
			C	0.102	3.441	0.575	1.076	1.076	1.756			
			D	0.379	2.339	0.643	1.2	1.2	5.388			
T12	148.46	5440.05	A	0.076	3.574	0.573	1.057	1.057	1.657	2035.30	370.05	D
95.0000-89.5000			B	0.076	3.574	0.573	1.057	1.057	1.657			
			C	0.076	3.574	0.573	1.057	1.057	1.657			
			D	0.341	2.452	0.629	1.2	1.2	6.006			
T13	166.15	5577.94	A	0.08	3.554	0.573	1.06	1.06	2.004	2299.75	418.14	D
89.5000-84.0000			B	0.08	3.554	0.573	1.06	1.06	2.004			
			C	0.08	3.554	0.573	1.06	1.06	2.004			
			D	0.338	2.463	0.628	1.2	1.2	6.876			
T14	206.72	6582.07	A	0.07	3.609	0.572	1.052	1.052	2.337	2833.96	435.99	D
84.0000-77.5000			B	0.07	3.609	0.572	1.052	1.052	2.337			
			C	0.07	3.609	0.572	1.052	1.052	2.337			
			D	0.308	2.564	0.618	1.2	1.2	8.307			
T15	209.99	7103.96	A	0.065	3.635	0.572	1.048	1.048	2.457	2933.90	451.37	D
77.5000-71.0000			B	0.065	3.635	0.572	1.048	1.048	2.457			
			C	0.065	3.635	0.572	1.048	1.048	2.457			
			D	0.278	2.671	0.609	1.2	1.2	8.457			
T16	214.41	7180.28	A	0.061	3.655	0.572	1.046	1.046	2.585	3000.28	461.58	D
71.0000-64.5000			B	0.061	3.655	0.572	1.046	1.046	2.585			
			C	0.061	3.655	0.572	1.046	1.046	2.585			
			D	0.255	2.755	0.603	1.191	1.191	8.604			
T17	218.03	7261.17	A	0.058	3.671	0.572	1.044	1.044	2.722	3029.08	466.01	D
64.5000-58.0000			B	0.058	3.671	0.572	1.044	1.044	2.722			
			C	0.058	3.671	0.572	1.044	1.044	2.722			
			D	0.236	2.829	0.599	1.177	1.177	8.709			
T18	151.35	7508.13	A	0.059	3.666	0.572	1.044	1.044	2.083	2135.24	474.50	D
58.0000-53.5000			B	0.059	3.666	0.572	1.044	1.044	2.083			
			C	0.059	3.666	0.572	1.044	1.044	2.083			
			D	0.223	2.883	0.595	1.167	1.167	6.189			
T19	154.56	8136.12	A	0.08	3.554	0.573	1.06	1.06	3.044	2435.28	541.17	D
53.5000-49.0000			B	0.08	3.554	0.573	1.06	1.06	3.044			
			C	0.08	3.554	0.573	1.06	1.06	3.044			
			D	0.238	2.823	0.599	1.178	1.178	7.383			
T20	154.56	7572.73	A	0.055	3.687	0.572	1.041	1.041	2.175	2114.47	469.88	D
49.0000-44.5000			B	0.055	3.687	0.572	1.041	1.041	2.175			
			C	0.055	3.687	0.572	1.041	1.041	2.175			
			D	0.204	2.961	0.591	1.153	1.153	6.273			
T21	154.56	8273.58	A	0.077	3.569	0.573	1.058	1.058	3.262	2409.46	535.44	D
44.5000-40.0000			B	0.077	3.569	0.573	1.058	1.058	3.262			
			C	0.077	3.569	0.573	1.058	1.058	3.262			
			D	0.219	2.901	0.594	1.164	1.164	7.511			
T22	154.56	7641.63	A	0.052	3.702	0.571	1.039	1.039	2.290	2051.89	455.98	D
40.0000-35.5000			B	0.052	3.702	0.571	1.039	1.039	2.290			
			C	0.052	3.702	0.571	1.039	1.039	2.290			
			D	0.187	3.037	0.588	1.14	1.14	6.311			
T23	154.56	8414.73	A	0.075	3.581	0.573	1.056	1.056	3.487	2348.03	521.78	D

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 29 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
35.5000-31.0000			B	0.075	3.581	0.573	1.056	1.056	3.487			
			C	0.075	3.581	0.573	1.056	1.056	3.487			
			D	0.203	2.967	0.591	1.152	1.152	7.665			
T24	154.56	7714.21	A	0.054	3.694	0.571	1.04	1.04	2.590	2009.27	446.50	D
31.0000-26.5000			B	0.054	3.694	0.571	1.04	1.04	2.590			
			C	0.054	3.694	0.571	1.04	1.04	2.590			
			D	0.176	3.083	0.586	1.132	1.132	6.578			
T25	158.58	8669.65	A	0.078	3.563	0.573	1.059	1.059	3.998	2332.18	518.26	D
26.5000-22.0000			B	0.078	3.563	0.573	1.059	1.059	3.998			
			C	0.078	3.563	0.573	1.059	1.059	3.998			
			D	0.199	2.986	0.59	1.149	1.149	8.276			
T26	179.77	8557.24	A	0.049	3.721	0.571	1.037	1.037	2.848	2056.24	411.25	D
22.0000-17.0000			B	0.049	3.721	0.571	1.037	1.037	2.848			
			C	0.049	3.721	0.571	1.037	1.037	2.848			
			D	0.166	3.129	0.584	1.125	1.125	7.411			
T27	215.72	11150.13	A	0.063	3.646	0.572	1.047	1.047	4.636	2552.69	425.45	D
17.0000-11.0000			B	0.063	3.646	0.572	1.047	1.047	4.636			
			C	0.063	3.646	0.572	1.047	1.047	4.636			
			D	0.174	3.093	0.586	1.131	1.131	10.234			
T28	179.77	8649.38	A	0.047	3.731	0.571	1.035	1.035	3.012	1757.66	351.53	D
11.0000-6.0000			B	0.047	3.731	0.571	1.035	1.035	3.012			
			C	0.047	3.731	0.571	1.035	1.035	3.012			
			D	0.154	3.187	0.582	1.115	1.115	7.515			
T29	215.72	11868.95	A	0.071	3.599	0.573	1.054	1.054	5.817	2605.00	434.17	D
6.0000-0.0000			B	0.071	3.599	0.573	1.054	1.054	5.817			
			C	0.071	3.599	0.573	1.054	1.054	5.817			
			D	0.173	3.097	0.585	1.13	1.13	11.461			
Sum Weight:	3768.63	173525.86						OTM	3507659 kg-m	55423.73		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T1	0.00	476.17	A	0.337	2.467	0.628	1	1	1.412	124.95	20.83	D
155.0000-149.0000			B	0.337	2.467	0.628	1	1	1.412			
			C	0.337	2.467	0.628	1	1	1.412			
			D	0.337	2.467	0.628	1	1	1.412			
T2	0.00	476.17	A	0.337	2.467	0.628	1	1	1.412	137.25	22.87	D
149.0000-143.0000			B	0.337	2.467	0.628	1	1	1.412			
			C	0.337	2.467	0.628	1	1	1.412			
			D	0.337	2.467	0.628	1	1	1.412			
T3	0.00	105.23	A	0.336	2.47	0.627	1	1	0.294	28.39	28.39	D
143.0000-142.0000			B	0.336	2.47	0.627	1	1	0.294			
			C	0.336	2.47	0.627	1	1	0.294			
			D	0.336	2.47	0.627	1	1	0.294			
T4	20.20	2449.64	A	0.204	2.964	0.591	1	1	1.469	192.19	30.03	D
142.0000-135.6000			B	0.204	2.964	0.591	1	1	1.469			
			C	0.204	2.964	0.591	1	1	1.469			
			D	0.307	2.567	0.618	1	1	1.928			
T5	36.25	2427.92	A	0.195	3.002	0.589	1	1	1.406	202.64	31.66	D
135.6000-129.2000			B	0.195	3.002	0.589	1	1	1.406			
			C	0.195	3.002	0.589	1	1	1.406			
			D	0.38	2.336	0.644	1	1	2.264			

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 30 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T6 129.2000-122.8000	59.56	2427.92	A	0.195	3.002	0.589	1	1	1.406	227.35	35.52	D
			B	0.195	3.002	0.589	1	1	1.406			
			C	0.195	3.002	0.589	1	1	1.406			
			D	0.499	2.053	0.697	1	1	2.932			
T7 122.8000-118.0000	49.72	1820.94	A	0.195	3.002	0.589	1	1	1.054	175.39	36.54	D
			B	0.195	3.002	0.589	1	1	1.054			
			C	0.195	3.002	0.589	1	1	1.054			
			D	0.533	1.992	0.715	1	1	2.362			
T8 118.0000-115.0000	31.07	1956.71	A	0.222	2.887	0.595	1	1	1.355	175.20	58.40	D
			B	0.222	2.887	0.595	1	1	1.355			
			C	0.222	2.887	0.595	1	1	1.355			
			D	0.41	2.254	0.656	1	1	2.104			
T9 115.0000-107.5000	100.12	6574.59	A	0.114	3.381	0.577	1	1	2.497	459.47	61.26	D
			B	0.114	3.381	0.577	1	1	2.497			
			C	0.114	3.381	0.577	1	1	2.497			
			D	0.282	2.656	0.61	1	1	4.746			
T10 107.5000-100.0000	158.82	6497.85	A	0.104	3.427	0.576	1	1	2.294	509.37	67.92	D
			B	0.104	3.427	0.576	1	1	2.294			
			C	0.104	3.427	0.576	1	1	2.294			
			D	0.371	2.363	0.64	1	1	6.033			
T11 100.0000-95.0000	120.84	5010.78	A	0.102	3.441	0.575	1	1	1.631	368.66	73.73	D
			B	0.102	3.441	0.575	1	1	1.631			
			C	0.102	3.441	0.575	1	1	1.631			
			D	0.379	2.339	0.643	1	1	4.490			
T12 95.0000-89.5000	148.46	5440.05	A	0.076	3.574	0.573	1	1	1.567	424.02	77.09	D
			B	0.076	3.574	0.573	1	1	1.567			
			C	0.076	3.574	0.573	1	1	1.567			
			D	0.341	2.452	0.629	1	1	5.005			
T13 89.5000-84.0000	166.15	5577.94	A	0.08	3.554	0.573	1	1	1.890	479.12	87.11	D
			B	0.08	3.554	0.573	1	1	1.890			
			C	0.08	3.554	0.573	1	1	1.890			
			D	0.338	2.463	0.628	1	1	5.730			
T14 84.0000-77.5000	206.72	6582.07	A	0.07	3.609	0.572	1	1	2.221	590.41	90.83	D
			B	0.07	3.609	0.572	1	1	2.221			
			C	0.07	3.609	0.572	1	1	2.221			
			D	0.308	2.564	0.618	1	1	6.922			
T15 77.5000-71.0000	209.99	7103.96	A	0.065	3.635	0.572	1	1	2.343	611.23	94.04	D
			B	0.065	3.635	0.572	1	1	2.343			
			C	0.065	3.635	0.572	1	1	2.343			
			D	0.278	2.671	0.609	1	1	7.047			
T16 71.0000-64.5000	214.41	7180.28	A	0.061	3.655	0.572	1	1	2.472	629.63	96.87	D
			B	0.061	3.655	0.572	1	1	2.472			
			C	0.061	3.655	0.572	1	1	2.472			
			D	0.255	2.755	0.603	1	1	7.223			
T17 64.5000-58.0000	218.03	7261.17	A	0.058	3.671	0.572	1	1	2.608	643.22	98.96	D
			B	0.058	3.671	0.572	1	1	2.608			
			C	0.058	3.671	0.572	1	1	2.608			
			D	0.236	2.829	0.599	1	1	7.397			
T18 58.0000-53.5000	151.35	7508.13	A	0.059	3.666	0.572	1	1	1.994	457.28	101.62	D
			B	0.059	3.666	0.572	1	1	1.994			
			C	0.059	3.666	0.572	1	1	1.994			
			D	0.223	2.883	0.595	1	1	5.301			
T19 53.5000-49.0000	154.56	8136.12	A	0.08	3.554	0.573	1	1	2.872	516.64	114.81	D
			B	0.08	3.554	0.573	1	1	2.872			
			C	0.08	3.554	0.573	1	1	2.872			
			D	0.238	2.823	0.599	1	1	6.265			
T20 49.0000-44.5000	154.56	7572.73	A	0.055	3.687	0.572	1	1	2.089	458.37	101.86	D
			B	0.055	3.687	0.572	1	1	2.089			
			C	0.055	3.687	0.572	1	1	2.089			
			D	0.204	2.961	0.591	1	1	5.439			

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 31 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T21 44.5000-40.00 00	154.56	8273.58	A	0.077	3.569	0.573	1	1	3.084	517.50	115.00	D
			B	0.077	3.569	0.573	1	1	3.084			
			C	0.077	3.569	0.573	1	1	3.084			
			D	0.219	2.901	0.594	1	1	6.453			
T22 40.0000-35.50 00	154.56	7641.63	A	0.052	3.702	0.571	1	1	2.203	449.88	99.97	D
			B	0.052	3.702	0.571	1	1	2.203			
			C	0.052	3.702	0.571	1	1	2.203			
			D	0.187	3.037	0.588	1	1	5.534			
T23 35.5000-31.00 00	154.56	8414.73	A	0.075	3.581	0.573	1	1	3.302	509.40	113.20	D
			B	0.075	3.581	0.573	1	1	3.302			
			C	0.075	3.581	0.573	1	1	3.302			
			D	0.203	2.967	0.591	1	1	6.652			
T24 31.0000-26.50 00	154.56	7714.21	A	0.054	3.694	0.571	1	1	2.489	443.60	98.58	D
			B	0.054	3.694	0.571	1	1	2.489			
			C	0.054	3.694	0.571	1	1	2.489			
			D	0.176	3.083	0.586	1	1	5.809			
T25 26.5000-22.00 00	158.58	8669.65	A	0.078	3.563	0.573	1	1	3.776	507.49	112.78	D
			B	0.078	3.563	0.573	1	1	3.776			
			C	0.078	3.563	0.573	1	1	3.776			
			D	0.199	2.986	0.59	1	1	7.204			
T26 22.0000-17.00 00	179.77	8557.24	A	0.049	3.721	0.571	1	1	2.747	457.05	91.41	D
			B	0.049	3.721	0.571	1	1	2.747			
			C	0.049	3.721	0.571	1	1	2.747			
			D	0.166	3.129	0.584	1	1	6.589			
T27 17.0000-11.00 00	215.72	11150.13	A	0.063	3.646	0.572	1	1	4.428	564.35	94.06	D
			B	0.063	3.646	0.572	1	1	4.428			
			C	0.063	3.646	0.572	1	1	4.428			
			D	0.174	3.093	0.586	1	1	9.050			
T28 11.0000-6.000 0	179.77	8649.38	A	0.047	3.731	0.571	1	1	2.909	393.97	78.79	D
			B	0.047	3.731	0.571	1	1	2.909			
			C	0.047	3.731	0.571	1	1	2.909			
			D	0.154	3.187	0.582	1	1	6.738			
T29 6.0000-0.0000	215.72	11868.95	A	0.071	3.599	0.573	1	1	5.522	576.31	96.05	D
			B	0.071	3.599	0.573	1	1	5.522			
			C	0.071	3.599	0.573	1	1	5.522			
			D	0.173	3.097	0.585	1	1	10.143			
Sum Weight:	3768.63	173525.86						OTM	738590 kg-m	11830.30		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T1 155.0000-149. 0000	0.00	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	149.94	24.99	D
			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.337	2.467	0.628	1.2	1.2	1.694			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T2 149.0000-143. 0000	0.00	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	164.70	27.45	D
			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.337	2.467	0.628	1.2	1.2	1.694			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T3 143.0000-142. 0000	0.00	105.23	A	0.336	2.47	0.627	1.2	1.2	0.352	34.06	34.06	D
			B	0.336	2.47	0.627	1.2	1.2	0.352			
			C	0.336	2.47	0.627	1.2	1.2	0.352			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T4 142.0000-135.6000	20.20	2449.64	D A B C D	0.336 0.204 0.204 0.204 0.307	2.47 2.964 2.964 2.964 2.567	0.627 0.591 0.591 0.591 0.618	1.2 1.153 1.153 1.153 1.2	1.2 1.153 1.153 1.153 1.2	0.352 1.693 1.693 1.693 2.314	230.62	36.03	D
T5 135.6000-129.2000	36.25	2427.92	A B C D	0.195 0.195 0.195 0.38	3.002 3.002 3.002 2.336	0.589 0.589 0.589 0.644	1.146 1.146 1.146 1.2	1.146 1.146 1.146 1.2	1.611 1.611 1.611 2.717	243.17	37.99	D
T6 129.2000-122.8000	59.56	2427.92	A B C D	0.195 0.195 0.195 0.499	3.002 3.002 3.002 2.053	0.589 0.589 0.589 0.697	1.146 1.146 1.146 1.2	1.146 1.146 1.146 1.2	1.611 1.611 1.611 3.519	272.82	42.63	D
T7 122.8000-118.0000	49.72	1820.94	A B C D	0.195 0.195 0.195 0.533	3.002 3.002 3.002 1.992	0.589 0.589 0.589 0.715	1.146 1.146 1.146 1.2	1.146 1.146 1.146 1.2	1.208 1.208 1.208 2.834	210.46	43.85	D
T8 118.0000-115.0000	31.07	1956.71	A B C D	0.222 0.222 0.222 0.41	2.887 2.887 2.887 2.254	0.595 0.595 0.595 0.656	1.167 1.167 1.167 1.2	1.167 1.167 1.167 1.2	1.580 1.580 1.580 2.525	210.24	70.08	D
T9 115.0000-107.5000	100.12	6574.59	A B C D	0.114 0.114 0.114 0.282	3.381 3.381 3.381 2.656	0.577 0.577 0.577 0.61	1.085 1.085 1.085 1.2	1.085 1.085 1.085 1.2	2.710 2.710 2.710 5.695	551.36	73.51	D
T10 107.5000-100.0000	158.82	6497.85	A B C D	0.104 0.104 0.104 0.371	3.427 3.427 3.427 2.363	0.576 0.576 0.576 0.64	1.078 1.078 1.078 1.2	1.078 1.078 1.078 1.2	2.473 2.473 2.473 7.239	611.24	81.50	D
T11 100.0000-95.0000	120.84	5010.78	A B C D	0.102 0.102 0.102 0.379	3.441 3.441 3.441 2.339	0.575 0.575 0.575 0.643	1.076 1.076 1.076 1.2	1.076 1.076 1.076 1.2	1.756 1.756 1.756 5.388	442.39	88.48	D
T12 95.0000-89.5000	148.46	5440.05	A B C D	0.076 0.076 0.076 0.341	3.574 3.574 3.574 2.452	0.573 0.573 0.573 0.629	1.057 1.057 1.057 1.2	1.057 1.057 1.057 1.2	1.657 1.657 1.657 6.006	508.82	92.51	D
T13 89.5000-84.0000	166.15	5577.94	A B C D	0.08 0.08 0.08 0.338	3.554 3.554 3.554 2.463	0.573 0.573 0.573 0.628	1.06 1.06 1.06 1.2	1.06 1.06 1.06 1.2	2.004 2.004 2.004 6.876	574.94	104.53	D
T14 84.0000-77.5000	206.72	6582.07	A B C D	0.07 0.07 0.07 0.308	3.609 3.609 3.609 2.564	0.572 0.572 0.572 0.618	1.052 1.052 1.052 1.2	1.052 1.052 1.052 1.2	2.337 2.337 2.337 8.307	708.49	109.00	D
T15 77.5000-71.0000	209.99	7103.96	A B C D	0.065 0.065 0.065 0.278	3.635 3.635 3.635 2.671	0.572 0.572 0.572 0.609	1.048 1.048 1.048 1.2	1.048 1.048 1.048 1.2	2.457 2.457 2.457 8.457	733.47	112.84	D
T16 71.0000-64.5000	214.41	7180.28	A B C D	0.061 0.061 0.061 0.255	3.655 3.655 3.655 2.755	0.572 0.572 0.572 0.603	1.046 1.046 1.046 1.191	1.046 1.046 1.046 1.191	2.585 2.585 2.585 8.604	750.07	115.40	D
T17 64.5000-58.0000	218.03	7261.17	A B C D	0.058 0.058 0.058 0.236	3.671 3.671 3.671 2.829	0.572 0.572 0.572 0.599	1.044 1.044 1.044 1.177	1.044 1.044 1.044 1.177	2.722 2.722 2.722 8.709	757.27	116.50	D
T18 58.0000-53.5000	151.35	7508.13	A B C	0.059 0.059 0.059	3.666 3.666 3.666	0.572 0.572 0.572	1.044 1.044 1.044	1.044 1.044 1.044	2.083 2.083 2.083	533.81	118.62	D

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T19	154.56	8136.12	D	0.223	2.883	0.595	1.167	1.167	6.189			
53.5000-49.00			A	0.08	3.554	0.573	1.06	1.06	3.044	608.82	135.29	D
00			B	0.08	3.554	0.573	1.06	1.06	3.044			
			C	0.08	3.554	0.573	1.06	1.06	3.044			
T20	154.56	7572.73	D	0.238	2.823	0.599	1.178	1.178	7.383			
49.0000-44.50			A	0.055	3.687	0.572	1.041	1.041	2.175	528.62	117.47	D
00			B	0.055	3.687	0.572	1.041	1.041	2.175			
			C	0.055	3.687	0.572	1.041	1.041	2.175			
T21	154.56	8273.58	D	0.204	2.961	0.591	1.153	1.153	6.273			
44.5000-40.00			A	0.077	3.569	0.573	1.058	1.058	3.262	602.37	133.86	D
00			B	0.077	3.569	0.573	1.058	1.058	3.262			
			C	0.077	3.569	0.573	1.058	1.058	3.262			
T22	154.56	7641.63	D	0.219	2.901	0.594	1.164	1.164	7.511			
40.0000-35.50			A	0.052	3.702	0.571	1.039	1.039	2.290	512.97	113.99	D
00			B	0.052	3.702	0.571	1.039	1.039	2.290			
			C	0.052	3.702	0.571	1.039	1.039	2.290			
T23	154.56	8414.73	D	0.187	3.037	0.588	1.14	1.14	6.311			
35.5000-31.00			A	0.075	3.581	0.573	1.056	1.056	3.487	587.01	130.45	D
00			B	0.075	3.581	0.573	1.056	1.056	3.487			
			C	0.075	3.581	0.573	1.056	1.056	3.487			
T24	154.56	7714.21	D	0.203	2.967	0.591	1.152	1.152	7.665			
31.0000-26.50			A	0.054	3.694	0.571	1.04	1.04	2.590	502.32	111.63	D
00			B	0.054	3.694	0.571	1.04	1.04	2.590			
			C	0.054	3.694	0.571	1.04	1.04	2.590			
T25	158.58	8669.65	D	0.176	3.083	0.586	1.132	1.132	6.578			
26.5000-22.00			A	0.078	3.563	0.573	1.059	1.059	3.998	583.05	129.57	D
00			B	0.078	3.563	0.573	1.059	1.059	3.998			
			C	0.078	3.563	0.573	1.059	1.059	3.998			
T26	179.77	8557.24	D	0.199	2.986	0.59	1.149	1.149	8.276			
22.0000-17.00			A	0.049	3.721	0.571	1.037	1.037	2.848	514.06	102.81	D
00			B	0.049	3.721	0.571	1.037	1.037	2.848			
			C	0.049	3.721	0.571	1.037	1.037	2.848			
T27	215.72	11150.13	D	0.166	3.129	0.584	1.125	1.125	7.411			
17.0000-11.00			A	0.063	3.646	0.572	1.047	1.047	4.636	638.17	106.36	D
00			B	0.063	3.646	0.572	1.047	1.047	4.636			
			C	0.063	3.646	0.572	1.047	1.047	4.636			
T28	179.77	8649.38	D	0.174	3.093	0.586	1.131	1.131	10.234			
11.0000-6.000			A	0.047	3.731	0.571	1.035	1.035	3.012	439.42	87.88	D
0			B	0.047	3.731	0.571	1.035	1.035	3.012			
			C	0.047	3.731	0.571	1.035	1.035	3.012			
T29	215.72	11868.95	D	0.154	3.187	0.582	1.115	1.115	7.515			
6.0000-0.0000			A	0.071	3.599	0.573	1.054	1.054	5.817	651.25	108.54	D
			B	0.071	3.599	0.573	1.054	1.054	5.817			
			C	0.071	3.599	0.573	1.054	1.054	5.817			
Sum Weight:	3768.63	173525.86	D	0.173	3.097	0.585	1.13	1.13	11.461			
							OTM		876915	13855.93		
									kg-m			

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Mast Vectors - No Ice

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T1	155.0000-149.0000	0	Wind Normal	499.81	0.00	-499.81	-75971	0	0
		45	Wind 90	599.77	424.10	-424.10	-64464	-64464	0
		90	Wind Normal	499.81	499.81	0.00	0	-75971	0
T2	149.0000-143.0000	0	Wind Normal	548.99	0.00	-548.99	-80153	0	0
		45	Wind 90	658.79	465.83	-465.83	-68012	-68012	0
		90	Wind Normal	548.99	548.99	0.00	0	-80153	0
T3	143.0000-142.0000	0	Wind Normal	113.55	0.00	-113.55	-16180	0	0
		45	Wind 90	136.26	96.35	-96.35	-13729	-13729	0
		90	Wind Normal	113.55	113.55	0.00	0	-16180	0
T4	142.0000-135.6000	0	Wind Normal	768.74	0.00	-768.74	-106691	0	0
		45	Wind 90	922.49	652.30	-652.30	-90529	-90539	38
		90	Wind Normal	768.74	768.74	0.00	10	-106702	45
T5	135.6000-129.2000	0	Wind Normal	810.55	0.00	-810.55	-107298	0	0
		45	Wind 90	972.66	687.78	-687.78	-91043	-91062	68
		90	Wind Normal	810.55	810.55	0.00	19	-107317	80
T6	129.2000-122.8000	0	Wind Normal	909.42	0.00	-909.42	-114556	0	0
		45	Wind 90	1091.30	771.67	-771.67	-97199	-97230	112
		90	Wind Normal	909.42	909.42	0.00	31	-114586	132
T7	122.8000-118.0000	0	Wind Normal	701.54	0.00	-701.54	-84440	0	0
		45	Wind 90	841.85	595.28	-595.28	-71646	-71672	93
		90	Wind Normal	701.54	701.54	0.00	26	-84466	109
T8	118.0000-115.0000	0	Wind Normal	700.79	0.00	-700.79	-81612	0	0
		45	Wind 90	840.95	594.64	-594.64	-69245	-69275	100
		90	Wind Normal	700.79	700.79	0.00	30	-81642	118
T9	115.0000-107.5000	0	Wind Normal	1837.87	0.00	-1837.87	-204321	0	0
		45	Wind 90	2205.44	1559.48	-1559.48	-173351	-173493	595
		90	Wind Normal	1837.87	1837.87	0.00	142	-204463	701
T10	107.5000-100.0000	0	Wind Normal	2037.48	0.00	-2037.48	-211164	0	0
		45	Wind 90	2444.98	1728.86	-1728.86	-179144	-179369	952
		90	Wind Normal	2037.48	2037.48	0.00	225	-211389	1122
T11	100.0000-95.0000	0	Wind Normal	1474.62	0.00	-1474.62	-143589	0	0
		45	Wind 90	1769.55	1251.26	-1251.26	-121811	-121998	783
		90	Wind Normal	1474.62	1474.62	0.00	186	-143776	922
T12	95.0000-89.5000	0	Wind Normal	1696.08	0.00	-1696.08	-156194	0	0
		45	Wind 90	2035.30	1439.17	-1439.17	-132494	-132764	1215
		90	Wind Normal	1696.08	1696.08	0.00	269	-156463	1432
T13	89.5000-84.0000	0	Wind Normal	1916.46	0.00	-1916.46	-165905	0	0
		45	Wind 90	2299.75	1626.17	-1626.17	-140723	-141070	1522
		90	Wind Normal	1916.46	1916.46	0.00	348	-166253	1793
T14	84.0000-77.5000	0	Wind Normal	2361.63	0.00	-2361.63	-190206	0	0
		45	Wind 90	2833.96	2003.91	-2003.91	-161320	-161816	2216
		90	Wind Normal	2361.63	2361.63	0.00	496	-190702	2612
T15	77.5000-71.0000	0	Wind Normal	2444.91	0.00	-2444.91	-180962	0	0
		45	Wind 90	2933.90	2074.58	-2074.58	-153464	-154037	2558
		90	Wind Normal	2444.91	2444.91	0.00	573	-181535	3015
T16	71.0000-64.5000	0	Wind Normal	2518.51	0.00	-2518.51	-169973	0	0

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T17	64.5000-58.0000	45	Wind 90	3000.28	2121.52	-2121.52	-143077	-143733	2879
		90	Wind Normal	2518.51	2518.51	0.00	656	-170629	3418
		0	Wind Normal	2572.88	0.00	-2572.88	-156850	0	0
T18	58.0000-53.5000	45	Wind 90	3029.08	2141.89	-2141.89	-130451	-131191	3154
		90	Wind Normal	2572.88	2572.88	0.00	740	-157589	3789
		0	Wind Normal	1829.10	0.00	-1829.10	-101417	0	0
T19	53.5000-49.0000	45	Wind 90	2135.24	1509.85	-1509.85	-83618	-84174	2276
		90	Wind Normal	1829.10	1829.10	0.00	556	-101972	2757
		0	Wind Normal	2066.55	0.00	-2066.55	-105308	0	0
T20	49.0000-44.5000	45	Wind 90	2435.28	1722.00	-1722.00	-87649	-88253	2220
		90	Wind Normal	2066.55	2066.55	0.00	603	-105911	2664
		0	Wind Normal	1833.50	0.00	-1833.50	-85077	0	0
T21	44.5000-40.0000	45	Wind 90	2114.47	1495.16	-1495.16	-69260	-69899	2497
		90	Wind Normal	1833.50	1833.50	0.00	639	-85716	3062
		0	Wind Normal	2070.00	0.00	-2070.00	-86783	0	0
T22	40.0000-35.5000	45	Wind 90	2409.46	1703.75	-1703.75	-71309	-71983	2339
		90	Wind Normal	2070.00	2070.00	0.00	674	-87457	2841
		0	Wind Normal	1799.51	0.00	-1799.51	-67222	0	0
T23	35.5000-31.0000	45	Wind 90	2051.89	1450.90	-1450.90	-54062	-54772	2607
		90	Wind Normal	1799.51	1799.51	0.00	710	-67932	3233
		0	Wind Normal	2037.60	0.00	-2037.60	-67005	0	0
T24	31.0000-26.5000	45	Wind 90	2348.03	1660.31	-1660.31	-54460	-55205	2403
		90	Wind Normal	2037.60	2037.60	0.00	745	-67750	2949
		0	Wind Normal	1774.42	0.00	-1774.42	-50234	0	0
T25	26.5000-22.0000	45	Wind 90	2009.27	1420.77	-1420.77	-40067	-40847	2602
		90	Wind Normal	1774.42	1774.42	0.00	780	-51015	3250
		0	Wind Normal	2029.97	0.00	-2029.97	-48389	0	0
T26	22.0000-17.0000	45	Wind 90	2332.18	1649.10	-1649.10	-39153	-39991	2418
		90	Wind Normal	2029.97	2029.97	0.00	837	-49227	2977
		0	Wind Normal	1828.21	0.00	-1828.21	-34657	0	0
T27	17.0000-11.0000	45	Wind 90	2056.24	1453.98	-1453.98	-27360	-28353	3007
		90	Wind Normal	1828.21	1828.21	0.00	993	-35650	3780
		0	Wind Normal	2257.40	0.00	-2257.40	-30352	0	0
T28	11.0000-6.0000	45	Wind 90	2552.69	1805.02	-1805.02	-24019	-25270	3228
		90	Wind Normal	2257.40	2257.40	0.00	1252	-31604	4038
		0	Wind Normal	1575.87	0.00	-1575.87	-12301	0	0
T29	6.0000-0.0000	45	Wind 90	1757.66	1242.85	-1242.85	-9471	-10564	2730
		90	Wind Normal	1575.87	1575.87	0.00	1093	-13395	3462
		0	Wind Normal	2305.25	0.00	-2305.25	-5543	0	0
		45	Wind 90	2605.00	1842.01	-1842.01	-4153	-5526	3086
		90	Wind Normal	2305.25	2305.25	0.00	1373	-6916	3862

Mast Totals - No Ice

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	-47321.21	-2940355	0	0
45	39190.50	-39190.50	-2466285	-2480290	47697
90	47321.21	0.00	14005	-2954359	58162

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Mast Vectors - Service

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T1	155.0000-149.000 0	0	Wind Normal	124.95	0.00	-124.95	-18993	0	0
		45	Wind 90	149.94	106.03	-106.03	-16116	-16116	0
		90	Wind Normal	124.95	124.95	0.00	0	-18993	0
T2	149.0000-143.000 0	0	Wind Normal	137.25	0.00	-137.25	-20038	0	0
		45	Wind 90	164.70	116.46	-116.46	-17003	-17003	0
		90	Wind Normal	137.25	137.25	0.00	0	-20038	0
T3	143.0000-142.000 0	0	Wind Normal	28.39	0.00	-28.39	-4045	0	0
		45	Wind 90	34.06	24.09	-24.09	-3432	-3432	0
		90	Wind Normal	28.39	28.39	0.00	0	-4045	0
T4	142.0000-135.600 0	0	Wind Normal	192.19	0.00	-192.19	-26665	0	0
		45	Wind 90	230.62	163.08	-163.08	-22624	-22635	9
		90	Wind Normal	192.19	192.19	0.00	10	-26675	11
T5	135.6000-129.200 0	0	Wind Normal	202.64	0.00	-202.64	-26811	0	0
		45	Wind 90	243.17	171.94	-171.94	-22747	-22765	17
		90	Wind Normal	202.64	202.64	0.00	19	-26829	20
T6	129.2000-122.800 0	0	Wind Normal	227.35	0.00	-227.35	-28616	0	0
		45	Wind 90	272.82	192.92	-192.92	-24277	-24307	28
		90	Wind Normal	227.35	227.35	0.00	31	-28647	33
T7	122.8000-118.000 0	0	Wind Normal	175.39	0.00	-175.39	-21091	0	0
		45	Wind 90	210.46	148.82	-148.82	-17892	-17918	23
		90	Wind Normal	175.39	175.39	0.00	26	-21116	27
T8	118.0000-115.000 0	0	Wind Normal	175.20	0.00	-175.20	-20380	0	0
		45	Wind 90	210.24	148.66	-148.66	-17289	-17319	25
		90	Wind Normal	175.20	175.20	0.00	30	-20410	29
T9	115.0000-107.500 0	0	Wind Normal	459.47	0.00	-459.47	-50974	0	0
		45	Wind 90	551.36	389.87	-389.87	-43231	-43373	149
		90	Wind Normal	459.47	459.47	0.00	142	-51116	175
T10	107.5000-100.000 0	0	Wind Normal	509.37	0.00	-509.37	-52622	0	0
		45	Wind 90	611.24	432.21	-432.21	-44617	-44842	238
		90	Wind Normal	509.37	509.37	0.00	225	-52847	281
T11	100.0000-95.0000	0	Wind Normal	368.66	0.00	-368.66	-35757	0	0
		45	Wind 90	442.39	312.81	-312.81	-30313	-30499	196
		90	Wind Normal	368.66	368.66	0.00	186	-35944	231
T12	95.0000-89.5000	0	Wind Normal	424.02	0.00	-424.02	-38847	0	0
		45	Wind 90	508.82	359.79	-359.79	-32922	-33191	304
		90	Wind Normal	424.02	424.02	0.00	269	-39116	358
T13	89.5000-84.0000	0	Wind Normal	479.12	0.00	-479.12	-41215	0	0
		45	Wind 90	574.94	406.54	-406.54	-34920	-35268	380
		90	Wind Normal	479.12	479.12	0.00	348	-41563	448
T14	84.0000-77.5000	0	Wind Normal	590.41	0.00	-590.41	-47180	0	0
		45	Wind 90	708.49	500.98	-500.98	-39958	-40454	554
		90	Wind Normal	590.41	590.41	0.00	496	-47675	653
T15	77.5000-71.0000	0	Wind Normal	611.23	0.00	-611.23	-44810	0	0
		45	Wind 90	733.47	518.64	-518.64	-37936	-38509	640
		90	Wind Normal	611.23	611.23	0.00	573	-45384	754
T16	71.0000-64.5000	0	Wind Normal	629.63	0.00	-629.63	-42001	0	0

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Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T17	64.5000-58.0000	45	Wind 90	750.07	530.38	-530.38	-35277	-35933	720
		90	Wind Normal	629.63	629.63	0.00	656	-42657	855
		0	Wind Normal	643.22	0.00	-643.22	-38658	0	0
T18	58.0000-53.5000	45	Wind 90	757.27	535.47	-535.47	-32058	-32798	788
		90	Wind Normal	643.22	643.22	0.00	740	-39397	947
		0	Wind Normal	457.28	0.00	-457.28	-24937	0	0
T19	53.5000-49.0000	45	Wind 90	533.81	377.46	-377.46	-20488	-21043	569
		90	Wind Normal	457.28	457.28	0.00	556	-25493	689
		0	Wind Normal	516.64	0.00	-516.64	-25875	0	0
T20	49.0000-44.5000	45	Wind 90	608.82	430.50	-430.50	-21460	-22063	555
		90	Wind Normal	516.64	516.64	0.00	603	-26478	666
		0	Wind Normal	458.37	0.00	-458.37	-20790	0	0
T21	44.5000-40.0000	45	Wind 90	528.62	373.79	-373.79	-16836	-17475	624
		90	Wind Normal	458.37	458.37	0.00	639	-21429	765
		0	Wind Normal	517.50	0.00	-517.50	-21190	0	0
T22	40.0000-35.5000	45	Wind 90	602.37	425.94	-425.94	-17322	-17996	585
		90	Wind Normal	517.50	517.50	0.00	674	-21864	710
		0	Wind Normal	449.88	0.00	-449.88	-16273	0	0
T23	35.5000-31.0000	45	Wind 90	512.97	362.73	-362.73	-12983	-13693	652
		90	Wind Normal	449.88	449.88	0.00	710	-16983	808
		0	Wind Normal	509.40	0.00	-509.40	-16193	0	0
T24	31.0000-26.5000	45	Wind 90	587.01	415.08	-415.08	-13056	-13801	601
		90	Wind Normal	509.40	509.40	0.00	745	-16938	737
		0	Wind Normal	443.60	0.00	-443.60	-11973	0	0
T25	26.5000-22.0000	45	Wind 90	502.32	355.19	-355.19	-9431	-10212	651
		90	Wind Normal	443.60	443.60	0.00	780	-12754	812
		0	Wind Normal	507.49	0.00	-507.49	-11469	0	0
T26	22.0000-17.0000	45	Wind 90	583.05	412.28	-412.28	-9160	-9998	605
		90	Wind Normal	507.49	507.49	0.00	837	-12307	744
		0	Wind Normal	457.05	0.00	-457.05	-7920	0	0
T27	17.0000-11.0000	45	Wind 90	514.06	363.50	-363.50	-6096	-7088	752
		90	Wind Normal	457.05	457.05	0.00	993	-8913	945
		0	Wind Normal	564.35	0.00	-564.35	-6649	0	0
T28	11.0000-6.0000	45	Wind 90	638.17	451.26	-451.26	-5066	-6318	807
		90	Wind Normal	564.35	564.35	0.00	1252	-7901	1009
		0	Wind Normal	393.97	0.00	-393.97	-2255	0	0
T29	6.0000-0.0000	45	Wind 90	439.42	310.71	-310.71	-1548	-2641	683
		90	Wind Normal	393.97	393.97	0.00	1093	-3349	865
		0	Wind Normal	576.31	0.00	-576.31	-356	0	0
		45	Wind 90	651.25	460.50	-460.50	-9	-1382	771
		90	Wind Normal	576.31	576.31	0.00	1373	-1729	966

Mast Totals - Service

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	-11830.30	-724585	0	0
45	9797.62	-9797.62	-606068	-620072	11924
90	11830.30	0.00	14005	-738590	14541

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Discrete Appurtenance Vectors - No Ice

2 ANT TV 0.15x0.60m - Elevation 142 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.25	0.00	-6.25	-888	8	-3
45	19.90	4.42	19.90	-4.42	-628	-2818	-2
90	28.14	0.00	28.14	0.00	0	-3988	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.14	0.00	0.00	-28.14	-4004	0	0
45	19.90	4.42	4.42	-19.90	-2834	-628	-2
90	0.00	6.25	6.25	0.00	-8	-888	-3

2 ANT TV 0.15x0.60m - Elevation 142 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.25	0.00	-6.25	-888	-8	3
45	19.90	4.42	19.90	-4.42	-628	-2834	2
90	28.14	0.00	28.14	0.00	0	-4004	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.14	0.00	0.00	-28.14	-3988	0	0
45	19.90	4.42	4.42	-19.90	-2818	-628	2
90	0.00	6.25	6.25	0.00	8	-888	3

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.22	0.00	-6.22	-868	24	-9
45	19.80	4.40	19.80	-4.40	-614	-2738	-7
90	28.00	0.00	28.00	0.00	0	-3882	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.00	0.00	0.00	-28.00	-3914	-8	14
45	19.80	4.40	4.40	-19.80	-2770	-622	8
90	0.00	6.22	6.22	0.00	-8	-876	-3

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2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.22	0.00	-6.22	-868	-24	9
45	19.80	4.40	19.80	-4.40	-614	-2786	7
90	28.00	0.00	28.00	0.00	0	-3930	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.00	0.00	0.00	-28.00	-3898	5	-8
45	19.80	4.40	4.40	-19.80	-2754	-609	-4
90	0.00	6.22	6.22	0.00	8	-863	3

2 ANT TV 0.15x0.60m - Elevation 137 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.19	0.00	-6.19	-848	8	-3
45	19.70	4.38	19.70	-4.38	-600	-2690	-2
90	27.86	0.00	27.86	0.00	0	-3808	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	27.86	0.00	0.00	-27.86	-3824	0	0
45	19.70	4.38	4.38	-19.70	-2706	-600	-2
90	0.00	6.19	6.19	0.00	-8	-848	-3

2 ANT TV 0.15x0.60m - Elevation 137 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.19	0.00	-6.19	-848	-8	3
45	19.70	4.38	19.70	-4.38	-600	-2706	2
90	27.86	0.00	27.86	0.00	0	-3824	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	27.86	0.00	0.00	-27.86	-3808	0	0
45	19.70	4.38	4.38	-19.70	-2690	-600	2
90	0.00	6.19	6.19	0.00	8	-848	3

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1 ANT TV 0.30x1.20m - Elevation 113 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.86	0.00	-5.86	-662	17	-8
45	15.54	4.14	15.54	-4.14	-468	-1739	-6
90	21.97	0.00	21.97	0.00	0	-2466	0

1 ANT TV 0.30x1.20m - Elevation 113 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.97	0.00	0.00	-21.97	-2499	0	0
45	15.54	4.14	4.14	-15.54	-1772	-468	-6
90	0.00	5.86	5.86	0.00	-17	-662	-8

1 ANT TV 0.30x1.20m - Elevation 113 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.86	0.00	-5.86	-662	-17	8
45	15.54	4.14	15.54	-4.14	-468	-1772	6
90	21.97	0.00	21.97	0.00	0	-2499	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.84	0.00	-5.84	-651	17	-8
45	15.48	4.13	15.48	-4.13	-460	-1709	-6
90	21.89	0.00	21.89	0.00	0	-2424	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.89	0.00	0.00	-21.89	-2457	0	0
45	15.48	4.13	4.13	-15.48	-1742	-460	-6
90	0.00	5.84	5.84	0.00	-17	-651	-8

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.84	0.00	-5.84	-651	-17	8
45	15.48	4.13	15.48	-4.13	-460	-1742	6
90	21.89	0.00	21.89	0.00	0	-2457	0

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 42 of 85
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1 ANT TV 0.30x1.20m - Elevation 110 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.81	0.00	-5.81	-640	29	-14
45	15.42	4.11	15.42	-4.11	-452	-1667	-10
90	21.80	0.00	21.80	0.00	0	-2369	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.80	0.00	0.00	-21.80	-2415	0	0
45	15.42	4.11	4.11	-15.42	-1713	-452	-6
90	0.00	5.81	5.81	0.00	-17	-640	-8

1 ANT TV 0.30x1.20m - Elevation 110 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.81	0.00	-5.81	-640	-29	14
45	15.42	4.11	15.42	-4.11	-452	-1725	10
90	21.80	0.00	21.80	0.00	0	-2427	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.79	0.00	-5.79	-628	29	-14
45	15.36	4.09	15.36	-4.09	-444	-1637	-10
90	21.72	0.00	21.72	0.00	0	-2327	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.72	0.00	0.00	-21.72	-2373	0	0
45	15.36	4.09	4.09	-15.36	-1683	-444	-6
90	0.00	5.79	5.79	0.00	-17	-628	-8

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.79	0.00	-5.79	-628	-29	14
45	15.36	4.09	15.36	-4.09	-444	-1695	10
90	21.72	0.00	21.72	0.00	0	-2385	0

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 43 of 85
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1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.76	0.00	-5.76	-613	29	-14
45	15.27	4.07	15.27	-4.07	-434	-1598	-10
90	21.60	0.00	21.60	0.00	0	-2272	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.60	0.00	0.00	-21.60	-2317	0	0
45	15.27	4.07	4.07	-15.27	-1644	-434	-6
90	0.00	5.76	5.76	0.00	-17	-613	-8

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.76	0.00	-5.76	-613	-29	14
45	15.27	4.07	15.27	-4.07	-434	-1656	10
90	21.60	0.00	21.60	0.00	0	-2329	0

2 ANT TV 0.30x1.20m - Elevation 106 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	43.14	0.00	0.00	-43.14	-4540	0	0
45	30.51	8.14	8.14	-30.51	-3200	-862	11
90	0.00	11.51	11.51	0.00	34	-1220	16

2 ANT TV 0.30x1.20m - Elevation 106 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	30.51	8.14	-15.82	-27.32	-2940	1721	-21
45	0.00	11.51	8.14	-8.14	-906	-819	-30
90	30.51	8.14	27.32	15.82	1633	-2853	-21

2 ANT TV 0.30x1.20m - Elevation 103.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	42.85	0.00	0.00	-42.85	-4401	0	0
45	30.30	8.08	8.08	-30.30	-3102	-836	11
90	0.00	11.43	11.43	0.00	34	-1183	16

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2 ANT TV 0.30x1.20m - Elevation 103.5 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	30.30	8.08	-15.71	-27.14	-2853	1670	-21
45	0.00	11.43	8.08	-8.08	-880	-793	-29
90	30.30	8.08	27.14	15.71	1582	-2765	-21

2 ANT TV 0.30x1.20m - Elevation 101 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	42.55	0.00	0.00	-42.55	-4264	0	0
45	30.09	8.02	8.02	-30.09	-3005	-810	11
90	0.00	11.35	11.35	0.00	34	-1146	16

2 ANT TV 0.30x1.20m - Elevation 101 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	30.09	8.02	-15.60	-26.95	-2766	1620	-21
45	0.00	11.35	8.02	-8.02	-854	-767	-29
90	30.09	8.02	26.95	15.60	1532	-2678	-21

2 ANT TV 0.30x1.20m - Elevation 95 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.81	0.00	0.00	-41.81	-4012	-12	21
45	29.57	7.88	7.88	-29.57	-2849	-761	2
90	0.00	11.15	11.15	0.00	-40	-1071	-18

2 ANT TV 0.30x1.20m - Elevation 95 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.81	0.00	0.00	-41.81	-3933	12	-21
45	29.57	7.88	7.88	-29.57	-2769	-737	-2
90	0.00	11.15	11.15	0.00	40	-1047	18

2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.50	0.00	0.00	-41.50	-3881	-12	21
45	29.34	7.82	7.82	-29.34	-2757	-736	1
90	0.00	11.07	11.07	0.00	-43	-1036	-20

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2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.50	0.00	0.00	-41.50	-3781	12	-21
45	29.34	7.82	7.82	-29.34	-2657	-712	4
90	0.00	11.07	11.07	0.00	57	-1012	26

2 ANT TV 0.30x1.20m - Elevation 90 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.17	0.00	0.00	-41.17	-3751	-12	21
45	29.11	7.76	7.76	-29.11	-2666	-711	0
90	0.00	10.98	10.98	0.00	-46	-1000	-21

2 ANT TV 0.30x1.20m - Elevation 90 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.17	0.00	0.00	-41.17	-3645	12	-21
45	29.11	7.76	7.76	-29.11	-2560	-687	5
90	0.00	10.98	10.98	0.00	60	-976	28

2 ANT TV 0.30x1.20m - Elevation 88 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	40.91	0.00	0.00	-40.91	-3648	0	0
45	28.93	7.71	7.71	-28.93	-2594	-679	-16
90	0.00	10.91	10.91	0.00	-48	-960	-22

2 ANT TV 0.30x1.20m - Elevation 85.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	40.57	0.00	0.00	-40.57	-3520	0	0
45	28.69	7.65	7.65	-28.69	-2504	-654	-16
90	0.00	10.82	10.82	0.00	-51	-925	-23

2 ANT TV 0.30x1.20m - Elevation 83 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	40.23	0.00	0.00	-40.23	-3394	0	0
45	28.45	7.59	7.59	-28.45	-2416	-630	-17
90	0.00	10.73	10.73	0.00	-54	-890	-24

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2 ANT TV 0.15x0.60m - Elevation 131 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.11	0.00	-6.11	-801	24	-9
45	19.45	4.32	19.45	-4.32	-566	-2523	-6
90	27.50	0.00	27.50	0.00	0	-3579	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.75	0.00	0.00	-13.75	-1805	0	0
45	9.72	2.16	2.16	-9.72	-1278	-283	-1
90	0.00	3.06	3.06	0.00	-4	-400	-2

1 ANT TV 0.15x0.60m - Elevation 131 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.06	0.00	-3.06	-400	-12	5
45	9.72	2.16	9.72	-2.16	-283	-1286	3
90	13.75	0.00	13.75	0.00	0	-1813	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.75	0.00	0.00	-13.75	-1797	0	0
45	9.72	2.16	2.16	-9.72	-1270	-283	1
90	0.00	3.06	3.06	0.00	4	-400	2

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.04	0.00	-3.04	-391	12	-5
45	9.67	2.15	9.67	-2.15	-276	-1231	-3
90	13.68	0.00	13.68	0.00	0	-1745	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.68	0.00	0.00	-13.68	-1761	-4	7
45	9.67	2.15	2.15	-9.67	-1247	-280	4
90	0.00	3.04	3.04	0.00	-4	-395	-2

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1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.04	0.00	-3.04	-391	-12	5
45	9.67	2.15	9.67	-2.15	-276	-1255	3
90	13.68	0.00	13.68	0.00	0	-1769	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.68	0.00	0.00	-13.68	-1753	2	-4
45	9.67	2.15	2.15	-9.67	-1239	-274	-2
90	0.00	3.04	3.04	0.00	4	-388	2

1 ANT TV 0.15x0.60m - Elevation 126 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.02	0.00	-3.02	-381	12	-5
45	9.62	2.14	9.62	-2.14	-269	-1200	-3
90	13.60	0.00	13.60	0.00	0	-1701	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.60	0.00	0.00	-13.60	-1717	0	0
45	9.62	2.14	2.14	-9.62	-1216	-269	-1
90	0.00	3.02	3.02	0.00	-4	-381	-2

1 ANT TV 0.15x0.60m - Elevation 126 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.02	0.00	-3.02	-381	-12	5
45	9.62	2.14	9.62	-2.14	-269	-1224	3
90	13.60	0.00	13.60	0.00	0	-1725	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.60	0.00	0.00	-13.60	-1709	0	0
45	9.62	2.14	2.14	-9.62	-1208	-269	1
90	0.00	3.02	3.02	0.00	4	-381	2

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Discrete Appurtenance Totals - No Ice

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	-47.13	-1056.41	-115713	5018	-59
45	518.86	-713.67	-78442	-61024	-120
90	780.91	47.13	4639	-91238	-111

Discrete Appurtenance Pressures - Service

G_H = 1.056

Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K _z	q _z kPa	C _A A _C Front m ²	C _A A _C Side m ²
2 ANT TV 0.15x0.60m	270.0000	16.00	-0.5000	0.0000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.0000	-0.5000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	0.5000	0.0000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	0.0000	0.5000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	270.0000	16.00	-1.5000	0.0000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.5000	-0.5000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	1.5000	0.0000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	-0.3000	0.5000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	270.0000	16.00	-0.5000	0.0000	137.0000	2.109	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.0000	-0.5000	137.0000	2.109	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	0.5000	0.0000	137.0000	2.109	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	0.0000	0.5000	137.0000	2.109	0.36	0.1800	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-1.4000	0.0000	113.0000	1.996	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	113.0000	1.996	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	1.4000	0.0000	113.0000	1.996	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-1.4000	0.0000	111.5000	1.988	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	111.5000	1.988	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	1.4000	0.0000	111.5000	1.988	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	110.0000	1.981	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	110.0000	1.981	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	110.0000	1.981	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	108.5000	1.973	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	108.5000	1.973	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	108.5000	1.973	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	106.5000	1.962	0.33	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	106.5000	1.962	0.33	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	106.5000	1.962	0.33	0.1500	0.0400
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	106.0000	1.960	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	106.0000	1.960	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	103.5000	1.947	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	103.5000	1.947	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	101.0000	1.933	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	101.0000	1.933	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.6550	95.0000	1.899	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	1.6550	95.0000	1.899	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.7825	92.5000	1.885	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	2.3825	92.5000	1.885	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.9100	90.0000	1.870	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	2.5100	90.0000	1.870	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.0120	88.0000	1.858	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.1395	85.5000	1.843	0.31	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.2670	83.0000	1.828	0.31	0.3000	0.0800
2 ANT TV 0.15x0.60m	270.0000	16.00	-1.5000	0.0000	131.0000	2.082	0.35	0.1800	0.0400
1 ANT TV 0.15x0.60m	0.0000	8.00	0.0000	-0.5000	131.0000	2.082	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	131.0000	2.082	0.35	0.0900	0.0200

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Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K _z	q _z kPa	C _{AAC} Front m ²	C _{AAC} Side m ²
1 ANT TV 0.15x0.60m	180.0000	8.00	0.0000	0.5000	131.0000	2.082	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	270.0000	8.00	-1.5000	0.0000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	0.0000	8.00	0.5000	-0.5000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	-0.3000	0.5000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	270.0000	8.00	-1.5000	0.0000	126.0000	2.059	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	0.0000	8.00	0.0000	-0.5000	126.0000	2.059	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	126.0000	2.059	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	0.0000	0.5000	126.0000	2.059	0.35	0.0900	0.0200
Sum		836.00							
Weight:									

Discrete Appurtenance Vectors - Service

2 ANT TV 0.15x0.60m - Elevation 142 - From Face A

Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-222	8	-1
45	4.97	1.11	4.97	-1.11	-157	-698	-1
90	7.04	0.00	7.04	0.00	0	-991	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face B

Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	7.04	0.00	0.00	-7.04	-1007	0	0
45	4.97	1.11	1.11	-4.97	-714	-157	-1
90	0.00	1.56	1.56	0.00	-8	-222	-1

2 ANT TV 0.15x0.60m - Elevation 142 - From Face C

Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-222	-8	1
45	4.97	1.11	4.97	-1.11	-157	-714	1
90	7.04	0.00	7.04	0.00	0	-1007	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face D

Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	7.04	0.00	0.00	-7.04	-991	0	0
45	4.97	1.11	1.11	-4.97	-698	-157	1
90	0.00	1.56	1.56	0.00	8	-222	1

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2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-217	24	-2
45	4.95	1.10	4.95	-1.10	-153	-666	-2
90	7.00	0.00	7.00	0.00	0	-952	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.00	0.00	0.00	-7.00	-984	-8	4
45	4.95	1.10	1.10	-4.95	-698	-161	2
90	0.00	1.56	1.56	0.00	-8	-225	-1

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-217	-24	2
45	4.95	1.10	4.95	-1.10	-153	-714	2
90	7.00	0.00	7.00	0.00	0	-1000	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.00	0.00	0.00	-7.00	-968	5	-2
45	4.95	1.10	1.10	-4.95	-682	-149	-1
90	0.00	1.56	1.56	0.00	8	-212	1

2 ANT TV 0.15x0.60m - Elevation 137 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.55	0.00	-1.55	-212	8	-1
45	4.92	1.09	4.92	-1.09	-150	-667	-1
90	6.96	0.00	6.96	0.00	0	-946	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	6.96	0.00	0.00	-6.96	-962	0	0
45	4.92	1.09	1.09	-4.92	-683	-150	-1
90	0.00	1.55	1.55	0.00	-8	-212	-1

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2 ANT TV 0.15x0.60m - Elevation 137 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.55	0.00	-1.55	-212	-8	1
45	4.92	1.09	4.92	-1.09	-150	-683	1
90	6.96	0.00	6.96	0.00	0	-962	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	6.96	0.00	0.00	-6.96	-946	0	0
45	4.92	1.09	1.09	-4.92	-667	-150	1
90	0.00	1.55	1.55	0.00	8	-212	1

1 ANT TV 0.30x1.20m - Elevation 113 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-166	17	-2
45	3.88	1.04	3.88	-1.04	-117	-422	-1
90	5.49	0.00	5.49	0.00	0	-604	0

1 ANT TV 0.30x1.20m - Elevation 113 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.49	0.00	0.00	-5.49	-637	0	0
45	3.88	1.04	1.04	-3.88	-456	-117	-1
90	0.00	1.46	1.46	0.00	-17	-166	-2

1 ANT TV 0.30x1.20m - Elevation 113 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-166	-17	2
45	3.88	1.04	3.88	-1.04	-117	-456	1
90	5.49	0.00	5.49	0.00	0	-637	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-163	17	-2
45	3.87	1.03	3.87	-1.03	-115	-415	-1
90	5.47	0.00	5.47	0.00	0	-593	0

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1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.47	0.00	0.00	-5.47	-627	0	0
45	3.87	1.03	1.03	-3.87	-448	-115	-1
90	0.00	1.46	1.46	0.00	-17	-163	-2

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-163	-17	2
45	3.87	1.03	3.87	-1.03	-115	-448	1
90	5.47	0.00	5.47	0.00	0	-627	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-160	29	-3
45	3.85	1.03	3.85	-1.03	-113	-395	-2
90	5.45	0.00	5.45	0.00	0	-571	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.45	0.00	0.00	-5.45	-616	0	0
45	3.85	1.03	1.03	-3.85	-441	-113	-1
90	0.00	1.45	1.45	0.00	-17	-160	-2

1 ANT TV 0.30x1.20m - Elevation 110 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-160	-29	3
45	3.85	1.03	3.85	-1.03	-113	-453	2
90	5.45	0.00	5.45	0.00	0	-628	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-157	29	-3
45	3.84	1.02	3.84	-1.02	-111	-388	-2
90	5.43	0.00	5.43	0.00	0	-560	0

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1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.43	0.00	0.00	-5.43	-606	0	0
45	3.84	1.02	1.02	-3.84	-433	-111	-1
90	0.00	1.45	1.45	0.00	-17	-157	-2

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-157	-29	3
45	3.84	1.02	3.84	-1.02	-111	-445	2
90	5.43	0.00	5.43	0.00	0	-618	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.44	0.00	-1.44	-153	29	-3
45	3.82	1.02	3.82	-1.02	-108	-378	-2
90	5.40	0.00	5.40	0.00	0	-546	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.40	0.00	0.00	-5.40	-592	0	0
45	3.82	1.02	1.02	-3.82	-423	-108	-1
90	0.00	1.44	1.44	0.00	-17	-153	-2

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.44	0.00	-1.44	-153	-29	3
45	3.82	1.02	3.82	-1.02	-108	-435	2
90	5.40	0.00	5.40	0.00	0	-604	0

2 ANT TV 0.30x1.20m - Elevation 106 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.79	0.00	0.00	-10.79	-1110	0	0
45	7.63	2.03	2.03	-7.63	-775	-216	3
90	0.00	2.88	2.88	0.00	34	-305	4

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2 ANT TV 0.30x1.20m - Elevation 106 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.63	2.03	-3.95	-6.83	-768	463	-5
45	0.00	2.88	2.03	-2.03	-259	-172	-7
90	7.63	2.03	6.83	3.95	375	-680	-5

2 ANT TV 0.30x1.20m - Elevation 103.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.71	0.00	0.00	-10.71	-1075	0	0
45	7.58	2.02	2.02	-7.58	-750	-209	3
90	0.00	2.86	2.86	0.00	34	-296	4

2 ANT TV 0.30x1.20m - Elevation 103.5 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.58	2.02	-3.93	-6.78	-746	450	-5
45	0.00	2.86	2.02	-2.02	-253	-165	-7
90	7.58	2.02	6.78	3.93	363	-658	-5

2 ANT TV 0.30x1.20m - Elevation 101 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.64	0.00	0.00	-10.64	-1041	0	0
45	7.52	2.01	2.01	-7.52	-726	-203	3
90	0.00	2.84	2.84	0.00	34	-287	4

2 ANT TV 0.30x1.20m - Elevation 101 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.52	2.01	-3.90	-6.74	-724	438	-5
45	0.00	2.84	2.01	-2.01	-246	-159	-7
90	7.52	2.01	6.74	3.90	350	-637	-5

2 ANT TV 0.30x1.20m - Elevation 95 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.45	0.00	0.00	-10.45	-1033	-12	5
45	7.39	1.97	1.97	-7.39	-742	-199	0
90	0.00	2.79	2.79	0.00	-40	-277	-5

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2 ANT TV 0.30x1.20m - Elevation 95 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.45	0.00	0.00	-10.45	-953	12	-5
45	7.39	1.97	1.97	-7.39	-663	-175	0
90	0.00	2.79	2.79	0.00	40	-253	5

2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.37	0.00	0.00	-10.37	-1002	-12	5
45	7.34	1.96	1.96	-7.34	-721	-193	0
90	0.00	2.77	2.77	0.00	-43	-268	-5

2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.37	0.00	0.00	-10.37	-902	12	-5
45	7.34	1.96	1.96	-7.34	-621	-169	1
90	0.00	2.77	2.77	0.00	57	-244	7

2 ANT TV 0.30x1.20m - Elevation 90 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.29	0.00	0.00	-10.29	-972	-12	5
45	7.28	1.94	1.94	-7.28	-701	-187	0
90	0.00	2.74	2.74	0.00	-46	-259	-5

2 ANT TV 0.30x1.20m - Elevation 90 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.29	0.00	0.00	-10.29	-866	12	-5
45	7.28	1.94	1.94	-7.28	-595	-163	1
90	0.00	2.74	2.74	0.00	60	-235	7

2 ANT TV 0.30x1.20m - Elevation 88 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.23	0.00	0.00	-10.23	-948	0	0
45	7.23	1.93	1.93	-7.23	-685	-170	-4
90	0.00	2.73	2.73	0.00	-48	-240	-5

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 56 of 85
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2 ANT TV 0.30x1.20m - Elevation 85.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.14	0.00	0.00	-10.14	-919	0	0
45	7.17	1.91	1.91	-7.17	-665	-164	-4
90	0.00	2.70	2.70	0.00	-51	-231	-6

2 ANT TV 0.30x1.20m - Elevation 83 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.06	0.00	0.00	-10.06	-889	0	0
45	7.11	1.90	1.90	-7.11	-645	-157	-4
90	0.00	2.68	2.68	0.00	-54	-223	-6

2 ANT TV 0.15x0.60m - Elevation 131 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.53	0.00	-1.53	-200	24	-2
45	4.86	1.08	4.86	-1.08	-142	-613	-2
90	6.88	0.00	6.88	0.00	0	-877	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.44	0.00	0.00	-3.44	-454	0	0
45	2.43	0.54	0.54	-2.43	-322	-71	0
90	0.00	0.76	0.76	0.00	-4	-100	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-100	-12	1
45	2.43	0.54	2.43	-0.54	-71	-330	1
90	3.44	0.00	3.44	0.00	0	-462	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.44	0.00	0.00	-3.44	-446	0	0
45	2.43	0.54	0.54	-2.43	-314	-71	0
90	0.00	0.76	0.76	0.00	4	-100	0

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1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-98	12	-1
45	2.42	0.54	2.42	-0.54	-69	-299	-1
90	3.42	0.00	3.42	0.00	0	-427	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.42	0.00	0.00	-3.42	-443	-4	2
45	2.42	0.54	0.54	-2.42	-315	-73	1
90	0.00	0.76	0.76	0.00	-4	-102	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-98	-12	1
45	2.42	0.54	2.42	-0.54	-69	-323	1
90	3.42	0.00	3.42	0.00	0	-451	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.42	0.00	0.00	-3.42	-435	2	-1
45	2.42	0.54	0.54	-2.42	-307	-67	0
90	0.00	0.76	0.76	0.00	4	-95	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-95	12	-1
45	2.40	0.53	2.40	-0.53	-67	-291	-1
90	3.40	0.00	3.40	0.00	0	-416	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.40	0.00	0.00	-3.40	-432	0	0
45	2.40	0.53	0.53	-2.40	-307	-67	0
90	0.00	0.76	0.76	0.00	-4	-95	0

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1 ANT TV 0.15x0.60m - Elevation 126 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-95	-12	1
45	2.40	0.53	2.40	-0.53	-67	-315	1
90	3.40	0.00	3.40	0.00	0	-440	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.40	0.00	0.00	-3.40	-424	0	0
45	2.40	0.53	0.53	-2.40	-299	-67	0
90	0.00	0.76	0.76	0.00	4	-95	0

Discrete Appurtenance Totals - Service

Wind Azimuth °	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	-11.78	-264.10	-29108	1358	-15
45	129.72	-178.42	-19790	-15152	-30
90	195.23	11.78	980	-22706	-28

Dish Pressures - No Ice

Elevation m	Dish Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	K_z	A_d m ²	q_z kPa
74.0000	HP8-102	45.0000	113.85	3.1503	-3.1503	1.769	4.6693	1.21
66.5000	HP12-21B	225.0000	385.55	-3.5328	3.5328	1.715	10.5064	1.17
54.0000	HP12-21B	225.0000	385.55	-4.1703	4.1703	1.616	10.5064	1.10
24.5000	6 FT DISH	225.0000	64.86	-5.6748	5.6748	1.290	2.6264	0.88
24.5000	6 FT DISH	45.0000	64.86	5.6748	-5.6748	1.290	2.6264	0.88
	Sum		1014.67					
	Weight:							

Dish Vectors - No Ice

HP8-102 - Elevation 74 - From Leg B											
Wind Azimuth °	V_A	V_S	V_M	V_A	V_S	V_M	V_x	V_z	OTM_x	OTM_z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.002295	0.000695	0.000218	-543.26	164.52	4953.93	267.81	-500.47	-37393	-20177	859
45	-0.002600	0.000000	0.000000	-615.45	0.00	0.00	435.19	-435.19	-32563	-32563	0
90	-0.002295	-0.000695	-0.000218	-543.26	-164.52	-4953.93	500.47	-267.81	-20177	-37393	-859

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HP12-21B - Elevation 66.5 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	1482.68	-387.46	7736.78	774.44	-1322.39	-86577	-50138	-1739
45	0.003230	0.000000	0.000000	1668.66	0.00	0.00	1179.92	-1179.92	-77103	-77103	0
90	0.002870	0.000750	-0.000104	1482.68	387.46	-7736.78	1322.39	-774.44	-50138	-86577	1739

HP12-21B - Elevation 54 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	1397.04	-365.08	7289.94	729.71	-1246.01	-65677	-37796	-1968
45	0.003230	0.000000	0.000000	1572.28	0.00	0.00	1111.77	-1111.77	-58428	-58428	0
90	0.002870	0.000750	-0.000104	1397.04	365.08	-7289.94	1246.01	-729.71	-37796	-65677	1968

6 FT DISH - Elevation 24.5 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.004170	-0.000125	0.000157	404.86	-12.14	1097.49	277.70	-294.86	-6856	-6436	-70
45	0.003970	0.000000	0.000000	385.44	0.00	0.00	272.55	-272.55	-6309	-6309	0
90	0.004170	0.000125	-0.000157	404.86	12.14	-1097.49	294.86	-277.70	-6436	-6856	70

6 FT DISH - Elevation 24.5 - From Leg B											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.001335	0.001170	0.000356	-129.61	113.59	2488.58	11.33	-171.97	-4581	-646	975
45	-0.002700	0.000000	0.000000	-262.14	0.00	0.00	185.36	-185.36	-4909	-4909	0
90	-0.001335	-0.001170	-0.000356	-129.61	-113.59	-2488.58	171.97	-11.33	-646	-4581	-975

Dish Totals - No Ice

Wind Azimuth °	V _x	V _z	OTM _x	OTM _z	Torque
	kg	kg	kg-m	kg-m	kg-m
0	2060.98	-3535.70	-201084	-115192	-1943
45	3184.79	-3184.79	-179312	-179312	0
90	3535.70	-2060.98	-115192	-201084	1943

Dish Pressures - Service

Elevation m	Dish Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	K _z	A _A m ²	q _z kPa
74.0000	HP8-102	45.0000	113.85	3.1503	-3.1503	1.769	4.6693	0.30
66.5000	HP12-21B	225.0000	385.55	-3.5328	3.5328	1.715	10.5064	0.29
54.0000	HP12-21B	225.0000	385.55	-4.1703	4.1703	1.616	10.5064	0.28
24.5000	6 FT DISH	225.0000	64.86	-5.6748	5.6748	1.290	2.6264	0.22
24.5000	6 FT DISH	45.0000	64.86	5.6748	-5.6748	1.290	2.6264	0.22
	Sum		1014.67					
	Weight:							

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Dish Vectors - Service

HP8-102 - Elevation 74 - From Leg B											
Wind Azimuth °	CA	CS	CM	FA	FS	FM	Vx	Vz	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.002295	0.000695	0.000218	-135.81	41.13	1238.48	66.95	-125.12	-9617	-5313	215
45	-0.002600	0.000000	0.000000	-153.86	0.00	0.00	108.80	-108.80	-8410	-8410	0
90	-0.002295	-0.000695	-0.000218	-135.81	-41.13	-1238.48	125.12	-66.95	-5313	-9617	-215

HP12-21B - Elevation 66.5 - From Leg D											
Wind Azimuth °	CA	CS	CM	FA	FS	FM	Vx	Vz	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	370.67	-96.86	1934.20	193.61	-330.60	-20623	-11513	-435
45	0.003230	0.000000	0.000000	417.16	0.00	0.00	294.98	-294.98	-18254	-18254	0
90	0.002870	0.000750	-0.000104	370.67	96.86	-1934.20	330.60	-193.61	-11513	-20623	435

HP12-21B - Elevation 54 - From Leg D											
Wind Azimuth °	CA	CS	CM	FA	FS	FM	Vx	Vz	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	349.26	-91.27	1822.48	182.43	-311.50	-15213	-8243	-492
45	0.003230	0.000000	0.000000	393.07	0.00	0.00	277.94	-277.94	-13401	-13401	0
90	0.002870	0.000750	-0.000104	349.26	91.27	-1822.48	311.50	-182.43	-8243	-15213	492

6 FT DISH - Elevation 24.5 - From Leg D											
Wind Azimuth °	CA	CS	CM	FA	FS	FM	Vx	Vz	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.004170	-0.000125	0.000157	101.22	-3.03	274.37	69.42	-73.72	-1438	-1333	-17
45	0.003970	0.000000	0.000000	96.36	0.00	0.00	68.14	-68.14	-1301	-1301	0
90	0.004170	0.000125	-0.000157	101.22	3.03	-274.37	73.72	-69.42	-1333	-1438	17

6 FT DISH - Elevation 24.5 - From Leg B											
Wind Azimuth °	CA	CS	CM	FA	FS	FM	Vx	Vz	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.001335	0.001170	0.000356	-32.40	28.40	622.15	2.83	-42.99	-1421	-437	244
45	-0.002700	0.000000	0.000000	-65.54	0.00	0.00	46.34	-46.34	-1503	-1503	0
90	-0.001335	-0.001170	-0.000356	-32.40	-28.40	-622.15	42.99	-2.83	-437	-1421	-244

Dish Totals - Service

Wind Azimuth °	V _x	V _z	OTM _x	OTM _z	Torque
	kg	kg	kg-m	kg-m	kg-m
0	515.24	-883.93	-48313	-26840	-486
45	796.20	-796.20	-42870	-42870	0
90	883.93	-515.24	-26840	-48313	486

<i>RISATower</i> BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 61 of 85
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User Load Vectors - No Ice

CxMANTENIMIENTO - Elevation 155								
Wind Azimuth °	Offset _x m	Offset _z m	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.0000	0.0000	0.00	0.00	0.00	0	0	0
45	0.0000	0.0000	0.00	0.00	0.00	0	0	0
90	0.0000	0.0000	0.00	0.00	0.00	0	0	0

User Load Totals - No Ice

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	0.00	0	0	0
45	0.00	0.00	0	0	0
90	0.00	0.00	0	0	0

User Load Vectors - Service

CxMANTENIMIENTO - Elevation 155								
Wind Azimuth °	Offset _x m	Offset _z m	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.0000	0.0000	0.00	0.00	0.00	0	0	0
45	0.0000	0.0000	0.00	0.00	0.00	0	0	0
90	0.0000	0.0000	0.00	0.00	0.00	0	0	0

User Load Totals - Service

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	0.00	0	0	0
45	0.00	0.00	0	0	0
90	0.00	0.00	0	0	0

RISA Tower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 62 of 85
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Force Totals

Load Case	Vertical Forces kg	Sum of Forces X kg	Sum of Forces Z kg	Sum of Overturning Moments, M_x kg-m	Sum of Overturning Moments, M_z kg-m	Sum of Torques kg-m
Leg Weight	135344.91					
Bracing Weight	38180.95					
Total Member Self-Weight	173525.86			16376	2750	
Total Weight	179465.15			16376	2750	
Wind 0 deg - No Ice		2013.84	-51913.32	-3257152	-110175	-2002
Wind 45 deg - No Ice		42894.15	-43088.95	-2724039	-2720626	47576
Wind 90 deg - No Ice		51637.82	-2013.84	-96548	-3246682	59994
Total Weight	179465.15			16376	2750	
Wind 0 deg - Service		503.46	-12978.33	-816011	-25481	-500
Wind 45 deg - Service		10723.54	-10772.24	-682732	-678094	11894
Wind 90 deg - Service		12909.46	-503.46	-25860	-809608	14998

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 45 deg - No Ice
4	Dead+Wind 90 deg - No Ice
5	Dead+Wind 0 deg - Service
6	Dead+Wind 45 deg - Service
7	Dead+Wind 90 deg - Service

Maximum Member Forces

Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T1	155 - 149	Leg	Max Tension	3	1656.27	0	1
			Max. Compression	3	-2037.87	-1	-4
			Max. Mx	3	-350.01	5	-1
			Max. My	3	-27.79	-2	5
			Max. Vy	2	12.36	-2	0
		Diagonal	Max. Vx	3	14.62	-2	5
			Max Tension	4	305.02	0	0
			Max. Compression	4	-309.76	0	0
			Max. Mx	4	70.48	0	0
			Max. My	3	15.03	0	0
		Top Girt	Max. Vy	4	1.32	0	0
			Max. Vx	3	-0.02	0	0
			Max Tension	3	5.11	0	0
			Max. Compression	3	-4.83	0	0
			Max. Mx	1	0.16	0	0
			Max. My	3	2.82	0	0
			Max. Vy	1	1.30	0	0
			Max. Vx	3	-0.00	0	0
T2	149 - 143	Leg	Max Tension	3	7612.23	3	-1
			Max. Compression	3	-8045.13	-30	-31
			Max. Mx	3	-8045.13	-30	-31

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T3	143 - 142	Diagonal	Max. My	3	-8045.13	-30	-31
			Max. Vy	3	-40.09	-21	12
			Max. Vx	3	92.49	-30	-31
			Max Tension	3	666.61	0	0
			Max. Compression	4	-648.49	0	0
			Max. Mx	4	335.48	0	0
			Max. My	3	-515.36	0	0
			Max. Vy	4	1.32	0	0
			Max. Vx	3	-0.01	0	0
			Max Tension	3	21.67	0	0
			Max. Compression	3	-15.50	0	0
			Max. Mx	1	3.24	0	0
		Top Girt	Max. My	3	21.67	0	0
			Max. Vy	1	1.30	0	0
			Max. Vx	3	-0.00	0	0
			Max Tension	3	6345.12	5	5
			Max. Compression	3	-6774.53	22	20
			Max. Mx	3	-6753.98	-30	-31
			Max. My	3	-6753.98	-30	-31
			Max. Vy	3	-61.46	-30	-31
			Max. Vx	3	-60.60	-30	-31
			Max Tension	3	1237.76	0	0
			Max. Compression	3	-1192.01	1	3
		Diagonal	Max. Mx	3	-116.96	2	3
			Max. My	3	-1147.70	1	-3
			Max. Vy	3	3.44	0	0
			Max. Vx	3	6.69	1	-3
			Max Tension	3	433.32	0	0
			Max. Compression	3	-412.55	0	0
			Max. Mx	4	236.61	0	0
			Max. My	3	-31.37	0	0
			Max. Vy	4	1.28	0	0
			Max. Vx	3	0.22	0	0
		Top Girt	Max Tension	3	12559.58	-130	-1
			Max. Compression	3	-14797.38	170	0
			Max. Mx	3	-14797.38	170	0
			Max. My	3	-800.71	-4	-163
			Max. Vy	3	-117.62	111	1
			Max. Vx	3	77.86	-5	-88
			Max Tension	4	973.15	6	-1
			Max. Compression	4	-995.06	0	0
			Max. Mx	3	810.70	12	0
			Max. My	3	811.36	10	-1
			Max. Vy	3	16.33	12	0
			Max. Vx	3	1.33	0	0
T4	142 - 135.6	Leg	Max Tension	2	1003.14	0	0
			Max. Compression	4	-848.12	0	0
			Max. Mx	1	76.27	-1	0
			Max. My	3	-695.42	0	0
			Max. Vy	1	2.72	0	0
			Max. Vx	3	-0.00	0	0
		Diagonal	Max Tension	3	24801.13	-261	-1
			Max. Compression	3	-28503.99	316	1
			Max. Mx	3	-28503.99	316	1
			Max. My	3	-1331.20	-5	-310
			Max. Vy	3	-63.77	275	1
			Max. Vx	3	65.52	-6	-267
		Top Girt	Max Tension	4	1419.09	12	-1
			Max. Compression	4	-1452.10	0	0
			Max. Mx	3	1211.10	22	1
			Max. My	3	1135.33	21	-3
			Max. Vy	3	1135.33	21	-3
			Max. Vx	3	1135.33	21	-3
			Max Tension	3	24801.13	-261	-1
			Max. Compression	3	-28503.99	316	1
			Max. Mx	3	-28503.99	316	1
			Max. My	3	-1331.20	-5	-310
			Max. Vy	3	-63.77	275	1
			Max. Vx	3	65.52	-6	-267
T5	135.6 - 129.2	Leg	Max Tension	3	24801.13	-261	-1
			Max. Compression	3	-28503.99	316	1
			Max. Mx	3	-28503.99	316	1
			Max. My	3	-1331.20	-5	-310
			Max. Vy	3	-63.77	275	1
			Max. Vx	3	65.52	-6	-267
		Diagonal	Max Tension	4	1419.09	12	-1
			Max. Compression	4	-1452.10	0	0
			Max. Mx	3	1211.10	22	1
			Max. My	3	1135.33	21	-3
			Max. Vy	3	1135.33	21	-3
			Max. Vx	3	1135.33	21	-3

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T6	129.2 - 122.8	Leg	Max. Vy	3	26.30	22	1
			Max. Vx	3	3.28	0	0
			Max Tension	3	42257.53	-429	-2
			Max. Compression	3	-46394.83	560	2
			Max. Mx	3	-46394.83	560	2
			Max. My	3	-2278.14	-1	-477
		Diagonal	Max. Vy	3	-117.56	560	2
			Max. Vx	3	88.83	-1	-477
			Max Tension	4	1918.73	20	-1
			Max. Compression	4	-1993.12	0	0
			Max. Mx	3	1354.25	35	-4
			Max. My	3	-1505.34	-31	-4
			Max. Vy	3	-40.26	35	-4
			Max. Vx	3	-4.70	-31	-4
T7	122.8 - 118	Leg	Max Tension	3	55547.97	-25	-4
			Max. Compression	3	-57816.33	2284	0
			Max. Mx	3	-57816.33	2284	0
			Max. My	3	-3655.75	-21	-1108
			Max. Vy	3	-1527.96	2284	0
			Max. Vx	3	-679.43	-21	-1108
		Diagonal	Max Tension	3	3783.32	23	12
			Max. Compression	3	-3838.65	0	0
			Max. Mx	3	-1275.33	51	9
			Max. My	4	-1518.05	-23	-15
			Max. Vy	3	-56.84	51	9
			Max. Vx	4	16.04	-23	-15
		Leg	Max Tension	3	44006.03	-2262	-1
			Max. Compression	3	-46073.39	-80	0
			Max. Mx	3	-45939.45	2284	0
			Max. My	3	-4140.57	44	-312
			Max. Vy	3	-1562.09	-2262	-1
			Max. Vx	3	199.86	45	-312
T8	118 - 115	Diagonal	Max Tension	3	14517.96	0	0
			Max. Compression	3	-15149.58	73	36
			Max. Mx	3	-3969.85	121	27
			Max. My	4	9891.51	-95	-44
			Max. Vy	4	-138.13	97	-40
			Max. Vx	4	62.67	0	0
		Top Girt	Max Tension	4	1715.23	0	0
			Max. Compression	4	-2104.59	0	0
			Max. Mx	7	296.87	-1	0
			Max. My	7	-657.76	0	0
			Max. Vy	7	-3.28	0	0
			Max. Vx	7	-0.98	0	0
T9	115 - 107.5	Leg	Max Tension	3	35534.49	-1	-5
			Max. Compression	3	-45054.67	97	-4
			Max. Mx	3	-34434.32	-525	-1
			Max. My	3	-4498.85	-19	-167
			Max. Vy	3	-470.66	398	-4
			Max. Vx	3	204.34	-19	-167
		Diagonal	Max Tension	4	2561.00	0	0
			Max. Compression	4	-2518.61	0	0
			Max. Mx	3	2323.17	12	2
			Max. My	3	-782.92	9	-3
			Max. Vy	3	-15.19	12	2
			Max. Vx	3	1.69	0	0
		Top Girt	Max Tension	4	3246.47	0	0
			Max. Compression	4	-2166.34	0	0
			Max. Mx	1	542.13	-7	0
			Max. My	4	532.69	0	0
			Max. Vy	1	9.59	0	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T10	107.5 - 100	Leg	Max. Vx	4	-0.00	0	0
			Max Tension	3	51184.80	68	-5
			Max. Compression	3	-64390.93	523	-7
			Max. Mx	3	-64390.93	523	-7
			Max. My	3	-5792.23	-40	-277
			Max. Vy	3	-379.36	523	-7
		Diagonal	Max. Vx	3	225.61	-40	-277
			Max Tension	4	3216.26	0	0
			Max. Compression	3	-3443.69	0	0
			Max. Mx	3	2172.81	12	2
			Max. My	3	-2987.11	8	-3
			Max. Vy	3	-15.54	12	2
T11	100 - 95	Leg	Max. Vx	3	1.79	0	0
			Max Tension	3	55979.41	-446	-12
			Max. Compression	3	-70943.18	34	-52
			Max. Mx	3	-69863.23	523	-7
			Max. My	3	-7429.49	-71	-456
			Max. Vy	3	-316.19	-446	-12
		Diagonal	Max. Vx	3	349.75	-71	-456
			Max Tension	3	1763.36	0	0
			Max. Compression	3	-2020.44	0	0
			Max. Mx	3	1049.56	14	-2
			Max. My	4	-1870.54	5	-7
			Max. Vy	3	15.03	14	-2
Top Girt	Max. Vx	4	3.44	0	0		
	Max Tension	4	734.46	0	0		
	Max. Compression	4	-1129.63	0	0		
	Max. Mx	4	-1129.63	-7	0		
	Max. My	4	-185.27	0	0		
	Max. Vy	4	9.58	0	0		
T12	95 - 89.5	Leg	Max. Vx	4	-0.49	0	0
			Max Tension	3	59956.09	-179	-48
			Max. Compression	3	-77814.78	384	-62
			Max. Mx	3	58743.93	-421	-48
			Max. My	3	-7826.64	-71	-456
			Max. Vy	3	363.50	-421	-48
		Diagonal	Max. Vx	3	-356.41	-71	-456
			Max Tension	4	2215.56	0	0
			Max. Compression	4	-2332.08	0	0
			Max. Mx	3	1180.11	15	-4
			Max. My	3	851.05	14	-5
			Max. Vy	3	16.35	14	-5
T13	89.5 - 84	Leg	Max. Vx	3	2.79	0	0
			Max Tension	3	63476.95	-421	-48
			Max. Compression	3	-83889.53	269	-70
			Max. Mx	3	63476.95	-421	-48
			Max. My	3	-10454.88	-58	-454
			Max. Vy	3	-347.48	-421	-48
		Diagonal	Max. Vx	3	390.35	-58	-454
			Max Tension	4	2593.34	0	0
			Max. Compression	4	-2768.49	0	0
			Max. Mx	3	1380.05	20	-5
			Max. My	4	-2693.37	9	-7
			Max. Vy	3	21.89	20	-5
T14	84 - 77.5	Leg	Max. Vx	4	3.34	0	0
			Max Tension	3	68849.22	-378	-67
			Max. Compression	3	-92243.47	451	-98
			Max. Mx	3	67447.47	-568	-97
			Max. My	3	-12229.32	-59	-612
			Max. Vy	3	438.31	-568	-97
T14	84 - 77.5	Leg	Max. Vx	3	464.09	-59	-612
			Max Tension	3	68849.22	-378	-67
			Max. Compression	3	-92243.47	451	-98
			Max. Mx	3	67447.47	-568	-97
			Max. My	3	-12229.32	-59	-612
			Max. Vy	3	438.31	-568	-97

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m		
T15	77.5 - 71	Diagonal	Max Tension	4	3343.67	0	0		
			Max. Compression	4	-3520.64	0	0		
		Leg	Max. Mx	3	1688.89	25	-7		
			Max. My	4	-3469.31	17	-8		
			Max. Vy	3	24.53	25	-7		
			Max. Vx	4	3.46	0	0		
			Max Tension	3	74983.50	-568	-97		
			Max. Compression	3	-101531.80	620	-85		
			Max. Mx	3	73630.77	-724	-87		
			Max. My	3	-14010.14	-53	-730		
			Max. Vy	3	525.52	-724	-87		
			Max. Vx	3	553.57	-53	-730		
		Diagonal	Max Tension	4	3842.98	0	0		
			Max. Compression	4	-4092.79	0	0		
		T16	71 - 64.5	Leg	Max. Mx	3	2022.91	41	-11
Max. My	4				-792.09	38	-12		
Max. Vy	3				40.34	41	-11		
Max. Vx	4				-5.12	0	0		
Max Tension	3				82097.18	-724	-87		
Max. Compression	3				-112096.02	620	-94		
Max. Mx	3				80412.13	-750	-94		
Max. My	3				-16198.01	-65	-779		
Max. Vy	3				736.76	-750	-94		
Max. Vx	3				757.20	-65	-779		
Diagonal	Max Tension			4	4569.40	0	0		
	Max. Compression			4	-4716.52	0	0		
T17	64.5 - 58			Leg	Max. Mx	3	2474.56	47	-12
					Max. My	4	-4641.93	36	-13
					Max. Vy	3	44.81	47	-12
		Max. Vx	4		5.47	0	0		
		Max Tension	3		89979.95	-750	-94		
		Max. Compression	3		-123472.80	200	-72		
		Max. Mx	3		89979.95	-750	-94		
		Max. My	3		-16676.07	-65	-779		
		Max. Vy	3		-497.50	-750	-94		
		Max. Vx	3		-517.29	-65	-779		
		Diagonal	Max Tension	4	5375.86	0	0		
			Max. Compression	4	-5598.40	0	0		
		T18	58 - 53.5	Leg	Max. Mx	3	2983.87	52	-13
					Max. My	4	-709.41	49	-14
					Max. Vy	3	49.05	52	-13
Max. Vx	4				-5.60	0	0		
Max Tension	3				100576.87	-322	-72		
Max. Compression	3				-137854.72	497	-25		
Max. Mx	3				-137854.72	497	-25		
Max. My	3				-18918.86	-62	-426		
Max. Vy	3				729.06	-478	-26		
Max. Vx	3				624.12	12	-204		
Diagonal	Max Tension			4	6670.19	0	0		
	Max. Compression			4	-6618.67	0	0		
T19	53.5 - 49			Leg	Max. Mx	2	5528.90	-70	0
					Max. My	4	939.62	0	6
					Max. Vy	2	48.61	0	0
		Max. Vx	4		-4.13	0	0		
		Max Tension	3		98620.33	-478	-26		
		Max. Compression	3		-139381.33	-135	-48		
		Max. Mx	3		-137818.43	497	-25		
		Max. My	3		-22242.14	-117	-438		
		Max. Vy	3		-445.95	-478	-26		
		Max. Vx	3		408.66	-117	-438		
		Diagonal	Max Tension	4	7337.28	0	0		

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T20	49 - 44.5	Horizontal	Max. Compression	4	-7864.54	0	0
			Max. Mx	2	5958.17	-83	0
			Max. My	4	529.15	0	6
			Max. Vy	2	54.88	0	0
			Max. Vx	4	-4.31	0	0
			Max Tension	4	863.52	19	0
			Max. Compression	4	-1009.50	19	0
			Max. Mx	2	-295.86	20	-3
			Max. My	2	-54.40	20	-3
			Max. Vy	2	25.80	20	-3
			Max. Vx	2	1.77	20	-3
			Max Tension	3	120.98	0	0
		Inner Bracing	Max. Compression	3	-153.63	0	0
			Max. Mx	1	-15.59	-39	0
			Max. My	3	119.13	0	0
			Max. Vy	1	29.17	0	0
			Max. Vx	3	-0.06	0	0
		Leg	Max Tension	3	111757.85	-103	-47
			Max. Compression	3	-157614.91	486	-28
			Max. Mx	3	-157614.91	486	-28
			Max. My	3	-22844.21	-117	-438
			Max. Vy	3	397.23	-438	-30
			Max. Vx	3	-384.38	-117	-438
		Diagonal	Max Tension	4	7592.23	0	0
			Max. Compression	4	-7525.89	0	0
			Max. Mx	2	6233.93	-83	0
			Max. My	4	992.49	0	6
			Max. Vy	2	54.88	0	0
			Max. Vx	4	-4.30	0	0
T21	44.5 - 40	Leg	Max Tension	3	110102.17	-438	-30
			Max. Compression	3	-159168.21	-48	-44
			Max. Mx	3	-157605.68	486	-29
			Max. My	3	-26075.89	-94	-375
			Max. Vy	3	-423.82	-438	-30
			Max. Vx	3	401.52	-94	-375
		Diagonal	Max Tension	4	7697.34	0	0
			Max. Compression	4	-8282.53	0	0
			Max. Mx	2	6299.54	-97	0
			Max. My	4	743.38	0	7
			Max. Vy	2	61.15	0	0
			Max. Vx	4	-4.52	0	0
		Horizontal	Max Tension	4	537.54	24	-2
			Max. Compression	3	-682.13	24	-1
			Max. Mx	2	52.46	25	0
			Max. My	2	-580.98	24	-2
			Max. Vy	2	-29.01	25	0
			Max. Vx	2	1.76	24	-2
		Inner Bracing	Max Tension	3	14.00	0	0
			Max. Compression	3	-46.72	0	0
			Max. Mx	1	-16.68	-49	0
			Max. My	3	12.27	0	0
			Max. Vy	1	32.72	0	0
			Max. Vx	3	-0.05	0	0
T22	40 - 35.5	Leg	Max Tension	3	123393.25	-147	-44
			Max. Compression	3	-177770.90	495	-26
			Max. Mx	3	-177770.90	495	-26
			Max. My	3	-26797.30	-94	-375
			Max. Vy	3	377.95	-432	-28
			Max. Vx	3	-363.11	-94	-375
		Diagonal	Max Tension	4	8023.69	0	0
			Max. Compression	4	-7881.51	0	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T23	35.5 - 31	Leg	Max. Mx	2	6648.28	-97	0
			Max. My	4	1013.65	0	7
			Max. Vy	2	61.15	0	0
			Max. Vx	4	-4.52	0	0
			Max Tension	3	121733.40	-432	-28
			Max. Compression	3	-179329.05	-175	-42
		Diagonal	Max. Mx	3	-177767.36	495	-26
			Max. My	3	-30032.86	-127	-435
			Max. Vy	3	-427.14	-432	-28
			Max. Vx	3	407.34	-127	-435
			Max Tension	4	8085.35	0	0
			Max. Compression	4	-8671.52	0	0
		Horizontal	Max. Mx	3	6713.62	-112	0
			Max. My	3	-4994.57	0	8
			Max. Vy	3	67.42	0	0
			Max. Vx	3	-4.72	0	0
			Max Tension	4	521.76	30	0
			Max. Compression	3	-669.75	30	-2
		Inner Bracing	Max. Mx	2	-190.32	30	-4
			Max. My	2	-181.37	30	-4
			Max. Vy	2	32.06	30	-4
			Max. Vx	2	2.10	30	-4
			Max Tension	1	0.00	0	0
			Max. Compression	3	-31.26	0	0
T24	31 - 26.5	Leg	Max. Mx	1	-17.79	-60	0
			Max. My	3	-7.80	0	0
			Max. Vy	1	36.27	0	0
			Max. Vx	3	-0.05	0	0
			Max Tension	3	134654.76	-90	-40
			Max. Compression	3	-197478.87	541	-23
		Diagonal	Max. Mx	3	-197478.87	541	-23
			Max. My	3	-30829.86	-127	-435
			Max. Vy	3	394.05	-473	-24
			Max. Vx	3	-354.82	-127	-435
			Max Tension	4	8395.72	0	0
			Max. Compression	4	-8249.25	0	0
T25	26.5 - 22	Leg	Max. Mx	3	6939.55	-112	0
			Max. My	3	-4427.14	0	8
			Max. Vy	3	67.42	0	0
			Max. Vx	3	-4.72	0	0
			Max Tension	3	132983.70	-473	-24
			Max. Compression	3	-199076.88	-8	-40
		Diagonal	Max. Mx	3	-197472.60	541	-23
			Max. My	3	-34102.85	-101	-406
			Max. Vy	3	-499.64	-473	-24
			Max. Vx	3	455.75	-101	-406
			Max Tension	4	8472.31	0	0
			Max. Compression	4	-9185.38	0	0
		Horizontal	Max. Mx	4	8472.31	-129	0
			Max. My	4	812.59	0	9
			Max. Vy	4	73.69	0	0
			Max. Vx	4	-4.96	0	0
			Max Tension	4	567.48	36	-4
			Max. Compression	3	-725.67	36	-2
		Inner Bracing	Max. Mx	2	18.74	37	0
			Max. My	2	-622.78	36	-4
			Max. Vy	2	-35.25	37	0
			Max. Vx	2	2.16	36	-4
			Max Tension	1	0.00	0	0
			Max. Compression	3	-33.01	0	0
			Max. Mx	1	-19.94	-98	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T26	22 - 17	Leg	Max. My	3	-7.69	0	0
			Max. Vy	1	53.65	0	0
			Max. Vx	3	-0.05	0	0
			Max Tension	3	147146.24	-205	-40
			Max. Compression	3	-218869.26	571	-40
			Max. Mx	3	-218869.26	571	-40
		Diagonal	Max. My	3	-35070.77	-101	-406
			Max. Vy	3	387.88	-538	-41
			Max. Vx	3	-347.17	-101	-406
			Max Tension	4	9349.10	0	0
			Max. Compression	4	-9054.87	0	0
			Max. Mx	4	9349.10	-135	0
			Max. My	4	1125.77	0	10
			Max. Vy	4	73.70	0	0
			Max. Vx	4	-5.24	0	0
T27	17 - 11	Leg	Max Tension	3	145293.99	-538	-41
			Max. Compression	3	-220949.98	-211	-46
			Max. Mx	3	-218879.97	571	-40
			Max. My	3	-39031.84	-163	-522
			Max. Vy	3	-464.32	-538	-41
			Max. Vx	3	423.10	-163	-522
		Diagonal	Max Tension	4	10174.90	0	0
			Max. Compression	4	-10781.76	0	0
			Max. Mx	3	8393.30	-172	0
			Max. My	4	-7406.92	0	13
		Horizontal	Max. Vy	3	81.39	0	0
			Max. Vx	4	-5.98	0	0
			Max Tension	4	531.59	43	4
			Max. Compression	3	-723.22	44	-2
			Max. Mx	2	-194.77	44	-8
			Max. My	4	-108.82	44	-8
		Inner Bracing	Max. Vy	2	38.51	44	-8
			Max. Vx	4	3.04	44	-8
			Max Tension	1	0.00	0	0
			Max. Compression	3	-43.44	0	0
			Max. Mx	1	-22.66	-117	0
			Max. My	3	-7.76	0	0
			Max. Vy	1	58.70	0	0
			Max. Vx	3	-0.04	0	0
T28	11 - 6	Leg	Max Tension	3	160785.88	-126	-45
			Max. Compression	3	-242579.13	548	-43
			Max. Mx	3	159041.26	-584	-44
			Max. My	3	-40077.04	-163	-522
			Max. Vy	3	375.47	-584	-44
			Max. Vx	3	-303.75	-163	-522
		Diagonal	Max Tension	4	9470.83	0	0
			Max. Compression	4	-9373.91	0	0
			Max. Mx	3	7875.92	-158	0
			Max. My	3	-5139.50	0	11
		Leg	Max. Vy	3	81.38	0	0
			Max. Vx	3	-5.46	0	0
			Max Tension	3	158869.97	-584	-43
			Max. Compression	3	-244718.40	0	0
T29	6 - 0	Leg	Max. Mx	3	158869.97	-584	-43
			Max. My	3	-41963.79	-25	414
			Max. Vy	3	-499.30	-584	-43
			Max. Vx	3	-419.44	-25	-302
		Diagonal	Max Tension	4	10178.35	0	0
			Max. Compression	4	-11203.17	0	0
			Max. Mx	4	10178.35	-197	0
			Max. My	2	-594.13	0	-14

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
		Horizontal	Max. Vy	4	89.02	0	0
			Max. Vx	2	6.22	0	0
			Max Tension	4	514.55	105	-11
			Max. Compression	4	-762.86	105	-11
			Max. Mx	2	-60.98	108	1
		Inner Bracing	Max. My	2	-685.05	105	-11
			Max. Vy	2	-84.69	108	1
			Max. Vx	2	5.29	105	-11
			Max Tension	1	0.00	0	0
			Max. Compression	3	-39.41	0	0
			Max. Mx	1	-27.17	-141	0
			Max. My	2	-24.76	0	0
			Max. Vy	1	64.54	0	0
			Max. Vx	2	0.02	0	0

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical kg	Horizontal, X kg	Horizontal, Z kg
Leg D	Max. Vert	1	45601.92	2609.17	-2582.05
	Max. H _x	1	45601.92	2609.17	-2582.05
	Max. H _z	3	-165690.14	-14607.57	12809.66
	Min. Vert	3	-165690.14	-14607.57	12809.66
	Min. H _x	3	-165690.14	-14607.57	12809.66
	Min. H _z	1	45601.92	2609.17	-2582.05
Leg C	Max. Vert	4	166625.62	-16400.89	-7293.36
	Max. H _x	2	-76771.77	3484.63	10181.40
	Max. H _z	2	-76771.77	3484.63	10181.40
	Min. Vert	2	-76771.77	3484.63	10181.40
	Min. H _x	4	166625.62	-16400.89	-7293.36
	Min. H _z	4	166625.62	-16400.89	-7293.36
Leg B	Max. Vert	3	255184.51	-17683.06	19545.78
	Max. H _x	1	44130.66	-2542.88	2570.00
	Max. H _z	3	255184.51	-17683.06	19545.78
	Min. Vert	1	44130.66	-2542.88	2570.00
	Min. H _x	3	255184.51	-17683.06	19545.78
	Min. H _z	1	44130.66	-2542.88	2570.00
Leg A	Max. Vert	2	166504.18	8428.85	15334.12
	Max. H _x	2	166504.18	8428.85	15334.12
	Max. H _z	2	166504.18	8428.85	15334.12
	Min. Vert	4	-76895.23	-9016.48	-4579.03
	Min. H _x	4	-76895.23	-9016.48	-4579.03
	Min. H _z	4	-76895.23	-9016.48	-4579.03

Tower Mast Reaction Summary

Load Combination	Vertical kg	Shear _x kg	Shear _z kg	Overturning Moment, M _x kg-m	Overturning Moment, M _z kg-m	Torque kg-m
Dead Only	179465.15	0.00	-0.00	16377	2750	0
Dead+Wind 0 deg - No Ice	179465.13	2013.83	-51911.31	-3273125	-110538	-2006
Dead+Wind 45 deg - No Ice	179465.12	42892.36	-43087.18	-2737379	-2733992	47590

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Load Combination	Vertical kg	Shear _x kg	Shear _z kg	Overturning Moment, M _x kg-m	Overturning Moment, M _z kg-m	Torque kg-m
Dead+Wind 90 deg - No Ice	179465.13	51635.81	-2013.84	-96831	-3262602	60013
Dead+Wind 0 deg - Service	179465.15	503.46	-12977.83	-805869	-25557	-502
Dead+Wind 45 deg - Service	179465.15	10723.11	-10771.82	-672008	-681417	11897
Dead+Wind 90 deg - Service	179465.15	12908.95	-503.46	-11881	-813538	15002

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX kg	PY kg	PZ kg	PX kg	PY kg	PZ kg	
1	0.00	-179465.15	0.00	-0.00	179465.15	0.00	0.000%
2	2013.84	-179465.15	-51913.32	-2013.83	179465.13	51911.31	0.001%
3	42894.15	-179465.15	-43088.95	-42892.36	179465.12	43087.18	0.001%
4	51637.82	-179465.15	-2013.84	-51635.81	179465.13	2013.84	0.001%
5	503.46	-179465.15	-12978.33	-503.46	179465.15	12977.83	0.000%
6	10723.54	-179465.15	-10772.24	-10723.11	179465.15	10771.82	0.000%
7	12909.46	-179465.15	-503.46	-12908.95	179465.15	503.46	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	18	0.00011662	0.00010293
3	Yes	18	0.00012337	0.00010997
4	Yes	18	0.00011679	0.00010327
5	Yes	18	0.00000001	0.00006776
6	Yes	18	0.00011708	0.00007502
7	Yes	18	0.00000001	0.00006809

Maximum Tower Deflections - Service Wind

Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T1	155 - 149	221.61	6	0.2873	0.0283
T2	149 - 143	191.59	6	0.2816	0.0284
T3	143 - 142	163.45	6	0.2418	0.0289
T4	142 - 135.6	159.40	6	0.2318	0.0289
T5	135.6 - 129.2	133.94	6	0.2200	0.0287
T6	129.2 - 122.8	110.39	6	0.1953	0.0280
T7	122.8 - 118	90.49	6	0.1521	0.0263
T8	118 - 115	79.40	6	0.1051	0.0243
T9	115 - 107.5	75.08	6	0.0796	0.0241
T10	107.5 - 100	64.61	6	0.0734	0.0235
T11	100 - 95	54.99	6	0.0644	0.0221
T12	95 - 89.5	49.43	6	0.0587	0.0201
T13	89.5 - 84	43.74	6	0.0537	0.0179
T14	84 - 77.5	38.54	6	0.0488	0.0162

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Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T15	77.5 - 71	32.87	6	0.0434	0.0140
T16	71 - 64.5	27.90	6	0.0381	0.0127
T17	64.5 - 58	23.48	6	0.0329	0.0114
T18	58 - 53.5	19.56	6	0.0279	0.0100
T19	53.5 - 49	17.09	6	0.0258	0.0092
T20	49 - 44.5	14.81	6	0.0236	0.0082
T21	44.5 - 40	12.62	6	0.0216	0.0074
T22	40 - 35.5	10.67	6	0.0194	0.0065
T23	35.5 - 31	8.80	6	0.0173	0.0058
T24	31 - 26.5	7.17	6	0.0150	0.0049
T25	26.5 - 22	5.63	6	0.0130	0.0042
T26	22 - 17	4.31	6	0.0107	0.0035
T27	17 - 11	2.93	6	0.0083	0.0028
T28	11 - 6	1.65	6	0.0052	0.0017
T29	6 - 0	0.70	6	0.0029	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation m	Appurtenance	Gov. Load Comb.	Deflection mm	Tilt °	Twist °	Radius of Curvature m
155.0000	CxMANTENIMIENTO	6	221.61	0.2873	0.0283	337404
142.0000	2 ANT TV 0.15x0.60m	6	159.40	0.2318	0.0289	16697
139.5000	2 ANT TV 0.15x0.60m	6	149.37	0.2198	0.0288	74899
137.0000	2 ANT TV 0.15x0.60m	6	139.42	0.2198	0.0288	27336
131.0000	2 ANT TV 0.15x0.60m	6	116.71	0.2050	0.0282	12595
128.5000	1 ANT TV 0.15x0.60m	6	108.00	0.1913	0.0279	10591
126.0000	1 ANT TV 0.15x0.60m	6	99.89	0.1761	0.0274	9370
113.0000	1 ANT TV 0.30x1.20m	6	72.36	0.0720	0.0241	44495
111.5000	1 ANT TV 0.30x1.20m	6	70.25	0.0706	0.0239	103200
110.0000	1 ANT TV 0.30x1.20m	6	68.13	0.0714	0.0238	323147
108.5000	1 ANT TV 0.30x1.20m	6	66.01	0.0728	0.0236	63287
106.5000	1 ANT TV 0.30x1.20m	6	63.24	0.0734	0.0233	39532
106.0000	2 ANT TV 0.30x1.20m	6	62.57	0.0732	0.0233	38670
103.5000	2 ANT TV 0.30x1.20m	6	59.28	0.0703	0.0229	35348
101.0000	2 ANT TV 0.30x1.20m	6	56.18	0.0660	0.0223	32610
95.0000	2 ANT TV 0.30x1.20m	6	49.43	0.0587	0.0201	87038
92.5000	2 ANT TV 0.30x1.20m	6	46.79	0.0564	0.0190	70774
90.0000	2 ANT TV 0.30x1.20m	6	44.24	0.0542	0.0181	55488
88.0000	2 ANT TV 0.30x1.20m	6	42.28	0.0524	0.0175	61452
85.5000	2 ANT TV 0.30x1.20m	6	39.92	0.0501	0.0167	86880
83.0000	2 ANT TV 0.30x1.20m	6	37.63	0.0479	0.0159	95361
74.0000	HP8-102	6	30.11	0.0406	0.0132	66271
66.5000	HP12-21B	6	24.78	0.0345	0.0118	79726
54.0000	HP12-21B	6	17.36	0.0260	0.0093	86231
24.5000	6 FT DISH	6	5.03	0.0120	0.0039	122386

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Maximum Tower Deflections - Design Wind

Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T1	155 - 149	892.74	3	1.1551	0.1150
T2	149 - 143	772.04	3	1.1324	0.1151
T3	143 - 142	658.89	3	0.9728	0.1156
T4	142 - 135.6	642.59	3	0.9322	0.1155
T5	135.6 - 129.2	540.18	3	0.8849	0.1148
T6	129.2 - 122.8	445.43	3	0.7855	0.1119
T7	122.8 - 118	365.39	3	0.6122	0.1054
T8	118 - 115	320.73	3	0.4237	0.0974
T9	115 - 107.5	303.28	3	0.3215	0.0966
T10	107.5 - 100	261.02	3	0.2967	0.0939
T11	100 - 95	222.13	3	0.2604	0.0882
T12	95 - 89.5	199.65	3	0.2375	0.0803
T13	89.5 - 84	176.66	3	0.2175	0.0717
T14	84 - 77.5	155.61	3	0.1975	0.0650
T15	77.5 - 71	132.68	3	0.1759	0.0562
T16	71 - 64.5	112.59	3	0.1547	0.0508
T17	64.5 - 58	94.67	3	0.1336	0.0456
T18	58 - 53.5	78.82	3	0.1132	0.0400
T19	53.5 - 49	68.82	3	0.1048	0.0370
T20	49 - 44.5	59.61	3	0.0958	0.0327
T21	44.5 - 40	50.74	3	0.0877	0.0296
T22	40 - 35.5	42.89	3	0.0789	0.0260
T23	35.5 - 31	35.33	3	0.0702	0.0231
T24	31 - 26.5	28.78	3	0.0609	0.0197
T25	26.5 - 22	22.57	3	0.0525	0.0169
T26	22 - 17	17.26	3	0.0436	0.0138
T27	17 - 11	11.69	3	0.0337	0.0110
T28	11 - 6	6.58	3	0.0210	0.0066
T29	6 - 0	2.78	3	0.0119	0.0039

Critical Deflections and Radius of Curvature - Design Wind

Elevation m	Appurtenance	Gov. Load Comb.	Deflection mm	Tilt °	Twist °	Radius of Curvature m
155.0000	CxMANTENIMIENTO	3	892.74	1.1551	0.1150	89379
142.0000	2 ANT TV 0.15x0.60m	3	642.59	0.9322	0.1155	4155
139.5000	2 ANT TV 0.15x0.60m	3	602.24	0.8841	0.1154	18843
137.0000	2 ANT TV 0.15x0.60m	3	562.22	0.8842	0.1151	6810
131.0000	2 ANT TV 0.15x0.60m	3	470.86	0.8248	0.1130	3135
128.5000	1 ANT TV 0.15x0.60m	3	435.85	0.7696	0.1115	2637
126.0000	1 ANT TV 0.15x0.60m	3	403.21	0.7086	0.1095	2333
113.0000	1 ANT TV 0.30x1.20m	3	292.29	0.2911	0.0962	11111
111.5000	1 ANT TV 0.30x1.20m	3	283.79	0.2855	0.0957	25766
110.0000	1 ANT TV 0.30x1.20m	3	275.21	0.2884	0.0951	80752
108.5000	1 ANT TV 0.30x1.20m	3	266.65	0.2942	0.0944	15806
106.5000	1 ANT TV 0.30x1.20m	3	255.48	0.2967	0.0934	9860
106.0000	2 ANT TV 0.30x1.20m	3	252.74	0.2958	0.0931	9640
103.5000	2 ANT TV 0.30x1.20m	3	239.48	0.2841	0.0916	8788
101.0000	2 ANT TV 0.30x1.20m	3	226.93	0.2670	0.0894	8089
95.0000	2 ANT TV 0.30x1.20m	3	199.65	0.2375	0.0803	21540
92.5000	2 ANT TV 0.30x1.20m	3	188.98	0.2283	0.0762	17577
90.0000	2 ANT TV 0.30x1.20m	3	178.67	0.2193	0.0724	13811
88.0000	2 ANT TV 0.30x1.20m	3	170.75	0.2120	0.0698	15268

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
m			mm	°	°	m
85.5000	2 ANT TV 0.30x1.20m	3	161.20	0.2028	0.0669	21448
83.0000	2 ANT TV 0.30x1.20m	3	151.94	0.1940	0.0636	23509
74.0000	HP8-102	3	121.54	0.1644	0.0529	16506
66.5000	HP12-21B	3	99.96	0.1402	0.0473	19523
54.0000	HP12-21B	3	69.88	0.1057	0.0374	20255
24.5000	6 FT DISH	3	20.13	0.0486	0.0155	29945

Bolt Design Data

Section No.	Elevation	Component Type	Bolt Grade	Bolt Size	Number Of Bolts	Maximum Load per Bolt	Allowable Load	Ratio Load Allowable	Allowable Ratio	Criteria
	m			mm		kg	kg			
T1	155	Leg	A394T0	16	4	50.82	4940.57	0.010	✓	1.333 Bearing
		Diagonal	A394T0	16	2	154.88	3699.61	0.042	✓	1.333 Member Bearing
		Top Girt	A394T0	16	1	5.11	2774.71	0.002	✓	1.333 Member Bearing
T2	149	Leg	A394T0	16	8	595.54	4940.57	0.121	✓	1.333 Bearing
		Diagonal	A394T0	16	2	333.31	3699.61	0.090	✓	1.333 Member Bearing
		Top Girt	A394T0	16	1	21.67	2774.71	0.008	✓	1.333 Member Bearing
T3	143	Leg	A394T0	16	8	1693.63	4940.57	0.343	✓	1.333 Bearing
		Diagonal	A394T0	16	2	618.88	3699.61	0.167	✓	1.333 Member Bearing
		Top Girt	A394T0	16	1	433.32	2774.71	0.156	✓	1.333 Member Bearing
T4	142	Leg	A394T0	16	12	1274.78	9979.03	0.128	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	497.53	4932.82	0.101	✓	1.333 Member Bearing
		Top Girt	A394T0	16	2	501.57	3699.61	0.136	✓	1.333 Member Bearing
T5	135.6	Leg	A394T0	19	12	2970.10	9979.03	0.298	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	726.05	4932.82	0.147	✓	1.333 Member Bearing
T6	129.2	Leg	A394T0	19	12	5435.17	9979.03	0.545	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	996.56	4932.82	0.202	✓	1.333 Member Bearing
T7	122.8	Leg	A394T0	19	12	8661.89	9979.03	0.868	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	1919.33	4932.82	0.389	✓	1.333 Member Bearing
T8	118	Leg	A394T0	19	12	7678.91	9979.03	0.770	✓	1.333 Bolt SS
		Diagonal	A394T0	16	4	3787.40	7399.23	0.512	✓	1.333 Member Bearing
		Top Girt	A394T0	16	3	701.53	3699.61	0.190	✓	1.333 Member Bearing
T9	115	Leg	A394T0	19	12	5813.65	9979.03	0.583	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	1280.50	4932.82	0.260	✓	1.333 Member Bearing
		Top Girt	A394T0	16	3	1082.16	3699.61	0.293	✓	1.333 Member Bearing
T10	107.5	Leg	A394T0	19	12	8490.75	9979.03	0.851	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	1721.84	4932.82	0.349	✓	1.333 Member Bearing
T11	100	Leg	A394T0	19	16	8867.91	9979.03	0.889	✓	1.333 Bolt SS
		Diagonal	A394T0	16	2	1010.22	4932.82	0.205	✓	1.333 Member Bearing
		Top Girt	A394T0	16	3	376.54	3699.61	0.102	✓	1.333 Member Bearing

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Section No.	Elevation m	Component Type	Bolt Bolt Size Grade mm	Number Of Bolts	Maximum Load per Bolt kg	Allowable Load kg	Ratio Load Allowable	Allowable Ratio	Criteria
T12	95	Leg	A490X 25	32	4863.42	9975.00	0.488	1.333	Bolt SS
		Diagonal	A394T0 16	2	1166.04	4932.82	0.236	1.333	Member Bearing
T13	89.5	Leg	A490X 25	32	5243.08	9975.00	0.526	1.333	Bolt SS
		Diagonal	A394T0 16	2	1384.25	4932.82	0.281	1.333	Member Bearing
T14	84	Leg	A490X 25	32	5765.21	9975.00	0.578	1.333	Bolt SS
		Diagonal	A394T0 16	2	1760.32	4932.82	0.357	1.333	Member Bearing
T15	77.5	Leg	A490X 25	32	6345.76	9975.00	0.636	1.333	Bolt SS
		Diagonal	A394T0 16	2	2046.40	7399.23	0.277	1.333	Member Bearing
T16	71	Leg	A490X 25	32	7006.01	9975.00	0.702	1.333	Bolt SS
		Diagonal	A394T0 16	2	2358.26	7399.23	0.319	1.333	Member Bearing
T17	64.5	Leg	A490X 25	32	7717.06	9975.00	0.774	1.333	Bolt SS
		Diagonal	A394T0 16	2	2799.20	7399.23	0.378	1.333	Member Bearing
T18	58	Leg	A490X 32	32	8615.90	15635.11	0.551	1.333	Bolt SS
		Diagonal	A394T0 25	2	3335.10	9979.03	0.334	1.333	Bolt Shear
T19	53.5	Leg	A490X 32	32	8711.33	15635.11	0.557	1.333	Bolt SS
		Diagonal	A394T0 25	2	3932.27	9979.03	0.394	1.333	Bolt Shear
		Horizontal	A394T0 16	2	504.75	4932.82	0.102	1.333	Member Bearing
T20	49	Leg	A490X 32	32	9850.94	15635.11	0.630	1.333	Bolt SS
		Diagonal	A394T0 25	2	3796.12	9979.03	0.380	1.333	Bolt Shear
T21	44.5	Leg	A490X 32	32	9948.01	15635.11	0.636	1.333	Bolt SS
		Diagonal	A394T0 25	2	4141.26	9979.03	0.415	1.333	Bolt Shear
		Horizontal	A394T0 16	2	341.07	4932.82	0.069	1.333	Member Bearing
T22	40	Leg	A490X 32	32	11110.70	15635.11	0.711	1.333	Bolt SS
		Diagonal	A394T0 25	2	4011.84	9979.03	0.402	1.333	Bolt Shear
T23	35.5	Leg	A490X 32	32	11208.04	15635.11	0.717	1.333	Bolt SS
		Diagonal	A394T0 25	2	4335.76	9979.03	0.434	1.333	Bolt Shear
		Horizontal	A394T0 16	2	334.88	4932.82	0.068	1.333	Member Bearing
T24	31	Leg	A490X 32	32	12342.43	15635.11	0.789	1.333	Bolt SS
		Diagonal	A394T0 25	2	4197.86	9979.03	0.421	1.333	Bolt Shear
T25	26.5	Leg	A490X 32	32	12442.31	15635.11	0.796	1.333	Bolt SS
		Diagonal	A394T0 25	2	4592.67	9979.03	0.460	1.333	Bolt Shear
		Horizontal	A394T0 16	2	362.84	4932.82	0.074	1.333	Member Bearing
T26	22	Leg	A490X 32	32	13679.35	15635.11	0.875	1.333	Bolt SS
		Diagonal	A394T0 25	2	4674.54	9979.03	0.468	1.333	Bolt Shear
T27	17	Leg	A490X 32	32	13809.35	15635.11	0.883	1.333	Bolt SS
		Diagonal	A394T0 25	2	5390.90	9979.03	0.540	1.333	Bolt Shear
		Horizontal	A394T0 16	2	361.61	4932.82	0.073	1.333	Member Bearing
T28	11	Leg	A490X 32	32	15161.19	15635.11	0.970	1.333	Bolt SS
		Diagonal	A394T0 25	2	4735.41	9979.03	0.475	1.333	Bolt Shear
T29	6	Leg	A490X 32	32	15294.91	15635.11	0.978	1.333	Bolt SS

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Section No.	Elevation m	Component Type	Bolt Grade	Bolt Size mm	Number Of Bolts	Maximum Load per Bolt kg	Allowable Load kg	Ratio Load Allowable	Allowable Ratio	Criteria
		Diagonal	A394T0	25	2	5601.60	9979.03	0.561 ✓	1.333	Bolt Shear
		Horizontal	A394T0	16	2	381.43	7399.23	0.052 ✓	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio P P _a
T1	155 - 149	L89x89x6	6.0000	0.5000	37.8 K=1.33	133491	1090	-2037.87	14841.73	0.137 ✓
T2	149 - 143	L89x89x6	6.0000	0.5000	37.8 K=1.33	133491	1090	-8045.14	14841.73	0.542 ✓
T3	143 - 142	L89x89x6	1.0302	1.0302	58.4 K=1.00	121199	1090	-6774.54	13475.19	0.503 ✓
T4	142 - 135.6	L127x13+L102x13	6.4000	1.6000	32.0 K=0.50	136484	5484	-14797.37	76321.93	0.194 ✓
T5	135.6 - 129.2	L127x13+L102x13	6.4000	1.6000	32.0 K=0.50	136484	5484	-28503.98	76321.93	0.373 ✓
T6	129.2 - 122.8	L127x13+L102x13	6.4000	1.6000	32.0 K=0.50	136484	5484	-46394.80	76321.93	0.608 ✓
T7	122.8 - 118	L127x13+L102x13	4.8000	1.6000	32.0 K=0.50	136484	5484	-57816.26	76321.93	0.758 ✓
T8	118 - 115	L127x13+L102x13	3.2588	1.6294	65.3 K=1.00	116616	5484	-46073.20	65211.63	0.707 ✓
T9	115 - 107.5	4L127x127x16	7.5000	2.5000	50.3 K=0.50	126328	15123	-45054.66	194808.00	0.231 ✓
T10	107.5 - 100	4L127x127x16	7.5000	2.5000	50.3 K=0.50	126328	15123	-64391.08	194808.00	0.331 ✓
T11	100 - 95	4L152x152x16	5.0130	5.0130	41.8 K=0.25	131302	18348	-70943.23	245667.51	0.289 ✓
T12	95 - 89.5	4L152x152x16	5.5143	5.5143	46.0 K=0.25	128909	18348	-77814.70	241191.01	0.323 ✓
T13	89.5 - 84	4L152x152x16	5.5143	5.5143	46.0 K=0.25	128909	18348	-83889.66	241191.01	0.348 ✓
T14	84 - 77.5	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-92243.48	231675.54	0.398 ✓
T15	77.5 - 71	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-101531.69	231675.54	0.438 ✓
T16	71 - 64.5	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-112095.86	231675.54	0.484 ✓
T17	64.5 - 58	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-123472.87	231675.54	0.533 ✓
T18	58 - 53.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-137854.92	401616.69	0.343 ✓

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Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T19	53.5 - 49	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-139381.26	401616.69	0.347
T20	49 - 44.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-157614.77	401616.69	0.392
T21	44.5 - 40	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-159168.33	401616.69	0.396
T22	40 - 35.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-177771.06	401616.69	0.443
T23	35.5 - 31	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-179329.15	401616.69	0.447
T24	31 - 26.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-197478.75	401616.69	0.492
T25	26.5 - 22	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-199076.76	401616.69	0.496
T26	22 - 17	4L203x203x19	5.0130	5.0130	41.2 K=0.33	131633	29419	-218869.27	394889.46	0.554
T27	17 - 11	4L203x203x19	6.0156	6.0156	37.5 K=0.25	133676	29419	-220949.90	401017.95	0.551
T28	11 - 6	4L203x203x19	5.0130	5.0130	41.2 K=0.33	131633	29419	-242579.00	394889.46	0.614
T29	6 - 0	4L203x203x19	6.0156	6.0156	37.5 K=0.25	133676	29419	-244718.60	401017.95	0.610

Diagonal Design Data (Compression)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T1	155 - 149	L38x38x5	0.8201	0.7079	95.0 K=1.00	93769	340	-309.76	3253.14	0.095
T2	149 - 143	L38x38x5	0.8201	0.7079	95.0 K=1.00	93769	340	-648.49	3253.14	0.199
T3	143 - 142	L38x38x5	1.3081	0.7239	97.1 K=1.00	91944	340	-1192.00	3189.83	0.374
T4	142 - 135.6	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-995.05	14285.03	0.070
T5	135.6 - 129.2	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-1452.09	14285.03	0.102
T6	129.2 - 122.8	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-1993.12	14285.03	0.140
T7	122.8 - 118	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-3838.65	14285.03	0.269
T8	118 - 115	L127x127x10	2.1342	1.3234	52.6 K=1.00	124909	2329	-15149.58	29665.18	0.511
T9	115 - 107.5	L89x89x6	3.7537	1.7917	101.6 K=1.00	88038	1090	-2518.61	9788.25	0.257
T10	107.5 - 100	L89x89x6	3.7537	1.7917	101.6 K=1.00	88038	1090	-3443.69	9788.25	0.352
T11	100 - 95	L89x89x6	5.8650	3.0319	54.8	123573	1090	-2020.44	13739.04	0.147

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	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio P P _a
T12	95 - 89.5	L89x89x6	6.5742	3.4052	K=0.50 61.5	119177	1090	-2332.08	13250.25	0.176
T13	89.5 - 84	L102x102x6	6.8966	3.5553	K=0.50 56.0	119219	1252	-2768.49	15215.76	0.182
T14	84 - 77.5	L102x102x6	8.0654	4.1850	K=0.50 65.9	112988	1252	-3520.64	14420.52	0.244
T15	77.5 - 71	L102x102x10	8.4739	4.3773	K=0.50 70.1	113245	1845	-4092.79	21307.51	0.192
T16	71 - 64.5	L102x102x10	8.9130	4.5880	K=0.50 73.4	110802	1845	-4716.50	20847.84	0.226
T17	64.5 - 58	L102x102x10	9.3785	4.8140	K=0.50 77.0	108117	1845	-5598.42	20342.49	0.275
T18	58 - 53.5	L127x127x10	5.7314	5.6086	K=0.33 73.6	110673	2329	-6618.69	26284.14	0.252
T19	53.5 - 49	L127x127x10	6.0258	5.8732	K=0.33 77.1	108092	2329	-7864.52	25671.34	0.306
T20	49 - 44.5	L127x127x10	6.0258	5.8732	K=0.33 77.1	108092	2329	-7525.87	25671.34	0.293
T21	44.5 - 40	L127x127x10	6.3399	6.1958	K=0.33 81.3	104862	2329	-8282.51	24904.09	0.333
T22	40 - 35.5	L127x127x10	6.3399	6.1958	K=0.33 81.3	104862	2329	-7881.53	24904.09	0.316
T23	35.5 - 31	L127x127x10	6.6708	6.5333	K=0.33 85.7	101383	2329	-8671.51	24077.78	0.360
T24	31 - 26.5	L127x127x10	6.6708	6.5333	K=0.33 85.7	101383	2329	-8249.26	24077.78	0.343
T25	26.5 - 22	L127x127x10	7.0161	6.8838	K=0.33 90.3	97660	2329	-9185.38	23193.82	0.396
T26	22 - 17	L127x127x10	7.3476	7.2091	K=0.33 94.6	94106	2329	-9054.89	22349.73	0.405
T27	17 - 11	L127x127x10	8.4478	8.3036	K=0.25 82.6	103894	2329	-10781.76	24674.39	0.437
T28	11 - 6	L127x127x10	7.7677	7.6350	K=0.33 100.2	89306	2329	-9373.90	21209.76	0.442
T29	6 - 0	L127x127x10	8.8512	8.7131	K=0.25 86.6	100673	2329	-11203.19	23909.40	0.469

Horizontal Design Data (Compression)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio P P _a
T19	53.5 - 49	L76x76x6	7.5430	3.6700	77.7 K=0.50	107636	929	-1009.50	10196.85	0.099
T21	44.5 - 40	L76x76x6	8.4610	4.1290	87.4 K=0.50	100053	929	-682.14	9478.50	0.072
T23	35.5 - 31	L76x76x6	9.3790	4.5880	97.1 K=0.50	91976	929	-669.75	8713.33	0.077
T25	26.5 - 22	L76x76x6	10.2970	5.0470	106.8	83391	929	-725.68	7900.04	0.092

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Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio $\frac{P}{P_a}$
T27	17 - 11	L76x76x6	11.2660	5.5315	K=0.50 117.1 K=0.50	73750	929	-723.22	6986.73	0.104 ✓
T29	6 - 0	L102x102x10	12.3880	6.0925	97.5 K=0.50	91640	1845	-762.86	17242.28	0.044 ✓

Top Girt Design Data (Compression)

Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio $\frac{P}{P_a}$
T1	155 - 149	L38x38x5	0.6500	0.5611	75.3 K=1.00	109417	340	-4.83	3795.99	0.001 ✓
T2	149 - 143	L38x38x5	0.6500	0.5611	75.3 K=1.00	109417	340	-15.50	3795.99	0.004 ✓
T3	143 - 142	L38x38x5	0.6500	0.5611	75.3 K=1.00	109417	340	-412.55	3795.99	0.109 ✓
T4	142 - 135.6	L51x51x5	1.0000	0.9111	91.0 K=1.00	97082	461	-848.12	4566.59	0.186 ✓
T8	118 - 115	L64x64x5	1.0000	0.8730	69.4 K=1.00	113688	582	-2104.59	6746.33	0.312 ✓
T9	115 - 107.5	L64x64x5	2.8000	2.6730	135.3 K=1.00	56273	582	-2166.34	3339.28	0.649 ✓
T11	100 - 95	L64x64x5	2.8000	2.6730	135.3 K=1.00	56273	582	-1129.63	3339.28	0.338 ✓

Inner Bracing Design Data (Compression)

Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio $\frac{P}{P_a}$
T19	53.5 - 49	L76x76x6	5.3337	5.3337	177.4 K=0.50	32733	929	-153.63	3100.93	0.050 ✓
T21	44.5 - 40	L76x76x6	5.9828	5.9828	198.9 K=0.50	26015	929	-46.73	2464.55	0.019 ✓
T23	35.5 - 31	L76x76x6	6.6320	6.6320	220.5 K=0.50	21172	929	-31.26	2005.70	0.016 ✓
T25	26.5 - 22	L102x102x6	7.2811	7.2811	180.3 K=0.50	31677	1252	-33.01	4042.86	0.008 ✓
T27	17 - 11	L102x102x6	7.9663	7.9663	197.3 K=0.50	26462	1252	-43.44	3377.31	0.013 ✓
T29	6 - 0	L102x102x6	8.7596	8.7596	216.9 K=0.50	21886	1252	-39.41	2793.24	0.014 ✓

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Tension Checks

Leg Design Data (Tension)

Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio <i>P</i> <i>P_a</i>
T1	155 - 149	L89x89x6	6.0000	0.5000	18.1	148927	1090	1656.27	16557.94	0.100
T2	149 - 143	L89x89x6	6.0000	0.5000	18.1	148927	1090	7612.23	16557.94	0.460
T3	143 - 142	L89x89x6	1.0302	1.0302	37.2	148927	1090	6345.12	16557.94	0.383
T4	142 - 135.6	L127x13+L102x13	6.4000	1.6000	64.1	148927	5484	12559.57	83279.58	0.151
T5	135.6 - 129.2	L127x13+L102x13	6.4000	1.6000	64.1	148927	5484	24801.12	83279.58	0.298
T6	129.2 - 122.8	L127x13+L102x13	6.4000	1.6000	64.1	148927	5484	42257.54	83279.58	0.507
T7	122.8 - 118	L127x13+L102x13	4.8000	1.6000	64.1	148927	5484	55547.84	83279.58	0.667
T8	118 - 115	L127x13+L102x13	3.2588	1.6294	65.3	148927	5484	44006.05	83279.58	0.528
T9	115 - 107.5	4L127x127x16	7.5000	2.5000	100.6	148927	15123	35528.54	229655.70	0.155
T10	107.5 - 100	4L127x127x16	7.5000	2.5000	100.6	148927	15123	51184.74	229655.70	0.223
T11	100 - 95	4L152x152x16	5.0130	5.0130	167.3	148927	18348	55979.21	278643.69	0.201
T12	95 - 89.5	4L152x152x16	5.5143	5.5143	184.0	148927	18348	59956.31	278643.69	0.215
T13	89.5 - 84	4L152x152x16	5.5143	5.5143	184.0	148927	18348	63477.09	278643.69	0.228
T14	84 - 77.5	4L152x152x16	6.5169	6.5169	217.4	148927	18348	68849.44	278643.69	0.247
T15	77.5 - 71	4L152x152x16	6.5169	6.5169	217.4	148927	18348	74983.38	278643.69	0.269
T16	71 - 64.5	4L152x152x16	6.5169	6.5169	217.4	148927	18348	82097.07	278643.69	0.295
T17	64.5 - 58	4L152x152x16	6.5169	6.5169	217.4	148927	18348	89980.05	278643.69	0.323
T18	58 - 53.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	100576.88	446770.47	0.225
T19	53.5 - 49	4L203x203x19	4.5117	4.5117	112.4	148927	29419	98620.53	446770.47	0.221
T20	49 - 44.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	111757.93	446770.47	0.250
T21	44.5 - 40	4L203x203x19	4.5117	4.5117	112.4	148927	29419	110102.32	446770.47	0.246
T22	40 - 35.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	123393.04	446770.47	0.276
T23	35.5 - 31	4L203x203x19	4.5117	4.5117	112.4	148927	29419	121733.34	446770.47	0.272

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Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio <i>P</i> <i>P_a</i>
T24	31 - 26.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	134654.83	446770.47	0.301
T25	26.5 - 22	4L203x203x19	4.5117	4.5117	112.4	148927	29419	132983.79	446770.47	0.298
T26	22 - 17	4L203x203x19	5.0130	5.0130	124.9	148927	29419	147146.31	446770.47	0.329
T27	17 - 11	4L203x203x19	6.0156	6.0156	149.9	148927	29419	145293.84	446770.47	0.325
T28	11 - 6	4L203x203x19	5.0130	5.0130	124.9	148927	29419	160785.84	446770.47	0.360
T29	6 - 0	4L203x203x19	6.0156	6.0156	149.9	148927	29419	158869.87	446770.47	0.356

Diagonal Design Data (Tension)

Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio <i>P</i> <i>P_a</i>
T1	155 - 149	L38x38x5	0.8201	0.7079	61.0	199948	249	305.02	5086.95	0.060
T2	149 - 143	L38x38x5	0.8201	0.7079	61.0	199948	249	666.61	5086.95	0.131
T3	143 - 142	L38x38x5	1.3081	0.7239	62.4	199948	249	1237.76	5086.95	0.243
T4	142 - 135.6	L89x89x6	1.8868	0.8236	29.7	148927	1090	973.15	16557.94	0.059
T5	135.6 - 129.2	L89x89x6	1.8868	0.8236	29.7	148927	1090	1419.09	16557.94	0.086
T6	129.2 - 122.8	L89x89x6	1.8868	0.8236	29.7	148927	1090	1918.73	16557.94	0.116
T7	122.8 - 118	L89x89x6	1.8868	0.8236	29.7	148927	1090	3783.32	16557.94	0.228
T8	118 - 115	L127x127x10	2.1342	1.3234	33.4	148927	2329	14517.95	35369.33	0.410
T9	115 - 107.5	L89x89x6	3.7537	1.7917	64.7	148927	1090	2561.00	16557.94	0.155
T10	107.5 - 100	L89x89x6	3.7537	1.7917	64.7	148927	1090	3216.26	16557.94	0.194
T11	100 - 95	L89x89x6	5.8650	3.0319	109.5	148927	1090	1763.36	16557.94	0.106
T12	95 - 89.5	L89x89x6	6.5742	3.4052	123.0	148927	1090	2215.56	16557.94	0.134
T13	89.5 - 84	L102x102x6	6.8966	3.5553	112.0	148927	1252	2593.34	19007.34	0.136
T14	84 - 77.5	L102x102x6	8.0654	4.1850	131.8	148927	1252	3343.67	19007.34	0.176
T15	77.5 - 71	L102x102x10	8.4739	4.3773	140.1	148927	1845	3842.98	28021.13	0.137
T16	71 - 64.5	L102x102x10	8.9130	4.5880	146.9	148927	1845	4569.40	28021.13	0.163

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Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio <i>P</i> <i>P_a</i>
T17	64.5 - 58	L102x102x10	9.3785	4.8140	154.1	148927	1845	5375.84	28021.13	0.192
T18	58 - 53.5	L127x127x10	5.7314	5.6086	141.5	148927	2329	6670.21	35369.33	0.189
T19	53.5 - 49	L127x127x10	6.0258	5.8732	148.2	148927	2329	7337.27	35369.33	0.207
T20	49 - 44.5	L127x127x10	6.0258	5.8732	148.2	148927	2329	7592.23	35369.33	0.215
T21	44.5 - 40	L127x127x10	6.3399	6.1958	156.4	148927	2329	7697.33	35369.33	0.218
T22	40 - 35.5	L127x127x10	6.3399	6.1958	156.4	148927	2329	8023.69	35369.33	0.227
T23	35.5 - 31	L127x127x10	6.6708	6.5333	164.9	148927	2329	8085.38	35369.33	0.229
T24	31 - 26.5	L127x127x10	6.6708	6.5333	164.9	148927	2329	8395.73	35369.33	0.237
T25	26.5 - 22	L127x127x10	7.0161	6.8838	173.7	148927	2329	8472.29	35369.33	0.240
T26	22 - 17	L127x127x10	7.3476	7.2091	181.9	148927	2329	9349.09	35369.33	0.264
T27	17 - 11	L127x127x10	8.4478	8.3036	209.6	148927	2329	10174.90	35369.33	0.288
T28	11 - 6	L127x127x10	7.7677	7.6350	192.7	148927	2329	9470.83	35369.33	0.268
T29	6 - 0	L127x127x10	8.8512	8.7131	219.9	148927	2329	10178.34	35369.33	0.288

Horizontal Design Data (Tension)

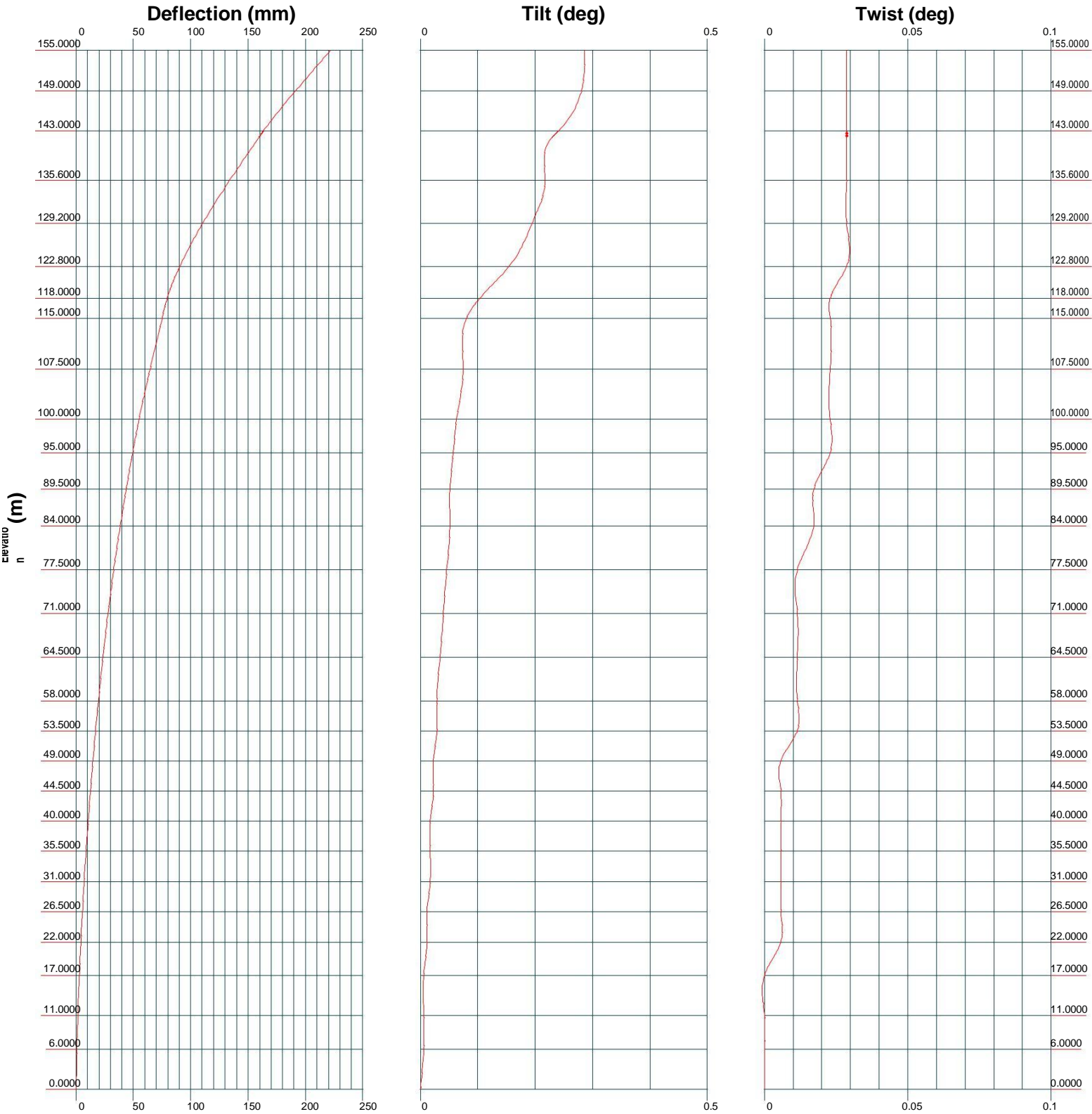
Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio <i>P</i> <i>P_a</i>
T19	53.5 - 49	L76x76x6	7.5430	3.6700	155.4	148927	929	863.51	14108.54	0.061
T21	44.5 - 40	L76x76x6	8.4610	4.1290	174.8	148927	929	537.54	14108.54	0.038
T23	35.5 - 31	L76x76x6	9.3790	4.5880	194.2	148927	929	521.76	14108.54	0.037
T25	26.5 - 22	L76x76x6	10.2970	5.0470	213.7	148927	929	567.48	14108.54	0.040
T27	17 - 11	L76x76x6	11.2660	5.5315	234.2	148927	929	531.59	14108.54	0.038
T29	6 - 0	L102x102x10	12.3880	6.0925	195.0	148927	1845	514.56	28021.13	0.018

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 84 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass Fail
T5	135.6 - 129.2	Leg	L127x13+L102x13	171	-28503.98	101737.12	28.0	Pass
		Diagonal	L89x89x6	174	-1452.09	19041.95	7.6	Pass
T6	129.2 - 122.8	Leg	L127x13+L102x13	207	-46394.80	101737.12	45.6	Pass
		Diagonal	L89x89x6	210	-1993.12	19041.95	10.5	Pass
T7	122.8 - 118	Leg	L127x13+L102x13	243	-57816.26	101737.12	56.8	Pass
							65.1 (b)	
T8	118 - 115	Diagonal	L89x89x6	248	-3838.65	19041.95	20.2	Pass
		Leg	L127x13+L102x13	271	-46073.20	86927.10	53.0	Pass
							57.7 (b)	
		Diagonal	L127x127x10	290	-15149.58	39543.68	38.3	Pass
							38.4 (b)	
T9	115 - 107.5	Top Girt	L64x64x5	274	-2104.59	8992.85	23.4	Pass
		Leg	4L127x127x16	295	-45054.66	259679.05	17.4	Pass
							43.7 (b)	
		Diagonal	L89x89x6	302	-2518.61	13047.74	19.3	Pass
							19.5 (b)	
T10	107.5 - 100	Top Girt	L64x64x5	300	-2166.34	4451.25	48.7	Pass
		Leg	4L127x127x16	327	-64391.08	259679.05	24.8	Pass
							63.8 (b)	
T11	100 - 95	Diagonal	L89x89x6	332	-3443.69	13047.74	26.4	Pass
		Leg	4L152x152x16	355	-70943.23	327474.78	21.7	Pass
							66.7 (b)	
		Diagonal	L89x89x6	364	-2020.44	18314.15	11.0	Pass
							15.4 (b)	
T12	95 - 89.5	Top Girt	L64x64x5	358	-1129.63	4451.25	25.4	Pass
		Leg	4L152x152x16	371	-77814.70	321507.60	24.2	Pass
		Diagonal	L89x89x6	374	-2332.08	17662.59	13.2	Pass
T13	89.5 - 84	Leg	4L152x152x16	383	-83889.66	321507.60	26.1	Pass
		Diagonal	L102x102x6	386	-2768.49	20282.61	13.6	Pass
T14	84 - 77.5	Leg	4L152x152x16	395	-92243.48	308823.49	29.9	Pass
							43.4 (b)	
T15	77.5 - 71	Diagonal	L102x102x6	398	-3520.64	19222.56	18.3	Pass
		Leg	4L152x152x16	407	-101531.69	308823.49	32.9	Pass
							47.7 (b)	
T16	71 - 64.5	Diagonal	L102x102x10	410	-4092.79	28402.91	14.4	Pass
		Leg	4L152x152x16	419	-112095.86	308823.49	36.3	Pass
							52.7 (b)	
		Diagonal	L102x102x10	422	-4716.50	27790.17	17.0	Pass
							23.9 (b)	
T17	64.5 - 58	Leg	4L152x152x16	431	-123472.87	308823.49	40.0	Pass
							58.0 (b)	
		Diagonal	L102x102x10	434	-5598.42	27116.54	20.6	Pass
							28.4 (b)	
T18	58 - 53.5	Leg	4L203x203x19	443	-137854.92	535355.03	25.8	Pass
							41.3 (b)	
		Diagonal	L127x127x10	446	-6618.69	35036.76	18.9	Pass
							25.1 (b)	
T19	53.5 - 49	Leg	4L203x203x19	459	-139381.26	535355.03	26.0	Pass
							41.8 (b)	
		Diagonal	L127x127x10	462	-7864.52	34219.90	23.0	Pass
							29.6 (b)	
		Horizontal	L76x76x6	445	-1009.50	13592.40	7.4	Pass
							7.7 (b)	
T20	49 - 44.5	Inner Bracing	L76x76x6	469	-153.63	4133.54	3.7	Pass
		Leg	4L203x203x19	475	-157614.77	535355.03	29.4	Pass
							47.3 (b)	
		Diagonal	L127x127x10	478	-7525.87	34219.90	22.0	Pass
							28.5 (b)	
T21	44.5 - 40	Leg	4L203x203x19	491	-159168.33	535355.03	29.7	Pass
							47.7 (b)	
		Diagonal	L127x127x10	494	-8282.51	33197.15	24.9	Pass

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H=155.0m PATA=13.00m V=120 KPH	Page 85 of 85
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.	Date 12:37:06 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass Fail
T22	40 - 35.5	Horizontal Inner Bracing Leg	L76x76x6	477	-682.14	12634.83	31.1 (b)	
			L76x76x6	501	-46.73	3285.24	5.4	Pass
			4L203x203x19	507	-177771.06	535355.03	1.4	Pass
T23	35.5 - 31	Diagonal Leg	L127x127x10	510	-7881.53	33197.15	53.3 (b)	
			4L203x203x19	523	-179329.15	535355.03	23.7	Pass
			L127x127x10	526	-8671.51	32095.68	30.2 (b)	
T24	31 - 26.5	Horizontal Inner Bracing Leg	L76x76x6	509	-669.75	11614.87	33.5	Pass
			L76x76x6	533	-31.26	2673.60	53.8 (b)	
			4L203x203x19	539	-197478.75	535355.03	27.0	Pass
T25	26.5 - 22	Diagonal Leg	L127x127x10	542	-8249.26	32095.68	32.6 (b)	
			4L203x203x19	555	-199076.76	535355.03	5.8	Pass
			L127x127x10	558	-9185.38	30917.36	25.7	Pass
T26	22 - 17	Horizontal Inner Bracing Leg	L76x76x6	541	-725.68	10530.75	31.6 (b)	
			L102x102x6	566	-19.94	4042.86	37.2	Pass
			4L203x203x19	571	-218869.27	526387.63	59.7 (b)	
T27	17 - 11	Diagonal Leg	L127x127x10	574	-9054.89	29792.18	29.7	Pass
			4L203x203x19	587	-220949.90	534556.91	34.5 (b)	
			L127x127x10	590	-10781.76	32890.96	6.9	Pass
T28	11 - 6	Horizontal Inner Bracing Leg	L76x76x6	573	-723.22	9313.31	0.8	Pass
			L102x102x6	597	-43.44	4501.95	41.6	Pass
			4L203x203x19	603	-242579.00	526387.63	65.6 (b)	
T29	6 - 0	Diagonal Leg	L127x127x10	606	-9373.90	28272.61	30.4	Pass
			4L203x203x19	619	-244718.60	534556.91	35.1 (b)	
			L127x127x10	622	-11203.19	31871.23	41.3	Pass
T29	6 - 0	Horizontal Inner Bracing	L102x102x10	605	-762.86	22983.95	66.3 (b)	
			L102x102x6	629	-39.41	3723.39	32.8	Pass
							40.5 (b)	
							Summary	
							Leg (T29)	Pass
							Diagonal (T29)	Pass
							Horizontal (T27)	Pass
							Top Girt (T9)	Pass
							Inner Bracing (T19)	Pass
							Bolt Checks	Pass
							RATING =	Pass
							73.4	Pass



Feedline Distribution Chart
0.0000 - 155.0000

Round

Flat

App In Face

App Out Face

Truss Leg

Face A

Face B

Face C

Face D



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Calle 129 No. 8 - 08 - Oficina 204.
BOGOTA D.C. - COLOMBIA.
Phone: 57 (1) 2740536.
FAX: 57 (1) 2740536.

Job: **DIAGRAMA CABLES GUIA DE ONDA-TC155.0m PATA=13.00m V=120 KPH**
Project: **EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.**
Client: **RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.**
Code: **TIA/EIA-222-F**
Date: **06/07/16**
Drawn by: **Ing. C. Londoño M.**
App'd: **Scale: NTS**
Dwg No. **E-7**

Stress Distribution Chart

0.0000 - 155.0000

> 100% 90%-100% 75%-90% 50%-75% < 50% Overstress

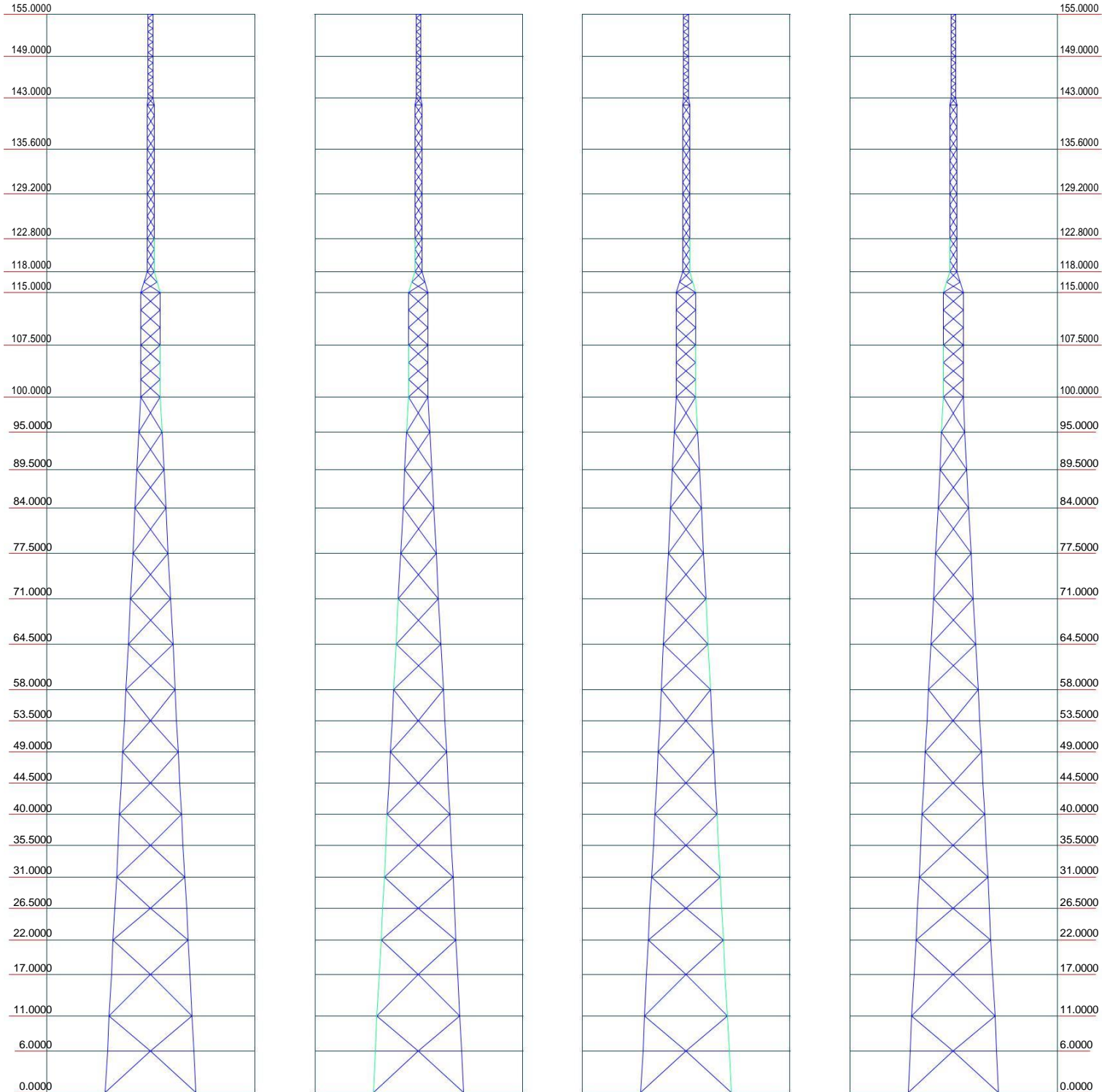
Face A

Face B

Face C

Face D

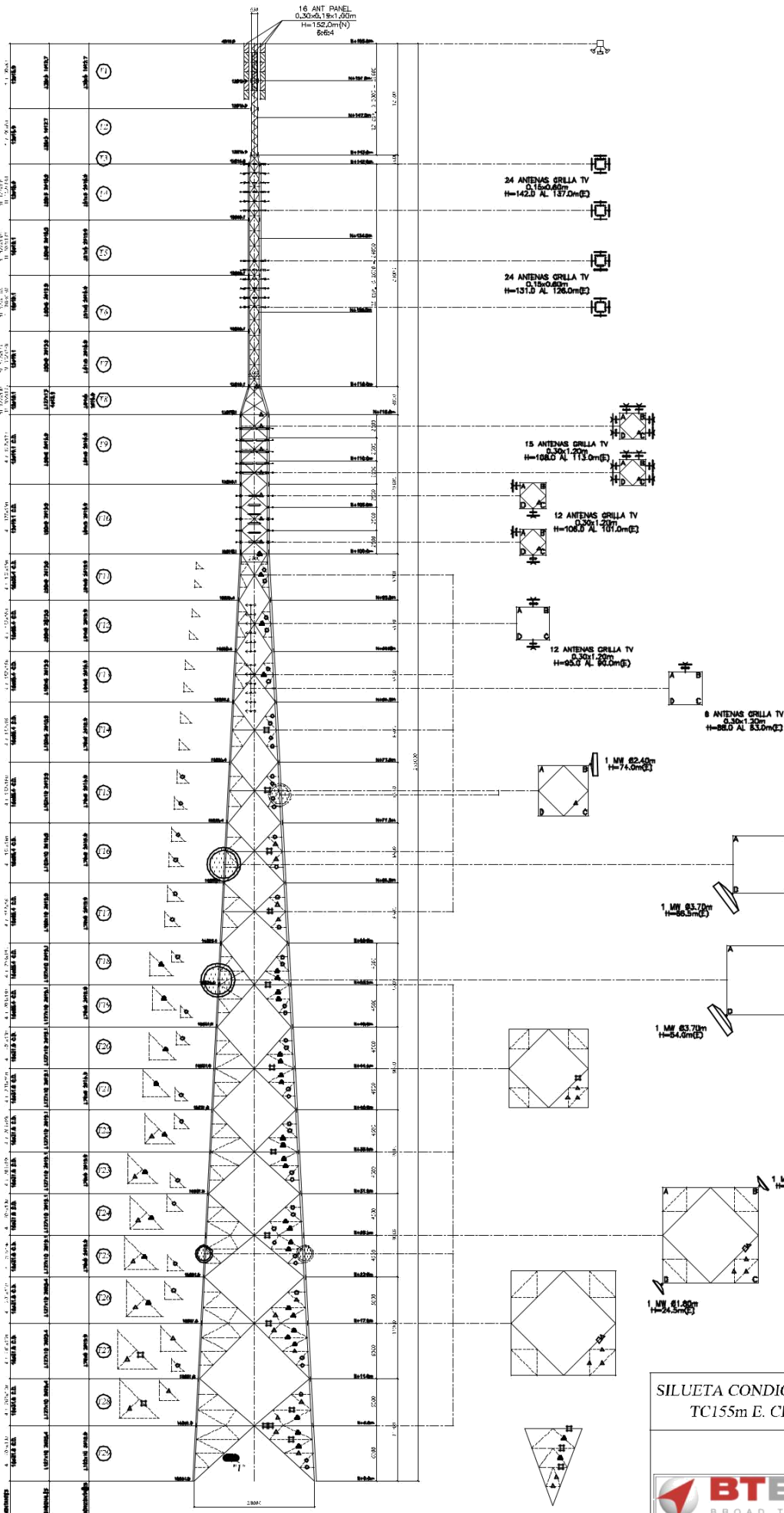
Elevation (m)



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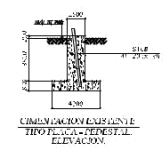
Job: **DIAGRAMA DE ESFUERZOS-TC155.0m PATA=13.00m V=120 KPH**
Project: **EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION ACTUAL.**
Client: RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.
Code: TIA/EIA-222-F
Date: 06/07/16
Scale: NTS
Dwg No. **F-8**

***CONDICION NUEVA (FUTURA).
ESTACION: CERRÓ MUNCHIQUE.***



CONEXIONES

●	AVC. L. 81x3.3
○	AVC. L. 81x3.5
+	AVC. L. 81x4.8
△	AVC. L. 81x4.8
□	AVC. L. 81x4.8
◇	AVC. L. 81x4.8
×	AVC. L. 81x4.8
•	AVC. L. 81x4.8
◊	AVC. L. 81x4.8
◌	AVC. L. 81x4.8
◐	AVC. L. 81x4.8
◑	AVC. L. 81x4.8
◒	AVC. L. 81x4.8
◅	AVC. L. 81x4.8
◆	AVC. L. 81x4.8
◇	AVC. L. 81x4.8
◈	AVC. L. 81x4.8
◉	AVC. L. 81x4.8
◊	AVC. L. 81x4.8
◌	AVC. L. 81x4.8
◐	AVC. L. 81x4.8
◑	AVC. L. 81x4.8
◒	AVC. L. 81x4.8
◅	AVC. L. 81x4.8
◆	AVC. L. 81x4.8
◇	AVC. L. 81x4.8
◈	AVC. L. 81x4.8
◉	AVC. L. 81x4.8



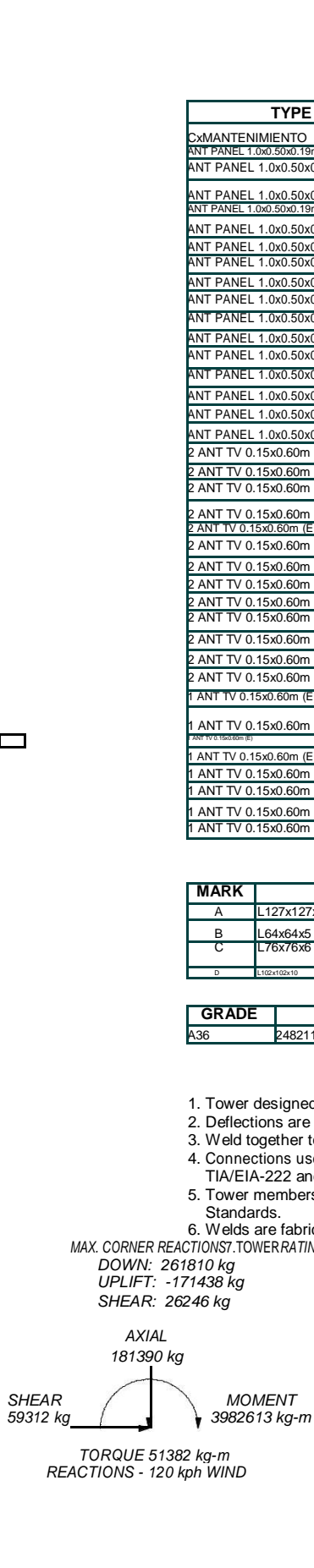
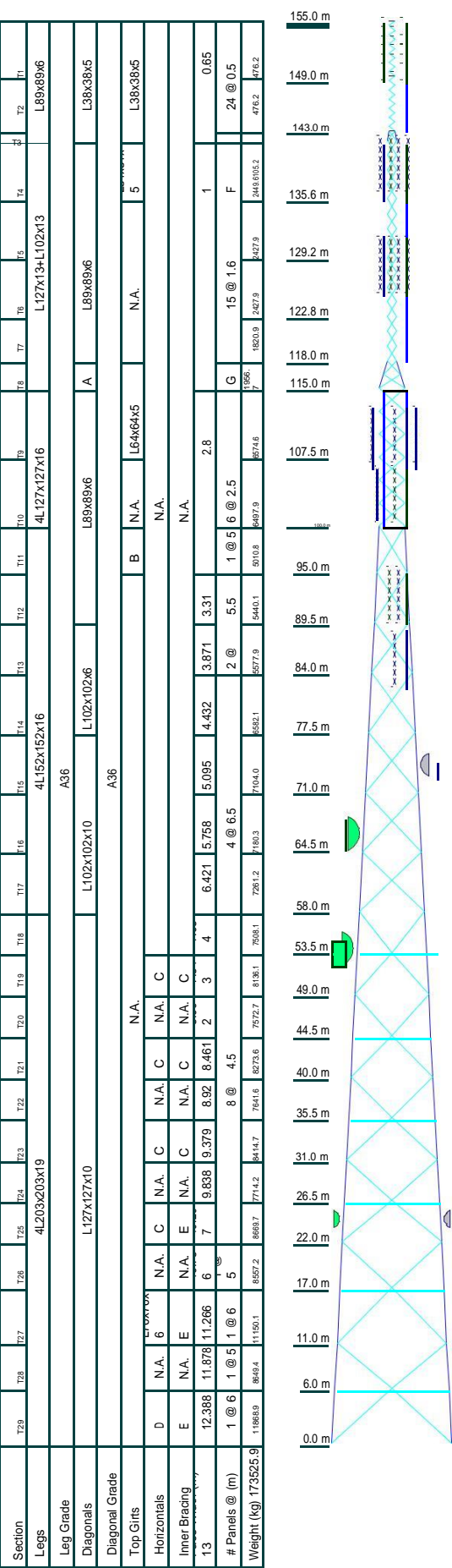
**SILUETA CONDICION NUEVA (FUTURA).
TC155m E. CERRO MUNCHIQUE.**

VISTA "1"

**SILUETA CONDICION NUEVA (FUTURA).
TC155m E. CERRO MUNCHIQUE.**

**PLANO No.
2/2.**



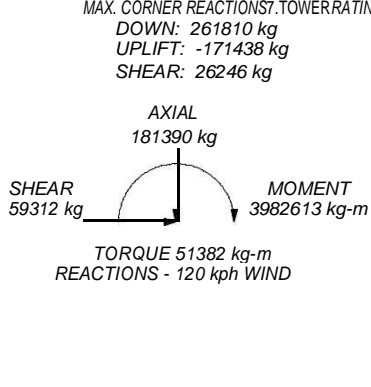


DESIGNED APPURTENANCE LOADING			
TYPE	ELEVATION	TYPE	ELEVATION
CxMANTENIMIENTO	155	1 ANT TV 0.15x0.60m (E)	126
ANT PANEL 1.0x0.50x0.19m (N)	154.5	1 ANT TV 0.15x0.60m (E)	126
ANT PANEL 1.0x0.50x0.19m (N)	154.5	1 ANT TV 0.15x0.60m (E)	126
ANT PANEL 1.0x0.50x0.19m (N)	153.5	1 ANT TV 0.30x1.20m (E)	113
ANT PANEL 1.0x0.50x0.19m (N)	153.5	1 ANT TV 0.30x1.20m (E)	113
ANT PANEL 1.0x0.50x0.19m (N)	153.5	1 ANT TV 0.30x1.20m (E)	113
ANT PANEL 1.0x0.50x0.19m (N)	152.5	1 ANT TV 0.30x1.20m (E)	111.5
ANT PANEL 1.0x0.50x0.19m (N)	152.5	1 ANT TV 0.30x1.20m (E)	111.5
ANT PANEL 1.0x0.50x0.19m (N)	151.5	1 ANT TV 0.30x1.20m (E)	110
ANT PANEL 1.0x0.50x0.19m (N)	151.5	1 ANT TV 0.30x1.20m (E)	110
ANT PANEL 1.0x0.50x0.19m (N)	151.5	1 ANT TV 0.30x1.20m (E)	110
ANT PANEL 1.0x0.50x0.19m (N)	150.5	1 ANT TV 0.30x1.20m (E)	108.5
ANT PANEL 1.0x0.50x0.19m (N)	150.5	1 ANT TV 0.30x1.20m (E)	108.5
ANT PANEL 1.0x0.50x0.19m (N)	149.5	1 ANT TV 0.30x1.20m (E)	106.5
ANT PANEL 1.0x0.50x0.19m (N)	149.5	1 ANT TV 0.30x1.20m (E)	106.5
2 ANT TV 0.15x0.60m (E)	142	1 ANT TV 0.30x1.20m (E)	106.5
2 ANT TV 0.15x0.60m (E)	142	2 ANT TV 0.30x1.20m (E)	106
2 ANT TV 0.15x0.60m (E)	142	2 ANT TV 0.30x1.20m (E)	106
2 ANT TV 0.15x0.60m (E)	142	2 ANT TV 0.30x1.20m (E)	103.5
2 ANT TV 0.15x0.60m (E)	139.5	2 ANT TV 0.30x1.20m (E)	103.5
2 ANT TV 0.15x0.60m (E)	139.5	2 ANT TV 0.30x1.20m (E)	101
2 ANT TV 0.15x0.60m (E)	139.5	2 ANT TV 0.30x1.20m (E)	101
2 ANT TV 0.15x0.60m (E)	139.5	2 ANT TV 0.30x1.20m (E)	95
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	95
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	92.5
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	92.5
2 ANT TV 0.15x0.60m (E)	137	2 ANT TV 0.30x1.20m (E)	90
2 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	90
1 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	88
1 ANT TV 0.15x0.60m (E)	131	2 ANT TV 0.30x1.20m (E)	85.5
1 ANT TV 0.15x0.60m (E)	128.5	HP8-102 (1 ANT MW Ø2.40m E)	74
1 ANT TV 0.15x0.60m (E)	128.5	HP12-21B (1 ANT MW Ø3.70m E)	66.5
1 ANT TV 0.15x0.60m (E)	128.5	HP12-21B (1 ANT MW Ø3.70m E)	54
1 ANT TV 0.15x0.60m (E)	128.5	6 FT DISH (1 ANT MW Ø1.80m E)	24.5
1 ANT TV 0.15x0.60m (E)	126	6 FT DISH (1 ANT MW Ø1.80m E)	24.5

SYMBOL LIST			
MARK	SIZE	MARK	SIZE
A	L127x127x10	E	L102x102x6
B	L64x64x5	F	1 @ 1
C	L76x76x6	G	2 @ 1.5
D	L102x102x10		

MATERIAL STRENGTH					
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	248211 kPa	399896 kPa			

- TOWER DESIGN NOTES**
1. Tower designed for a 120 kph basic wind in accordance with the TIA/EIA-222-F Standard.
 2. Deflections are based upon a 60 kph wind.
 3. Weld together tower sections have flange connections.
 4. Connections use galvanized A-394 T0 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
 5. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
 6. Welds are fabricated with ER-70S-6 electrodes.



BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.		Job: SILUETA DE CALCULO-TC155.0m PATA=13.00m V=120 KPH Project: EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA). Client: RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA. Code: TIA/EIA-222-F Patn:		Drawn by: Ing. C. Londoño M. Date: 06/08/16 App'd: Scale: NTS Dwg No. F-1	
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<i>RISATower</i> BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 1 of 93
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	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

SALIDA 2 – CONDICION NUEVA (FUTURA).

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 155.0000 m above the ground line.

The base of the tower is set at an elevation of 0.0000 m above the ground line.

The face width of the tower is 0.6500 m at the top and 13.0000 m at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Basic wind speed of 120 kph.

Deflections calculated using a wind speed of 60 kph.

Weld together tower sections have flange connections.

Connections use galvanized A-394 T0 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.

Welds are fabricated with ER-70S-6 electrodes.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

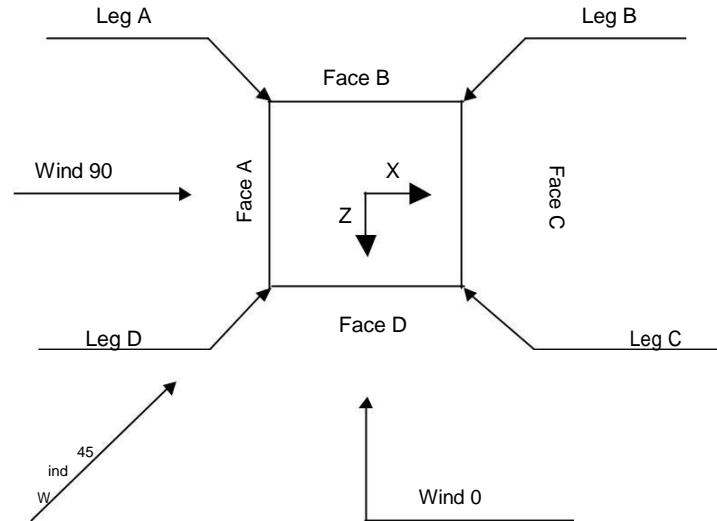
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	√ Distribute Leg Loads As Uniform	√ Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
Use Code Safety Factors - Guys	Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	√ Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 2 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.



Square To wer

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	m			m		m
T1	155.0000-149.0000			0.6500	1	6.0000
T2	149.0000-143.0000			0.6500	1	6.0000
T3	143.0000-142.0000			0.6500	1	1.0000
T4	142.0000-135.6000			1.0000	1	6.4000
T5	135.6000-129.2000			1.0000	1	6.4000
T6	129.2000-122.8000			1.0000	1	6.4000
T7	122.8000-118.0000			1.0000	1	4.8000
T8	118.0000-115.0000			1.0000	1	3.0000
T9	115.0000-107.5000			2.8000	1	7.5000
T10	107.5000-100.0000			2.8000	1	7.5000
T11	100.0000-95.0000			2.8000	1	5.0000
T12	95.0000-89.5000			3.3100	1	5.5000
T13	89.5000-84.0000			3.8710	1	5.5000
T14	84.0000-77.5000			4.4320	1	6.5000
T15	77.5000-71.0000			5.0950	1	6.5000
T16	71.0000-64.5000			5.7580	1	6.5000
T17	64.5000-58.0000			6.4210	1	6.5000
T18	58.0000-53.5000			7.0840	1	4.5000
T19	53.5000-49.0000			7.5430	1	4.5000

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Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	m			m		m
T20	49.0000-44.5000			8.0020	1	4.5000
T21	44.5000-40.0000			8.4610	1	4.5000
T22	40.0000-35.5000			8.9200	1	4.5000
T23	35.5000-31.0000			9.3790	1	4.5000
T24	31.0000-26.5000			9.8380	1	4.5000
T25	26.5000-22.0000			10.2970	1	4.5000
T26	22.0000-17.0000			10.7560	1	5.0000
T27	17.0000-11.0000			11.2660	1	6.0000
T28	11.0000-6.0000			11.8780	1	5.0000
T29	6.0000-0.0000			12.3880	1	6.0000

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontal	Top Girt Offset	Bottom Girt Offset
	m	m				mm	mm
T1	155.0000-149.0000	0.5000	K Brace Right	No	No	0	0
T2	149.0000-143.0000	0.5000	K Brace Right	No	No	0	0
T3	143.0000-142.0000	1.0000	X Brace	No	No	0	0
T4	142.0000-135.6000	1.6000	X Brace	No	No	0	0
T5	135.6000-129.2000	1.6000	X Brace	No	No	0	0
T6	129.2000-122.8000	1.6000	X Brace	No	No	0	0
T7	122.8000-118.0000	1.6000	X Brace	No	No	0	0
T8	118.0000-115.0000	1.5000	X Brace	No	No	0	0
T9	115.0000-107.5000	2.5000	X Brace	No	No	0	0
T10	107.5000-100.0000	2.5000	X Brace	No	No	0	0
T11	100.0000-95.0000	5.0000	X Brace	No	No	0	0
T12	95.0000-89.5000	5.5000	X Brace	No	No	0	0
T13	89.5000-84.0000	5.5000	X Brace	No	No	0	0
T14	84.0000-77.5000	6.5000	X Brace	No	No	0	0
T15	77.5000-71.0000	6.5000	X Brace	No	No	0	0
T16	71.0000-64.5000	6.5000	X Brace	No	No	0	0
T17	64.5000-58.0000	6.5000	X Brace	No	No	0	0
T18	58.0000-53.5000	4.5000	K Brace Up	No	Yes	0	0
T19	53.5000-49.0000	4.5000	K Brace Down	No	Yes	0	0
T20	49.0000-44.5000	4.5000	K Brace Up	No	Yes	0	0
T21	44.5000-40.0000	4.5000	K Brace Down	No	Yes	0	0
T22	40.0000-35.5000	4.5000	K Brace Up	No	Yes	0	0
T23	35.5000-31.0000	4.5000	K Brace Down	No	Yes	0	0
T24	31.0000-26.5000	4.5000	K Brace Up	No	Yes	0	0
T25	26.5000-22.0000	4.5000	K Brace Down	No	Yes	0	0
T26	22.0000-17.0000	5.0000	K Brace Up	No	Yes	0	0
T27	17.0000-11.0000	6.0000	K Brace Down	No	Yes	0	0
T28	11.0000-6.0000	5.0000	K Brace Up	No	Yes	0	0
T29	6.0000-0.0000	6.0000	K Brace Down	No	Yes	0	0

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Tower Section Geometry (cont'd)

<i>Tower Elevation m</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
T1 155.0000-149.00 00	Equal Angle	L89x89x6	A36 (248211 kPa)	Equal Angle	L38x38x5	A36 (248211 kPa)
T2 149.0000-143.00 00	Equal Angle	L89x89x6	A36 (248211 kPa)	Equal Angle	L38x38x5	A36 (248211 kPa)
T3 143.0000-142.00 00	Equal Angle	L89x89x6	A36 (248211 kPa)	Equal Angle	L38x38x5	A36 (248211 kPa)
T4 142.0000-135.60 00	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T5 135.6000-129.20 00	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T6 129.2000-122.80 00	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T7 122.8000-118.00 00	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T8 118.0000-115.00 00	Arbitrary Shape	L127x13+L102x13	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T9 115.0000-107.50 00	Arbitrary Shape	4L127x127x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T10 107.5000-100.00 00	Arbitrary Shape	4L127x127x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T11 100.0000-95.000 0	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T12 95.0000-89.5000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L89x89x6	A36 (248211 kPa)
T13 89.5000-84.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T14 84.0000-77.5000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T15 77.5000-71.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)
T16 71.0000-64.5000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)
T17 64.5000-58.0000	Arbitrary Shape	4L152x152x16	A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)
T18 58.0000-53.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T19 53.5000-49.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T20 49.0000-44.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T21 44.5000-40.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T22 40.0000-35.5000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T23 35.5000-31.0000	Arbitrary Shape	4L203x203x19	A36 (248211 kPa)	Equal Angle	L127x127x10	A36 (248211 kPa)
T24	Arbitrary Shape	4L203x203x19	A36	Equal Angle	L127x127x10	A36

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<i>Tower Elevation m</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
31.0000-26.5000 T25	Arbitrary Shape	4L203x203x19	(248211 kPa) A36	Equal Angle	L127x127x10	(248211 kPa) A36
26.5000-22.0000 T26	Arbitrary Shape	4L203x203x19	(248211 kPa) A36	Equal Angle	L127x127x10	(248211 kPa) A36
22.0000-17.0000 T27	Arbitrary Shape	4L203x203x19	(248211 kPa) A36	Equal Angle	L127x127x10	(248211 kPa) A36
17.0000-11.0000 T28	Arbitrary Shape	4L203x203x19	(248211 kPa) A36	Equal Angle	L127x127x10	(248211 kPa) A36
11.0000-6.0000 T29	Arbitrary Shape	4L203x203x19	(248211 kPa) A36	Equal Angle	L127x127x10	(248211 kPa) A36
6.0000-0.0000			(248211 kPa)			(248211 kPa)

Tower Section Geometry (cont'd)

<i>Tower Elevation m</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
T1 155.0000-149.00 00	Equal Angle	L38x38x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T2 149.0000-143.00 00	Equal Angle	L38x38x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T3 143.0000-142.00 00	Equal Angle	L38x38x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T4 142.0000-135.60 00	Equal Angle	L51x51x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T8 118.0000-115.00 00	Equal Angle	L64x64x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T9 115.0000-107.50 00	Equal Angle	L64x64x5	A36 (248211 kPa)	Equal Angle		A36 (248211 kPa)
T11 100.0000-95.000 0	Equal Angle	L64x64x5	A36 (248211 kPa)	Single Angle		A36 (248211 kPa)

Tower Section Geometry (cont'd)

<i>Tower Elevation m</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T18 58.0000-53.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T19 53.5000-49.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T20 49.0000-44.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T21 44.5000-40.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)

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<i>Tower Elevation</i> <i>m</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T22 40.0000-35.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T23 35.5000-31.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T24 31.0000-26.5000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T25 26.5000-22.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T26 22.0000-17.0000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T27 17.0000-11.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T28 11.0000-6.0000	None	Equal Angle		A36 (248211 kPa)	Solid Round	8	A36 (248211 kPa)
T29 6.0000-0.0000	None	Equal Angle		A36 (248211 kPa)	Equal Angle	L102x102x10	A36 (248211 kPa)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>m</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
T19 53.5000-49.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T21 44.5000-40.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T23 35.5000-31.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L76x76x6	A36 (248211 kPa)
T25 26.5000-22.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T27 17.0000-11.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)
T29 6.0000-0.0000	Solid Round		A36 (248211 kPa)	Equal Angle	L102x102x6	A36 (248211 kPa)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>m</i>	<i>Gusset Area (per face)</i> <i>m²</i>	<i>Gusset Thickness</i> <i>mm</i>	<i>Gusset Grade</i>	<i>Adjust. Factor A_r</i>	<i>Adjust. Factor A_r</i>	<i>Weight Mult.</i>	<i>Double Angle Stitch Bolt Spacing Diagonals mm</i>	<i>Double Angle Stitch Bolt Spacing Horizontals mm</i>
T1 155.0000-149.0000	0.0000	0	A36 (248211 kPa)	1	1	1.5	0	0
T2 149.0000-143.0000	0.0000	0	A36 (248211 kPa)	1	1	1.5	0	0
T3 143.0000-142.0000	0.0000	0	A36 (248211 kPa)	1	1	1.5	0	0
T4 142.0000-135.6000	0.0000	0	A36 (248211 kPa)	1.2	1	1.5	0	0
T5	0.0000	0	A36	1.2	1	1.5	0	0

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals mm	Double Angle Stitch Bolt Spacing Horizontals mm
m	m ²	mm						
135.6000-129.2000			(248211 kPa)					
T6	0.0000	0	A36	1.2	1	1.5	0	0
129.2000-122.8000			(248211 kPa)					
T7	0.0000	0	A36	1.2	1	1.5	0	0
122.8000-118.0000			(248211 kPa)					
T8	0.0000	0	A36	1.1	1	1.5	0	0
118.0000-115.0000			(248211 kPa)					
T9	0.0000	0	A36	1.2	1	1.5	0	0
115.0000-107.5000			(248211 kPa)					
T10	0.0000	0	A36	1.2	1	1.5	0	0
107.5000-100.0000			(248211 kPa)					
T11	0.0000	0	A36	1.4	1	1.5	0	0
100.0000-95.0000			(248211 kPa)					
T12	0.0000	0	A36	1.4	1	1.5	0	0
95.0000-89.5000			(248211 kPa)					
T13	0.0000	0	A36	1.4	1	1.5	0	0
89.5000-84.0000			(248211 kPa)					
T14	0.0000	0	A36	1.4	1	1.5	0	0
84.0000-77.5000			(248211 kPa)					
T15	0.0000	0	A36	1.4	1	1.5	0	0
77.5000-71.0000			(248211 kPa)					
T16	0.0000	0	A36	1.4	1	1.5	0	0
71.0000-64.5000			(248211 kPa)					
T17	0.0000	0	A36	1.4	1	1.5	0	0
64.5000-58.0000			(248211 kPa)					
T18	0.0000	0	A36	1.4	1	1.5	0	0
58.0000-53.5000			(248211 kPa)					
T19	0.0000	0	A36	1.4	1	1.5	0	0
53.5000-49.0000			(248211 kPa)					
T20	0.0000	0	A36	1.4	1	1.5	0	0
49.0000-44.5000			(248211 kPa)					
T21	0.0000	0	A36	1.4	1	1.5	0	0
44.5000-40.0000			(248211 kPa)					
T22	0.0000	0	A36	1.4	1	1.5	0	0
40.0000-35.5000			(248211 kPa)					
T23	0.0000	0	A36	1.4	1	1.5	0	0
35.5000-31.0000			(248211 kPa)					
T24	0.0000	0	A36	1.5	1	1.5	0	0
31.0000-26.5000			(248211 kPa)					

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals mm	Double Angle Stitch Bolt Spacing Horizontal mm
m	m ²	mm						
T25 26.5000-22.00 00	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
T26 22.0000-17.00 00	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
T27 17.0000-11.00 00	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
T28 11.0000-6.000 0	0.0000	0	A36 (248211 kPa)	1.5	1	1.5	0	0
T29 6.0000-0.0000	0.0000	0	A36 (248211 kPa)	1.6	1	1.5	0	0

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors'						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 155.0000-149. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 149.0000-143. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 143.0000-142. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 142.0000-135. 6000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 135.6000-129. 2000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 129.2000-122. 8000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 122.8000-118. 0000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 118.0000-115. 0000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 115.0000-107. 5000	No	No	0.5	1 1	1 1	1 1	1 0.5	1 1	1 1	1 1
T10 107.5000-100. 0000	No	No	0.5	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 100.0000-95.0 000	No	No	0.25	0.5 0.25	1 1	1 1	1 0.5	1 1	1 1	1 1

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Tower Elevation m	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T12	No	No	0.25	0.5	1	1	1	1	1	1
95.0000-89.50				0.25	1	1	1	1	1	1
00										
T13	No	No	0.25	0.5	1	1	1	1	1	1
89.5000-84.00				0.25	1	1	1	1	1	1
00										
T14	No	No	0.25	0.5	1	1	1	1	1	1
84.0000-77.50				0.25	1	1	1	1	1	1
00										
T15	No	No	0.25	0.5	1	1	1	1	1	1
77.5000-71.00				0.25	1	1	1	1	1	1
00										
T16	No	No	0.25	0.5	1	1	1	1	1	1
71.0000-64.50				0.25	1	1	1	1	1	1
00										
T17	No	No	0.25	0.5	1	1	1	1	1	1
64.5000-58.00				0.25	1	1	1	1	1	1
00										
T18	No	No	0.33	1	0.33	1	1	1	1	1
58.0000-53.50				1	0.33	1	1	1	1	1
00										
T19	No	No	0.33	1	0.33	1	1	0.5	1	0.5
53.5000-49.00				1	0.33	1	1	0.25	1	0.5
00										
T20	No	No	0.33	1	0.33	1	1	1	1	1
49.0000-44.50				1	0.33	1	1	1	1	1
00										
T21	No	No	0.33	1	0.33	1	1	0.5	1	0.5
44.5000-40.00				1	0.33	1	1	0.25	1	0.5
00										
T22	No	No	0.33	1	0.33	1	1	1	1	1
40.0000-35.50				1	0.33	1	1	1	1	1
00										
T23	No	No	0.33	1	0.33	1	1	0.5	1	0.5
35.5000-31.00				1	0.33	1	1	0.25	1	0.5
00										
T24	No	No	0.33	1	0.33	1	1	1	1	1
31.0000-26.50				1	0.33	1	1	1	1	1
00										
T25	No	No	0.33	1	0.33	1	1	0.5	1	0.5
26.5000-22.00				1	0.33	1	1	0.25	1	0.5
00										
T26	No	No	0.33	1	0.33	1	1	1	1	1
22.0000-17.00				1	0.33	1	1	1	1	1
00										
T27	No	No	0.25	1	0.25	1	1	0.5	1	0.5
17.0000-11.00				1	0.25	1	1	0.25	1	0.5
00										
T28	No	No	0.33	1	0.33	1	1	1	1	1
11.0000-6.000				1	0.33	1	1	1	1	1
0										
T29	No	No	0.25	1	0.25	1	1	0.5	1	0.5
6.0000-0.0000				1	0.25	1	1	0.25	1	0.5

¹Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

<i>RISATower</i> BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 10 of 93
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Tower Section Geometry (cont'd)

Tower Elevation m	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U	Net Width Deduct mm	U
T1 155.0000-149.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T2 149.0000-143.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T3 143.0000-142.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T4 142.0000-135.6000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T5 135.6000-129.2000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T6 129.2000-122.8000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T7 122.8000-118.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T8 118.0000-115.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T9 115.0000-107.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T10 107.5000-100.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T11 100.0000-95.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T12 95.0000-89.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T13 89.5000-84.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T14 84.0000-77.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T15 77.5000-71.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T16 71.0000-64.5000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75
T17 64.5000-58.0000	0	1	0	1	0	1	0	1	0	0.75	0	1	0	0.75

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Tower Elevation m	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.
T4 142.0000-135.6000	Sleeve SS	16 A394T0	12	16 A394T0	2	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T5 135.6000-129.2000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T6 129.2000-122.8000	Sleeve SS	19 A394T0	12	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T7 122.8000-118.0000	Sleeve SS	19 A394T0	14	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T8 118.0000-115.0000	Sleeve SS	19 A394T0	14	16 A394T0	4	16 A394T0	3	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T9 115.0000-107.5000	Sleeve SS	19 A394T0	14	16 A394T0	2	16 A394T0	3	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T10 107.5000-100.0000	Sleeve SS	19 A394T0	16	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T11 100.0000-95.0000	Sleeve SS	19 A394T0	16	16 A394T0	2	16 A394T0	3	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T12 95.0000-89.5000	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T13 89.5000-84.0000	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T14 84.0000-77.5000	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T15 77.5000-71.0000	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T16 71.0000-64.5000	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T17 64.5000-58.0000	Sleeve SS	25 A490X	32	16 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T18 58.0000-53.5000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T19 53.5000-49.0000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T20 49.0000-44.5000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T21 44.5000-40.0000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T22 40.0000-35.5000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0

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Tower Elevation m	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.	Bolt Size mm	No.
T23 35.5000-31.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T24 31.0000-26.50 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T25 26.5000-22.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T26 22.0000-17.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T27 17.0000-11.00 00	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0
T28 11.0000-6.000 0	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	0
T29 6.0000-0.0000	Sleeve SS	32 A490X	32	25 A394T0	2	16 A394T0	0	16 A394T0	0	16 A394T0	0	16 A394T0	2	16 A394T0	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement m	Total Number	Number Per Row	Clear Spacing mm	Width or Diameter mm	Perimeter mm	Weight kg/m
1 (8 ANT TV E)	D	No	Ar (CfAe)	142.0000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	D	No	Ar (CfAe)	139.5000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	D	No	Ar (CfAe)	137.0000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	113.0000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	111.5000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	110.0000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	108.5000 - 0.0000	2	2	32	32		0.86
1 (3 ANT TV E)	D	No	Ar (CfAe)	106.5000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	106.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	103.5000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	101.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	95.0000 - 0.0000	2	2	32	32		0.86
1 (4 ANT TV E)	D	No	Ar (CfAe)	92.5000 - 0.0000	2	2	32	32		0.86
1 (4 ANT MW E)	D	No	Ar (CfAe)	90.0000 - 0.0000	2	2	32	32		0.86

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 14 of 93
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Description	Face or Leg	Allow Shield	Component Type	Placement m	Total Number	Number Per Row	Clear Spacing mm	Width or Diameter mm	Perimeter mm	Weight kg/m
1 (2 ANT MW E)	D	No	Ar (CfAe)	88.0000 - 0.0000	1	1	32	32		0.86
1 (2 ANT MW E)	D	No	Ar (CfAe)	85.5000 - 0.0000	1	1	32	32		0.86
1 (2 ANT MW E)	D	No	Ar (CfAe)	83.0000 - 0.0000	1	1	32	32		0.86
7/8 (1 ANT MW E)	D	No	Ar (CfAe)	74.0000 - 0.0000	1	1	28	28		0.80
7/8 (1 ANT MW E)	D	No	Ar (CfAe)	66.5000 - 0.0000	1	1	28	28		0.80
7/8 (1 ANT MW E)	D	No	Ar (CfAe)	54.0000 - 0.0000	1	1	28	28		0.80
7/8 (2 ANT MW E)	D	No	Ar (CfAe)	24.5000 - 0.0000	2	2	28	28		0.80
1 (8 ANT TV E)	C	No	Ar (CfAe)	131.0000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	C	No	Ar (CfAe)	128.5000 - 0.0000	2	2	32	32		0.86
1 (8 ANT TV E)	C	No	Ar (CfAe)	126.0000 - 0.0000	2	2	32	32		0.86
3 (4 ANT UHF N)	C	No	Ar (CfAe)	153.0000 - 0.0000	1	1	76	76		2.65
3 (4 ANT UHF N)	C	No	Ar (CfAe)	152.0000 - 0.0000	1	1	76	76		2.65
3 (4 ANT UHF N)	C	No	Ar (CfAe)	151.0000 - 0.0000	1	1	76	76		2.65
3 (4 ANT UHF N)	C	No	Ar (CfAe)	150.0000 - 0.0000	1	1	76	76		2.65

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation m	Face	A _R m ²	A _F m ²	C _{AA} A _A In Face m ²	C _{AA} A _A Out Face m ²	Weight kg
T1	155.0000-149.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.765	0.000	0.000	0.000	26.49
		D	0.000	0.000	0.000	0.000	0.00
T2	149.0000-143.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	1.835	0.000	0.000	0.000	63.57
		D	0.000	0.000	0.000	0.000	0.00
T3	143.0000-142.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.306	0.000	0.000	0.000	10.60
		D	0.000	0.000	0.000	0.000	0.00
T4	142.0000-135.600 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	1.957	0.000	0.000	0.000	67.81
		D	0.743	0.000	0.000	0.000	20.20
T5	135.6000-129.200 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.072	0.000	0.000	0.000	70.92
		D	1.219	0.000	0.000	0.000	33.14
T6	129.2000-122.800 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.929	0.000	0.000	0.000	94.22
		D	1.219	0.000	0.000	0.000	33.14

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Tower Section	Tower Elevation m	Face	A_R m ²	A_F m ²	$C_A A_A$ In Face m ²	$C_A A_A$ Out Face m ²	Weight kg
T7	122.8000-118.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.382	0.000	0.000	0.000	75.72
		D	0.914	0.000	0.000	0.000	24.86
T8	118.0000-115.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	1.489	0.000	0.000	0.000	47.32
		D	0.572	0.000	0.000	0.000	15.54
T9	115.0000-107.500 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.722	0.000	0.000	0.000	118.31
		D	2.254	0.000	0.000	0.000	61.28
T10	107.5000-100.000 0	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.722	0.000	0.000	0.000	118.31
		D	4.413	0.000	0.000	0.000	119.98
T11	100.0000-95.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.482	0.000	0.000	0.000	78.87
		D	3.493	0.000	0.000	0.000	94.94
T12	95.0000-89.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.730	0.000	0.000	0.000	86.76
		D	4.413	0.000	0.000	0.000	119.98
T13	89.5000-84.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.730	0.000	0.000	0.000	86.76
		D	5.064	0.000	0.000	0.000	137.67
T14	84.0000-77.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.226	0.000	0.000	0.000	102.53
		D	6.366	0.000	0.000	0.000	173.06
T15	77.5000-71.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.226	0.000	0.000	0.000	102.53
		D	6.482	0.000	0.000	0.000	176.33
T16	71.0000-64.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.226	0.000	0.000	0.000	102.53
		D	6.637	0.000	0.000	0.000	180.75
T17	64.5000-58.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	3.226	0.000	0.000	0.000	102.53
		D	6.764	0.000	0.000	0.000	184.37
T18	58.0000-53.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.697	0.000	0.000	0.000	128.04
T19	53.5000-49.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.810	0.000	0.000	0.000	131.26
T20	49.0000-44.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.810	0.000	0.000	0.000	131.26
T21	44.5000-40.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.810	0.000	0.000	0.000	131.26
T22	40.0000-35.5000	A	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation m	Face	A_R m ²	A_F m ²	$C_A A_A$ In Face m ²	$C_A A_A$ Out Face m ²	Weight kg
T23	35.5000-31.0000	B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.810	0.000	0.000	0.000	131.26
		A	0.000	0.000	0.000	0.000	0.00
T24	31.0000-26.5000	B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.810	0.000	0.000	0.000	131.26
		A	0.000	0.000	0.000	0.000	0.00
T25	26.5000-22.0000	B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.810	0.000	0.000	0.000	131.26
		A	0.000	0.000	0.000	0.000	0.00
T26	22.0000-17.0000	B	0.000	0.000	0.000	0.000	0.00
		C	2.233	0.000	0.000	0.000	70.99
		D	4.951	0.000	0.000	0.000	135.27
		A	0.000	0.000	0.000	0.000	0.00
T27	17.0000-11.0000	B	0.000	0.000	0.000	0.000	0.00
		C	2.482	0.000	0.000	0.000	78.87
		D	5.626	0.000	0.000	0.000	153.88
		A	0.000	0.000	0.000	0.000	0.00
T28	11.0000-6.0000	B	0.000	0.000	0.000	0.000	0.00
		C	2.978	0.000	0.000	0.000	94.65
		D	6.751	0.000	0.000	0.000	184.65
		A	0.000	0.000	0.000	0.000	0.00
T29	6.0000-0.0000	B	0.000	0.000	0.000	0.000	0.00
		C	2.482	0.000	0.000	0.000	78.87
		D	5.626	0.000	0.000	0.000	153.88
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	2.978	0.000	0.000	0.000	94.65
		D	6.751	0.000	0.000	0.000	184.65
		A	0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation m	CP_X mm	CP_Z mm	CP_X Ice mm	CP_Z Ice mm
T1	155.0000-149.0000	43	0	43	0
T2	149.0000-143.0000	89	0	89	0
T3	143.0000-142.0000	93	0	93	0
T4	142.0000-135.6000	123	45	123	45
T5	135.6000-129.2000	125	71	125	71
T6	129.2000-122.8000	159	64	159	64
T7	122.8000-118.0000	168	63	168	63
T8	118.0000-115.0000	195	74	195	74
T9	115.0000-107.5000	333	200	333	200
T10	107.5000-100.0000	307	361	307	361
T11	100.0000-95.0000	309	431	309	431
T12	95.0000-89.5000	371	597	371	597
T13	89.5000-84.0000	374	690	374	690
T14	84.0000-77.5000	421	826	421	826
T15	77.5000-71.0000	464	928	464	928
T16	71.0000-64.5000	502	1029	502	1029
T17	64.5000-58.0000	538	1123	538	1123
T18	58.0000-53.5000	552	1157	552	1157
T19	53.5000-49.0000	472	1013	472	1013
T20	49.0000-44.5000	601	1291	601	1291
T21	44.5000-40.0000	504	1082	504	1082

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Section	Elevation	CP _X	CP _Z	CP _X Ice	CP _Z Ice
	m	mm	mm	mm	mm
T22	40.0000-35.5000	649	1392	649	1392
T23	35.5000-31.0000	533	1145	533	1145
T24	31.0000-26.5000	665	1429	665	1429
T25	26.5000-22.0000	530	1173	530	1173
T26	22.0000-17.0000	719	1627	719	1627
T27	17.0000-11.0000	631	1427	631	1427
T28	11.0000-6.0000	766	1733	766	1733
T29	6.0000-0.0000	597	1350	597	1350

User Defined Loads

Description	Elevation	Offset From Centroid	Azimuth Angle	Weight	F _x	F _z	Wind Force	C _A A _C
	m	m	°	kg	kg	kg	kg	m²
CxMANTENIMIENTO	155.0000	0.0000	0.0000	No Ice	320.00	0.00	0.00	0.0000
				Service	320.00	0.00	0.00	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C _A A _A Front	C _A A _A Side	Weight
			m m m	°	m		m²	m²	kg
2 ANT TV 0.15x0.60m (E)	A	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	C	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	142.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	A	From Face	1.0000 0.0000 0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	C	From Face	1.0000 0.0000 0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	D	From Face	0.0000 0.3000 0.0000	0.0000	139.5000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m	A	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _{AA} Front m ²	C _{AA} Side m ²	Weight kg
(E)			0.0000						
2 ANT TV 0.15x0.60m (E)	B	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	C	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
2 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	137.0000	No Ice	0.1800	0.0400	16.00
1 ANT TV 0.30x1.20m (E)	A	From Face	0.0000	0.0000	113.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	113.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	0.0000	0.0000	113.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	0.0000	0.0000	111.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	111.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	0.0000	0.0000	111.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	1.0000	0.0000	110.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	110.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	1.0000	0.0000	110.0000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	1.0000	0.0000	108.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	108.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	1.0000	0.0000	108.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	A	From Face	1.0000	0.0000	106.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	B	From Face	0.0000	0.0000	106.5000	No Ice	0.1500	0.0400	12.00
1 ANT TV 0.30x1.20m (E)	C	From Face	1.0000	0.0000	106.5000	No Ice	0.1500	0.0400	12.00
2 ANT TV 0.30x1.20m	D	From Face	0.0000	0.0000	106.0000	No Ice	0.3000	0.0800	24.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _{AA} Front m ²	C _{AA} Side m ²	Weight kg
(E)			0.0000 0.0000						
2 ANT TV 0.30x1.20m (E)	A	From Leg	0.6000 0.0000 0.0000	0.0000	106.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	103.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	A	From Leg	0.6000 0.0000 0.0000	0.0000	103.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	101.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	A	From Leg	0.6000 0.0000 0.0000	0.0000	101.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	95.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.0000 0.5000 0.0000	0.0000	95.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	92.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.6000 0.5000 0.0000	0.0000	92.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.5000 0.0000	0.0000	90.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	D	From Face	0.6000 0.5000 0.0000	0.0000	90.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	88.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	85.5000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.30x1.20m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	83.0000	No Ice	0.3000	0.0800	24.00
2 ANT TV 0.15x0.60m (E)	A	From Face	1.0000 0.0000 0.0000	0.0000	131.0000	No Ice	0.1800	0.0400	16.00
1 ANT TV 0.15x0.60m (E)	B	From Face	0.0000 0.0000 0.0000	0.0000	131.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	C	From Face	1.0000 0.0000 0.0000	0.0000	131.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	D	From Face	0.0000 0.0000 0.0000	0.0000	131.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m	A	From Face	1.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _{AA} Front m ²	C _{AA} Side m ²	Weight kg
(E)			0.0000						
1 ANT TV 0.15x0.60m (E)	B	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	C	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	128.5000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	A	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	B	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	C	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
1 ANT TV 0.15x0.60m (E)	D	From Face	0.0000	0.0000	126.0000	No Ice	0.0900	0.0200	8.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Leg	0.0000	0.0000	154.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	C	From Leg	0.0000	0.0000	154.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Leg	0.0000	0.0000	153.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Face	0.0000	0.0000	153.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	C	From Leg	0.0000	0.0000	153.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Leg	0.0000	0.0000	152.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Face	0.0000	0.0000	152.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	C	From Leg	0.0000	0.0000	152.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Leg	0.0000	0.0000	151.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	D	From Face	0.0000	0.0000	151.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL 1.0x0.50x0.19m (N)	C	From Leg	0.0000	0.0000	151.5000	No Ice	0.5000	0.2000	20.00
ANT PANEL	D	From Leg	0.0000	0.0000	150.5000	No Ice	0.5000	0.2000	20.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m		C _{AA} Front m ²	C _{AA} Side m ²	Weight kg
1.0x0.50x0.19m (N)			0.0000						
ANT PANEL	D	From Face	0.0000	0.0000	150.5000	No Ice	0.5000	0.2000	20.00
1.0x0.50x0.19m (N)			0.0000						
ANT PANEL	C	From Leg	1.0000	0.0000	150.5000	No Ice	0.5000	0.2000	20.00
1.0x0.50x0.19m (N)			0.0000						
ANT PANEL	D	From Leg	1.0000	0.0000	149.5000	No Ice	0.5000	0.2000	20.00
1.0x0.50x0.19m (N)			0.0000						
ANT PANEL	C	From Leg	1.0000	0.0000	149.5000	No Ice	0.5000	0.2000	20.00
1.0x0.50x0.19m (N)			0.0000						
			0.0000						

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert m	Azimuth Adjustment °	3 dB Beam Width °	Elevation m	Outside Diameter m	Aperture Area m ²	Weight kg
HP8-102 (1 ANT MW Ø2.40m E)	B	Paraboloid w/Shroud (HP)	From Leg	0.6000 0.0000 0.0000	Worst		74.0000	2.4384	No Ice 4.6693	113.85
HP12-21B (1 ANT MW Ø3.70m E)	D	Paraboloid w/Shroud (HP)	From Leg	0.6000 0.0000 0.0000	Worst		66.5000	3.6576	No Ice 10.5064	385.55
HP12-21B (1 ANT MW Ø3.70m E)	D	Paraboloid w/Shroud (HP)	From Leg	0.6000 0.0000 0.0000	Worst		54.0000	3.6576	No Ice 10.5064	385.55
6 FT DISH (1 ANT MW Ø1.80m E)	D	Paraboloid w/o Radome	From Leg	0.6000 0.0000 0.0000	Worst		24.5000	1.8288	No Ice 2.6264	64.86
6 FT DISH (1 ANT MW Ø1.80m E)	B	Paraboloid w/o Radome	From Leg	0.6000 0.0000 0.0000	Worst		24.5000	1.8288	No Ice 2.6264	64.86

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Tower Pressures - No Ice

$$G_H = 1.056$$

Section Elevation m	z m	K _z	q _z kPa	A _G m ²	F a c e	A _F m ²	A _R m ²	A _{leg} m ²	Leg %	C _A A _A In Face m ²	C _A A _A Out Face m ²
T1 155.0000-149. 0000	152.0000	2.172	1.48	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	0.765		49.02	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T2 149.0000-143. 0000	146.0000	2.148	1.46	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	1.835		32.86	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T3 143.0000-142. 0000	142.5000	2.133	1.45	0.875	A	0.294	0.000	0.183	62.36	0.000	0.000
					B	0.294	0.000		62.36	0.000	0.000
					C	0.294	0.306		30.55	0.000	0.000
					D	0.294	0.000		62.36	0.000	0.000
T4 142.0000-135. 6000	138.8000	2.117	1.44	7.213	A	1.469	0.000	0.000	0.00	0.000	0.000
					B	1.469	0.000		0.00	0.000	0.000
					C	1.469	1.957		0.00	0.000	0.000
					D	1.469	0.743		0.00	0.000	0.000
T5 135.6000-129. 2000	132.4000	2.088	1.42	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	2.072		0.00	0.000	0.000
					D	1.406	1.219		0.00	0.000	0.000
T6 129.2000-122. 8000	126.0000	2.059	1.40	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	2.929		0.00	0.000	0.000
					D	1.406	1.219		0.00	0.000	0.000
T7 122.8000-118. 0000	120.4000	2.032	1.39	5.410	A	1.054	0.000	0.000	0.00	0.000	0.000
					B	1.054	0.000		0.00	0.000	0.000
					C	1.054	2.382		0.00	0.000	0.000
					D	1.054	0.914		0.00	0.000	0.000
T8 118.0000-115. 0000	116.5000	2.013	1.37	6.098	A	1.355	0.000	0.000	0.00	0.000	0.000
					B	1.355	0.000		0.00	0.000	0.000
					C	1.355	1.489		0.00	0.000	0.000
					D	1.355	0.572		0.00	0.000	0.000
T9 115.0000-107. 5000	111.2500	1.987	1.35	21.952	A	2.497	0.000	0.000	0.00	0.000	0.000
					B	2.497	0.000		0.00	0.000	0.000
					C	2.497	3.722		0.00	0.000	0.000
					D	2.497	2.254		0.00	0.000	0.000
T10 107.5000-100. 0000	103.7500	1.948	1.33	21.952	A	2.294	0.000	0.000	0.00	0.000	0.000
					B	2.294	0.000		0.00	0.000	0.000
					C	2.294	3.722		0.00	0.000	0.000
					D	2.294	4.413		0.00	0.000	0.000
T11 100.0000-95.0 000	97.5000	1.914	1.30	16.036	A	1.631	0.000	0.000	0.00	0.000	0.000
					B	1.631	0.000		0.00	0.000	0.000
					C	1.631	2.482		0.00	0.000	0.000
					D	1.631	3.493		0.00	0.000	0.000
T12 95.0000-89.50 00	92.2500	1.884	1.28	20.585	A	1.567	0.000	0.000	0.00	0.000	0.000
					B	1.567	0.000		0.00	0.000	0.000
					C	1.567	2.730		0.00	0.000	0.000
					D	1.567	4.413		0.00	0.000	0.000
T13 89.5000-84.00 00	86.7500	1.851	1.26	23.670	A	1.890	0.000	0.000	0.00	0.000	0.000
					B	1.890	0.000		0.00	0.000	0.000
					C	1.890	2.730		0.00	0.000	0.000
					D	1.890	5.064		0.00	0.000	0.000
T14	80.7500	1.813	1.24	31.952	A	2.221	0.000	0.000	0.00	0.000	0.000

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 23 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	z m	K _Z	q _Z kPa	A _G m ²	F a c e	A _F m ²	A _R m ²	A _{leg} m ²	Leg %	C _A A _A In Face m ²	C _A A _A Out Face m ²
84.0000-77.5000					B	2.221	0.000		0.00	0.000	0.000
					C	2.221	3.226		0.00	0.000	0.000
					D	2.221	6.366		0.00	0.000	0.000
T15	74.2500	1.77	1.21	36.262	A	2.343	0.000	0.000	0.00	0.000	0.000
77.5000-71.0000					B	2.343	0.000		0.00	0.000	0.000
					C	2.343	3.226		0.00	0.000	0.000
					D	2.343	6.482		0.00	0.000	0.000
T16	67.7500	1.725	1.18	40.571	A	2.472	0.000	0.000	0.00	0.000	0.000
71.0000-64.5000					B	2.472	0.000		0.00	0.000	0.000
					C	2.472	3.226		0.00	0.000	0.000
					D	2.472	6.637		0.00	0.000	0.000
T17	61.2500	1.676	1.14	44.881	A	2.608	0.000	0.000	0.00	0.000	0.000
64.5000-58.0000					B	2.608	0.000		0.00	0.000	0.000
					C	2.608	3.226		0.00	0.000	0.000
					D	2.608	6.764		0.00	0.000	0.000
T18	55.7500	1.631	1.11	33.825	A	1.994	0.000	0.000	0.00	0.000	0.000
58.0000-53.5000					B	1.994	0.000		0.00	0.000	0.000
					C	1.994	2.233		0.00	0.000	0.000
					D	1.994	4.697		0.00	0.000	0.000
T19	51.2500	1.592	1.09	35.891	A	2.872	0.000	0.000	0.00	0.000	0.000
53.5000-49.0000					B	2.872	0.000		0.00	0.000	0.000
					C	2.872	2.233		0.00	0.000	0.000
					D	2.872	4.810		0.00	0.000	0.000
T20	46.7500	1.551	1.06	37.956	A	2.089	0.000	0.000	0.00	0.000	0.000
49.0000-44.5000					B	2.089	0.000		0.00	0.000	0.000
					C	2.089	2.233		0.00	0.000	0.000
					D	2.089	4.810		0.00	0.000	0.000
T21	42.2500	1.507	1.03	40.022	A	3.084	0.000	0.000	0.00	0.000	0.000
44.5000-40.0000					B	3.084	0.000		0.00	0.000	0.000
					C	3.084	2.233		0.00	0.000	0.000
					D	3.084	4.810		0.00	0.000	0.000
T22	37.7500	1.459	0.99	42.087	A	2.203	0.000	0.000	0.00	0.000	0.000
40.0000-35.5000					B	2.203	0.000		0.00	0.000	0.000
					C	2.203	2.233		0.00	0.000	0.000
					D	2.203	4.810		0.00	0.000	0.000
T23	33.2500	1.407	0.96	44.153	A	3.302	0.000	0.000	0.00	0.000	0.000
35.5000-31.0000					B	3.302	0.000		0.00	0.000	0.000
					C	3.302	2.233		0.00	0.000	0.000
					D	3.302	4.810		0.00	0.000	0.000
T24	28.7500	1.35	0.92	46.218	A	2.489	0.000	0.000	0.00	0.000	0.000
31.0000-26.5000					B	2.489	0.000		0.00	0.000	0.000
					C	2.489	2.233		0.00	0.000	0.000
					D	2.489	4.810		0.00	0.000	0.000
T25	24.2500	1.286	0.88	48.284	A	3.776	0.000	0.000	0.00	0.000	0.000
26.5000-22.0000					B	3.776	0.000		0.00	0.000	0.000
					C	3.776	2.233		0.00	0.000	0.000
					D	3.776	4.951		0.00	0.000	0.000
T26	19.5000	1.208	0.82	56.071	A	2.747	0.000	0.000	0.00	0.000	0.000
22.0000-17.0000					B	2.747	0.000		0.00	0.000	0.000
					C	2.747	2.482		0.00	0.000	0.000
					D	2.747	5.626		0.00	0.000	0.000
T27	14.0000	1.099	0.75	70.652	A	4.428	0.000	0.000	0.00	0.000	0.000
17.0000-11.0000					B	4.428	0.000		0.00	0.000	0.000
					C	4.428	2.978		0.00	0.000	0.000
					D	4.428	6.751		0.00	0.000	0.000
T28	8.5000	1	0.68	61.681	A	2.909	0.000	0.000	0.00	0.000	0.000
11.0000-6.0000					B	2.909	0.000		0.00	0.000	0.000
					C	2.909	2.482		0.00	0.000	0.000
					D	2.909	5.626		0.00	0.000	0.000
T29	3.0000	1	0.68	77.384	A	5.522	0.000	0.000	0.00	0.000	0.000

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	z	K _Z	q _Z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
m	m		kPa	m ²		m ²	m ²	m ²		m ²	m ²
6.0000-0.0000					B	5.522	0.000		0.00	0.000	0.000
					C	5.522	2.978		0.00	0.000	0.000
					D	5.522	6.751		0.00	0.000	0.000

Tower Pressure - Service

$$G_H = 1.056$$

Section Elevation	z	K _Z	q _Z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
m	m		kPa	m ²		m ²	m ²	m ²		m ²	m ²
T1 155.0000-149.0000	152.0000	2.172	0.37	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	0.765		49.02	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T2 149.0000-143.0000	146.0000	2.148	0.37	4.195	A	1.412	0.000	1.067	75.56	0.000	0.000
					B	1.412	0.000		75.56	0.000	0.000
					C	1.412	1.835		32.86	0.000	0.000
					D	1.412	0.000		75.56	0.000	0.000
T3 143.0000-142.0000	142.5000	2.133	0.36	0.875	A	0.294	0.000	0.183	62.36	0.000	0.000
					B	0.294	0.000		62.36	0.000	0.000
					C	0.294	0.306		30.55	0.000	0.000
					D	0.294	0.000		62.36	0.000	0.000
T4 142.0000-135.6000	138.8000	2.117	0.36	7.213	A	1.469	0.000	0.000	0.00	0.000	0.000
					B	1.469	0.000		0.00	0.000	0.000
					C	1.469	1.957		0.00	0.000	0.000
					D	1.469	0.743		0.00	0.000	0.000
T5 135.6000-129.2000	132.4000	2.088	0.36	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	2.072		0.00	0.000	0.000
					D	1.406	1.219		0.00	0.000	0.000
T6 129.2000-122.8000	126.0000	2.059	0.35	7.213	A	1.406	0.000	0.000	0.00	0.000	0.000
					B	1.406	0.000		0.00	0.000	0.000
					C	1.406	2.929		0.00	0.000	0.000
					D	1.406	1.219		0.00	0.000	0.000
T7 122.8000-118.0000	120.4000	2.032	0.35	5.410	A	1.054	0.000	0.000	0.00	0.000	0.000
					B	1.054	0.000		0.00	0.000	0.000
					C	1.054	2.382		0.00	0.000	0.000
					D	1.054	0.914		0.00	0.000	0.000
T8 118.0000-115.0000	116.5000	2.013	0.34	6.098	A	1.355	0.000	0.000	0.00	0.000	0.000
					B	1.355	0.000		0.00	0.000	0.000
					C	1.355	1.489		0.00	0.000	0.000
					D	1.355	0.572		0.00	0.000	0.000
T9 115.0000-107.5000	111.2500	1.987	0.34	21.952	A	2.497	0.000	0.000	0.00	0.000	0.000
					B	2.497	0.000		0.00	0.000	0.000
					C	2.497	3.722		0.00	0.000	0.000
					D	2.497	2.254		0.00	0.000	0.000
T10 107.5000-100.0000	103.7500	1.948	0.33	21.952	A	2.294	0.000	0.000	0.00	0.000	0.000
					B	2.294	0.000		0.00	0.000	0.000
					C	2.294	3.722		0.00	0.000	0.000
					D	2.294	4.413		0.00	0.000	0.000
T11 100.0000-95.0000	97.5000	1.914	0.33	16.036	A	1.631	0.000	0.000	0.00	0.000	0.000
					B	1.631	0.000		0.00	0.000	0.000
					C	1.631	2.482		0.00	0.000	0.000
					D	1.631	3.493		0.00	0.000	0.000

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	z m	K _Z	q _Z kPa	A _G m ²	F a c e	A _F m ²	A _R m ²	A _{leg} m ²	Leg %	C _A A _A In Face m ²	C _A A _A Out Face m ²
T12 95.0000-89.50 00	92.2500	1.884	0.32	20.585	A	1.567	0.000	0.000	0.00	0.000	0.000
					B	1.567	0.000		0.00	0.000	0.000
					C	1.567	2.730		0.00	0.000	0.000
					D	1.567	4.413		0.00	0.000	0.000
T13 89.5000-84.00 00	86.7500	1.851	0.32	23.670	A	1.890	0.000	0.000	0.00	0.000	0.000
					B	1.890	0.000		0.00	0.000	0.000
					C	1.890	2.730		0.00	0.000	0.000
					D	1.890	5.064		0.00	0.000	0.000
T14 84.0000-77.50 00	80.7500	1.813	0.31	31.952	A	2.221	0.000	0.000	0.00	0.000	0.000
					B	2.221	0.000		0.00	0.000	0.000
					C	2.221	3.226		0.00	0.000	0.000
					D	2.221	6.366		0.00	0.000	0.000
T15 77.5000-71.00 00	74.2500	1.77	0.30	36.262	A	2.343	0.000	0.000	0.00	0.000	0.000
					B	2.343	0.000		0.00	0.000	0.000
					C	2.343	3.226		0.00	0.000	0.000
					D	2.343	6.482		0.00	0.000	0.000
T16 71.0000-64.50 00	67.7500	1.725	0.29	40.571	A	2.472	0.000	0.000	0.00	0.000	0.000
					B	2.472	0.000		0.00	0.000	0.000
					C	2.472	3.226		0.00	0.000	0.000
					D	2.472	6.637		0.00	0.000	0.000
T17 64.5000-58.00 00	61.2500	1.676	0.29	44.881	A	2.608	0.000	0.000	0.00	0.000	0.000
					B	2.608	0.000		0.00	0.000	0.000
					C	2.608	3.226		0.00	0.000	0.000
					D	2.608	6.764		0.00	0.000	0.000
T18 58.0000-53.50 00	55.7500	1.631	0.28	33.825	A	1.994	0.000	0.000	0.00	0.000	0.000
					B	1.994	0.000		0.00	0.000	0.000
					C	1.994	2.233		0.00	0.000	0.000
					D	1.994	4.697		0.00	0.000	0.000
T19 53.5000-49.00 00	51.2500	1.592	0.27	35.891	A	2.872	0.000	0.000	0.00	0.000	0.000
					B	2.872	0.000		0.00	0.000	0.000
					C	2.872	2.233		0.00	0.000	0.000
					D	2.872	4.810		0.00	0.000	0.000
T20 49.0000-44.50 00	46.7500	1.551	0.26	37.956	A	2.089	0.000	0.000	0.00	0.000	0.000
					B	2.089	0.000		0.00	0.000	0.000
					C	2.089	2.233		0.00	0.000	0.000
					D	2.089	4.810		0.00	0.000	0.000
T21 44.5000-40.00 00	42.2500	1.507	0.26	40.022	A	3.084	0.000	0.000	0.00	0.000	0.000
					B	3.084	0.000		0.00	0.000	0.000
					C	3.084	2.233		0.00	0.000	0.000
					D	3.084	4.810		0.00	0.000	0.000
T22 40.0000-35.50 00	37.7500	1.459	0.25	42.087	A	2.203	0.000	0.000	0.00	0.000	0.000
					B	2.203	0.000		0.00	0.000	0.000
					C	2.203	2.233		0.00	0.000	0.000
					D	2.203	4.810		0.00	0.000	0.000
T23 35.5000-31.00 00	33.2500	1.407	0.24	44.153	A	3.302	0.000	0.000	0.00	0.000	0.000
					B	3.302	0.000		0.00	0.000	0.000
					C	3.302	2.233		0.00	0.000	0.000
					D	3.302	4.810		0.00	0.000	0.000
T24 31.0000-26.50 00	28.7500	1.35	0.23	46.218	A	2.489	0.000	0.000	0.00	0.000	0.000
					B	2.489	0.000		0.00	0.000	0.000
					C	2.489	2.233		0.00	0.000	0.000
					D	2.489	4.810		0.00	0.000	0.000
T25 26.5000-22.00 00	24.2500	1.286	0.22	48.284	A	3.776	0.000	0.000	0.00	0.000	0.000
					B	3.776	0.000		0.00	0.000	0.000
					C	3.776	2.233		0.00	0.000	0.000
					D	3.776	4.951		0.00	0.000	0.000
T26 22.0000-17.00 00	19.5000	1.208	0.21	56.071	A	2.747	0.000	0.000	0.00	0.000	0.000
					B	2.747	0.000		0.00	0.000	0.000
					C	2.747	2.482		0.00	0.000	0.000
					D	2.747	5.626		0.00	0.000	0.000

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 26 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	z m	K _Z	q _Z kPa	A _G m ²	F a c e m ²	A _F m ²	A _R m ²	A _{leg} m ²	Leg % %	C _A A _A In Face m ²	C _A A _A Out Face m ²
T27 17.0000-11.00 00	14.0000	1.099	0.19	70.652	A	4.428	0.000	0.000	0.00	0.000	0.000
					B	4.428	0.000		0.00	0.000	0.000
					C	4.428	2.978		0.00	0.000	0.000
					D	4.428	6.751		0.00	0.000	0.000
T28 11.0000-6.000 0	8.5000	1	0.17	61.681	A	2.909	0.000	0.000	0.00	0.000	0.000
					B	2.909	0.000		0.00	0.000	0.000
					C	2.909	2.482		0.00	0.000	0.000
					D	2.909	5.626		0.00	0.000	0.000
T29 6.0000-0.0000	3.0000	1	0.17	77.384	A	5.522	0.000	0.000	0.00	0.000	0.000
					B	5.522	0.000		0.00	0.000	0.000
					C	5.522	2.978		0.00	0.000	0.000
					D	5.522	6.751		0.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation m	Add Weight kg	Self Weight kg	F a c e m ²	e m	C _F	R _R	D _F	D _R	A _E m ²	F kg	w kg/m	Ctrl. Face
T1 155.0000-149. 0000	26.49	476.17	A	0.337	2.467	0.628	1	1	1.412	627.43	104.57	C
			B	0.337	2.467	0.628	1	1	1.412			
			C	0.519	2.016	0.707	1	1	1.953			
			D	0.337	2.467	0.628	1	1	1.412			
T2 149.0000-143. 0000	63.57	476.17	A	0.337	2.467	0.628	1	1	1.412	870.27	145.05	C
			B	0.337	2.467	0.628	1	1	1.412			
			C	0.774	1.83	0.875	1	1	3.018			
			D	0.337	2.467	0.628	1	1	1.412			
T3 143.0000-142. 0000	10.60	105.23	A	0.336	2.47	0.627	1	1	0.294	155.47	155.47	C
			B	0.336	2.47	0.627	1	1	0.294			
			C	0.685	1.835	0.809	1	1	0.541			
			D	0.336	2.47	0.627	1	1	0.294			
T4 142.0000-135. 6000	88.01	2449.64	A	0.204	2.964	0.591	1	1	1.469	916.53	143.21	C
			B	0.204	2.964	0.591	1	1	1.469			
			C	0.475	2.1	0.685	1	1	2.810			
			D	0.307	2.567	0.618	1	1	1.928			
T5 135.6000-129. 2000	104.06	2427.92	A	0.195	3.002	0.589	1	1	1.406	905.05	141.41	C
			B	0.195	3.002	0.589	1	1	1.406			
			C	0.482	2.085	0.689	1	1	2.832			
			D	0.364	2.383	0.638	1	1	2.183			
T6 129.2000-122. 8000	127.37	2427.92	A	0.195	3.002	0.589	1	1	1.406	1037.11	162.05	C
			B	0.195	3.002	0.589	1	1	1.406			
			C	0.601	1.899	0.754	1	1	3.615			
			D	0.364	2.383	0.638	1	1	2.183			
T7 122.8000-118. 0000	100.58	1820.94	A	0.195	3.002	0.589	1	1	1.054	807.88	168.31	C
			B	0.195	3.002	0.589	1	1	1.054			
			C	0.635	1.866	0.776	1	1	2.903			
			D	0.364	2.383	0.638	1	1	1.637			
T8 118.0000-115. 0000	62.86	1956.71	A	0.222	2.887	0.595	1	1	1.355	741.33	247.11	C
			B	0.222	2.887	0.595	1	1	1.355			
			C	0.466	2.119	0.681	1	1	2.368			
			D	0.316	2.535	0.621	1	1	1.709			
T9 115.0000-107. 5000	179.59	6574.59	A	0.114	3.381	0.577	1	1	2.497	1843.38	245.78	C
			B	0.114	3.381	0.577	1	1	2.497			
			C	0.283	2.649	0.611	1	1	4.771			
			D	0.216	2.91	0.594	1	1	3.836			
T10 107.5000-100.	238.28	6497.85	A	0.104	3.427	0.576	1	1	2.294	1844.39	245.92	D
			B	0.104	3.427	0.576	1	1	2.294			

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 27 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation m	Add Weight kg	Self Weight kg	F a c e	e	C _F	R _R	D _F	D _R	A _E m ²	F kg	w kg/m	Ctrl. Face
0000			C	0.274	2.684	0.608	1	1	4.558			
			D	0.306	2.571	0.618	1	1	5.019			
T11	173.82	5010.78	A	0.102	3.441	0.575	1	1	1.631	1347.70	269.54	D
100.0000-95.0000			B	0.102	3.441	0.575	1	1	1.631			
			C	0.256	2.75	0.604	1	1	3.129			
			D	0.32	2.523	0.622	1	1	3.804			
T12	206.74	5440.05	A	0.076	3.574	0.573	1	1	1.567	1549.41	281.71	D
95.0000-89.5000			B	0.076	3.574	0.573	1	1	1.567			
			C	0.209	2.943	0.592	1	1	3.184			
			D	0.291	2.623	0.613	1	1	4.273			
T13	224.43	5577.94	A	0.08	3.554	0.573	1	1	1.890	1773.51	322.46	D
89.5000-84.0000			B	0.08	3.554	0.573	1	1	1.890			
			C	0.195	3.001	0.589	1	1	3.499			
			D	0.294	2.612	0.614	1	1	5.000			
T14	275.59	6582.07	A	0.07	3.609	0.572	1	1	2.221	2188.53	336.70	D
84.0000-77.5000			B	0.07	3.609	0.572	1	1	2.221			
			C	0.17	3.11	0.585	1	1	4.108			
			D	0.269	2.703	0.607	1	1	6.084			
T15	278.87	7103.96	A	0.065	3.635	0.572	1	1	2.343	2268.31	348.97	D
77.5000-71.0000			B	0.065	3.635	0.572	1	1	2.343			
			C	0.154	3.188	0.582	1	1	4.221			
			D	0.243	2.801	0.6	1	1	6.234			
T16	283.29	7180.28	A	0.061	3.655	0.572	1	1	2.472	2339.63	359.94	D
71.0000-64.5000			B	0.061	3.655	0.572	1	1	2.472			
			C	0.14	3.25	0.58	1	1	4.344			
			D	0.225	2.877	0.596	1	1	6.426			
T17	286.90	7261.17	A	0.058	3.671	0.572	1	1	2.608	2392.81	368.12	D
64.5000-58.0000			B	0.058	3.671	0.572	1	1	2.608			
			C	0.13	3.301	0.579	1	1	4.475			
			D	0.209	2.942	0.592	1	1	6.614			
T18	199.03	7508.13	A	0.059	3.666	0.572	1	1	1.994	1705.13	378.92	D
58.0000-53.5000			B	0.059	3.666	0.572	1	1	1.994			
			C	0.125	3.325	0.578	1	1	3.285			
			D	0.198	2.989	0.59	1	1	4.765			
T19	202.24	8136.12	A	0.08	3.554	0.573	1	1	2.872	1953.88	434.19	D
53.5000-49.0000			B	0.08	3.554	0.573	1	1	2.872			
			C	0.142	3.242	0.58	1	1	4.168			
			D	0.214	2.921	0.593	1	1	5.725			
T20	202.24	7572.73	A	0.055	3.687	0.572	1	1	2.089	1710.42	380.09	D
49.0000-44.5000			B	0.055	3.687	0.572	1	1	2.089			
			C	0.114	3.38	0.577	1	1	3.376			
			D	0.182	3.06	0.587	1	1	4.911			
T21	202.24	8273.58	A	0.077	3.569	0.573	1	1	3.084	1958.94	435.32	D
44.5000-40.0000			B	0.077	3.569	0.573	1	1	3.084			
			C	0.133	3.287	0.579	1	1	4.377			
			D	0.197	2.992	0.59	1	1	5.921			
T22	202.24	7641.63	A	0.052	3.702	0.571	1	1	2.203	1678.96	373.10	D
40.0000-35.5000			B	0.052	3.702	0.571	1	1	2.203			
			C	0.105	3.423	0.576	1	1	3.489			
			D	0.167	3.128	0.584	1	1	5.013			
T23	202.24	8414.73	A	0.075	3.581	0.573	1	1	3.302	1930.20	428.93	D
35.5000-31.0000			B	0.075	3.581	0.573	1	1	3.302			
			C	0.125	3.323	0.578	1	1	4.593			
			D	0.184	3.051	0.587	1	1	6.126			
T24	202.24	7714.21	A	0.054	3.694	0.571	1	1	2.489	1660.72	369.05	D
31.0000-26.5000			B	0.054	3.694	0.571	1	1	2.489			
			C	0.102	3.439	0.575	1	1	3.774			
			D	0.158	3.168	0.583	1	1	5.292			
T25	206.26	8669.65	A	0.078	3.563	0.573	1	1	3.776	1931.68	429.26	D
26.5000-22.0000			B	0.078	3.563	0.573	1	1	3.776			

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
00			C	0.124	3.328	0.578	1	1	5.067			
			D	0.181	3.064	0.587	1	1	6.681			
T26	232.75	8557.24	A	0.049	3.721	0.571	1	1	2.747	1711.60	342.32	D
22.0000-17.00			B	0.049	3.721	0.571	1	1	2.747			
00			C	0.093	3.485	0.574	1	1	4.172			
			D	0.149	3.208	0.581	1	1	6.018			
T27	279.30	11150.13	A	0.063	3.646	0.572	1	1	4.428	2135.71	355.95	D
17.0000-11.00			B	0.063	3.646	0.572	1	1	4.428			
00			C	0.105	3.425	0.576	1	1	6.142			
			D	0.158	3.167	0.583	1	1	8.363			
T28	232.75	8649.38	A	0.047	3.731	0.571	1	1	2.909	1476.26	295.25	D
11.0000-6.000			B	0.047	3.731	0.571	1	1	2.909			
0			C	0.087	3.515	0.574	1	1	4.333			
			D	0.138	3.26	0.58	1	1	6.171			
T29	279.30	11868.95	A	0.071	3.599	0.573	1	1	5.522	2196.22	366.04	D
6.0000-0.0000			B	0.071	3.599	0.573	1	1	5.522			
			C	0.11	3.4	0.576	1	1	7.238			
			D	0.159	3.165	0.583	1	1	9.457			
Sum Weight:	5373.88	173525.86						OTM	2943253	45658.44		
									kg-m			

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T1	26.49	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	752.92	125.49	C
155.0000-149.0000			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.519	2.016	0.707	1.2	1.2	2.343			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T2	63.57	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	1044.33	174.05	C
149.0000-143.0000			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.774	1.83	0.875	1.2	1.2	3.622			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T3	10.60	105.23	A	0.336	2.47	0.627	1.2	1.2	0.352	186.56	186.56	C
143.0000-142.0000			B	0.336	2.47	0.627	1.2	1.2	0.352			
			C	0.685	1.835	0.809	1.2	1.2	0.650			
			D	0.336	2.47	0.627	1.2	1.2	0.352			
T4	88.01	2449.64	A	0.204	2.964	0.591	1.153	1.153	1.693	1099.84	171.85	C
142.0000-135.6000			B	0.204	2.964	0.591	1.153	1.153	1.693			
			C	0.475	2.1	0.685	1.2	1.2	3.372			
			D	0.307	2.567	0.618	1.2	1.2	2.314			
T5	104.06	2427.92	A	0.195	3.002	0.589	1.146	1.146	1.611	1086.05	169.70	C
135.6000-129.2000			B	0.195	3.002	0.589	1.146	1.146	1.611			
			C	0.482	2.085	0.689	1.2	1.2	3.398			
			D	0.364	2.383	0.638	1.2	1.2	2.620			
T6	127.37	2427.92	A	0.195	3.002	0.589	1.146	1.146	1.611	1244.53	194.46	C
129.2000-122.8000			B	0.195	3.002	0.589	1.146	1.146	1.611			
			C	0.601	1.899	0.754	1.2	1.2	4.338			
			D	0.364	2.383	0.638	1.2	1.2	2.620			
T7	100.58	1820.94	A	0.195	3.002	0.589	1.146	1.146	1.208	969.45	201.97	C
122.8000-118.0000			B	0.195	3.002	0.589	1.146	1.146	1.208			
			C	0.635	1.866	0.776	1.2	1.2	3.483			
			D	0.364	2.383	0.638	1.2	1.2	1.965			
T8	62.86	1956.71	A	0.222	2.887	0.595	1.167	1.167	1.580	889.59	296.53	C

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
118.0000-115.0000			B	0.222	2.887	0.595	1.167	1.167	1.580			
			C	0.466	2.119	0.681	1.2	1.2	2.842			
			D	0.316	2.535	0.621	1.2	1.2	2.051			
T9	179.59	6574.59	A	0.114	3.381	0.577	1.085	1.085	2.710	2212.06	294.94	C
115.0000-107.5000			B	0.114	3.381	0.577	1.085	1.085	2.710			
			C	0.283	2.649	0.611	1.2	1.2	5.726			
			D	0.216	2.91	0.594	1.162	1.162	4.459			
T10	238.28	6497.85	A	0.104	3.427	0.576	1.078	1.078	2.473	2213.27	295.10	D
107.5000-100.0000			B	0.104	3.427	0.576	1.078	1.078	2.473			
			C	0.274	2.684	0.608	1.2	1.2	5.470			
			D	0.306	2.571	0.618	1.2	1.2	6.023			
T11	173.82	5010.78	A	0.102	3.441	0.575	1.076	1.076	1.756	1617.24	323.45	D
100.0000-95.0000			B	0.102	3.441	0.575	1.076	1.076	1.756			
			C	0.256	2.75	0.604	1.192	1.192	3.731			
			D	0.32	2.523	0.622	1.2	1.2	4.564			
T12	206.74	5440.05	A	0.076	3.574	0.573	1.057	1.057	1.657	1859.30	338.05	D
95.0000-89.5000			B	0.076	3.574	0.573	1.057	1.057	1.657			
			C	0.209	2.943	0.592	1.157	1.157	3.683			
			D	0.291	2.623	0.613	1.2	1.2	5.128			
T13	224.43	5577.94	A	0.08	3.554	0.573	1.06	1.06	2.004	2128.21	386.95	D
89.5000-84.0000			B	0.08	3.554	0.573	1.06	1.06	2.004			
			C	0.195	3.001	0.589	1.146	1.146	4.012			
			D	0.294	2.612	0.614	1.2	1.2	6.000			
T14	275.59	6582.07	A	0.07	3.609	0.572	1.052	1.052	2.337	2626.23	404.04	D
84.0000-77.5000			B	0.07	3.609	0.572	1.052	1.052	2.337			
			C	0.17	3.11	0.585	1.128	1.128	4.633			
			D	0.269	2.703	0.607	1.2	1.2	7.301			
T15	278.87	7103.96	A	0.065	3.635	0.572	1.048	1.048	2.457	2682.36	412.67	D
77.5000-71.0000			B	0.065	3.635	0.572	1.048	1.048	2.457			
			C	0.154	3.188	0.582	1.115	1.115	4.707			
			D	0.243	2.801	0.6	1.183	1.183	7.372			
T16	283.29	7180.28	A	0.061	3.655	0.572	1.046	1.046	2.585	2733.62	420.56	D
71.0000-64.5000			B	0.061	3.655	0.572	1.046	1.046	2.585			
			C	0.14	3.25	0.58	1.105	1.105	4.801			
			D	0.225	2.877	0.596	1.168	1.168	7.508			
T17	286.90	7261.17	A	0.058	3.671	0.572	1.044	1.044	2.722	2767.56	425.78	D
64.5000-58.0000			B	0.058	3.671	0.572	1.044	1.044	2.722			
			C	0.13	3.301	0.579	1.097	1.097	4.911			
			D	0.209	2.942	0.592	1.157	1.157	7.650			
T18	199.03	7508.13	A	0.059	3.666	0.572	1.044	1.044	2.083	1958.11	435.14	D
58.0000-53.5000			B	0.059	3.666	0.572	1.044	1.044	2.083			
			C	0.125	3.325	0.578	1.094	1.094	3.593			
			D	0.198	2.989	0.59	1.148	1.148	5.472			
T19	202.24	8136.12	A	0.08	3.554	0.573	1.06	1.06	3.044	2267.50	503.89	D
53.5000-49.0000			B	0.08	3.554	0.573	1.06	1.06	3.044			
			C	0.142	3.242	0.58	1.107	1.107	4.612			
			D	0.214	2.921	0.593	1.161	1.161	6.644			
T20	202.24	7572.73	A	0.055	3.687	0.572	1.041	1.041	2.175	1943.56	431.90	D
49.0000-44.5000			B	0.055	3.687	0.572	1.041	1.041	2.175			
			C	0.114	3.38	0.577	1.085	1.085	3.665			
			D	0.182	3.06	0.587	1.136	1.136	5.581			
T21	202.24	8273.58	A	0.077	3.569	0.573	1.058	1.058	3.262	2248.72	499.72	D
44.5000-40.0000			B	0.077	3.569	0.573	1.058	1.058	3.262			
			C	0.133	3.287	0.579	1.1	1.1	4.814			
			D	0.197	2.992	0.59	1.148	1.148	6.797			
T22	202.24	7641.63	A	0.052	3.702	0.571	1.039	1.039	2.290	1888.78	419.73	D
40.0000-35.5000			B	0.052	3.702	0.571	1.039	1.039	2.290			
			C	0.105	3.423	0.576	1.079	1.079	3.765			
			D	0.167	3.128	0.584	1.125	1.125	5.639			
T23	202.24	8414.73	A	0.075	3.581	0.573	1.056	1.056	3.487	2196.17	488.04	D

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 30 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
35.5000-31.0000			B	0.075	3.581	0.573	1.056	1.056	3.487			
			C	0.125	3.323	0.578	1.094	1.094	5.025			
			D	0.184	3.051	0.587	1.138	1.138	6.971			
T24	202.24	7714.21	A	0.054	3.694	0.571	1.04	1.04	2.590	1857.42	412.76	D
31.0000-26.5000			B	0.054	3.694	0.571	1.04	1.04	2.590			
			C	0.102	3.439	0.575	1.077	1.077	4.063			
			D	0.158	3.168	0.583	1.118	1.118	5.919			
T25	206.26	8669.65	A	0.078	3.563	0.573	1.059	1.059	3.998	2193.54	487.45	D
26.5000-22.0000			B	0.078	3.563	0.573	1.059	1.059	3.998			
			C	0.124	3.328	0.578	1.093	1.093	5.540			
			D	0.181	3.064	0.587	1.136	1.136	7.587			
T26	232.75	8557.24	A	0.049	3.721	0.571	1.037	1.037	2.848	1903.29	380.66	D
22.0000-17.0000			B	0.049	3.721	0.571	1.037	1.037	2.848			
			C	0.093	3.485	0.574	1.07	1.07	4.464			
			D	0.149	3.208	0.581	1.112	1.112	6.691			
T27	279.30	11150.13	A	0.063	3.646	0.572	1.047	1.047	4.636	2389.17	398.19	D
17.0000-11.0000			B	0.063	3.646	0.572	1.047	1.047	4.636			
			C	0.105	3.425	0.576	1.079	1.079	6.625			
			D	0.158	3.167	0.583	1.119	1.119	9.355			
T28	232.75	8649.38	A	0.047	3.731	0.571	1.035	1.035	3.012	1629.47	325.89	D
11.0000-6.0000			B	0.047	3.731	0.571	1.035	1.035	3.012			
			C	0.087	3.515	0.574	1.066	1.066	4.617			
			D	0.138	3.26	0.58	1.104	1.104	6.811			
T29	279.30	11868.95	A	0.071	3.599	0.573	1.054	1.054	5.817	2457.46	409.58	D
6.0000-0.0000			B	0.071	3.599	0.573	1.054	1.054	5.817			
			C	0.11	3.4	0.576	1.082	1.082	7.834			
			D	0.159	3.165	0.583	1.119	1.119	10.582			
Sum Weight:	5373.88	173525.86						OTM	3476560 kg-m	53046.31		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T1	26.49	476.17	A	0.337	2.467	0.628	1	1	1.412	156.86	26.14	C
155.0000-149.0000			B	0.337	2.467	0.628	1	1	1.412			
			C	0.519	2.016	0.707	1	1	1.953			
			D	0.337	2.467	0.628	1	1	1.412			
T2	63.57	476.17	A	0.337	2.467	0.628	1	1	1.412	217.57	36.26	C
149.0000-143.0000			B	0.337	2.467	0.628	1	1	1.412			
			C	0.774	1.83	0.875	1	1	3.018			
			D	0.337	2.467	0.628	1	1	1.412			
T3	10.60	105.23	A	0.336	2.47	0.627	1	1	0.294	38.87	38.87	C
143.0000-142.0000			B	0.336	2.47	0.627	1	1	0.294			
			C	0.685	1.835	0.809	1	1	0.541			
			D	0.336	2.47	0.627	1	1	0.294			
T4	88.01	2449.64	A	0.204	2.964	0.591	1	1	1.469	229.13	35.80	C
142.0000-135.6000			B	0.204	2.964	0.591	1	1	1.469			
			C	0.475	2.1	0.685	1	1	2.810			
			D	0.307	2.567	0.618	1	1	1.928			
T5	104.06	2427.92	A	0.195	3.002	0.589	1	1	1.406	226.26	35.35	C
135.6000-129.2000			B	0.195	3.002	0.589	1	1	1.406			
			C	0.482	2.085	0.689	1	1	2.832			
			D	0.364	2.383	0.638	1	1	2.183			

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 31 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T6 129.2000-122.8000	127.37	2427.92	A	0.195	3.002	0.589	1	1	1.406	259.28	40.51	C
			B	0.195	3.002	0.589	1	1	1.406			
			C	0.601	1.899	0.754	1	1	3.615			
			D	0.364	2.383	0.638	1	1	2.183			
T7 122.8000-118.0000	100.58	1820.94	A	0.195	3.002	0.589	1	1	1.054	201.97	42.08	C
			B	0.195	3.002	0.589	1	1	1.054			
			C	0.635	1.866	0.776	1	1	2.903			
			D	0.364	2.383	0.638	1	1	1.637			
T8 118.0000-115.0000	62.86	1956.71	A	0.222	2.887	0.595	1	1	1.355	185.33	61.78	C
			B	0.222	2.887	0.595	1	1	1.355			
			C	0.466	2.119	0.681	1	1	2.368			
			D	0.316	2.535	0.621	1	1	1.709			
T9 115.0000-107.5000	179.59	6574.59	A	0.114	3.381	0.577	1	1	2.497	460.85	61.45	C
			B	0.114	3.381	0.577	1	1	2.497			
			C	0.283	2.649	0.611	1	1	4.771			
			D	0.216	2.91	0.594	1	1	3.836			
T10 107.5000-100.0000	238.28	6497.85	A	0.104	3.427	0.576	1	1	2.294	461.10	61.48	D
			B	0.104	3.427	0.576	1	1	2.294			
			C	0.274	2.684	0.608	1	1	4.558			
			D	0.306	2.571	0.618	1	1	5.019			
T11 100.0000-95.0000	173.82	5010.78	A	0.102	3.441	0.575	1	1	1.631	336.93	67.39	D
			B	0.102	3.441	0.575	1	1	1.631			
			C	0.256	2.75	0.604	1	1	3.129			
			D	0.32	2.523	0.622	1	1	3.804			
T12 95.0000-89.5000	206.74	5440.05	A	0.076	3.574	0.573	1	1	1.567	387.35	70.43	D
			B	0.076	3.574	0.573	1	1	1.567			
			C	0.209	2.943	0.592	1	1	3.184			
			D	0.291	2.623	0.613	1	1	4.273			
T13 89.5000-84.0000	224.43	5577.94	A	0.08	3.554	0.573	1	1	1.890	443.38	80.61	D
			B	0.08	3.554	0.573	1	1	1.890			
			C	0.195	3.001	0.589	1	1	3.499			
			D	0.294	2.612	0.614	1	1	5.000			
T14 84.0000-77.5000	275.59	6582.07	A	0.07	3.609	0.572	1	1	2.221	547.13	84.17	D
			B	0.07	3.609	0.572	1	1	2.221			
			C	0.17	3.11	0.585	1	1	4.108			
			D	0.269	2.703	0.607	1	1	6.084			
T15 77.5000-71.0000	278.87	7103.96	A	0.065	3.635	0.572	1	1	2.343	567.08	87.24	D
			B	0.065	3.635	0.572	1	1	2.343			
			C	0.154	3.188	0.582	1	1	4.221			
			D	0.243	2.801	0.6	1	1	6.234			
T16 71.0000-64.5000	283.29	7180.28	A	0.061	3.655	0.572	1	1	2.472	584.91	89.99	D
			B	0.061	3.655	0.572	1	1	2.472			
			C	0.14	3.25	0.58	1	1	4.344			
			D	0.225	2.877	0.596	1	1	6.426			
T17 64.5000-58.0000	286.90	7261.17	A	0.058	3.671	0.572	1	1	2.608	598.20	92.03	D
			B	0.058	3.671	0.572	1	1	2.608			
			C	0.13	3.301	0.579	1	1	4.475			
			D	0.209	2.942	0.592	1	1	6.614			
T18 58.0000-53.5000	199.03	7508.13	A	0.059	3.666	0.572	1	1	1.994	426.28	94.73	D
			B	0.059	3.666	0.572	1	1	1.994			
			C	0.125	3.325	0.578	1	1	3.285			
			D	0.198	2.989	0.59	1	1	4.765			
T19 53.5000-49.0000	202.24	8136.12	A	0.08	3.554	0.573	1	1	2.872	488.47	108.55	D
			B	0.08	3.554	0.573	1	1	2.872			
			C	0.142	3.242	0.58	1	1	4.168			
			D	0.214	2.921	0.593	1	1	5.725			
T20 49.0000-44.5000	202.24	7572.73	A	0.055	3.687	0.572	1	1	2.089	427.60	95.02	D
			B	0.055	3.687	0.572	1	1	2.089			
			C	0.114	3.38	0.577	1	1	3.376			
			D	0.182	3.06	0.587	1	1	4.911			

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 32 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T21 44.5000-40.00 00	202.24	8273.58	A	0.077	3.569	0.573	1	1	3.084	489.73	108.83	D
			B	0.077	3.569	0.573	1	1	3.084			
			C	0.133	3.287	0.579	1	1	4.377			
			D	0.197	2.992	0.59	1	1	5.921			
T22 40.0000-35.50 00	202.24	7641.63	A	0.052	3.702	0.571	1	1	2.203	419.74	93.28	D
			B	0.052	3.702	0.571	1	1	2.203			
			C	0.105	3.423	0.576	1	1	3.489			
			D	0.167	3.128	0.584	1	1	5.013			
T23 35.5000-31.00 00	202.24	8414.73	A	0.075	3.581	0.573	1	1	3.302	482.55	107.23	D
			B	0.075	3.581	0.573	1	1	3.302			
			C	0.125	3.323	0.578	1	1	4.593			
			D	0.184	3.051	0.587	1	1	6.126			
T24 31.0000-26.50 00	202.24	7714.21	A	0.054	3.694	0.571	1	1	2.489	415.18	92.26	D
			B	0.054	3.694	0.571	1	1	2.489			
			C	0.102	3.439	0.575	1	1	3.774			
			D	0.158	3.168	0.583	1	1	5.292			
T25 26.5000-22.00 00	206.26	8669.65	A	0.078	3.563	0.573	1	1	3.776	482.92	107.32	D
			B	0.078	3.563	0.573	1	1	3.776			
			C	0.124	3.328	0.578	1	1	5.067			
			D	0.181	3.064	0.587	1	1	6.681			
T26 22.0000-17.00 00	232.75	8557.24	A	0.049	3.721	0.571	1	1	2.747	427.90	85.58	D
			B	0.049	3.721	0.571	1	1	2.747			
			C	0.093	3.485	0.574	1	1	4.172			
			D	0.149	3.208	0.581	1	1	6.018			
T27 17.0000-11.00 00	279.30	11150.13	A	0.063	3.646	0.572	1	1	4.428	533.93	88.99	D
			B	0.063	3.646	0.572	1	1	4.428			
			C	0.105	3.425	0.576	1	1	6.142			
			D	0.158	3.167	0.583	1	1	8.363			
T28 11.0000-6.000 0	232.75	8649.38	A	0.047	3.731	0.571	1	1	2.909	369.06	73.81	D
			B	0.047	3.731	0.571	1	1	2.909			
			C	0.087	3.515	0.574	1	1	4.333			
			D	0.138	3.26	0.58	1	1	6.171			
T29 6.0000-0.0000	279.30	11868.95	A	0.071	3.599	0.573	1	1	5.522	549.05	91.51	D
			B	0.071	3.599	0.573	1	1	5.522			
			C	0.11	3.4	0.576	1	1	7.238			
			D	0.159	3.165	0.583	1	1	9.457			
Sum Weight:	5373.88	173525.86						OTM	735813 kg-m	11414.61		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T1 155.0000-149. 0000	26.49	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	188.23	31.37	C
			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.519	2.016	0.707	1.2	1.2	2.343			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T2 149.0000-143. 0000	63.57	476.17	A	0.337	2.467	0.628	1.2	1.2	1.694	261.08	43.51	C
			B	0.337	2.467	0.628	1.2	1.2	1.694			
			C	0.774	1.83	0.875	1.2	1.2	3.622			
			D	0.337	2.467	0.628	1.2	1.2	1.694			
T3 143.0000-142. 0000	10.60	105.23	A	0.336	2.47	0.627	1.2	1.2	0.352	46.64	46.64	C
			B	0.336	2.47	0.627	1.2	1.2	0.352			
			C	0.685	1.835	0.809	1.2	1.2	0.650			

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 33 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T4 142.0000-135.6000	88.01	2449.64	D A B C D	0.336 0.204 0.204 0.475 0.307	2.47 2.964 2.964 2.1 2.567	0.627 0.591 0.591 0.685 0.618	1.2 1.153 1.153 1.2 1.2	1.2 1.153 1.153 1.2 1.2	0.352 1.693 1.693 3.372 2.314	274.96	42.96	C
T5 135.6000-129.2000	104.06	2427.92	A B C D	0.195 0.195 0.482 0.364	3.002 3.002 2.085 2.383	0.589 0.589 0.689 0.638	1.146 1.146 1.2 1.2	1.146 1.146 1.2 1.2	1.611 1.611 3.398 2.620	271.51	42.42	C
T6 129.2000-122.8000	127.37	2427.92	A B C D	0.195 0.195 0.601 0.364	3.002 3.002 1.899 2.383	0.589 0.589 0.754 0.638	1.146 1.146 1.2 1.2	1.146 1.146 1.2 1.2	1.611 1.611 4.338 2.620	311.13	48.61	C
T7 122.8000-118.0000	100.58	1820.94	A B C D	0.195 0.195 0.635 0.364	3.002 3.002 1.866 2.383	0.589 0.589 0.776 0.638	1.146 1.146 1.2 1.2	1.146 1.146 1.2 1.2	1.208 1.208 3.483 1.965	242.36	50.49	C
T8 118.0000-115.0000	62.86	1956.71	A B C D	0.222 0.222 0.466 0.316	2.887 2.887 2.119 2.535	0.595 0.595 0.681 0.621	1.167 1.167 1.2 1.2	1.167 1.167 1.2 1.2	1.580 1.580 2.842 2.051	222.40	74.13	C
T9 115.0000-107.5000	179.59	6574.59	A B C D	0.114 0.114 0.283 0.216	3.381 3.381 2.649 2.91	0.577 0.577 0.611 0.594	1.085 1.085 1.2 1.162	1.085 1.085 1.2 1.162	2.710 2.710 5.726 4.459	553.01	73.74	C
T10 107.5000-100.0000	238.28	6497.85	A B C D	0.104 0.104 0.274 0.306	3.427 3.427 2.684 2.571	0.576 0.576 0.608 0.618	1.078 1.078 1.2 1.2	1.078 1.078 1.2 1.2	2.473 2.473 5.470 6.023	553.32	73.78	D
T11 100.0000-95.0000	173.82	5010.78	A B C D	0.102 0.102 0.256 0.32	3.441 3.441 2.75 2.523	0.575 0.575 0.604 0.622	1.076 1.076 1.192 1.2	1.076 1.076 1.192 1.2	1.756 1.756 3.731 4.564	404.31	80.86	D
T12 95.0000-89.5000	206.74	5440.05	A B C D	0.076 0.076 0.209 0.291	3.574 3.574 2.943 2.623	0.573 0.573 0.592 0.613	1.057 1.057 1.157 1.2	1.057 1.057 1.157 1.2	1.657 1.657 3.683 5.128	464.82	84.51	D
T13 89.5000-84.0000	224.43	5577.94	A B C D	0.08 0.08 0.195 0.294	3.554 3.554 3.001 2.612	0.573 0.573 0.589 0.614	1.06 1.06 1.146 1.2	1.06 1.06 1.146 1.2	2.004 2.004 4.012 6.000	532.05	96.74	D
T14 84.0000-77.5000	275.59	6582.07	A B C D	0.07 0.07 0.17 0.269	3.609 3.609 3.11 2.703	0.572 0.572 0.585 0.607	1.052 1.052 1.128 1.2	1.052 1.052 1.128 1.2	2.337 2.337 4.633 7.301	656.56	101.01	D
T15 77.5000-71.0000	278.87	7103.96	A B C D	0.065 0.065 0.154 0.243	3.635 3.635 3.188 2.801	0.572 0.572 0.582 0.6	1.048 1.048 1.115 1.183	1.048 1.048 1.115 1.183	2.457 2.457 4.707 7.372	670.59	103.17	D
T16 71.0000-64.5000	283.29	7180.28	A B C D	0.061 0.061 0.14 0.225	3.655 3.655 3.25 2.877	0.572 0.572 0.58 0.596	1.046 1.046 1.105 1.168	1.046 1.046 1.105 1.168	2.585 2.585 4.801 7.508	683.41	105.14	D
T17 64.5000-58.0000	286.90	7261.17	A B C D	0.058 0.058 0.13 0.209	3.671 3.671 3.301 2.942	0.572 0.572 0.579 0.592	1.044 1.044 1.097 1.157	1.044 1.044 1.097 1.157	2.722 2.722 4.911 7.650	691.89	106.44	D
T18 58.0000-53.5000	199.03	7508.13	A B C	0.059 0.059 0.125	3.666 3.666 3.325	0.572 0.572 0.578	1.044 1.044 1.094	1.044 1.044 1.094	2.083 2.083 3.593	489.53	108.78	D

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 34 of 93
	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg							m ²	kg	kg/m	
T19	202.24	8136.12	D	0.198	2.989	0.59	1.148	1.148	5.472			
53.5000-49.00			A	0.08	3.554	0.573	1.06	1.06	3.044	566.87	125.97	D
00			B	0.08	3.554	0.573	1.06	1.06	3.044			
			C	0.142	3.242	0.58	1.107	1.107	4.612			
T20	202.24	7572.73	D	0.214	2.921	0.593	1.161	1.161	6.644			
49.0000-44.50			A	0.055	3.687	0.572	1.041	1.041	2.175	485.89	107.98	D
00			B	0.055	3.687	0.572	1.041	1.041	2.175			
			C	0.114	3.38	0.577	1.085	1.085	3.665			
T21	202.24	8273.58	D	0.182	3.06	0.587	1.136	1.136	5.581			
44.5000-40.00			A	0.077	3.569	0.573	1.058	1.058	3.262	562.18	124.93	D
00			B	0.077	3.569	0.573	1.058	1.058	3.262			
			C	0.133	3.287	0.579	1.1	1.1	4.814			
T22	202.24	7641.63	D	0.197	2.992	0.59	1.148	1.148	6.797			
40.0000-35.50			A	0.052	3.702	0.571	1.039	1.039	2.290	472.20	104.93	D
00			B	0.052	3.702	0.571	1.039	1.039	2.290			
			C	0.105	3.423	0.576	1.079	1.079	3.765			
T23	202.24	8414.73	D	0.167	3.128	0.584	1.125	1.125	5.639			
35.5000-31.00			A	0.075	3.581	0.573	1.056	1.056	3.487	549.04	122.01	D
00			B	0.075	3.581	0.573	1.056	1.056	3.487			
			C	0.125	3.323	0.578	1.094	1.094	5.025			
T24	202.24	7714.21	D	0.184	3.051	0.587	1.138	1.138	6.971			
31.0000-26.50			A	0.054	3.694	0.571	1.04	1.04	2.590	464.36	103.19	D
00			B	0.054	3.694	0.571	1.04	1.04	2.590			
			C	0.102	3.439	0.575	1.077	1.077	4.063			
T25	206.26	8669.65	D	0.158	3.168	0.583	1.118	1.118	5.919			
26.5000-22.00			A	0.078	3.563	0.573	1.059	1.059	3.998	548.39	121.86	D
00			B	0.078	3.563	0.573	1.059	1.059	3.998			
			C	0.124	3.328	0.578	1.093	1.093	5.540			
T26	232.75	8557.24	D	0.181	3.064	0.587	1.136	1.136	7.587			
22.0000-17.00			A	0.049	3.721	0.571	1.037	1.037	2.848	475.82	95.16	D
00			B	0.049	3.721	0.571	1.037	1.037	2.848			
			C	0.093	3.485	0.574	1.07	1.07	4.464			
T27	279.30	11150.13	D	0.149	3.208	0.581	1.112	1.112	6.691			
17.0000-11.00			A	0.063	3.646	0.572	1.047	1.047	4.636	597.29	99.55	D
00			B	0.063	3.646	0.572	1.047	1.047	4.636			
			C	0.105	3.425	0.576	1.079	1.079	6.625			
T28	232.75	8649.38	D	0.158	3.167	0.583	1.119	1.119	9.355			
11.0000-6.000			A	0.047	3.731	0.571	1.035	1.035	3.012	407.37	81.47	D
0			B	0.047	3.731	0.571	1.035	1.035	3.012			
			C	0.087	3.515	0.574	1.066	1.066	4.617			
T29	279.30	11868.95	D	0.138	3.26	0.58	1.104	1.104	6.811			
6.0000-0.0000			A	0.071	3.599	0.573	1.054	1.054	5.817	614.37	102.39	D
			B	0.071	3.599	0.573	1.054	1.054	5.817			
			C	0.11	3.4	0.576	1.082	1.082	7.834			
Sum Weight:	5373.88	173525.86	D	0.159	3.165	0.583	1.119	1.119	10.582			
								OTM	869140	13261.58		
									kg-m			

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
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Mast Vectors - No Ice

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T1	155.0000-149.0000	0	Wind Normal	627.43	0.00	-627.43	-95369	-10	27
		45	Wind 90	752.92	532.39	-532.39	-80924	-80933	23
		90	Wind Normal	627.43	627.43	0.00	0	-95379	0
T2	149.0000-143.0000	0	Wind Normal	870.27	0.00	-870.27	-127060	-23	78
		45	Wind 90	1044.33	738.45	-738.45	-107814	-107837	66
		90	Wind Normal	870.27	870.27	0.00	0	-127083	0
T3	143.0000-142.0000	0	Wind Normal	155.47	0.00	-155.47	-22154	-5	14
		45	Wind 90	186.56	131.92	-131.92	-18798	-18803	12
		90	Wind Normal	155.47	155.47	0.00	0	-22159	0
T4	142.0000-135.6000	0	Wind Normal	916.53	0.00	-916.53	-127204	-36	113
		45	Wind 90	1099.84	777.70	-777.70	-107934	-107981	130
		90	Wind Normal	916.53	916.53	0.00	10	-127251	41
T5	135.6000-129.2000	0	Wind Normal	905.05	0.00	-905.05	-119811	-38	113
		45	Wind 90	1086.05	767.96	-767.96	-101660	-101716	150
		90	Wind Normal	905.05	905.05	0.00	17	-119866	64
T6	129.2000-122.8000	0	Wind Normal	1037.11	0.00	-1037.11	-130659	-50	165
		45	Wind 90	1244.53	880.02	-880.02	-110865	-110932	197
		90	Wind Normal	1037.11	1037.11	0.00	17	-130726	67
T7	122.8000-118.0000	0	Wind Normal	807.88	0.00	-807.88	-97256	-40	136
		45	Wind 90	969.45	685.51	-685.51	-82522	-82575	158
		90	Wind Normal	807.88	807.88	0.00	13	-97309	51
T8	118.0000-115.0000	0	Wind Normal	741.33	0.00	-741.33	-86350	-46	145
		45	Wind 90	889.59	629.04	-629.04	-73268	-73329	169
		90	Wind Normal	741.33	741.33	0.00	15	-86411	55
T9	115.0000-107.5000	0	Wind Normal	1843.38	0.00	-1843.38	-204989	-169	614
		45	Wind 90	2212.06	1564.16	-1564.16	-173926	-174182	834
		90	Wind Normal	1843.38	1843.38	0.00	87	-205245	369
T10	107.5000-100.0000	0	Wind Normal	1844.39	0.00	-1844.39	-191186	-169	567
		45	Wind 90	2213.27	1565.02	-1565.02	-162201	-162540	1046
		90	Wind Normal	1844.39	1844.39	0.00	170	-191525	666
T11	100.0000-95.0000	0	Wind Normal	1347.70	0.00	-1347.70	-131254	-123	417
		45	Wind 90	1617.24	1143.56	-1143.56	-111351	-111620	847
		90	Wind Normal	1347.70	1347.70	0.00	147	-131524	581
T12	95.0000-89.5000	0	Wind Normal	1549.41	0.00	-1549.41	-142716	-158	575
		45	Wind 90	1859.30	1314.72	-1314.72	-121065	-121441	1273
		90	Wind Normal	1549.41	1549.41	0.00	218	-143092	925
T13	89.5000-84.0000	0	Wind Normal	1773.51	0.00	-1773.51	-153564	-183	664
		45	Wind 90	2128.21	1504.87	-1504.87	-130259	-130730	1602
		90	Wind Normal	1773.51	1773.51	0.00	288	-154035	1225
T14	84.0000-77.5000	0	Wind Normal	2188.53	0.00	-2188.53	-176309	-247	921
		45	Wind 90	2626.23	1857.03	-1857.03	-149540	-150202	2316
		90	Wind Normal	2188.53	2188.53	0.00	415	-176971	1808
T15	77.5000-71.0000	0	Wind Normal	2268.31	0.00	-2268.31	-167940	-281	1052
		45	Wind 90	2682.36	1896.71	-1896.71	-140349	-141112	2639
		90	Wind Normal	2268.31	2268.31	0.00	481	-168703	2104
T16	71.0000-64.5000	0	Wind Normal	2339.63	0.00	-2339.63	-157956	-315	1175

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T17	64.5000-58.0000	45	Wind 90	2733.62	1932.96	-1932.96	-130405	-131274	2959
		90	Wind Normal	2339.63	2339.63	0.00	553	-158825	2407
		0	Wind Normal	2392.81	0.00	-2392.81	-145934	-349	1287
T18	58.0000-53.5000	45	Wind 90	2767.56	1956.96	-1956.96	-119239	-120213	3252
		90	Wind Normal	2392.81	2392.81	0.00	625	-146909	2688
		0	Wind Normal	1705.13	0.00	-1705.13	-94591	-262	942
T19	53.5000-49.0000	45	Wind 90	1958.11	1384.59	-1384.59	-76721	-77453	2367
		90	Wind Normal	1705.13	1705.13	0.00	470	-95323	1973
		0	Wind Normal	1953.88	0.00	-1953.88	-99624	-278	922
T20	49.0000-44.5000	45	Wind 90	2267.50	1603.36	-1603.36	-81660	-82450	2381
		90	Wind Normal	1953.88	1953.88	0.00	512	-100414	1979
		0	Wind Normal	1710.42	0.00	-1710.42	-79420	-294	1028
T21	44.5000-40.0000	45	Wind 90	1943.56	1374.30	-1374.30	-63706	-64543	2600
		90	Wind Normal	1710.42	1710.42	0.00	542	-80256	2207
		0	Wind Normal	1958.94	0.00	-1958.94	-82193	-311	988
T22	40.0000-35.5000	45	Wind 90	2248.72	1590.09	-1590.09	-66609	-67492	2523
		90	Wind Normal	1958.94	1958.94	0.00	572	-83076	2120
		0	Wind Normal	1678.96	0.00	-1678.96	-62778	-327	1089
T23	35.5000-31.0000	45	Wind 90	1888.78	1335.57	-1335.57	-49815	-50745	2726
		90	Wind Normal	1678.96	1678.96	0.00	603	-63708	2338
		0	Wind Normal	1930.20	0.00	-1930.20	-63547	-343	1029
T24	31.0000-26.5000	45	Wind 90	2196.17	1552.93	-1552.93	-51002	-51978	2606
		90	Wind Normal	1930.20	1930.20	0.00	633	-64522	2210
		0	Wind Normal	1660.72	0.00	-1660.72	-47083	-360	1105
T25	26.5000-22.0000	45	Wind 90	1857.42	1313.40	-1313.40	-37097	-38120	2750
		90	Wind Normal	1660.72	1660.72	0.00	663	-48105	2373
		0	Wind Normal	1931.68	0.00	-1931.68	-46129	-376	1024
T26	22.0000-17.0000	45	Wind 90	2193.54	1551.07	-1551.07	-36899	-37989	2642
		90	Wind Normal	1931.68	1931.68	0.00	714	-47219	2265
		0	Wind Normal	1711.60	0.00	-1711.60	-32527	-437	1231
T27	17.0000-11.0000	45	Wind 90	1903.29	1345.83	-1345.83	-25394	-26680	3158
		90	Wind Normal	1711.60	1711.60	0.00	850	-33813	2784
		0	Wind Normal	2135.71	0.00	-2135.71	-28829	-551	1348
T28	11.0000-6.0000	45	Wind 90	2389.17	1689.40	-1689.40	-22580	-24202	3477
		90	Wind Normal	2135.71	2135.71	0.00	1071	-30450	3048
		0	Wind Normal	1476.26	0.00	-1476.26	-11612	-481	1131
T29	6.0000-0.0000	45	Wind 90	1629.47	1152.21	-1152.21	-8858	-10275	2880
		90	Wind Normal	1476.26	1476.26	0.00	936	-13029	2559
		0	Wind Normal	2196.22	0.00	-2196.22	-5414	-604	1311
		45	Wind 90	2457.46	1737.69	-1737.69	-4038	-5817	3383
		90	Wind Normal	2196.22	2196.22	0.00	1175	-7192	2965

Mast Totals - No Ice

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	-45658.44	-2931455	-6867	21211
45	37509.41	-37509.41	-2446501	-2465166	51165
90	45658.44	0.00	11798	-2950120	41871

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	Project EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).	Date 15:55:30 06/07/16
	Client RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.	Designed by Ing. C. Londoño M.

Mast Vectors - Service

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T1	155.0000-149.000 0	0	Wind Normal	156.86	0.00	-156.86	-23842	-10	7
		45	Wind 90	188.23	133.10	-133.10	-20231	-20241	6
		90	Wind Normal	156.86	156.86	0.00	0	-23852	0
T2	149.0000-143.000 0	0	Wind Normal	217.57	0.00	-217.57	-31765	-23	19
		45	Wind 90	261.08	184.61	-184.61	-26953	-26977	16
		90	Wind Normal	217.57	217.57	0.00	0	-31788	0
T3	143.0000-142.000 0	0	Wind Normal	38.87	0.00	-38.87	-5538	-5	4
		45	Wind 90	46.64	32.98	-32.98	-4700	-4704	3
		90	Wind Normal	38.87	38.87	0.00	0	-5543	0
T4	142.0000-135.600 0	0	Wind Normal	229.13	0.00	-229.13	-31793	-36	28
		45	Wind 90	274.96	194.43	-194.43	-26976	-27023	33
		90	Wind Normal	229.13	229.13	0.00	10	-31840	10
T5	135.6000-129.200 0	0	Wind Normal	226.26	0.00	-226.26	-29940	-38	28
		45	Wind 90	271.51	191.99	-191.99	-25402	-25457	38
		90	Wind Normal	226.26	226.26	0.00	17	-29995	16
T6	129.2000-122.800 0	0	Wind Normal	259.28	0.00	-259.28	-32652	-50	41
		45	Wind 90	311.13	220.00	-220.00	-27703	-27771	49
		90	Wind Normal	259.28	259.28	0.00	17	-32719	17
T7	122.8000-118.000 0	0	Wind Normal	201.97	0.00	-201.97	-24304	-40	34
		45	Wind 90	242.36	171.38	-171.38	-20621	-20674	40
		90	Wind Normal	201.97	201.97	0.00	13	-24357	13
T8	118.0000-115.000 0	0	Wind Normal	185.33	0.00	-185.33	-21576	-46	36
		45	Wind 90	222.40	157.26	-157.26	-18306	-18367	42
		90	Wind Normal	185.33	185.33	0.00	15	-21638	14
T9	115.0000-107.500 0	0	Wind Normal	460.85	0.00	-460.85	-51182	-169	154
		45	Wind 90	553.01	391.04	-391.04	-43416	-43672	209
		90	Wind Normal	460.85	460.85	0.00	87	-51438	92
T10	107.5000-100.000 0	0	Wind Normal	461.10	0.00	-461.10	-47669	-169	142
		45	Wind 90	553.32	391.26	-391.26	-40423	-40762	262
		90	Wind Normal	461.10	461.10	0.00	170	-48008	166
T11	100.0000-95.0000	0	Wind Normal	336.93	0.00	-336.93	-32704	-123	104
		45	Wind 90	404.31	285.89	-285.89	-27728	-27997	212
		90	Wind Normal	336.93	336.93	0.00	147	-32973	145
T12	95.0000-89.5000	0	Wind Normal	387.35	0.00	-387.35	-35516	-158	144
		45	Wind 90	464.82	328.68	-328.68	-30103	-30479	318
		90	Wind Normal	387.35	387.35	0.00	218	-35892	231
T13	89.5000-84.0000	0	Wind Normal	443.38	0.00	-443.38	-38175	-183	166
		45	Wind 90	532.05	376.22	-376.22	-32349	-32820	401
		90	Wind Normal	443.38	443.38	0.00	288	-38646	306
T14	84.0000-77.5000	0	Wind Normal	547.13	0.00	-547.13	-43766	-247	230
		45	Wind 90	656.56	464.26	-464.26	-37074	-37736	579
		90	Wind Normal	547.13	547.13	0.00	415	-44428	452
T15	77.5000-71.0000	0	Wind Normal	567.08	0.00	-567.08	-41624	-281	263
		45	Wind 90	670.59	474.18	-474.18	-34726	-35489	660
		90	Wind Normal	567.08	567.08	0.00	481	-42387	526
T16	71.0000-64.5000	0	Wind Normal	584.91	0.00	-584.91	-39074	-315	294

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 38 of 93
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Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
T17	64.5000-58.0000	45	Wind 90	683.41	483.24	-483.24	-32186	-33055	740
		90	Wind Normal	584.91	584.91	0.00	553	-39943	602
		0	Wind Normal	598.20	0.00	-598.20	-36014	-349	322
T18	58.0000-53.5000	45	Wind 90	691.89	489.24	-489.24	-29341	-30315	813
		90	Wind Normal	598.20	598.20	0.00	625	-36989	672
		0	Wind Normal	426.28	0.00	-426.28	-23295	-262	235
T19	53.5000-49.0000	45	Wind 90	489.53	346.15	-346.15	-18827	-19560	592
		90	Wind Normal	426.28	426.28	0.00	470	-24027	493
		0	Wind Normal	488.47	0.00	-488.47	-24522	-278	231
T20	49.0000-44.5000	45	Wind 90	566.87	400.84	-400.84	-20031	-20821	595
		90	Wind Normal	488.47	488.47	0.00	512	-25312	495
		0	Wind Normal	427.60	0.00	-427.60	-19448	-294	257
T21	44.5000-40.0000	45	Wind 90	485.89	343.58	-343.58	-15520	-16357	650
		90	Wind Normal	427.60	427.60	0.00	542	-20285	552
		0	Wind Normal	489.73	0.00	-489.73	-20119	-311	247
T22	40.0000-35.5000	45	Wind 90	562.18	397.52	-397.52	-16223	-17106	631
		90	Wind Normal	489.73	489.73	0.00	572	-21002	530
		0	Wind Normal	419.74	0.00	-419.74	-15243	-327	272
T23	35.5000-31.0000	45	Wind 90	472.20	333.89	-333.89	-12002	-12931	681
		90	Wind Normal	419.74	419.74	0.00	603	-16172	584
		0	Wind Normal	482.55	0.00	-482.55	-15412	-343	257
T24	31.0000-26.5000	45	Wind 90	549.04	388.23	-388.23	-12276	-13252	651
		90	Wind Normal	482.55	482.55	0.00	633	-16388	552
		0	Wind Normal	415.18	0.00	-415.18	-11274	-360	276
T25	26.5000-22.0000	45	Wind 90	464.36	328.35	-328.35	-8777	-9800	688
		90	Wind Normal	415.18	415.18	0.00	663	-12296	593
		0	Wind Normal	482.92	0.00	-482.92	-10997	-376	256
T26	22.0000-17.0000	45	Wind 90	548.39	387.77	-387.77	-8689	-9779	660
		90	Wind Normal	482.92	482.92	0.00	714	-12087	566
		0	Wind Normal	427.90	0.00	-427.90	-7494	-437	308
T27	17.0000-11.0000	45	Wind 90	475.82	336.46	-336.46	-5711	-6998	789
		90	Wind Normal	427.90	427.90	0.00	850	-8781	696
		0	Wind Normal	533.93	0.00	-533.93	-6404	-551	337
T28	11.0000-6.0000	45	Wind 90	597.29	422.35	-422.35	-4842	-6463	869
		90	Wind Normal	533.93	533.93	0.00	1071	-8026	762
		0	Wind Normal	369.06	0.00	-369.06	-2201	-481	283
T29	6.0000-0.0000	45	Wind 90	407.37	288.05	-288.05	-1513	-2929	720
		90	Wind Normal	369.06	369.06	0.00	936	-3618	640
		0	Wind Normal	549.05	0.00	-549.05	-472	-604	328
		45	Wind 90	614.37	434.42	-434.42	-128	-1907	846
		90	Wind Normal	549.05	549.05	0.00	1175	-2251	741

Mast Totals - Service

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	-11414.61	-724015	-6867	5303
45	9377.35	-9377.35	-602777	-621442	12791
90	11414.61	0.00	11798	-742680	10468

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Discrete Appurtenance Pressures - No Ice $G_H = 1.056$

Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K _z	q _z kPa	C _{AA} C _{Front} m ²	C _{AA} C _{Side} m ²
2 ANT TV 0.15x0.60m	270.0000	16.00	-0.5000	0.0000	142.0000	2.131	1.45	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.0000	-0.5000	142.0000	2.131	1.45	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	0.5000	0.0000	142.0000	2.131	1.45	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	0.0000	0.5000	142.0000	2.131	1.45	0.1800	0.0400
2 ANT TV 0.15x0.60m	270.0000	16.00	-1.5000	0.0000	139.5000	2.120	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.5000	-0.5000	139.5000	2.120	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	1.5000	0.0000	139.5000	2.120	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	-0.3000	0.5000	139.5000	2.120	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	270.0000	16.00	-0.5000	0.0000	137.0000	2.109	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.0000	-0.5000	137.0000	2.109	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	0.5000	0.0000	137.0000	2.109	1.44	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	0.0000	0.5000	137.0000	2.109	1.44	0.1800	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-1.4000	0.0000	113.0000	1.996	1.36	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	113.0000	1.996	1.36	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	1.4000	0.0000	113.0000	1.996	1.36	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-1.4000	0.0000	111.5000	1.988	1.36	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	111.5000	1.988	1.36	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	1.4000	0.0000	111.5000	1.988	1.36	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	110.0000	1.981	1.35	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	110.0000	1.981	1.35	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	110.0000	1.981	1.35	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	108.5000	1.973	1.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	108.5000	1.973	1.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	108.5000	1.973	1.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	106.5000	1.962	1.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	106.5000	1.962	1.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	106.5000	1.962	1.34	0.1500	0.0400
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	106.0000	1.960	1.34	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	106.0000	1.960	1.34	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	103.5000	1.947	1.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	103.5000	1.947	1.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	101.0000	1.933	1.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	101.0000	1.933	1.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.6550	95.0000	1.899	1.29	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	1.6550	95.0000	1.899	1.29	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.7825	92.5000	1.885	1.28	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	2.3825	92.5000	1.885	1.28	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.9100	90.0000	1.870	1.27	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	2.5100	90.0000	1.870	1.27	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.0120	88.0000	1.858	1.27	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.1395	85.5000	1.843	1.26	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.2670	83.0000	1.828	1.25	0.3000	0.0800
2 ANT TV 0.15x0.60m	270.0000	16.00	-1.5000	0.0000	131.0000	2.082	1.42	0.1800	0.0400
1 ANT TV 0.15x0.60m	0.0000	8.00	0.0000	-0.5000	131.0000	2.082	1.42	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	131.0000	2.082	1.42	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	0.0000	0.5000	131.0000	2.082	1.42	0.0900	0.0200
1 ANT TV 0.15x0.60m	270.0000	8.00	-1.5000	0.0000	128.5000	2.071	1.41	0.0900	0.0200
1 ANT TV 0.15x0.60m	0.0000	8.00	0.5000	-0.5000	128.5000	2.071	1.41	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	128.5000	2.071	1.41	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	-0.3000	0.5000	128.5000	2.071	1.41	0.0900	0.0200
1 ANT TV 0.15x0.60m	270.0000	8.00	-1.5000	0.0000	126.0000	2.059	1.40	0.0900	0.0200
1 ANT TV 0.15x0.60m	0.0000	8.00	0.0000	-0.5000	126.0000	2.059	1.40	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	126.0000	2.059	1.40	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	0.0000	0.5000	126.0000	2.059	1.40	0.0900	0.0200
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	154.5000	2.183	1.49	0.5000	0.2000

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Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K _z	q _z kPa	C _{AAC} Front m ²	C _{AAC} Side m ²
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	154.5000	2.183	1.49	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	153.5000	2.179	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	153.5000	2.179	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	153.5000	2.179	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	152.5000	2.174	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	152.5000	2.174	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	152.5000	2.174	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	151.5000	2.170	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	151.5000	2.170	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	151.5000	2.170	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	150.5000	2.166	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	150.5000	2.166	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	150.5000	2.166	1.48	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	149.5000	2.162	1.47	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	149.5000	2.162	1.47	0.5000	0.2000
Sum Weight:		1156.00							

Discrete Appurtenance Vectors - No Ice

2 ANT TV 0.15x0.60m - Elevation 142 - From Face A							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	6.25	0.00	-6.25	-888	8	-3
45	19.90	4.42	19.90	-4.42	-628	-2818	-2
90	28.14	0.00	28.14	0.00	0	-3988	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face B							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	28.14	0.00	0.00	-28.14	-4004	0	0
45	19.90	4.42	4.42	-19.90	-2834	-628	-2
90	0.00	6.25	6.25	0.00	-8	-888	-3

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2 ANT TV 0.15x0.60m - Elevation 142 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.25	0.00	-6.25	-888	-8	3
45	19.90	4.42	19.90	-4.42	-628	-2834	2
90	28.14	0.00	28.14	0.00	0	-4004	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.14	0.00	0.00	-28.14	-3988	0	0
45	19.90	4.42	4.42	-19.90	-2818	-628	2
90	0.00	6.25	6.25	0.00	8	-888	3

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.22	0.00	-6.22	-868	24	-9
45	19.80	4.40	19.80	-4.40	-614	-2738	-7
90	28.00	0.00	28.00	0.00	0	-3882	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.00	0.00	0.00	-28.00	-3914	-8	14
45	19.80	4.40	4.40	-19.80	-2770	-622	8
90	0.00	6.22	6.22	0.00	-8	-876	-3

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.22	0.00	-6.22	-868	-24	9
45	19.80	4.40	19.80	-4.40	-614	-2786	7
90	28.00	0.00	28.00	0.00	0	-3930	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	28.00	0.00	0.00	-28.00	-3898	5	-8
45	19.80	4.40	4.40	-19.80	-2754	-609	-4
90	0.00	6.22	6.22	0.00	8	-863	3

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2 ANT TV 0.15x0.60m - Elevation 137 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.19	0.00	-6.19	-848	8	-3
45	19.70	4.38	19.70	-4.38	-600	-2690	-2
90	27.86	0.00	27.86	0.00	0	-3808	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	27.86	0.00	0.00	-27.86	-3824	0	0
45	19.70	4.38	4.38	-19.70	-2706	-600	-2
90	0.00	6.19	6.19	0.00	-8	-848	-3

2 ANT TV 0.15x0.60m - Elevation 137 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.19	0.00	-6.19	-848	-8	3
45	19.70	4.38	19.70	-4.38	-600	-2706	2
90	27.86	0.00	27.86	0.00	0	-3824	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	27.86	0.00	0.00	-27.86	-3808	0	0
45	19.70	4.38	4.38	-19.70	-2690	-600	2
90	0.00	6.19	6.19	0.00	8	-848	3

1 ANT TV 0.30x1.20m - Elevation 113 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.86	0.00	-5.86	-662	17	-8
45	15.54	4.14	15.54	-4.14	-468	-1739	-6
90	21.97	0.00	21.97	0.00	0	-2466	0

1 ANT TV 0.30x1.20m - Elevation 113 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.97	0.00	0.00	-21.97	-2499	0	0
45	15.54	4.14	4.14	-15.54	-1772	-468	-6
90	0.00	5.86	5.86	0.00	-17	-662	-8

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1 ANT TV 0.30x1.20m - Elevation 113 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.86	0.00	-5.86	-662	-17	8
45	15.54	4.14	15.54	-4.14	-468	-1772	6
90	21.97	0.00	21.97	0.00	0	-2499	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.84	0.00	-5.84	-651	17	-8
45	15.48	4.13	15.48	-4.13	-460	-1709	-6
90	21.89	0.00	21.89	0.00	0	-2424	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.89	0.00	0.00	-21.89	-2457	0	0
45	15.48	4.13	4.13	-15.48	-1742	-460	-6
90	0.00	5.84	5.84	0.00	-17	-651	-8

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.84	0.00	-5.84	-651	-17	8
45	15.48	4.13	15.48	-4.13	-460	-1742	6
90	21.89	0.00	21.89	0.00	0	-2457	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.81	0.00	-5.81	-640	29	-14
45	15.42	4.11	15.42	-4.11	-452	-1667	-10
90	21.80	0.00	21.80	0.00	0	-2369	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.80	0.00	0.00	-21.80	-2415	0	0
45	15.42	4.11	4.11	-15.42	-1713	-452	-6
90	0.00	5.81	5.81	0.00	-17	-640	-8

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1 ANT TV 0.30x1.20m - Elevation 110 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.81	0.00	-5.81	-640	-29	14
45	15.42	4.11	15.42	-4.11	-452	-1725	10
90	21.80	0.00	21.80	0.00	0	-2427	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.79	0.00	-5.79	-628	29	-14
45	15.36	4.09	15.36	-4.09	-444	-1637	-10
90	21.72	0.00	21.72	0.00	0	-2327	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.72	0.00	0.00	-21.72	-2373	0	0
45	15.36	4.09	4.09	-15.36	-1683	-444	-6
90	0.00	5.79	5.79	0.00	-17	-628	-8

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.79	0.00	-5.79	-628	-29	14
45	15.36	4.09	15.36	-4.09	-444	-1695	10
90	21.72	0.00	21.72	0.00	0	-2385	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.76	0.00	-5.76	-613	29	-14
45	15.27	4.07	15.27	-4.07	-434	-1598	-10
90	21.60	0.00	21.60	0.00	0	-2272	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	21.60	0.00	0.00	-21.60	-2317	0	0
45	15.27	4.07	4.07	-15.27	-1644	-434	-6
90	0.00	5.76	5.76	0.00	-17	-613	-8

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1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	5.76	0.00	-5.76	-613	-29	14
45	15.27	4.07	15.27	-4.07	-434	-1656	10
90	21.60	0.00	21.60	0.00	0	-2329	0

2 ANT TV 0.30x1.20m - Elevation 106 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	43.14	0.00	0.00	-43.14	-4540	0	0
45	30.51	8.14	8.14	-30.51	-3200	-862	11
90	0.00	11.51	11.51	0.00	34	-1220	16

2 ANT TV 0.30x1.20m - Elevation 106 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	30.51	8.14	-15.82	-27.32	-2940	1721	-21
45	0.00	11.51	8.14	-8.14	-906	-819	-30
90	30.51	8.14	27.32	15.82	1633	-2853	-21

2 ANT TV 0.30x1.20m - Elevation 103.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	42.85	0.00	0.00	-42.85	-4401	0	0
45	30.30	8.08	8.08	-30.30	-3102	-836	11
90	0.00	11.43	11.43	0.00	34	-1183	16

2 ANT TV 0.30x1.20m - Elevation 103.5 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	30.30	8.08	-15.71	-27.14	-2853	1670	-21
45	0.00	11.43	8.08	-8.08	-880	-793	-29
90	30.30	8.08	27.14	15.71	1582	-2765	-21

2 ANT TV 0.30x1.20m - Elevation 101 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	42.55	0.00	0.00	-42.55	-4264	0	0
45	30.09	8.02	8.02	-30.09	-3005	-810	11
90	0.00	11.35	11.35	0.00	34	-1146	16

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2 ANT TV 0.30x1.20m - Elevation 101 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	30.09	8.02	-15.60	-26.95	-2766	1620	-21
45	0.00	11.35	8.02	-8.02	-854	-767	-29
90	30.09	8.02	26.95	15.60	1532	-2678	-21

2 ANT TV 0.30x1.20m - Elevation 95 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.81	0.00	0.00	-41.81	-4012	-12	21
45	29.57	7.88	7.88	-29.57	-2849	-761	2
90	0.00	11.15	11.15	0.00	-40	-1071	-18

2 ANT TV 0.30x1.20m - Elevation 95 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.81	0.00	0.00	-41.81	-3933	12	-21
45	29.57	7.88	7.88	-29.57	-2769	-737	-2
90	0.00	11.15	11.15	0.00	40	-1047	18

2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.50	0.00	0.00	-41.50	-3881	-12	21
45	29.34	7.82	7.82	-29.34	-2757	-736	1
90	0.00	11.07	11.07	0.00	-43	-1036	-20

2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.50	0.00	0.00	-41.50	-3781	12	-21
45	29.34	7.82	7.82	-29.34	-2657	-712	4
90	0.00	11.07	11.07	0.00	57	-1012	26

2 ANT TV 0.30x1.20m - Elevation 90 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.17	0.00	0.00	-41.17	-3751	-12	21
45	29.11	7.76	7.76	-29.11	-2666	-711	0
90	0.00	10.98	10.98	0.00	-46	-1000	-21

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2 ANT TV 0.30x1.20m - Elevation 90 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	41.17	0.00	0.00	-41.17	-3645	12	-21
45	29.11	7.76	7.76	-29.11	-2560	-687	5
90	0.00	10.98	10.98	0.00	60	-976	28

2 ANT TV 0.30x1.20m - Elevation 88 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	40.91	0.00	0.00	-40.91	-3648	0	0
45	28.93	7.71	7.71	-28.93	-2594	-679	-16
90	0.00	10.91	10.91	0.00	-48	-960	-22

2 ANT TV 0.30x1.20m - Elevation 85.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	40.57	0.00	0.00	-40.57	-3520	0	0
45	28.69	7.65	7.65	-28.69	-2504	-654	-16
90	0.00	10.82	10.82	0.00	-51	-925	-23

2 ANT TV 0.30x1.20m - Elevation 83 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	40.23	0.00	0.00	-40.23	-3394	0	0
45	28.45	7.59	7.59	-28.45	-2416	-630	-17
90	0.00	10.73	10.73	0.00	-54	-890	-24

2 ANT TV 0.15x0.60m - Elevation 131 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	6.11	0.00	-6.11	-801	24	-9
45	19.45	4.32	19.45	-4.32	-566	-2523	-6
90	27.50	0.00	27.50	0.00	0	-3579	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.75	0.00	0.00	-13.75	-1805	0	0
45	9.72	2.16	2.16	-9.72	-1278	-283	-1
90	0.00	3.06	3.06	0.00	-4	-400	-2

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1 ANT TV 0.15x0.60m - Elevation 131 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.06	0.00	-3.06	-400	-12	5
45	9.72	2.16	9.72	-2.16	-283	-1286	3
90	13.75	0.00	13.75	0.00	0	-1813	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.75	0.00	0.00	-13.75	-1797	0	0
45	9.72	2.16	2.16	-9.72	-1270	-283	1
90	0.00	3.06	3.06	0.00	4	-400	2

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.04	0.00	-3.04	-391	12	-5
45	9.67	2.15	9.67	-2.15	-276	-1231	-3
90	13.68	0.00	13.68	0.00	0	-1745	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.68	0.00	0.00	-13.68	-1761	-4	7
45	9.67	2.15	2.15	-9.67	-1247	-280	4
90	0.00	3.04	3.04	0.00	-4	-395	-2

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.04	0.00	-3.04	-391	-12	5
45	9.67	2.15	9.67	-2.15	-276	-1255	3
90	13.68	0.00	13.68	0.00	0	-1769	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.68	0.00	0.00	-13.68	-1753	2	-4
45	9.67	2.15	2.15	-9.67	-1239	-274	-2
90	0.00	3.04	3.04	0.00	4	-388	2

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1 ANT TV 0.15x0.60m - Elevation 126 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.02	0.00	-3.02	-381	12	-5
45	9.62	2.14	9.62	-2.14	-269	-1200	-3
90	13.60	0.00	13.60	0.00	0	-1701	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.60	0.00	0.00	-13.60	-1717	0	0
45	9.62	2.14	2.14	-9.62	-1216	-269	-1
90	0.00	3.02	3.02	0.00	-4	-381	-2

1 ANT TV 0.15x0.60m - Elevation 126 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	3.02	0.00	-3.02	-381	-12	5
45	9.62	2.14	9.62	-2.14	-269	-1224	3
90	13.60	0.00	13.60	0.00	0	-1725	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	13.60	0.00	0.00	-13.60	-1709	0	0
45	9.62	2.14	2.14	-9.62	-1208	-269	1
90	0.00	3.02	3.02	0.00	4	-381	2

ANT PANEL 1.0x0.50x0.19m - Elevation 154.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.62	22.65	24.02	-56.06	-8640	-3691	-33
45	80.08	0.00	56.62	-56.62	-8728	-8728	0
90	56.62	22.65	56.06	-24.02	-3691	-8640	33

ANT PANEL 1.0x0.50x0.19m - Elevation 154.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.62	22.65	-24.02	-56.06	-8640	3691	33
45	0.00	32.03	22.65	-22.65	-3479	-3520	47
90	56.62	22.65	56.06	24.02	3732	-8681	33

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 50 of 93
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ANT PANEL 1.0x0.50x0.19m - Elevation 153.5 - From Leg D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	56.52	22.61	23.98	-55.95	-8568	-3660	-33
45	79.93	0.00	56.52	-56.52	-8655	-8655	0
90	56.52	22.61	55.95	-23.98	-3660	-8568	33

ANT PANEL 1.0x0.50x0.19m - Elevation 153.5 - From Face D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	79.93	0.00	0.00	-79.93	-12263	0	0
45	56.52	22.61	22.61	-56.52	-8669	-3470	7
90	0.00	31.97	31.97	0.00	7	-4908	10

ANT PANEL 1.0x0.50x0.19m - Elevation 153.5 - From Leg C							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	56.52	22.61	-23.98	-55.95	-8568	3660	33
45	0.00	31.97	22.61	-22.61	-3450	-3491	47
90	56.52	22.61	55.95	23.98	3701	-8609	33

ANT PANEL 1.0x0.50x0.19m - Elevation 152.5 - From Leg D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	56.41	22.57	23.93	-55.85	-8496	-3629	-33
45	79.78	0.00	56.41	-56.41	-8583	-8583	0
90	56.41	22.57	55.85	-23.93	-3629	-8496	33

ANT PANEL 1.0x0.50x0.19m - Elevation 152.5 - From Face D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	79.78	0.00	0.00	-79.78	-12160	0	0
45	56.41	22.57	22.57	-56.41	-8597	-3441	7
90	0.00	31.91	31.91	0.00	7	-4867	10

ANT PANEL 1.0x0.50x0.19m - Elevation 152.5 - From Leg C							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	56.41	22.57	-23.93	-55.85	-8496	3629	33
45	0.00	31.91	22.57	-22.57	-3421	-3462	47
90	56.41	22.57	55.85	23.93	3671	-8537	33

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 51 of 93
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ANT PANEL 1.0x0.50x0.19m - Elevation 151.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.31	22.52	23.89	-55.74	-8424	-3599	-33
45	79.63	0.00	56.31	-56.31	-8510	-8510	0
90	56.31	22.52	55.74	-23.89	-3599	-8424	33

ANT PANEL 1.0x0.50x0.19m - Elevation 151.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	79.63	0.00	0.00	-79.63	-12058	0	0
45	56.31	22.52	22.52	-56.31	-8524	-3412	7
90	0.00	31.85	31.85	0.00	7	-4826	10

ANT PANEL 1.0x0.50x0.19m - Elevation 151.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.31	22.52	-23.89	-55.74	-8424	3599	33
45	0.00	31.85	22.52	-22.52	-3392	-3433	46
90	56.31	22.52	55.74	23.89	3640	-8466	33

ANT PANEL 1.0x0.50x0.19m - Elevation 150.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.20	22.48	23.84	-55.64	-8353	-3568	-33
45	79.48	0.00	56.20	-56.20	-8438	-8438	0
90	56.20	22.48	55.64	-23.84	-3568	-8353	33

ANT PANEL 1.0x0.50x0.19m - Elevation 150.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	79.48	0.00	0.00	-79.48	-11956	0	0
45	56.20	22.48	22.48	-56.20	-8452	-3383	7
90	0.00	31.79	31.79	0.00	7	-4785	10

ANT PANEL 1.0x0.50x0.19m - Elevation 150.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.20	22.48	-23.84	-55.64	-8353	3568	33
45	0.00	31.79	22.48	-22.48	-3363	-3404	46
90	56.20	22.48	55.64	23.84	3609	-8394	33

RISATower BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 52 of 93
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ANT PANEL 1.0x0.50x0.19m - Elevation 149.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.10	22.44	23.80	-55.53	-8281	-3537	-33
45	79.33	0.00	56.10	-56.10	-8366	-8366	0
90	56.10	22.44	55.53	-23.80	-3537	-8281	33

ANT PANEL 1.0x0.50x0.19m - Elevation 149.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	56.10	22.44	-23.80	-55.53	-8281	3537	33
45	0.00	31.73	22.44	-22.44	-3334	-3375	46
90	56.10	22.44	55.53	23.80	3579	-8323	33

Discrete Appurtenance Totals - No Ice

Wind Azimuth °	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	-47.13	-2044.77	-265675	5018	-59
45	1082.47	-1412.54	-184400	-146696	188
90	1577.98	47.13	4913	-212396	325

Discrete Appurtenance Pressures - Service

$G_H = 1.056$

Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K_z	q_z kPa	$C_{A/C}$ Front m ²	$C_{A/C}$ Side m ²
2 ANT TV 0.15x0.60m	270.0000	16.00	-0.5000	0.0000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.0000	-0.5000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	0.5000	0.0000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	0.0000	0.5000	142.0000	2.131	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	270.0000	16.00	-1.5000	0.0000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.5000	-0.5000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	1.5000	0.0000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	-0.3000	0.5000	139.5000	2.120	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	270.0000	16.00	-0.5000	0.0000	137.0000	2.109	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	0.0000	16.00	0.0000	-0.5000	137.0000	2.109	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	90.0000	16.00	0.5000	0.0000	137.0000	2.109	0.36	0.1800	0.0400
2 ANT TV 0.15x0.60m	180.0000	16.00	0.0000	0.5000	137.0000	2.109	0.36	0.1800	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-1.4000	0.0000	113.0000	1.996	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	113.0000	1.996	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	1.4000	0.0000	113.0000	1.996	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-1.4000	0.0000	111.5000	1.988	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	111.5000	1.988	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	1.4000	0.0000	111.5000	1.988	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	110.0000	1.981	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	110.0000	1.981	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	110.0000	1.981	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	108.5000	1.973	0.34	0.1500	0.0400

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Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K _z	q _z kPa	C _{AAC} Front m ²	C _{AAC} Side m ²
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	108.5000	1.973	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	108.5000	1.973	0.34	0.1500	0.0400
1 ANT TV 0.30x1.20m	270.0000	12.00	-2.4000	0.0000	106.5000	1.962	0.33	0.1500	0.0400
1 ANT TV 0.30x1.20m	0.0000	12.00	0.0000	-1.4000	106.5000	1.962	0.33	0.1500	0.0400
1 ANT TV 0.30x1.20m	90.0000	12.00	2.4000	0.0000	106.5000	1.962	0.33	0.1500	0.0400
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	106.0000	1.960	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	106.0000	1.960	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	103.5000	1.947	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	103.5000	1.947	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	0.0000	1.4000	101.0000	1.933	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	315.0000	24.00	-1.8243	-1.8243	101.0000	1.933	0.33	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.6550	95.0000	1.899	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	1.6550	95.0000	1.899	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.7825	92.5000	1.885	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	2.3825	92.5000	1.885	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.5000	-1.9100	90.0000	1.870	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	180.0000	24.00	-0.5000	2.5100	90.0000	1.870	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.0120	88.0000	1.858	0.32	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.1395	85.5000	1.843	0.31	0.3000	0.0800
2 ANT TV 0.30x1.20m	0.0000	24.00	0.0000	-2.2670	83.0000	1.828	0.31	0.3000	0.0800
2 ANT TV 0.15x0.60m	270.0000	16.00	-1.5000	0.0000	131.0000	2.082	0.35	0.1800	0.0400
1 ANT TV 0.15x0.60m	0.0000	8.00	0.0000	-0.5000	131.0000	2.082	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	131.0000	2.082	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	0.0000	0.5000	131.0000	2.082	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	270.0000	8.00	-1.5000	0.0000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	0.0000	8.00	0.5000	-0.5000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	-0.3000	0.5000	128.5000	2.071	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	270.0000	8.00	-1.5000	0.0000	126.0000	2.059	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	0.0000	8.00	0.0000	-0.5000	126.0000	2.059	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	90.0000	8.00	1.5000	0.0000	126.0000	2.059	0.35	0.0900	0.0200
1 ANT TV 0.15x0.60m	180.0000	8.00	0.0000	0.5000	126.0000	2.059	0.35	0.0900	0.0200
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	154.5000	2.183	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	154.5000	2.183	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	153.5000	2.179	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	153.5000	2.179	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	153.5000	2.179	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	152.5000	2.174	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	152.5000	2.174	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	152.5000	2.174	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	151.5000	2.170	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	151.5000	2.170	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	151.5000	2.170	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	150.5000	2.166	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	180.0000	20.00	0.0000	0.3250	150.5000	2.166	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	150.5000	2.166	0.37	0.5000	0.2000
ANT PANEL 1.0x0.50x0.19m	225.0000	20.00	-1.0321	1.0321	149.5000	2.162	0.37	0.5000	0.2000

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Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	z m	K _z	q _z kPa	C _{AAC} Front m ²	C _{AAC} Side m ²
1.0x0.50x0.19m ANT PANEL 1.0x0.50x0.19m	135.0000	20.00	1.0321	1.0321	149.5000	2.162	0.37	0.5000	0.2000
	Sum Weight:	1156.00							

Discrete Appurtenance Vectors - Service

2 ANT TV 0.15x0.60m - Elevation 142 - From Face A							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-222	8	-1
45	4.97	1.11	4.97	-1.11	-157	-698	-1
90	7.04	0.00	7.04	0.00	0	-991	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face B							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	7.04	0.00	0.00	-7.04	-1007	0	0
45	4.97	1.11	1.11	-4.97	-714	-157	-1
90	0.00	1.56	1.56	0.00	-8	-222	-1

2 ANT TV 0.15x0.60m - Elevation 142 - From Face C							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-222	-8	1
45	4.97	1.11	4.97	-1.11	-157	-714	1
90	7.04	0.00	7.04	0.00	0	-1007	0

2 ANT TV 0.15x0.60m - Elevation 142 - From Face D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	7.04	0.00	0.00	-7.04	-991	0	0
45	4.97	1.11	1.11	-4.97	-698	-157	1
90	0.00	1.56	1.56	0.00	8	-222	1

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face A							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-217	24	-2
45	4.95	1.10	4.95	-1.10	-153	-666	-2
90	7.00	0.00	7.00	0.00	0	-952	0

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2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.00	0.00	0.00	-7.00	-984	-8	4
45	4.95	1.10	1.10	-4.95	-698	-161	2
90	0.00	1.56	1.56	0.00	-8	-225	-1

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.56	0.00	-1.56	-217	-24	2
45	4.95	1.10	4.95	-1.10	-153	-714	2
90	7.00	0.00	7.00	0.00	0	-1000	0

2 ANT TV 0.15x0.60m - Elevation 139.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.00	0.00	0.00	-7.00	-968	5	-2
45	4.95	1.10	1.10	-4.95	-682	-149	-1
90	0.00	1.56	1.56	0.00	8	-212	1

2 ANT TV 0.15x0.60m - Elevation 137 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.55	0.00	-1.55	-212	8	-1
45	4.92	1.09	4.92	-1.09	-150	-667	-1
90	6.96	0.00	6.96	0.00	0	-946	0

2 ANT TV 0.15x0.60m - Elevation 137 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	6.96	0.00	0.00	-6.96	-962	0	0
45	4.92	1.09	1.09	-4.92	-683	-150	-1
90	0.00	1.55	1.55	0.00	-8	-212	-1

2 ANT TV 0.15x0.60m - Elevation 137 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.55	0.00	-1.55	-212	-8	1
45	4.92	1.09	4.92	-1.09	-150	-683	1
90	6.96	0.00	6.96	0.00	0	-962	0

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2 ANT TV 0.15x0.60m - Elevation 137 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	6.96	0.00	0.00	-6.96	-946	0	0
45	4.92	1.09	1.09	-4.92	-667	-150	1
90	0.00	1.55	1.55	0.00	8	-212	1

1 ANT TV 0.30x1.20m - Elevation 113 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-166	17	-2
45	3.88	1.04	3.88	-1.04	-117	-422	-1
90	5.49	0.00	5.49	0.00	0	-604	0

1 ANT TV 0.30x1.20m - Elevation 113 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.49	0.00	0.00	-5.49	-637	0	0
45	3.88	1.04	1.04	-3.88	-456	-117	-1
90	0.00	1.46	1.46	0.00	-17	-166	-2

1 ANT TV 0.30x1.20m - Elevation 113 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-166	-17	2
45	3.88	1.04	3.88	-1.04	-117	-456	1
90	5.49	0.00	5.49	0.00	0	-637	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-163	17	-2
45	3.87	1.03	3.87	-1.03	-115	-415	-1
90	5.47	0.00	5.47	0.00	0	-593	0

1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.47	0.00	0.00	-5.47	-627	0	0
45	3.87	1.03	1.03	-3.87	-448	-115	-1
90	0.00	1.46	1.46	0.00	-17	-163	-2

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1 ANT TV 0.30x1.20m - Elevation 111.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.46	0.00	-1.46	-163	-17	2
45	3.87	1.03	3.87	-1.03	-115	-448	1
90	5.47	0.00	5.47	0.00	0	-627	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-160	29	-3
45	3.85	1.03	3.85	-1.03	-113	-395	-2
90	5.45	0.00	5.45	0.00	0	-571	0

1 ANT TV 0.30x1.20m - Elevation 110 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.45	0.00	0.00	-5.45	-616	0	0
45	3.85	1.03	1.03	-3.85	-441	-113	-1
90	0.00	1.45	1.45	0.00	-17	-160	-2

1 ANT TV 0.30x1.20m - Elevation 110 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-160	-29	3
45	3.85	1.03	3.85	-1.03	-113	-453	2
90	5.45	0.00	5.45	0.00	0	-628	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-157	29	-3
45	3.84	1.02	3.84	-1.02	-111	-388	-2
90	5.43	0.00	5.43	0.00	0	-560	0

1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.43	0.00	0.00	-5.43	-606	0	0
45	3.84	1.02	1.02	-3.84	-433	-111	-1
90	0.00	1.45	1.45	0.00	-17	-157	-2

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1 ANT TV 0.30x1.20m - Elevation 108.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.45	0.00	-1.45	-157	-29	3
45	3.84	1.02	3.84	-1.02	-111	-445	2
90	5.43	0.00	5.43	0.00	0	-618	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.44	0.00	-1.44	-153	29	-3
45	3.82	1.02	3.82	-1.02	-108	-378	-2
90	5.40	0.00	5.40	0.00	0	-546	0

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	5.40	0.00	0.00	-5.40	-592	0	0
45	3.82	1.02	1.02	-3.82	-423	-108	-1
90	0.00	1.44	1.44	0.00	-17	-153	-2

1 ANT TV 0.30x1.20m - Elevation 106.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.44	0.00	-1.44	-153	-29	3
45	3.82	1.02	3.82	-1.02	-108	-435	2
90	5.40	0.00	5.40	0.00	0	-604	0

2 ANT TV 0.30x1.20m - Elevation 106 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.79	0.00	0.00	-10.79	-1110	0	0
45	7.63	2.03	2.03	-7.63	-775	-216	3
90	0.00	2.88	2.88	0.00	34	-305	4

2 ANT TV 0.30x1.20m - Elevation 106 - From Leg A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	7.63	2.03	-3.95	-6.83	-768	463	-5
45	0.00	2.88	2.03	-2.03	-259	-172	-7
90	7.63	2.03	6.83	3.95	375	-680	-5

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2 ANT TV 0.30x1.20m - Elevation 103.5 - From Face D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	10.71	0.00	0.00	-10.71	-1075	0	0
45	7.58	2.02	2.02	-7.58	-750	-209	3
90	0.00	2.86	2.86	0.00	34	-296	4

2 ANT TV 0.30x1.20m - Elevation 103.5 - From Leg A							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	7.58	2.02	-3.93	-6.78	-746	450	-5
45	0.00	2.86	2.02	-2.02	-253	-165	-7
90	7.58	2.02	6.78	3.93	363	-658	-5

2 ANT TV 0.30x1.20m - Elevation 101 - From Face D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	10.64	0.00	0.00	-10.64	-1041	0	0
45	7.52	2.01	2.01	-7.52	-726	-203	3
90	0.00	2.84	2.84	0.00	34	-287	4

2 ANT TV 0.30x1.20m - Elevation 101 - From Leg A							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	7.52	2.01	-3.90	-6.74	-724	438	-5
45	0.00	2.84	2.01	-2.01	-246	-159	-7
90	7.52	2.01	6.74	3.90	350	-637	-5

2 ANT TV 0.30x1.20m - Elevation 95 - From Face B							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	10.45	0.00	0.00	-10.45	-1033	-12	5
45	7.39	1.97	1.97	-7.39	-742	-199	0
90	0.00	2.79	2.79	0.00	-40	-277	-5

2 ANT TV 0.30x1.20m - Elevation 95 - From Face D							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	10.45	0.00	0.00	-10.45	-953	12	-5
45	7.39	1.97	1.97	-7.39	-663	-175	0
90	0.00	2.79	2.79	0.00	40	-253	5

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2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.37	0.00	0.00	-10.37	-1002	-12	5
45	7.34	1.96	1.96	-7.34	-721	-193	0
90	0.00	2.77	2.77	0.00	-43	-268	-5

2 ANT TV 0.30x1.20m - Elevation 92.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.37	0.00	0.00	-10.37	-902	12	-5
45	7.34	1.96	1.96	-7.34	-621	-169	1
90	0.00	2.77	2.77	0.00	57	-244	7

2 ANT TV 0.30x1.20m - Elevation 90 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.29	0.00	0.00	-10.29	-972	-12	5
45	7.28	1.94	1.94	-7.28	-701	-187	0
90	0.00	2.74	2.74	0.00	-46	-259	-5

2 ANT TV 0.30x1.20m - Elevation 90 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.29	0.00	0.00	-10.29	-866	12	-5
45	7.28	1.94	1.94	-7.28	-595	-163	1
90	0.00	2.74	2.74	0.00	60	-235	7

2 ANT TV 0.30x1.20m - Elevation 88 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.23	0.00	0.00	-10.23	-948	0	0
45	7.23	1.93	1.93	-7.23	-685	-170	-4
90	0.00	2.73	2.73	0.00	-48	-240	-5

2 ANT TV 0.30x1.20m - Elevation 85.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.14	0.00	0.00	-10.14	-919	0	0
45	7.17	1.91	1.91	-7.17	-665	-164	-4
90	0.00	2.70	2.70	0.00	-51	-231	-6

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2 ANT TV 0.30x1.20m - Elevation 83 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	10.06	0.00	0.00	-10.06	-889	0	0
45	7.11	1.90	1.90	-7.11	-645	-157	-4
90	0.00	2.68	2.68	0.00	-54	-223	-6

2 ANT TV 0.15x0.60m - Elevation 131 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	1.53	0.00	-1.53	-200	24	-2
45	4.86	1.08	4.86	-1.08	-142	-613	-2
90	6.88	0.00	6.88	0.00	0	-877	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.44	0.00	0.00	-3.44	-454	0	0
45	2.43	0.54	0.54	-2.43	-322	-71	0
90	0.00	0.76	0.76	0.00	-4	-100	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-100	-12	1
45	2.43	0.54	2.43	-0.54	-71	-330	1
90	3.44	0.00	3.44	0.00	0	-462	0

1 ANT TV 0.15x0.60m - Elevation 131 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.44	0.00	0.00	-3.44	-446	0	0
45	2.43	0.54	0.54	-2.43	-314	-71	0
90	0.00	0.76	0.76	0.00	4	-100	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-98	12	-1
45	2.42	0.54	2.42	-0.54	-69	-299	-1
90	3.42	0.00	3.42	0.00	0	-427	0

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1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.42	0.00	0.00	-3.42	-443	-4	2
45	2.42	0.54	0.54	-2.42	-315	-73	1
90	0.00	0.76	0.76	0.00	-4	-102	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-98	-12	1
45	2.42	0.54	2.42	-0.54	-69	-323	1
90	3.42	0.00	3.42	0.00	0	-451	0

1 ANT TV 0.15x0.60m - Elevation 128.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.42	0.00	0.00	-3.42	-435	2	-1
45	2.42	0.54	0.54	-2.42	-307	-67	0
90	0.00	0.76	0.76	0.00	4	-95	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face A							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-95	12	-1
45	2.40	0.53	2.40	-0.53	-67	-291	-1
90	3.40	0.00	3.40	0.00	0	-416	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face B							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.40	0.00	0.00	-3.40	-432	0	0
45	2.40	0.53	0.53	-2.40	-307	-67	0
90	0.00	0.76	0.76	0.00	-4	-95	0

1 ANT TV 0.15x0.60m - Elevation 126 - From Face C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	0.00	0.76	0.00	-0.76	-95	-12	1
45	2.40	0.53	2.40	-0.53	-67	-315	1
90	3.40	0.00	3.40	0.00	0	-440	0

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1 ANT TV 0.15x0.60m - Elevation 126 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	3.40	0.00	0.00	-3.40	-424	0	0
45	2.40	0.53	0.53	-2.40	-299	-67	0
90	0.00	0.76	0.76	0.00	4	-95	0

ANT PANEL 1.0x0.50x0.19m - Elevation 154.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.16	5.66	6.01	-14.01	-2145	-907	-8
45	20.02	0.00	14.16	-14.16	-2166	-2166	0
90	14.16	5.66	14.01	-6.01	-907	-2145	8

ANT PANEL 1.0x0.50x0.19m - Elevation 154.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.16	5.66	-6.01	-14.01	-2145	907	8
45	0.00	8.01	5.66	-5.66	-854	-895	12
90	14.16	5.66	14.01	6.01	949	-2186	8

ANT PANEL 1.0x0.50x0.19m - Elevation 153.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.13	5.65	5.99	-13.99	-2127	-900	-8
45	19.98	0.00	14.13	-14.13	-2148	-2148	0
90	14.13	5.65	13.99	-5.99	-900	-2127	8

ANT PANEL 1.0x0.50x0.19m - Elevation 153.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	19.98	0.00	0.00	-19.98	-3061	0	0
45	14.13	5.65	5.65	-14.13	-2162	-868	2
90	0.00	7.99	7.99	0.00	7	-1227	3

ANT PANEL 1.0x0.50x0.19m - Elevation 153.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.13	5.65	-5.99	-13.99	-2127	900	8
45	0.00	7.99	5.65	-5.65	-847	-888	12
90	14.13	5.65	13.99	5.99	941	-2168	8

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ANT PANEL 1.0x0.50x0.19m - Elevation 152.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.10	5.64	5.98	-13.96	-2109	-892	-8
45	19.95	0.00	14.10	-14.10	-2130	-2130	0
90	14.10	5.64	13.96	-5.98	-892	-2109	8

ANT PANEL 1.0x0.50x0.19m - Elevation 152.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	19.95	0.00	0.00	-19.95	-3035	0	0
45	14.10	5.64	5.64	-14.10	-2144	-860	2
90	0.00	7.98	7.98	0.00	7	-1217	3

ANT PANEL 1.0x0.50x0.19m - Elevation 152.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.10	5.64	-5.98	-13.96	-2109	892	8
45	0.00	7.98	5.64	-5.64	-840	-881	12
90	14.10	5.64	13.96	5.98	933	-2150	8

ANT PANEL 1.0x0.50x0.19m - Elevation 151.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.08	5.63	5.97	-13.94	-2091	-884	-8
45	19.91	0.00	14.08	-14.08	-2112	-2112	0
90	14.08	5.63	13.94	-5.97	-884	-2091	8

ANT PANEL 1.0x0.50x0.19m - Elevation 151.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	19.91	0.00	0.00	-19.91	-3010	0	0
45	14.08	5.63	5.63	-14.08	-2126	-853	2
90	0.00	7.96	7.96	0.00	7	-1206	3

ANT PANEL 1.0x0.50x0.19m - Elevation 151.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.08	5.63	-5.97	-13.94	-2091	884	8
45	0.00	7.96	5.63	-5.63	-832	-874	12
90	14.08	5.63	13.94	5.97	925	-2132	8

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ANT PANEL 1.0x0.50x0.19m - Elevation 150.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.05	5.62	5.96	-13.91	-2073	-877	-8
45	19.87	0.00	14.05	-14.05	-2094	-2094	0
90	14.05	5.62	13.91	-5.96	-877	-2073	8

ANT PANEL 1.0x0.50x0.19m - Elevation 150.5 - From Face D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	19.87	0.00	0.00	-19.87	-2984	0	0
45	14.05	5.62	5.62	-14.05	-2108	-846	2
90	0.00	7.95	7.95	0.00	7	-1196	3

ANT PANEL 1.0x0.50x0.19m - Elevation 150.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.05	5.62	-5.96	-13.91	-2073	877	8
45	0.00	7.95	5.62	-5.62	-825	-866	12
90	14.05	5.62	13.91	5.96	918	-2114	8

ANT PANEL 1.0x0.50x0.19m - Elevation 149.5 - From Leg D							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.02	5.61	5.95	-13.88	-2055	-869	-8
45	19.83	0.00	14.02	-14.02	-2076	-2076	0
90	14.02	5.61	13.88	-5.95	-869	-2055	8

ANT PANEL 1.0x0.50x0.19m - Elevation 149.5 - From Leg C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	14.02	5.61	-5.95	-13.88	-2055	869	8
45	0.00	7.93	5.61	-5.61	-818	-859	12
90	14.02	5.61	13.88	5.95	910	-2096	8

Discrete Appurtenance Totals - Service

Wind Azimuth °	V_x kg	V_z kg	OTM_x kg-m	OTM_z kg-m	Torque kg-m
0	-11.78	-511.19	-66393	1358	-15
45	270.62	-353.14	-46075	-36570	47
90	394.49	11.78	1254	-52995	81

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Dish Pressures - No Ice

Elevation m	Dish Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	K _z	A _A m ²	q _z kPa
74.0000	HP8-102	45.0000	113.85	3.1503	-3.1503	1.769	4.6693	1.21
66.5000	HP12-21B	225.0000	385.55	-3.5328	3.5328	1.715	10.5064	1.17
54.0000	HP12-21B	225.0000	385.55	-4.1703	4.1703	1.616	10.5064	1.10
24.5000	6 FT DISH	225.0000	64.86	-5.6748	5.6748	1.290	2.6264	0.88
24.5000	6 FT DISH	45.0000	64.86	5.6748	-5.6748	1.290	2.6264	0.88
		Sum	1014.67					
		Weight:						

Dish Vectors - No Ice

HP8-102 - Elevation 74 - From Leg B											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.002295	0.000695	0.000218	-543.26	164.52	4953.93	267.81	-500.47	-37393	-20177	859
45	-0.002600	0.000000	0.000000	-615.45	0.00	0.00	435.19	-435.19	-32563	-32563	0
90	-0.002295	-0.000695	-0.000218	-543.26	-164.52	-4953.93	500.47	-267.81	-20177	-37393	-859

HP12-21B - Elevation 66.5 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	1482.68	-387.46	7736.78	774.44	-1322.39	-86577	-50138	-1739
45	0.003230	0.000000	0.000000	1668.66	0.00	0.00	1179.92	-1179.92	-77103	-77103	0
90	0.002870	0.000750	-0.000104	1482.68	387.46	-7736.78	1322.39	-774.44	-50138	-86577	1739

HP12-21B - Elevation 54 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	1397.04	-365.08	7289.94	729.71	-1246.01	-65677	-37796	-1968
45	0.003230	0.000000	0.000000	1572.28	0.00	0.00	1111.77	-1111.77	-58428	-58428	0
90	0.002870	0.000750	-0.000104	1397.04	365.08	-7289.94	1246.01	-729.71	-37796	-65677	1968

6 FT DISH - Elevation 24.5 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.004170	-0.000125	0.000157	404.86	-12.14	1097.49	277.70	-294.86	-6856	-6436	-70
45	0.003970	0.000000	0.000000	385.44	0.00	0.00	272.55	-272.55	-6309	-6309	0
90	0.004170	0.000125	-0.000157	404.86	12.14	-1097.49	294.86	-277.70	-6436	-6856	70

6 FT DISH - Elevation 24.5 - From Leg B											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.001335	0.001170	0.000356	-129.61	113.59	2488.58	11.33	-171.97	-4581	-646	975
45	-0.002700	0.000000	0.000000	-262.14	0.00	0.00	185.36	-185.36	-4909	-4909	0
90	-0.001335	-0.001170	-0.000356	-129.61	-113.59	-2488.58	171.97	-11.33	-646	-4581	-975

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Dish Totals - No Ice

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	2060.98	-3535.70	-201084	-115192	-1943
45	3184.79	-3184.79	-179312	-179312	0
90	3535.70	-2060.98	-115192	-201084	1943

Dish Pressures - Service

Elevation m	Dish Description	Aiming Azimuth °	Weight kg	Offset _x m	Offset _z m	K _z	A _A m ²	q _z kPa
74.0000	HP8-102	45.0000	113.85	3.1503	-3.1503	1.769	4.6693	0.30
66.5000	HP12-21B	225.0000	385.55	-3.5328	3.5328	1.715	10.5064	0.29
54.0000	HP12-21B	225.0000	385.55	-4.1703	4.1703	1.616	10.5064	0.28
24.5000	6 FT DISH	225.0000	64.86	-5.6748	5.6748	1.290	2.6264	0.22
24.5000	6 FT DISH	45.0000	64.86	5.6748	-5.6748	1.290	2.6264	0.22
		Sum	1014.67					
		Weight:						

Dish Vectors - Service

HP8-102 - Elevation 74 - From Leg B											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.002295	0.000695	0.000218	-135.81	41.13	1238.48	66.95	-125.12	-9617	-5313	215
45	-0.002600	0.000000	0.000000	-153.86	0.00	0.00	108.80	-108.80	-8410	-8410	0
90	-0.002295	-0.000695	-0.000218	-135.81	-41.13	-1238.48	125.12	-66.95	-5313	-9617	-215

HP12-21B - Elevation 66.5 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	370.67	-96.86	1934.20	193.61	-330.60	-20623	-11513	-435
45	0.003230	0.000000	0.000000	417.16	0.00	0.00	294.98	-294.98	-18254	-18254	0
90	0.002870	0.000750	-0.000104	370.67	96.86	-1934.20	330.60	-193.61	-11513	-20623	435

HP12-21B - Elevation 54 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.002870	-0.000750	0.000104	349.26	-91.27	1822.48	182.43	-311.50	-15213	-8243	-492
45	0.003230	0.000000	0.000000	393.07	0.00	0.00	277.94	-277.94	-13401	-13401	0
90	0.002870	0.000750	-0.000104	349.26	91.27	-1822.48	311.50	-182.43	-8243	-15213	492

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6 FT DISH - Elevation 24.5 - From Leg D											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	0.004170	-0.000125	0.000157	101.22	-3.03	274.37	69.42	-73.72	-1438	-1333	-170
45	0.003970	0.000000	0.000000	96.36	0.00	0.00	68.14	-68.14	-1301	-1301	0
90	0.004170	0.000125	-0.000157	101.22	3.03	-274.37	73.72	-69.42	-1333	-1438	170

6 FT DISH - Elevation 24.5 - From Leg B											
Wind Azimuth °	C _A	C _S	C _M	F _A	F _S	F _M	V _x	V _z	OTM _x	OTM _z	Torque
				kg	kg	kg	kg	kg	kg-m	kg-m	kg-m
0	-0.001335	0.001170	0.000356	-32.40	28.40	622.15	2.83	-42.99	-1421	-437	244
45	-0.002700	0.000000	0.000000	-65.54	0.00	0.00	46.34	-46.34	-1503	-1503	0
90	-0.001335	-0.001170	-0.000356	-32.40	-28.40	-622.15	42.99	-2.83	-437	-1421	-244

Dish Totals - Service

Wind Azimuth °	V _x	V _z	OTM _x	OTM _z	Torque
	kg	kg	kg-m	kg-m	kg-m
0	515.24	-883.93	-48313	-26840	-486
45	796.20	-796.20	-42870	-42870	0
90	883.93	-515.24	-26840	-48313	486

User Load Vectors - No Ice

CxMANTENIMIENTO - Elevation 155								
Wind Azimuth °	Offset _x	Offset _z	F	V _x	V _z	OTM _x	OTM _z	Torque
	m	m	kg	kg	kg	kg-m	kg-m	kg-m
0	0.0000	0.0000	0.00	0.00	0.00	0	0	0
45	0.0000	0.0000	0.00	0.00	0.00	0	0	0
90	0.0000	0.0000	0.00	0.00	0.00	0	0	0

User Load Totals - No Ice

Wind Azimuth °	V _x	V _z	OTM _x	OTM _z	Torque
	kg	kg	kg-m	kg-m	kg-m
0	0.00	0.00	0	0	0
45	0.00	0.00	0	0	0
90	0.00	0.00	0	0	0

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User Load Vectors - Service

CxMANTENIMIENTO - Elevation 155								
Wind Azimuth °	Offset _x m	Offset _z m	F kg	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.0000	0.0000	0.00	0.00	0.00	0	0	0
45	0.0000	0.0000	0.00	0.00	0.00	0	0	0
90	0.0000	0.0000	0.00	0.00	0.00	0	0	0

User Load Totals - Service

Wind Azimuth °	V _x kg	V _z kg	OTM _x kg-m	OTM _z kg-m	Torque kg-m
0	0.00	0.00	0	0	0
45	0.00	0.00	0	0	0
90	0.00	0.00	0	0	0

Force Totals

Load Case	Vertical Forces kg	Sum of Forces X kg	Sum of Forces Z kg	Sum of Overturning Moments, M _x kg-m	Sum of Overturning Moments, M _z kg-m	Sum of Torques kg-m
Leg Weight	135344.91					
Bracing Weight	38180.95					
Total Member Self-Weight	173525.86			14443	-4117	
Total Weight	181390.41			14443	-4117	
Wind 0 deg - No Ice		2013.84	-51238.91	-3398214	-117042	19209
Wind 45 deg - No Ice		41776.67	-42106.74	-2810214	-2791174	51353
Wind 90 deg - No Ice		50772.12	-2013.84	-98481	-3363600	44139
Total Weight	181390.41			14443	-4117	
Wind 0 deg - Service		503.46	-12809.73	-850519	-25481	4802
Wind 45 deg - Service		10444.17	-10526.69	-703519	-694014	12838
Wind 90 deg - Service		12693.03	-503.46	-25586	-837121	11035

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 45 deg - No Ice
4	Dead+Wind 90 deg - No Ice
5	Dead+Wind 0 deg - Service
6	Dead+Wind 45 deg - Service

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Maximum Member Forces

Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T1	155 - 149	Leg	Max Tension	3	4781.63	1	0
			Max. Compression	3	-4828.69	5	-1
			Max. Mx	4	-3542.06	-16	3
			Max. My	3	-78.01	6	-12
			Max. Vy	4	50.52	-10	-2
		Diagonal	Max. Vx	4	79.33	4	2
			Max Tension	4	1210.77	0	0
			Max. Compression	4	-1309.23	0	0
			Max. Mx	2	196.70	0	0
			Max. My	3	40.18	0	0
		Top Girt	Max. Vy	2	1.33	0	0
			Max. Vx	3	-0.05	0	0
			Max Tension	2	7.25	0	0
			Max. Compression	3	-10.85	0	0
			Max. Mx	1	0.20	0	0
			Max. My	3	0.62	0	0
			Max. Vy	1	1.30	0	0
			Max. Vx	3	-0.00	0	0
T2	149 - 143	Leg	Max Tension	3	19683.57	-2	7
			Max. Compression	3	-18694.30	-100	-103
			Max. Mx	3	-18694.30	-100	-103
			Max. My	3	-18694.30	-100	-103
			Max. Vy	3	-125.19	-56	26
		Diagonal	Max. Vx	3	301.50	-100	-103
			Max Tension	4	1844.33	0	0
			Max. Compression	3	-1853.51	0	0
			Max. Mx	2	1085.42	0	0
			Max. My	3	-1385.41	0	0
		Top Girt	Max. Vy	2	1.33	0	0
			Max. Vx	3	-0.03	0	0
			Max Tension	2	57.22	0	0
			Max. Compression	2	-50.86	0	0
			Max. Mx	1	8.09	0	0
			Max. My	3	48.02	0	0
			Max. Vy	1	1.30	0	0
			Max. Vx	3	-0.00	0	0
T3	143 - 142	Leg	Max Tension	3	15962.78	43	34
			Max. Compression	3	-15737.42	87	79
			Max. Mx	3	-15711.53	-100	-103
			Max. My	3	-15711.53	-100	-103
			Max. Vy	3	-198.47	-100	-103
		Diagonal	Max. Vx	3	-189.55	-100	-103
			Max Tension	3	3412.92	0	0
			Max. Compression	3	-3004.77	3	18
			Max. Mx	3	-220.28	4	16
			Max. My	3	-3004.77	3	18
		Top Girt	Max. Vy	2	-7.82	4	-1
			Max. Vx	3	-34.46	3	18
			Max Tension	3	1326.67	0	0
			Max. Compression	3	-760.49	0	0
			Max. Mx	2	727.73	0	0
			Max. My	3	73.62	0	0
			Max. Vy	2	1.28	0	0
			Max. Vx	3	0.22	0	0
T4	142 - 135.6	Leg	Max Tension	3	26612.94	-270	7
			Max. Compression	3	-29962.08	352	-8
			Max. Mx	3	-29962.08	352	-8
			Max. My	3	346.50	-24	-332

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m		
T5	135.6 - 129.2	Diagonal	Max. Vy	3	-271.30	259	-6		
			Max. Vx	3	152.90	-23	-198		
			Max Tension	4	1847.46	13	-2		
			Max. Compression	4	-1882.45	0	0		
			Max. Mx	3	1535.92	25	3		
			Max. My	3	1643.77	21	-7		
		Top Girt	Max. Vy	3	30.28	25	3		
			Max. Vx	3	7.20	0	0		
			Max Tension	2	2603.88	0	0		
			Max. Compression	2	-2397.48	0	0		
			Max. Mx	1	136.86	-1	0		
			Max. My	3	-1704.33	0	0		
		Leg	Max. Vy	1	2.72	0	0		
			Max. Vx	3	-0.00	0	0		
			Max Tension	3	46296.30	-476	10		
			Max. Compression	3	-51687.14	586	-12		
			Max. Mx	3	-51687.14	586	-12		
			Max. My	3	481.08	-33	-565		
			Diagonal	Max. Vy	3	-81.61	525	-11	
				Max. Vx	3	86.42	-33	-499	
				Max Tension	4	2332.17	22	-3	
				Max. Compression	4	-2399.48	0	0	
				Max. Mx	3	2066.85	40	8	
				Max. My	3	-2136.91	-38	-12	
T6	129.2 - 122.8	Leg	Max. Vy	3	45.90	40	8		
			Max. Vx	3	-13.25	-38	-12		
			Max Tension	3	72726.36	-729	14		
			Max. Compression	3	-76814.98	928	-13		
			Max. Mx	3	72628.49	-934	12		
			Max. My	3	-920.78	-18	-811		
		Diagonal	Max. Vy	3	167.41	-934	12		
			Max. Vx	3	121.05	-18	-811		
			Max Tension	3	2920.92	58	11		
			Max. Compression	2	-3039.33	0	0		
			Max. Mx	3	2920.92	58	11		
			Max. My	3	-2409.12	-53	-17		
		T7	122.8 - 118	Leg	Max. Vy	3	65.22	58	11
					Max. Vx	3	-17.74	-53	-17
					Max Tension	3	92112.55	-44	29
					Max. Compression	3	-91696.81	-142	-31
					Max. Mx	3	92014.77	-3731	1
					Max. My	3	-4245.25	11	-1784
Diagonal	Max. Vy			3	2345.25	-3731	1		
	Max. Vx			3	-1081.80	11	-1784		
	Max Tension			3	6170.99	37	23		
	Max. Compression			3	-5720.33	0	0		
	Max. Mx			3	1106.93	-79	25		
	Max. My			3	1903.16	-78	-30		
T8	118 - 115	Leg	Max. Vy	3	86.55	0	0		
			Max. Vx	3	31.93	-78	-30		
			Max Tension	3	72379.48	-3731	2		
			Max. Compression	3	-70620.46	-177	-11		
			Max. Mx	3	72379.48	-3731	2		
			Max. My	3	-4200.28	43	-497		
		Diagonal	Max. Vy	3	-2535.33	-3731	2		
			Max. Vx	3	-293.91	43	-497		
			Max Tension	3	24302.46	0	0		
			Max. Compression	3	-23811.17	108	57		
			Max. Mx	3	-7256.60	198	50		
			Max. My	2	-18597.34	163	-74		
			Max. Vy	2	229.54	0	0		

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T9	115 - 107.5	Top Girt	Max. Vx	2	103.64	162	-74
			Max Tension	2	3031.94	0	0
			Max. Compression	2	-3501.69	0	0
			Max. Mx	2	3031.94	-1	0
			Max. My	2	-3501.69	0	0
			Max. Vy	2	-3.28	0	0
		Leg	Max. Vx	2	-0.98	0	0
			Max Tension	3	54685.31	29	-3
			Max. Compression	3	-64184.98	129	-6
			Max. Mx	3	-50917.42	-746	-5
			Max. My	3	-3976.26	-19	-242
			Max. Vy	3	-624.95	561	-2
		Diagonal	Max. Vx	3	264.62	-19	-242
			Max Tension	3	3265.98	0	0
			Max. Compression	2	-3207.23	0	0
			Max. Mx	2	1137.82	15	0
			Max. My	2	-2127.38	3	-5
			Max. Vy	3	-17.08	15	-4
T10	107.5 - 100	Top Girt	Max. Vx	2	2.72	3	-5
			Max Tension	2	4997.96	0	0
			Max. Compression	2	-3855.64	0	0
			Max. Mx	1	577.40	-7	0
			Max. My	3	-2888.02	0	0
			Max. Vy	1	9.59	0	0
		Leg	Max. Vx	3	-0.00	0	0
			Max Tension	3	73576.91	118	-2
			Max. Compression	3	-87431.93	678	-4
			Max. Mx	3	-87431.93	678	-4
			Max. My	3	-4812.99	-40	-369
			Max. Vy	3	-455.43	678	-4
		Diagonal	Max. Vx	3	256.49	-40	-369
			Max Tension	3	3884.35	0	0
			Max. Compression	3	-4274.38	0	0
			Max. Mx	3	1879.14	15	-3
			Max. My	3	-3516.76	9	-5
			Max. Vy	3	-17.05	15	-3
T11	100 - 95	Leg	Max. Vx	3	2.61	0	0
			Max Tension	3	78137.80	-584	-10
			Max. Compression	3	-93903.09	-36	-59
			Max. Mx	3	-92799.34	678	-4
			Max. My	3	-6435.36	-71	-505
			Max. Vy	3	-336.66	-584	-10
		Diagonal	Max. Vx	3	345.96	-71	-505
			Max Tension	3	1656.85	0	0
			Max. Compression	3	-1871.61	0	0
			Max. Mx	3	523.20	16	-1
			Max. My	3	-1836.77	-1	-8
			Max. Vy	3	15.76	16	-1
T12	95 - 89.5	Top Girt	Max. Vx	3	3.75	0	0
			Max Tension	2	1123.46	0	0
			Max. Compression	2	-1563.94	0	0
			Max. Mx	4	-1523.65	-7	0
			Max. My	3	855.82	0	0
			Max. Vy	4	9.58	0	0
		Leg	Max. Vx	3	-0.49	0	0
			Max Tension	3	80966.36	-116	-49
			Max. Compression	3	-99652.69	419	-64
			Max. Mx	3	79780.37	-448	-52
			Max. My	3	-6873.23	-71	-505
			Max. Vy	3	357.20	-448	-52
		Diagonal	Max. Vx	3	-352.41	-71	-505

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T13	89.5 - 84	Diagonal	Max Tension	3	1845.64	0	0
			Max. Compression	3	-1981.33	0	0
		Leg	Max. Mx	3	657.28	17	-5
			Max. My	3	144.60	15	-6
			Max. Vy	3	16.64	15	-6
			Max. Vx	3	3.13	0	0
			Max Tension	3	82932.83	-448	-52
			Max. Compression	3	-104135.50	243	-74
			Max. Mx	3	82932.83	-448	-52
			Max. My	3	-9610.58	-61	-467
			Max. Vy	3	-334.40	-448	-52
			Max. Vx	3	380.85	-61	-467
		Diagonal	Max Tension	3	2069.39	0	0
			Max. Compression	3	-2231.42	0	0
T14	84 - 77.5	Leg	Max. Mx	3	872.42	22	-5
			Max. My	3	-2188.07	6	-7
			Max. Vy	3	22.38	22	-5
			Max. Vx	3	3.46	0	0
			Max Tension	3	87128.53	-355	-69
			Max. Compression	3	-111274.43	433	-104
		Diagonal	Max. Mx	3	85757.50	-548	-102
			Max. My	3	-11518.35	-59	-585
			Max. Vy	3	411.90	-548	-102
			Max. Vx	3	436.17	-59	-585
			Max Tension	4	2626.79	0	0
			Max. Compression	4	-2819.32	0	0
T15	77.5 - 71	Leg	Max. Mx	3	1147.74	26	-8
			Max. My	3	1147.74	26	-8
			Max. Vy	3	24.81	26	-8
			Max. Vx	3	3.48	0	0
			Max Tension	3	92044.16	-548	-102
			Max. Compression	3	-119213.63	589	-87
		Diagonal	Max. Mx	3	90721.29	-694	-89
			Max. My	3	-13414.01	-55	-711
			Max. Vy	3	491.53	-694	-89
			Max. Vx	3	526.10	-55	-711
			Max Tension	4	3128.19	0	0
			Max. Compression	4	-3391.47	0	0
T16	71 - 64.5	Leg	Max. Mx	3	1535.78	42	-12
			Max. My	3	1535.78	42	-12
			Max. Vy	3	40.66	42	-12
			Max. Vx	3	5.19	0	0
			Max Tension	3	98067.25	-695	-89
			Max. Compression	3	-128594.65	595	-97
		Diagonal	Max. Mx	3	96411.78	-725	-97
			Max. My	3	-15743.62	-65	-749
			Max. Vy	3	703.07	-725	-97
			Max. Vx	3	724.82	-65	-749
			Max Tension	4	3852.70	0	0
			Max. Compression	4	-4011.09	0	0
T17	64.5 - 58	Leg	Max. Mx	3	2000.54	48	-12
			Max. My	3	-3582.68	32	-13
			Max. Vy	3	45.03	48	-12
			Max. Vx	3	-5.39	0	0
			Max Tension	3	104904.63	-725	-97
			Max. Compression	3	-138790.09	162	-74
		Diagonal	Max. Mx	3	104904.63	-725	-97
			Max. My	3	-16324.06	-66	-749
			Max. Vy	3	-465.63	-725	-97
			Max. Vx	3	-485.25	-66	-749
		Diagonal	Max Tension	4	4644.81	0	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T18	58 - 53.5	Leg	Max. Compression	4	-4877.03	0	0
			Max. Mx	3	2515.71	53	-14
			Max. My	4	-442.06	50	-14
			Max. Vy	3	49.24	53	-14
			Max. Vx	4	-5.56	0	0
			Max Tension	3	114254.25	-285	-74
			Max. Compression	3	-151802.55	516	-26
			Max. Mx	3	-151802.55	516	-26
			Max. My	3	-18717.00	-63	-409
			Max. Vy	3	718.61	-496	-28
			Max. Vx	3	604.77	13	-190
		Diagonal	Max Tension	4	5791.12	0	0
			Max. Compression	4	-5743.21	0	0
			Max. Mx	2	5431.24	-70	0
			Max. My	4	621.02	0	6
T19	53.5 - 49	Leg	Max. Vy	2	48.62	0	0
			Max. Vx	4	-4.12	0	0
			Max Tension	3	112318.59	-496	-28
			Max. Compression	3	-153352.57	-181	-52
			Max. Mx	3	-151768.96	516	-26
			Max. My	3	-22064.25	-118	-434
		Diagonal	Max. Vy	3	-437.51	-496	-28
			Max. Vx	3	393.69	-118	-434
			Max Tension	4	6453.53	0	0
			Max. Compression	4	-6984.65	0	0
			Max. Mx	2	5875.59	-83	0
			Max. My	3	-3875.87	0	6
		Horizontal	Max. Vy	2	54.89	0	0
			Max. Vx	3	-4.30	0	0
			Max Tension	4	817.59	19	0
			Max. Compression	4	-970.95	19	0
			Max. Mx	2	-338.25	20	-2
			Max. My	2	-45.39	20	-2
		Inner Bracing	Max. Vy	2	25.80	20	-2
			Max. Vx	2	1.75	20	-2
			Max Tension	3	172.33	0	0
			Max. Compression	3	-204.97	0	0
			Max. Mx	1	-15.60	-39	0
			Max. My	3	170.50	0	0
T20	49 - 44.5	Leg	Max. Vy	1	29.17	0	0
			Max. Vx	3	-0.06	0	0
			Max Tension	3	123951.04	-61	-49
			Max. Compression	3	-170225.12	503	-30
			Max. Mx	3	-170225.12	503	-30
			Max. My	3	-22639.38	-118	-434
		Diagonal	Max. Vy	3	387.49	-452	-32
			Max. Vx	3	-367.84	-118	-434
			Max Tension	4	6712.16	0	0
			Max. Compression	4	-6648.40	0	0
			Max. Mx	2	6152.26	-83	0
			Max. My	3	-3432.72	0	6
		Leg	Max. Vy	2	54.89	0	0
			Max. Vx	3	-4.30	0	0
T21	44.5 - 40	Leg	Max Tension	3	122316.41	-452	-32
			Max. Compression	3	-171801.84	-87	-47
			Max. Mx	3	-170218.50	503	-30
			Max. My	3	-25895.12	-94	-369
			Max. Vy	3	-414.11	-452	-32
			Max. Vx	3	387.22	-94	-369
		Diagonal	Max Tension	4	6803.35	0	0
			Max. Compression	4	-7391.23	0	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T22	40 - 35.5	Horizontal	Max. Mx	2	6230.87	-97	0
			Max. My	4	402.28	0	7
			Max. Vy	2	61.16	0	0
			Max. Vx	4	-4.51	0	0
			Max Tension	4	489.45	24	-2
			Max. Compression	3	-681.57	24	-1
			Max. Mx	2	90.07	25	0
			Max. My	2	-535.95	24	-2
			Max. Vy	2	-29.02	25	0
			Max. Vx	2	1.75	24	-2
			Max Tension	3	22.43	0	0
			Max. Compression	3	-55.21	0	0
		Inner Bracing	Max. Mx	1	-16.68	-49	0
			Max. My	3	20.67	0	0
			Max. Vy	1	32.72	0	0
			Max. Vx	3	-0.06	0	0
			Max Tension	3	134147.45	-111	-46
			Max. Compression	3	-189101.71	507	-28
			Max. Mx	3	-189101.71	507	-28
			Max. My	3	-26590.07	-94	-369
			Max. Vy	3	366.90	-441	-30
			Max. Vx	3	-346.68	-94	-369
			Max Tension	4	7133.87	0	0
			Max. Compression	4	-6994.38	0	0
		Diagonal	Max. Mx	2	6578.40	-97	0
			Max. My	4	673.84	0	7
			Max. Vy	2	61.16	0	0
			Max. Vx	4	-4.52	0	0
			Max Tension	3	132509.05	-441	-30
			Max. Compression	3	-190683.47	-213	-45
			Max. Mx	3	-189100.83	507	-28
			Max. My	3	-29849.70	-128	-429
			Max. Vy	3	-416.47	-441	-30
			Max. Vx	3	393.83	-128	-429
			Max Tension	4	7177.60	0	0
			Max. Compression	4	-7766.49	0	0
T23	35.5 - 31	Leg	Max. Mx	2	6611.57	-112	0
			Max. My	3	-4383.96	0	8
			Max. Vy	2	67.43	0	0
			Max. Vx	3	-4.72	0	0
			Max Tension	4	474.82	30	0
			Max. Compression	3	-666.43	30	-2
		Diagonal	Max. Mx	2	-229.93	30	-3
			Max. My	2	-170.15	30	-3
			Max. Vy	2	32.06	30	-3
			Max. Vx	2	2.08	30	-3
			Max Tension	1	0.00	0	0
			Max. Compression	3	-31.53	0	0
		Horizontal	Max. Mx	1	-17.79	-60	0
			Max. My	3	-7.49	0	0
			Max. Vy	1	36.27	0	0
			Max. Vx	3	-0.05	0	0
			Max Tension	3	144042.24	-58	-43
			Max. Compression	3	-207564.32	550	-24
		Inner Bracing	Max. Mx	3	-207564.32	550	-24
			Max. My	3	-30635.26	-128	-429
			Max. Vy	3	382.70	-479	-26
			Max. Vx	3	-339.66	-128	-429
			Max Tension	4	7494.82	0	0
			Max. Compression	4	-7350.82	0	0
T24	31 - 26.5	Leg	Max. Mx	2	6923.68	-112	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T25	26.5 - 22	Leg	Max. My	3	-3821.49	0	8
			Max. Vy	2	67.43	0	0
			Max. Vx	3	-4.72	0	0
			Max Tension	3	142392.99	-479	-26
			Max. Compression	3	-209186.04	-38	-43
			Max. Mx	3	-207560.59	550	-24
		Diagonal	Max. My	3	-33932.29	-101	-398
			Max. Vy	3	-488.88	-479	-26
			Max. Vx	3	442.87	-101	-398
			Max Tension	4	7554.11	0	0
			Max. Compression	4	-8269.63	0	0
			Max. Mx	2	7007.05	-129	0
		Horizontal	Max. My	4	455.64	0	9
			Max. Vy	2	73.69	0	0
			Max. Vx	4	-4.96	0	0
			Max Tension	2	531.97	36	-4
			Max. Compression	3	-721.05	36	-2
			Max. Mx	2	48.87	37	0
		Inner Bracing	Max. My	2	-581.62	36	-4
			Max. Vy	2	-35.25	37	0
			Max. Vx	2	2.15	36	-4
			Max Tension	1	0.00	0	0
			Max. Compression	3	-32.10	0	0
			Max. Mx	1	-19.94	-98	0
T26	22 - 17	Leg	Max. My	3	-8.69	0	0
			Max. Vy	1	53.65	0	0
			Max. Vx	3	-0.06	0	0
			Max Tension	3	155160.51	-178	-42
			Max. Compression	3	-227671.78	570	-42
			Max. Mx	3	-227671.78	570	-42
		Diagonal	Max. My	3	-34899.16	-101	-398
			Max. Vy	3	372.55	-534	-44
			Max. Vx	3	-332.15	-101	-398
			Max Tension	4	8401.92	0	0
			Max. Compression	4	-8110.00	0	0
			Max. Mx	2	7880.49	-135	0
		Horizontal	Max. My	4	752.06	0	10
			Max. Vy	2	73.70	0	0
			Max. Vx	4	-5.24	0	0
			Max Tension	3	153333.33	-534	-44
			Max. Compression	3	-229784.64	-245	-50
			Max. Mx	3	-227686.04	570	-42
T27	17 - 11	Leg	Max. My	3	-38889.62	-164	-514
			Max. Vy	3	-447.09	-534	-44
			Max. Vx	3	407.83	-164	-514
		Diagonal	Max Tension	4	9116.07	0	0
			Max. Compression	4	-9725.08	0	0
			Max. Mx	3	7904.44	-172	0
		Horizontal	Max. My	2	-7945.81	0	13
			Max. Vy	3	81.39	0	0
			Max. Vx	2	-5.98	0	0
			Max Tension	4	476.13	43	3
			Max. Compression	3	-712.13	44	-2
		Inner Bracing	Max. Mx	2	-231.29	44	-8
			Max. My	2	-189.81	44	-8
			Max. Vy	2	38.52	44	-8
			Max. Vx	2	3.01	44	-8
			Max Tension	1	0.00	0	0
			Max. Compression	3	-43.01	0	0
			Max. Mx	1	-22.66	-117	0
			Max. My	3	-8.10	0	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Force kg	Major Axis Moment kg-m	Minor Axis Moment kg-m
T28	11 - 6	Leg	Max. Vy	1	58.70	0	0
			Max. Vx	3	-0.04	0	0
			Max Tension	3	167299.32	-96	-48
			Max. Compression	3	-249973.09	540	-46
			Max. Mx	3	165578.60	-574	-47
			Max. My	3	-39955.71	-164	-514
		Diagonal	Max. Vy	3	362.35	-574	-47
			Max. Vx	3	-291.39	-164	-514
			Max Tension	4	8520.96	0	0
			Max. Compression	4	-8426.09	0	0
			Max. Mx	3	7449.87	-158	0
			Max. My	3	-4514.70	0	11
			Max. Vy	3	81.38	0	0
			Max. Vx	3	-5.46	0	0
T29	Leg	Max Tension	3	165409.15	-574	-47	
		Max. Compression	3	-252144.73	0	0	
		Max. Mx	3	165409.15	-574	-47	
		Max. My	3	-41855.83	-26	400	
		Max. Vy	3	-477.91	-574	-47	
		Max. Vx	3	-402.44	-26	-286	
	Diagonal	Max Tension	4	9123.15	0	0	
		Max. Compression	4	-10149.77	0	0	
		Max. Mx	4	9123.15	-197	0	
		Max. My	2	-1128.87	0	-14	
		Max. Vy	4	89.02	0	0	
		Max. Vx	2	6.22	0	0	
	Horizontal	Max Tension	4	462.14	105	-11	
		Max. Compression	3	-733.43	102	-5	
		Max. Mx	2	-33.32	109	1	
		Max. My	2	-634.02	105	-11	
		Max. Vy	2	-84.72	109	1	
		Max. Vx	2	5.27	105	-11	
	Inner Bracing	Max Tension	1	0.00	0	0	
		Max. Compression	3	-39.36	0	0	
		Max. Mx	5	-27.13	-141	0	
		Max. My	2	-24.87	0	0	
		Max. Vy	5	64.54	0	0	
		Max. Vx	2	0.02	0	0	

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical kg	Horizontal, X kg	Horizontal, Z kg
Leg D	Max. Vert	1	45744.46	2630.00	-2593.09
	Max. H _x	1	45744.46	2630.00	-2593.09
	Max. H _z	3	-171438.40	-14551.75	12609.24
	Min. Vert	3	-171438.40	-14551.75	12609.24
	Min. H _x	3	-171438.40	-14551.75	12609.24
Leg C	Min. H _z	1	45744.46	2630.00	-2593.09
	Max. Vert	4	171628.26	-15903.80	-7852.43
	Max. H _x	2	-81557.18	3342.05	10383.66
	Max. H _z	2	-81557.18	3342.05	10383.66
	Min. Vert	2	-81557.18	3342.05	10383.66
	Min. H _x	4	171628.26	-15903.80	-7852.43
Leg B	Min. H _z	4	171628.26	-15903.80	-7852.43
	Max. Vert	3	261810.28	-17526.20	19537.06

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Location	Condition	Gov. Load Comb.	Vertical kg	Horizontal, X kg	Horizontal, Z kg
Leg A	Max. H _x	1	44950.74	-2571.43	2608.35
	Max. H _z	3	261810.28	-17526.20	19537.06
	Min. Vert	1	44950.74	-2571.43	2608.35
	Min. H _x	3	261810.28	-17526.20	19537.06
	Min. H _z	1	44950.74	-2571.43	2608.35
	Max. Vert	2	172252.83	9138.15	14772.19
	Max. H _x	2	172252.83	9138.15	14772.19
	Max. H _z	2	172252.83	9138.15	14772.19
	Min. Vert	4	-80930.29	-9076.23	-4490.68
	Min. H _x	4	-80930.29	-9076.23	-4490.68
	Min. H _z	4	-80930.29	-9076.23	-4490.68

Tower Mast Reaction Summary

Load Combination	Vertical kg	Shear _x kg	Shear _z kg	Overturning Moment, M _x kg-m	Overturning Moment, M _z kg-m	Torque kg-m
Dead Only	181390.41	-0.02	-0.07	14434	-4116	0
Dead+Wind 0 deg - No Ice	181390.35	2013.81	-51235.60	-3416997	-117467	19219
Dead+Wind 45 deg - No Ice	181390.35	41774.42	-42104.45	-2825713	-2806520	51382
Dead+Wind 90 deg - No Ice	181390.36	50768.92	-2013.89	-98776	-3382037	44166
Dead+Wind 0 deg - Service	181390.40	503.45	-12808.91	-843289	-32464	4805
Dead+Wind 45 deg - Service	181390.40	10443.50	-10526.02	-695487	-704685	12847
Dead+Wind 90 deg - Service	181390.40	12692.23	-503.47	-13818	-848573	11040

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX kg	PY kg	PZ kg	PX kg	PY kg	PZ kg	
1	0.00	-181390.41	0.00	0.02	181390.41	0.07	0.000%
2	2013.84	-181390.41	-51238.91	-2013.81	181390.35	51235.60	0.002%
3	41776.67	-181390.41	-42106.74	-41774.42	181390.35	42104.45	0.002%
4	50772.12	-181390.41	-2013.84	-50768.92	181390.36	2013.89	0.002%
5	503.46	-181390.41	-12809.73	-503.45	181390.40	12808.91	0.000%
6	10444.17	-181390.41	-10526.69	-10443.50	181390.40	10526.02	0.001%
7	12693.03	-181390.41	-503.46	-12692.23	181390.40	503.47	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00001425
2	Yes	18	0.00013923	0.00014654
3	Yes	19	0.00012157	0.00012574
4	Yes	18	0.00013894	0.00014425
5	Yes	18	0.00013945	0.00010335
6	Yes	18	0.00014042	0.00011037
7	Yes	18	0.00013921	0.00010172

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Maximum Tower Deflections - Service Wind

Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T1	155 - 149	315.01	6	0.4939	0.0940
T2	149 - 143	263.33	6	0.4821	0.0805
T3	143 - 142	216.14	6	0.3868	0.0503
T4	142 - 135.6	209.80	6	0.3631	0.0480
T5	135.6 - 129.2	170.22	6	0.3380	0.0439
T6	129.2 - 122.8	134.51	6	0.2913	0.0386
T7	122.8 - 118	105.41	6	0.2168	0.0318
T8	118 - 115	90.03	6	0.1402	0.0255
T9	115 - 107.5	84.58	6	0.0996	0.0249
T10	107.5 - 100	71.59	6	0.0903	0.0236
T11	100 - 95	59.89	6	0.0774	0.0215
T12	95 - 89.5	53.39	6	0.0693	0.0189
T13	89.5 - 84	46.86	6	0.0625	0.0165
T14	84 - 77.5	40.96	6	0.0559	0.0146
T15	77.5 - 71	34.65	6	0.0491	0.0124
T16	71 - 64.5	29.16	6	0.0426	0.0110
T17	64.5 - 58	24.34	6	0.0363	0.0097
T18	58 - 53.5	20.14	6	0.0304	0.0084
T19	53.5 - 49	17.50	6	0.0281	0.0077
T20	49 - 44.5	15.10	6	0.0255	0.0069
T21	44.5 - 40	12.79	6	0.0233	0.0063
T22	40 - 35.5	10.76	6	0.0209	0.0055
T23	35.5 - 31	8.81	6	0.0185	0.0049
T24	31 - 26.5	7.15	6	0.0160	0.0042
T25	26.5 - 22	5.56	6	0.0138	0.0036
T26	22 - 17	4.23	6	0.0114	0.0030
T27	17 - 11	2.83	6	0.0088	0.0024
T28	11 - 6	1.58	6	0.0055	0.0014
T29	6 - 0	0.64	6	0.0031	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation m	Appurtenance	Gov. Load Comb.	Deflection mm	Tilt °	Twist °	Radius of Curvature m
155.0000	CxMANTENIMIENTO	6	315.01	0.4939	0.0940	95048
154.5000	ANT PANEL 1.0x0.50x0.19m	6	310.69	0.4943	0.0935	95048
153.5000	ANT PANEL 1.0x0.50x0.19m	6	302.06	0.4948	0.0922	95048
152.5000	ANT PANEL 1.0x0.50x0.19m	6	293.42	0.4947	0.0907	57941
151.5000	ANT PANEL 1.0x0.50x0.19m	6	284.80	0.4934	0.0887	41386
150.5000	ANT PANEL 1.0x0.50x0.19m	6	276.20	0.4905	0.0860	32189
149.5000	ANT PANEL 1.0x0.50x0.19m	6	267.62	0.4855	0.0826	22566
142.0000	2 ANT TV 0.15x0.60m	6	209.80	0.3631	0.0480	6999
139.5000	2 ANT TV 0.15x0.60m	6	194.16	0.3354	0.0452	36623
137.0000	2 ANT TV 0.15x0.60m	6	178.69	0.3365	0.0443	12871
131.0000	2 ANT TV 0.15x0.60m	6	143.98	0.3099	0.0404	6780
128.5000	1 ANT TV 0.15x0.60m	6	130.96	0.2840	0.0379	5930
126.0000	1 ANT TV 0.15x0.60m	6	119.00	0.2571	0.0355	5365
113.0000	1 ANT TV 0.30x1.20m	6	81.22	0.0875	0.0248	29841
111.5000	1 ANT TV 0.30x1.20m	6	78.60	0.0854	0.0245	70843

<i>RISATower</i> BTESA BROAD TELECOM. Calle 129 No. 8 - 08 - Oficina 204. BOGOTA D.C. - COLOMBIA. Phone: 57 (1) 2740536. FAX: 57 (1) 2740536.	Job TORRE SECCION CUADRADA H= 155.0m PATA=13.00m V=120 KPH	Page 80 of 93
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<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>m</i>			<i>mm</i>	<i>°</i>	<i>°</i>	<i>m</i>
110.0000	1 ANT TV 0.30x1.20m	6	75.95	0.0867	0.0242	189422
108.5000	1 ANT TV 0.30x1.20m	6	73.32	0.0891	0.0238	40725
106.5000	1 ANT TV 0.30x1.20m	6	69.89	0.0904	0.0233	25733
106.0000	2 ANT TV 0.30x1.20m	6	69.06	0.0901	0.0232	25209
103.5000	2 ANT TV 0.30x1.20m	6	65.05	0.0860	0.0226	23197
101.0000	2 ANT TV 0.30x1.20m	6	61.31	0.0798	0.0219	21520
95.0000	2 ANT TV 0.30x1.20m	6	53.39	0.0693	0.0189	58722
92.5000	2 ANT TV 0.30x1.20m	6	50.35	0.0662	0.0177	52824
90.0000	2 ANT TV 0.30x1.20m	6	47.43	0.0631	0.0166	44150
88.0000	2 ANT TV 0.30x1.20m	6	45.19	0.0607	0.0159	47618
85.5000	2 ANT TV 0.30x1.20m	6	42.52	0.0577	0.0151	60652
83.0000	2 ANT TV 0.30x1.20m	6	39.94	0.0548	0.0143	65870
74.0000	HP8-102	6	31.60	0.0455	0.0115	56023
66.5000	HP12-21B	6	25.76	0.0383	0.0101	64098
54.0000	HP12-21B	6	17.78	0.0283	0.0078	64702
24.5000	6 FT DISH	6	4.95	0.0127	0.0033	108101

Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load Comb.</i>	<i>Tilt</i>	<i>Twist</i>
	<i>m</i>	<i>mm</i>		<i>°</i>	<i>°</i>
T1	155 - 149	1274.36	3	2.0320	0.3796
T2	149 - 143	1062.09	3	1.9758	0.3244
T3	143 - 142	869.47	3	1.5679	0.2016
T4	142 - 135.6	843.88	3	1.4659	0.1923
T5	135.6 - 129.2	684.25	3	1.3624	0.1759
T6	129.2 - 122.8	540.41	3	1.1719	0.1545
T7	122.8 - 118	423.50	3	0.8704	0.1271
T8	118 - 115	361.77	3	0.5628	0.1020
T9	115 - 107.5	339.93	3	0.3998	0.0997
T10	107.5 - 100	287.75	3	0.3625	0.0943
T11	100 - 95	240.77	3	0.3108	0.0859
T12	95 - 89.5	214.65	3	0.2785	0.0758
T13	89.5 - 84	188.43	3	0.2512	0.0658
T14	84 - 77.5	164.70	3	0.2249	0.0584
T15	77.5 - 71	139.30	3	0.1975	0.0495
T16	71 - 64.5	117.23	3	0.1715	0.0439
T17	64.5 - 58	97.81	3	0.1465	0.0387
T18	58 - 53.5	80.88	3	0.1228	0.0338
T19	53.5 - 49	70.24	3	0.1133	0.0309
T20	49 - 44.5	60.61	3	0.1029	0.0276
T21	44.5 - 40	51.30	3	0.0939	0.0251
T22	40 - 35.5	43.17	3	0.0841	0.0220
T23	35.5 - 31	35.33	3	0.0747	0.0196
T24	31 - 26.5	28.63	3	0.0645	0.0167
T25	26.5 - 22	22.26	3	0.0555	0.0145
T26	22 - 17	16.92	3	0.0459	0.0118
T27	17 - 11	11.29	3	0.0355	0.0094
T28	11 - 6	6.30	3	0.0220	0.0057
T29	6 - 0	2.56	3	0.0124	0.0033

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Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
m		Comb.	mm	°	°	m
155.0000	CxMANTENIMIENTO	3	1274.36	2.0320	0.3796	24370
154.5000	ANT PANEL 1.0x0.50x0.19m	3	1256.60	2.0330	0.3772	24370
153.5000	ANT PANEL 1.0x0.50x0.19m	3	1221.10	2.0341	0.3720	24370
152.5000	ANT PANEL 1.0x0.50x0.19m	3	1185.64	2.0324	0.3657	14856
151.5000	ANT PANEL 1.0x0.50x0.19m	3	1150.23	2.0258	0.3576	10611
150.5000	ANT PANEL 1.0x0.50x0.19m	3	1114.89	2.0126	0.3469	8253
149.5000	ANT PANEL 1.0x0.50x0.19m	3	1079.66	1.9906	0.3328	5679
142.0000	2 ANT TV 0.15x0.60m	3	843.88	1.4659	0.1923	1669
139.5000	2 ANT TV 0.15x0.60m	3	780.82	1.3479	0.1809	9737
137.0000	2 ANT TV 0.15x0.60m	3	718.41	1.3546	0.1775	3132
131.0000	2 ANT TV 0.15x0.60m	3	578.51	1.2482	0.1616	1664
128.5000	1 ANT TV 0.15x0.60m	3	526.17	1.1420	0.1518	1463
126.0000	1 ANT TV 0.15x0.60m	3	478.09	1.0329	0.1422	1326
113.0000	1 ANT TV 0.30x1.20m	3	326.42	0.3516	0.0991	7449
111.5000	1 ANT TV 0.30x1.20m	3	315.91	0.3430	0.0981	17667
110.0000	1 ANT TV 0.30x1.20m	3	305.28	0.3481	0.0968	47534
108.5000	1 ANT TV 0.30x1.20m	3	294.69	0.3578	0.0953	10183
106.5000	1 ANT TV 0.30x1.20m	3	280.94	0.3631	0.0934	6430
106.0000	2 ANT TV 0.30x1.20m	3	277.60	0.3619	0.0929	6299
103.5000	2 ANT TV 0.30x1.20m	3	261.49	0.3454	0.0905	5792
101.0000	2 ANT TV 0.30x1.20m	3	246.46	0.3204	0.0875	5371
95.0000	2 ANT TV 0.30x1.20m	3	214.65	0.2785	0.0758	14659
92.5000	2 ANT TV 0.30x1.20m	3	202.44	0.2659	0.0709	13191
90.0000	2 ANT TV 0.30x1.20m	3	190.71	0.2537	0.0666	11027
88.0000	2 ANT TV 0.30x1.20m	3	181.72	0.2439	0.0637	11888
85.5000	2 ANT TV 0.30x1.20m	3	170.95	0.2319	0.0604	15124
83.0000	2 ANT TV 0.30x1.20m	3	160.60	0.2205	0.0570	16426
74.0000	HP8-102	3	127.03	0.1833	0.0461	14012
66.5000	HP12-21B	3	103.51	0.1543	0.0403	15860
54.0000	HP12-21B	3	71.37	0.1143	0.0312	15597
24.5000	6 FT DISH	3	19.81	0.0513	0.0133	26728

Bolt Design Data

Section No.	Elevation	Component Type	Bolt Grade	Bolt Size	Number Of Bolts	Maximum Load per Bolt	Allowable Load	Ratio Load Allowable	Allowable Ratio	Criteria
	m			mm		kg	kg			
T1	155	Leg	A394T0	19	6	41.61	5919.38	0.007 ✓	1.333	Bearing
		Diagonal	A394T0	16	2	654.62	3699.61	0.177 ✓	1.333	Member Bearing
		Top Girt	A394T0	16	1	10.85	3699.61	0.003 ✓	1.333	Member Bearing
T2	149	Leg	A394T0	16	8	1542.93	4940.57	0.312 ✓	1.333	Bearing
		Diagonal	A394T0	16	2	926.76	3699.61	0.251 ✓	1.333	Member Bearing
		Top Girt	A394T0	16	1	57.22	2774.71	0.021 ✓	1.333	Member Bearing
T3	143	Leg	A394T0	16	8	3990.70	4940.57	0.808 ✓	1.333	Bearing
		Diagonal	A394T0	16	2	1706.46	3699.61	0.461 ✓	1.333	Member Bearing
		Top Girt	A394T0	16	1	1326.67	2774.71	0.478 ✓	1.333	Member Bearing
T4	142	Leg	A394T0	16	12	2871.96	9979.03	0.288 ✓	1.333	Bolt SS

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Section No.	Elevation m	Component Type	Bolt Grade	Bolt Size mm	Number Of Bolts	Maximum Load per Bolt kg	Allowable Load kg	Ratio Load Allowable	Allowable Ratio	Criteria
T5	135.6	Diagonal	A394T0	16	2	941.23	4932.82	0.191	✓	Member Bearing
		Top Girt	A394T0	16	2	1301.94	3699.61	0.352	✓	Member Bearing
		Leg	A394T0	19	12	5832.75	9979.03	0.584	✓	Bolt SS
T6	129.2	Diagonal	A394T0	16	2	1199.74	4932.82	0.243	✓	Member Bearing
		Leg	A394T0	19	12	9621.65	9979.03	0.964	✓	Bolt SS
T7	122.8	Diagonal	A394T0	16	2	1519.67	4932.82	0.308	✓	Member Bearing
		Leg	A394T0	19	14	12032.77	9979.03	1.206	✓	Bolt SS
T8	118	Diagonal	A394T0	16	2	3085.49	4932.82	0.626	✓	Member Bearing
		Leg	A394T0	19	14	10339.91	9979.03	1.036	✓	Bolt SS
		Diagonal	A394T0	16	4	6075.60	7399.23	0.821	✓	Member Bearing
T9	115	Top Girt	A394T0	16	3	1167.23	3699.61	0.316	✓	Member Bearing
		Leg	A394T0	19	14	7339.72	9979.03	0.736	✓	Bolt SS
		Diagonal	A394T0	16	2	1632.99	4932.82	0.331	✓	Member Bearing
T10	107.5	Top Girt	A394T0	16	3	1665.99	3699.61	0.450	✓	Member Bearing
		Leg	A394T0	19	16	8924.34	9979.03	0.894	✓	Bolt SS
		Diagonal	A394T0	16	2	2137.19	4932.82	0.433	✓	Member Bearing
T11	100	Leg	A394T0	19	16	11737.89	9979.03	1.176	✓	Bolt SS
		Diagonal	A394T0	16	2	935.81	4932.82	0.190	✓	Member Bearing
		Top Girt	A394T0	16	3	521.31	3699.61	0.141	✓	Member Bearing
T12	95	Leg	A490X	25	32	6228.28	9975.00	0.624	✓	Bolt SS
		Diagonal	A394T0	16	2	990.66	4932.82	0.201	✓	Member Bearing
T13	89.5	Leg	A490X	25	32	6508.46	9975.00	0.652	✓	Bolt SS
		Diagonal	A394T0	16	2	1115.71	4932.82	0.226	✓	Member Bearing
T14	84	Leg	A490X	25	32	6954.66	9975.00	0.697	✓	Bolt SS
		Diagonal	A394T0	16	2	1409.66	4932.82	0.286	✓	Member Bearing
T15	77.5	Leg	A490X	25	32	7450.85	9975.00	0.747	✓	Bolt SS
		Diagonal	A394T0	16	2	1695.74	7399.23	0.229	✓	Member Bearing
T16	71	Leg	A490X	25	32	8037.16	9975.00	0.806	✓	Bolt SS
		Diagonal	A394T0	16	2	2005.55	7399.23	0.271	✓	Member Bearing
T17	64.5	Leg	A490X	25	32	8674.37	9975.00	0.870	✓	Bolt SS
		Diagonal	A394T0	16	2	2438.52	7399.23	0.330	✓	Member Bearing
T18	58	Leg	A490X	32	32	9487.66	15635.11	0.607	✓	Bolt SS
		Diagonal	A394T0	25	2	2895.56	9979.03	0.290	✓	Bolt Shear
T19	53.5	Leg	A490X	32	32	9584.55	15635.11	0.613	✓	Bolt SS
		Diagonal	A394T0	25	2	3492.33	9979.03	0.350	✓	Bolt Shear
T20	49	Horizontal	A394T0	16	2	485.48	4932.82	0.098	✓	Member Bearing
		Leg	A490X	32	32	10639.06	15635.11	0.680	✓	Bolt SS
T21	44.5	Diagonal	A394T0	25	2	3356.08	9979.03	0.336	✓	Bolt Shear
		Leg	A490X	32	32	10737.62	15635.11	0.687	✓	Bolt SS
		Diagonal	A394T0	25	2	3695.62	9979.03	0.370	✓	Bolt Shear

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Section No.	Elevation m	Component Type	Bolt Grade	Bolt Size mm	Number Of Bolts	Maximum Load per Bolt kg	Allowable Load kg	Ratio Load Allowable	Allowable Ratio	Criteria
T22	40	Horizontal	A394T0	16	2	340.79	4932.82	0.069 ✓	1.333	Member Bearing
		Leg	A490X	32	32	11818.85	15635.11	0.756 ✓	1.333	Bolt SS
T23	35.5	Diagonal	A394T0	25	2	3566.94	9979.03	0.357 ✓	1.333	Bolt Shear
		Leg	A490X	32	32	11917.73	15635.11	0.762 ✓	1.333	Bolt SS
T24	31	Diagonal	A394T0	25	2	3883.25	9979.03	0.389 ✓	1.333	Bolt Shear
		Horizontal	A394T0	16	2	333.21	4932.82	0.068 ✓	1.333	Member Bearing
T25	26.5	Leg	A490X	32	32	12972.79	15635.11	0.830 ✓	1.333	Bolt SS
		Diagonal	A394T0	25	2	3747.41	9979.03	0.376 ✓	1.333	Bolt Shear
T26	22	Leg	A490X	32	32	13074.12	15635.11	0.836 ✓	1.333	Bolt SS
		Diagonal	A394T0	25	2	4134.81	9979.03	0.414 ✓	1.333	Bolt Shear
T27	17	Horizontal	A394T0	16	2	360.52	4932.82	0.073 ✓	1.333	Member Bearing
		Leg	A490X	32	32	14229.47	15635.11	0.910 ✓	1.333	Bolt SS
T28	11	Diagonal	A394T0	25	2	4200.96	9979.03	0.421 ✓	1.333	Bolt Shear
		Leg	A490X	32	32	14361.56	15635.11	0.919 ✓	1.333	Bolt SS
T29	6	Diagonal	A394T0	25	2	4862.56	9979.03	0.487 ✓	1.333	Bolt Shear
		Horizontal	A394T0	16	2	356.07	4932.82	0.072 ✓	1.333	Member Bearing
T29	6	Leg	A490X	32	32	15623.31	15635.11	0.999 ✓	1.333	Bolt SS
		Diagonal	A394T0	25	2	4260.48	9979.03	0.427 ✓	1.333	Bolt Shear
T29	6	Leg	A490X	32	32	15759.03	15635.11	1.008 ✓	1.333	Bolt SS
		Diagonal	A394T0	25	2	5074.88	9979.03	0.509 ✓	1.333	Bolt Shear
T29	6	Horizontal	A394T0	16	2	366.71	7399.23	0.050 ✓	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio P P _a
T1	155 - 149	L89x89x6	6.0000	0.5000	37.8 K=1.33	133491	1090	-4812.34	14841.73	0.324 ✓
T2	149 - 143	L89x89x6	6.0000	0.5000	37.8 K=1.33	133491	1090	-18694.32	14841.73	1.260 ✓
T3	143 - 142	L89x89x6	1.0302	1.0302	58.4 K=1.00	121199	1090	-15737.44	13475.19	1.168 ✓
T4	142 - 135.6	L127x13+L102x13	6.4000	1.6000	32.0 K=0.50	136484	5484	-29962.10	76321.93	0.393 ✓
T5	135.6 - 129.2	L127x13+L102x13	6.4000	1.6000	32.0 K=0.50	136484	5484	-51687.32	76321.93	0.677 ✓
T6	129.2 - 122.8	L127x13+L102x13	6.4000	1.6000	32.0	136484	5484	-76814.98	76321.93	1.006 ✓

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Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio P P _a
T7	122.8 - 118	L127x13+L102x13	4.8000	1.6000	K=0.50 32.0 K=0.50	136484	5484	-91696.90	76321.93	1.201
T8	118 - 115	L127x13+L102x13	3.2588	1.6294	65.3 K=1.00	116616	5484	-70620.27	65211.63	1.083
T9	115 - 107.5	4L127x127x16	7.5000	2.5000	50.3 K=0.50	126328	15123	-64185.15	194808.00	0.329
T10	107.5 - 100	4L127x127x16	7.5000	2.5000	50.3 K=0.50	126328	15123	-87431.77	194808.00	0.449
T11	100 - 95	4L152x152x16	5.0130	5.0130	41.8 K=0.25	131302	18348	-93903.17	245667.51	0.382
T12	95 - 89.5	4L152x152x16	5.5143	5.5143	46.0 K=0.25	128909	18348	-99652.91	241191.01	0.413
T13	89.5 - 84	4L152x152x16	5.5143	5.5143	46.0 K=0.25	128909	18348	-104135.31	241191.01	0.432
T14	84 - 77.5	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-111274.40	231675.54	0.480
T15	77.5 - 71	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-119213.63	231675.54	0.515
T16	71 - 64.5	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-128594.83	231675.54	0.555
T17	64.5 - 58	4L152x152x16	6.5169	6.5169	54.4 K=0.25	123824	18348	-138790.23	231675.54	0.599
T18	58 - 53.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-151802.44	401616.69	0.378
T19	53.5 - 49	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-153352.37	401616.69	0.382
T20	49 - 44.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-170225.10	401616.69	0.424
T21	44.5 - 40	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-171801.79	401616.69	0.428
T22	40 - 35.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-189101.81	401616.69	0.471
T23	35.5 - 31	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-190683.48	401616.69	0.475
T24	31 - 26.5	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-207564.38	401616.69	0.517
T25	26.5 - 22	4L203x203x19	4.5117	4.5117	37.1 K=0.33	133875	29419	-209185.97	401616.69	0.521
T26	22 - 17	4L203x203x19	5.0130	5.0130	41.2 K=0.33	131633	29419	-227671.68	394889.46	0.577
T27	17 - 11	4L203x203x19	6.0156	6.0156	37.5 K=0.25	133676	29419	-229784.52	401017.95	0.573
T28	11 - 6	4L203x203x19	5.0130	5.0130	41.2 K=0.33	131633	29419	-249973.01	394889.46	0.633
T29	6 - 0	4L203x203x19	6.0156	6.0156	37.5 K=0.25	133676	29419	-252144.81	401017.95	0.629

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Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KI/r	F _a	A	Actual P	Allow. P _a	Ratio P
	m		m	m		kPa	mm ²	kg	kg	P _a
T1	155 - 149	L38x38x5	0.8201	0.7079	95.0 K=1.00	93769	340	-1309.23	3253.14	0.402
T2	149 - 143	L38x38x5	0.8201	0.7079	95.0 K=1.00	93769	340	-1853.51	3253.14	0.570
T3	143 - 142	L38x38x5	1.3081	0.7239	97.1 K=1.00	91944	340	-3004.77	3189.83	0.942
T4	142 - 135.6	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-1882.45	14285.03	0.132
T5	135.6 - 129.2	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-2399.48	14285.03	0.168
T6	129.2 - 122.8	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-3039.33	14285.03	0.213
T7	122.8 - 118	L89x89x6	1.8868	0.8236	46.7 K=1.00	128484	1090	-5720.35	14285.03	0.400
T8	118 - 115	L127x127x10	2.1342	1.3234	52.6 K=1.00	124909	2329	-23811.16	29665.18	0.803
T9	115 - 107.5	L89x89x6	3.7537	1.7917	101.6 K=1.00	88038	1090	-3207.23	9788.25	0.328
T10	107.5 - 100	L89x89x6	3.7537	1.7917	101.6 K=1.00	88038	1090	-4274.38	9788.25	0.437
T11	100 - 95	L89x89x6	5.8650	3.0319	54.8 K=0.50	123573	1090	-1871.61	13739.04	0.136
T12	95 - 89.5	L89x89x6	6.5742	3.4052	61.5 K=0.50	119177	1090	-1981.33	13250.25	0.150
T13	89.5 - 84	L102x102x6	6.8966	3.5553	56.0 K=0.50	119219	1252	-2231.42	15215.76	0.147
T14	84 - 77.5	L102x102x6	8.0654	4.1850	65.9 K=0.50	112988	1252	-2819.32	14420.52	0.196
T15	77.5 - 71	L102x102x10	8.4739	4.3773	70.1 K=0.50	113245	1845	-3391.47	21307.51	0.159
T16	71 - 64.5	L102x102x10	8.9130	4.5880	73.4 K=0.50	110802	1845	-4011.09	20847.84	0.192
T17	64.5 - 58	L102x102x10	9.3785	4.8140	77.0 K=0.50	108117	1845	-4877.03	20342.49	0.240
T18	58 - 53.5	L127x127x10	5.7314	5.6086	73.6 K=0.33	110673	2329	-5743.21	26284.14	0.219
T19	53.5 - 49	L127x127x10	6.0258	5.8732	77.1 K=0.33	108092	2329	-6984.64	25671.34	0.272
T20	49 - 44.5	L127x127x10	6.0258	5.8732	77.1 K=0.33	108092	2329	-6648.40	25671.34	0.259
T21	44.5 - 40	L127x127x10	6.3399	6.1958	81.3 K=0.33	104862	2329	-7391.24	24904.09	0.297
T22	40 - 35.5	L127x127x10	6.3399	6.1958	81.3 K=0.33	104862	2329	-6994.40	24904.09	0.281
T23	35.5 - 31	L127x127x10	6.6708	6.5333	85.7 K=0.33	101383	2329	-7766.50	24077.78	0.323
T24	31 - 26.5	L127x127x10	6.6708	6.5333	85.7 K=0.33	101383	2329	-7350.83	24077.78	0.305
T25	26.5 - 22	L127x127x10	7.0161	6.8838	90.3 K=0.33	97660	2329	-8269.63	23193.82	0.357

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Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T26	22 - 17	L127x127x10	7.3476	7.2091	94.6 K=0.33	94106	2329	-8110.01	22349.73	0.363
T27	17 - 11	L127x127x10	8.4478	8.3036	82.6 K=0.25	103894	2329	-9725.07	24674.39	0.394
T28	11 - 6	L127x127x10	7.7677	7.6350	100.2 K=0.33	89306	2329	-8426.07	21209.76	0.397
T29	6 - 0	L127x127x10	8.8512	8.7131	86.6 K=0.25	100673	2329	-10149.77	23909.40	0.425

Horizontal Design Data (Compression)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T19	53.5 - 49	L76x76x6	7.5430	3.6700	77.7 K=0.50	107636	929	-970.95	10196.85	0.095
T21	44.5 - 40	L76x76x6	8.4610	4.1290	87.4 K=0.50	100053	929	-681.57	9478.50	0.072
T23	35.5 - 31	L76x76x6	9.3790	4.5880	97.1 K=0.50	91976	929	-666.43	8713.33	0.076
T25	26.5 - 22	L76x76x6	10.2970	5.0470	106.8 K=0.50	83391	929	-721.05	7900.04	0.091
T27	17 - 11	L76x76x6	11.2660	5.5315	117.1 K=0.50	73750	929	-712.13	6986.73	0.102
T29	6 - 0	L102x102x10	12.3880	6.0925	97.5 K=0.50	91640	1845	-733.43	17242.28	0.043

Top Girt Design Data (Compression)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T1	155 - 149	L38x38x5	0.6500	0.5611	75.3 K=1.00	109417	340	-10.85	3795.99	0.003
T2	149 - 143	L38x38x5	0.6500	0.5611	75.3 K=1.00	109417	340	-50.86	3795.99	0.013
T3	143 - 142	L38x38x5	0.6500	0.5611	75.3 K=1.00	109417	340	-760.49	3795.99	0.200
T4	142 - 135.6	L51x51x5	1.0000	0.9111	91.0 K=1.00	97082	461	-2397.49	4566.59	0.525
T8	118 - 115	L64x64x5	1.0000	0.8730	69.4 K=1.00	113688	582	-3501.69	6746.33	0.519
T9	115 - 107.5	L64x64x5	2.8000	2.6730	135.3 K=1.00	56273	582	-3855.65	3339.28	1.155
T11	100 - 95	L64x64x5	2.8000	2.6730	135.3 K=1.00	56273	582	-1563.94	3339.28	0.468

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Inner Bracing Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	m		m	m		kPa	mm ²	kg	kg	
T19	53.5 - 49	L76x76x6	5.3337	5.3337	177.4 K=0.50	32733	929	-204.97	3100.93	0.066
T21	44.5 - 40	L76x76x6	5.9828	5.9828	198.9 K=0.50	26015	929	-55.21	2464.55	0.022
T23	35.5 - 31	L76x76x6	6.6320	6.6320	220.5 K=0.50	21172	929	-31.53	2005.70	0.016
T25	26.5 - 22	L102x102x6	7.2811	7.2811	180.3 K=0.50	31677	1252	-32.10	4042.86	0.008
T27	17 - 11	L102x102x6	7.9663	7.9663	197.3 K=0.50	26462	1252	-43.01	3377.31	0.013
T29	6 - 0	L102x102x6	8.7596	8.7596	216.9 K=0.50	21886	1252	-39.36	2793.24	0.014

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	m		m	m		kPa	mm ²	kg	kg	
T1	155 - 149	L89x89x6	6.0000	0.5000	18.1	199948	808	4740.77	16475.61	0.288
T2	149 - 143	L89x89x6	6.0000	0.5000	18.1	148927	1090	19683.56	16557.94	1.189
T3	143 - 142	L89x89x6	1.0302	1.0302	37.2	148927	1090	15962.78	16557.94	0.964
T4	142 - 135.6	L127x13+L102x13	6.4000	1.6000	64.1	148927	5484	26612.95	83279.58	0.320
T5	135.6 - 129.2	L127x13+L102x13	6.4000	1.6000	64.1	148927	5484	46296.37	83279.58	0.556
T6	129.2 - 122.8	L127x13+L102x13	6.4000	1.6000	64.1	148927	5484	72726.30	83279.58	0.873
T7	122.8 - 118	L127x13+L102x13	4.8000	1.6000	64.1	148927	5484	92112.39	83279.58	1.106
T8	118 - 115	L127x13+L102x13	3.2588	1.6294	65.3	148927	5484	72379.30	83279.58	0.869
T9	115 - 107.5	4L127x127x16	7.5000	2.5000	100.6	148927	15123	54679.21	229655.70	0.238
T10	107.5 - 100	4L127x127x16	7.5000	2.5000	100.6	148927	15123	73576.79	229655.70	0.320
T11	100 - 95	4L152x152x16	5.0130	5.0130	167.3	148927	18348	78137.66	278643.69	0.280
T12	95 - 89.5	4L152x152x16	5.5143	5.5143	184.0	148927	18348	80966.26	278643.69	0.291

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Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T13	89.5 - 84	4L152x152x16	5.5143	5.5143	184.0	148927	18348	82933.04	278643.69	0.298
T14	84 - 77.5	4L152x152x16	6.5169	6.5169	217.4	148927	18348	87128.31	278643.69	0.313
T15	77.5 - 71	4L152x152x16	6.5169	6.5169	217.4	148927	18348	92044.35	278643.69	0.330
T16	71 - 64.5	4L152x152x16	6.5169	6.5169	217.4	148927	18348	98067.15	278643.69	0.352
T17	64.5 - 58	4L152x152x16	6.5169	6.5169	217.4	148927	18348	104904.60	278643.69	0.376
T18	58 - 53.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	114254.05	446770.47	0.256
T19	53.5 - 49	4L203x203x19	4.5117	4.5117	112.4	148927	29419	112318.57	446770.47	0.251
T20	49 - 44.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	123950.95	446770.47	0.277
T21	44.5 - 40	4L203x203x19	4.5117	4.5117	112.4	148927	29419	122316.21	446770.47	0.274
T22	40 - 35.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	134147.26	446770.47	0.300
T23	35.5 - 31	4L203x203x19	4.5117	4.5117	112.4	148927	29419	132508.88	446770.47	0.297
T24	31 - 26.5	4L203x203x19	4.5117	4.5117	112.4	148927	29419	144042.38	446770.47	0.322
T25	26.5 - 22	4L203x203x19	4.5117	4.5117	112.4	148927	29419	142393.12	446770.47	0.319
T26	22 - 17	4L203x203x19	5.0130	5.0130	124.9	148927	29419	155160.39	446770.47	0.347
T27	17 - 11	4L203x203x19	6.0156	6.0156	149.9	148927	29419	153333.32	446770.47	0.343
T28	11 - 6	4L203x203x19	5.0130	5.0130	124.9	148927	29419	167299.43	446770.47	0.374
T29	6 - 0	4L203x203x19	6.0156	6.0156	149.9	148927	29419	165409.31	446770.47	0.370

Diagonal Design Data (Tension)

Section No.	Elevation m	Size	L m	L _u m	KI/r	F _a kPa	A mm ²	Actual P kg	Allow. P _a kg	Ratio $\frac{P}{P_a}$
T1	155 - 149	L38x38x5	0.8201	0.7079	61.0	199948	249	1210.77	5086.95	0.238
T2	149 - 143	L38x38x5	0.8201	0.7079	61.0	199948	249	1844.33	5086.95	0.363
T3	143 - 142	L38x38x5	1.3081	0.7239	62.4	199948	249	3412.92	5086.95	0.671
T4	142 - 135.6	L89x89x6	1.8868	0.8236	29.7	148927	1090	1847.46	16557.94	0.112
T5	135.6 - 129.2	L89x89x6	1.8868	0.8236	29.7	148927	1090	2332.17	16557.94	0.141

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Section No.	Elevation <i>m</i>	Size	<i>L</i> <i>m</i>	<i>L_u</i> <i>m</i>	<i>KI/r</i>	<i>F_a</i> <i>kPa</i>	<i>A</i> <i>mm²</i>	Actual <i>P</i> <i>kg</i>	Allow. <i>P_a</i> <i>kg</i>	Ratio <i>P</i> <i>P_a</i>
T6	129.2 - 122.8	L89x89x6	1.8868	0.8236	29.7	148927	1090	2920.92	16557.94	0.176
T7	122.8 - 118	L89x89x6	1.8868	0.8236	29.7	148927	1090	6170.99	16557.94	0.373
T8	118 - 115	L127x127x10	2.1342	1.3234	33.4	148927	2329	24302.44	35369.33	0.687
T9	115 - 107.5	L89x89x6	3.7537	1.7917	64.7	148927	1090	3265.97	16557.94	0.197
T10	107.5 - 100	L89x89x6	3.7537	1.7917	64.7	148927	1090	3884.35	16557.94	0.235
T11	100 - 95	L89x89x6	5.8650	3.0319	109.5	148927	1090	1656.85	16557.94	0.100
T12	95 - 89.5	L89x89x6	6.5742	3.4052	123.0	148927	1090	1845.64	16557.94	0.111
T13	89.5 - 84	L102x102x6	6.8966	3.5553	112.0	148927	1252	2069.39	19007.34	0.109
T14	84 - 77.5	L102x102x6	8.0654	4.1850	131.8	148927	1252	2626.79	19007.34	0.138
T15	77.5 - 71	L102x102x10	8.4739	4.3773	140.1	148927	1845	3128.19	28021.13	0.112
T16	71 - 64.5	L102x102x10	8.9130	4.5880	146.9	148927	1845	3852.70	28021.13	0.137
T17	64.5 - 58	L102x102x10	9.3785	4.8140	154.1	148927	1845	4644.83	28021.13	0.166
T18	58 - 53.5	L127x127x10	5.7314	5.6086	141.5	148927	2329	5791.11	35369.33	0.164
T19	53.5 - 49	L127x127x10	6.0258	5.8732	148.2	148927	2329	6453.53	35369.33	0.182
T20	49 - 44.5	L127x127x10	6.0258	5.8732	148.2	148927	2329	6712.17	35369.33	0.190
T21	44.5 - 40	L127x127x10	6.3399	6.1958	156.4	148927	2329	6803.34	35369.33	0.192
T22	40 - 35.5	L127x127x10	6.3399	6.1958	156.4	148927	2329	7133.88	35369.33	0.202
T23	35.5 - 31	L127x127x10	6.6708	6.5333	164.9	148927	2329	7177.60	35369.33	0.203
T24	31 - 26.5	L127x127x10	6.6708	6.5333	164.9	148927	2329	7494.80	35369.33	0.212
T25	26.5 - 22	L127x127x10	7.0161	6.8838	173.7	148927	2329	7554.13	35369.33	0.214
T26	22 - 17	L127x127x10	7.3476	7.2091	181.9	148927	2329	8401.94	35369.33	0.238
T27	17 - 11	L127x127x10	8.4478	8.3036	209.6	148927	2329	9116.08	35369.33	0.258
T28	11 - 6	L127x127x10	7.7677	7.6350	192.7	148927	2329	8520.96	35369.33	0.241
T29	6 - 0	L127x127x10	8.8512	8.7131	219.9	148927	2329	9123.15	35369.33	0.258

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Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L _u	KI/r	F _a	A	Actual P	Allow. P _a	Ratio P
	m		m	m		kPa	mm ²	kg	kg	$\frac{P}{P_a}$
T19	53.5 - 49	L76x76x6	7.5430	3.6700	155.4	148927	929	817.59	14108.54	0.058
T21	44.5 - 40	L76x76x6	8.4610	4.1290	174.8	148927	929	489.44	14108.54	0.035
T23	35.5 - 31	L76x76x6	9.3790	4.5880	194.2	148927	929	474.82	14108.54	0.034
T25	26.5 - 22	L76x76x6	10.2970	5.0470	213.7	148927	929	531.97	14108.54	0.038
T27	17 - 11	L76x76x6	11.2660	5.5315	234.2	148927	929	476.13	14108.54	0.034
T29	6 - 0	L102x102x10	12.3880	6.0925	195.0	148927	1845	462.14	28021.13	0.016

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L _u	KI/r	F _a	A	Actual P	Allow. P _a	Ratio P
	m		m	m		kPa	mm ²	kg	kg	$\frac{P}{P_a}$
T1	155 - 149	L38x38x5	0.6500	0.5611	48.4	199948	249	7.25	5086.95	0.001
T2	149 - 143	L38x38x5	0.6500	0.5611	48.4	199948	249	57.22	5086.95	0.011
T3	143 - 142	L38x38x5	0.6500	0.5611	48.4	199948	249	1326.67	5086.95	0.261
T4	142 - 135.6	L51x51x5	1.0000	0.9111	58.1	148927	461	2603.88	7005.28	0.372
T8	118 - 115	L64x64x5	1.0000	0.8730	44.2	148927	582	3031.94	8837.43	0.343
T9	115 - 107.5	L64x64x5	2.8000	2.6730	135.3	148927	582	4997.95	8837.43	0.566
T11	100 - 95	L64x64x5	2.8000	2.6730	135.3	148927	582	1123.46	8837.43	0.127

Inner Bracing Design Data (Tension)

Section No.	Elevation	Size	L	L _u	KI/r	F _a	A	Actual P	Allow. P _a	Ratio P
	m		m	m		kPa	mm ²	kg	kg	$\frac{P}{P_a}$
T19	53.5 - 49	L76x76x6	5.3337	5.3337	225.8	148927	929	172.33	14108.54	0.012
T21	44.5 - 40	L76x76x6	5.9828	5.9828	253.3	148927	929	22.43	14108.54	0.002

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Section Capacity Table

Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass Fail
T1	155 - 149	Leg	L89x89x6	3	-4812.34	19784.02	24.3	Pass
		Diagonal	L38x38x5	9	-1309.23	4336.44	30.2	Pass
		Top Girt	L38x38x5	6	-10.85	5060.06	0.2	Pass
T2	149 - 143	Leg	L89x89x6	59	-18694.32	19784.02	94.5	Pass
		Diagonal	L38x38x5	65	-1853.51	4336.44	42.7	Pass
		Top Girt	L38x38x5	61	-50.86	5060.06	1.0	Pass
T3	143 - 142	Leg	L89x89x6	115	-15737.44	17962.43	87.6	Pass
		Diagonal	L38x38x5	126	-3004.77	4252.04	70.7	Pass
		Top Girt	L38x38x5	117	1326.67	6780.90	19.6	Pass
T4	142 - 135.6	Leg	L127x13+L102x13	131	-29962.10	101737.12	29.5	Pass
		Diagonal	L89x89x6	138	-1882.45	19041.95	9.9	Pass
		Top Girt	L51x51x5	133	-2397.49	6087.26	39.4	Pass
T5	135.6 - 129.2	Leg	L127x13+L102x13	171	-51687.32	101737.12	50.8	Pass
		Diagonal	L89x89x6	174	-2399.48	19041.95	12.6	Pass
		Top Girt	L51x51x5	174	-2399.48	19041.95	12.6	Pass
T6	129.2 - 122.8	Leg	L127x13+L102x13	207	-76814.98	101737.12	75.5	Pass
		Diagonal	L89x89x6	212	-3039.33	19041.95	16.0	Pass
		Top Girt	L51x51x5	212	-3039.33	19041.95	16.0	Pass
T7	122.8 - 118	Leg	L127x13+L102x13	243	-91696.90	101737.12	90.1	Pass
		Diagonal	L89x89x6	248	-5720.35	19041.95	30.0	Pass
		Top Girt	L51x51x5	248	-5720.35	19041.95	30.0	Pass
T8	118 - 115	Leg	L127x13+L102x13	271	-70620.27	86927.10	81.2	Pass
		Diagonal	L127x127x10	290	-23811.16	39543.68	60.2	Pass
		Top Girt	L64x64x5	275	-3501.69	8992.85	38.9	Pass
T9	115 - 107.5	Leg	4L127x127x16	295	-64185.15	259679.05	24.7	Pass
		Diagonal	L89x89x6	304	-3207.23	13047.74	24.6	Pass
		Top Girt	L64x64x5	297	-3855.65	4451.25	86.6	Pass
T10	107.5 - 100	Leg	4L127x127x16	327	-87431.77	259679.05	33.7	Pass
		Diagonal	L89x89x6	332	-4274.38	13047.74	32.8	Pass
		Top Girt	L64x64x5	327	-87431.77	259679.05	33.7	Pass
T11	100 - 95	Leg	4L152x152x16	355	-93903.17	327474.78	28.7	Pass
		Diagonal	L89x89x6	364	-1871.61	18314.15	10.2	Pass
		Top Girt	L64x64x5	359	-1563.94	4451.25	35.1	Pass
T12	95 - 89.5	Leg	4L152x152x16	371	-99652.91	321507.60	31.0	Pass
		Diagonal	L89x89x6	374	-1981.33	17662.59	11.2	Pass
		Top Girt	L64x64x5	371	-99652.91	321507.60	31.0	Pass
T13	89.5 - 84	Leg	4L152x152x16	383	-104135.31	321507.60	32.4	Pass
		Diagonal	L102x102x6	388	-2231.42	20282.61	11.0	Pass
		Top Girt	L64x64x5	383	-104135.31	321507.60	32.4	Pass
T14	84 - 77.5	Leg	4L152x152x16	395	-111274.40	308823.49	36.0	Pass
		Diagonal	L102x102x6	398	-2819.32	19222.56	14.7	Pass
		Top Girt	L64x64x5	395	-111274.40	308823.49	36.0	Pass
T15	77.5 - 71	Leg	4L152x152x16	407	-119213.63	308823.49	38.6	Pass
		Diagonal	L102x102x10	410	-3391.47	28402.91	11.9	Pass
		Top Girt	L64x64x5	407	-119213.63	308823.49	38.6	Pass

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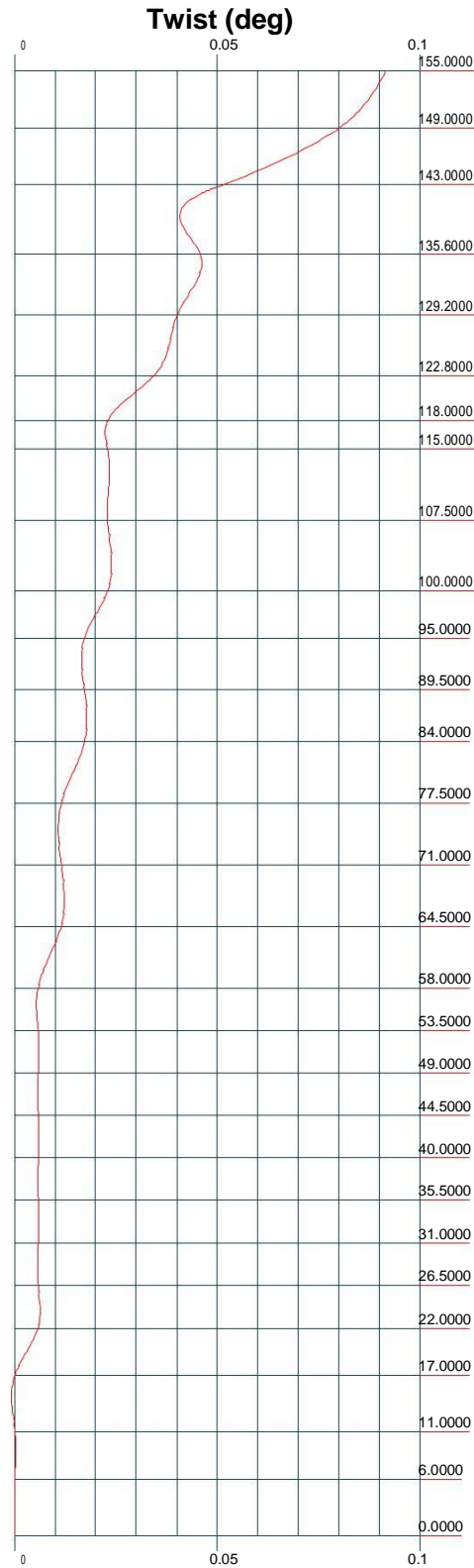
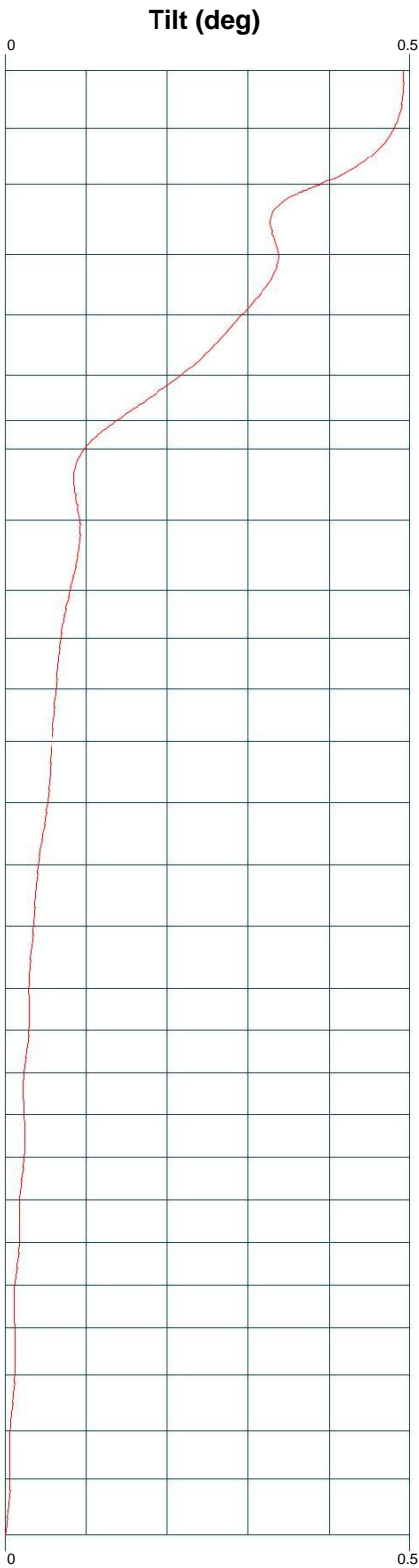
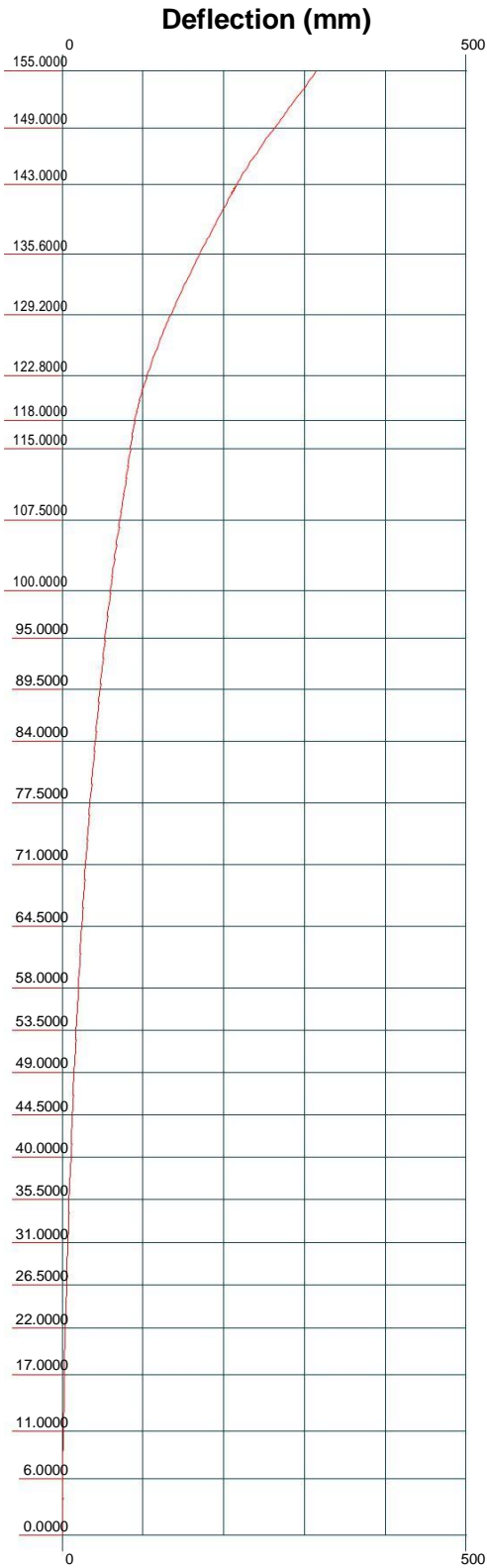
Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass Fail
T16	71 - 64.5	Leg	4L152x152x16	419	-128594.83	308823.49	41.6	Pass
		Diagonal	L102x102x10	422	-4011.09	27790.17	60.4 (b) 14.4	Pass
T17	64.5 - 58	Leg	4L152x152x16	431	-138790.23	308823.49	20.3 (b) 44.9	Pass
		Diagonal	L102x102x10	434	-4877.03	27116.54	65.2 (b) 18.0	Pass
T18	58 - 53.5	Leg	4L203x203x19	443	-151802.44	535355.03	24.7 (b) 28.4	Pass
		Diagonal	L127x127x10	446	-5743.21	35036.76	45.5 (b) 16.4	Pass
T19	53.5 - 49	Leg	4L203x203x19	459	-153352.37	535355.03	21.8 (b) 28.6	Pass
		Diagonal	L127x127x10	462	-6984.64	34219.90	46.0 (b) 20.4	Pass
		Horizontal	L76x76x6	445	-970.95	13592.40	26.3 (b) 7.1	Pass
T20	49 - 44.5	Inner Bracing	L76x76x6	469	-204.97	4133.54	7.4 (b) 5.0	Pass
		Leg	4L203x203x19	475	-170225.10	535355.03	31.8	Pass
		Diagonal	L127x127x10	478	-6648.40	34219.90	51.0 (b) 19.4	Pass
T21	44.5 - 40	Leg	4L203x203x19	491	-171801.79	535355.03	25.2 (b) 32.1	Pass
		Diagonal	L127x127x10	494	-7391.24	33197.15	51.5 (b) 22.3	Pass
		Horizontal	L76x76x6	477	-681.57	12634.83	27.8 (b) 5.4	Pass
T22	40 - 35.5	Inner Bracing	L76x76x6	501	-55.21	3285.24	5.4	Pass
		Leg	4L203x203x19	507	-189101.81	535355.03	1.7	Pass
		Diagonal	L127x127x10	510	-6994.40	33197.15	35.3	Pass
T23	35.5 - 31	Leg	4L203x203x19	523	-190683.48	535355.03	56.7 (b) 21.1	Pass
		Diagonal	L127x127x10	526	-7766.50	32095.68	26.8 (b) 35.6	Pass
		Horizontal	L76x76x6	509	-666.43	11614.87	57.2 (b) 24.2	Pass
T24	31 - 26.5	Inner Bracing	L76x76x6	533	-31.53	2673.60	29.2 (b) 5.7	Pass
		Leg	4L203x203x19	539	-207564.38	535355.03	1.2	Pass
		Diagonal	L127x127x10	542	-7350.83	32095.68	38.8	Pass
T25	26.5 - 22	Leg	4L203x203x19	555	-209185.97	535355.03	62.2 (b) 22.9	Pass
		Diagonal	L127x127x10	558	-8269.63	30917.36	28.2 (b) 39.1	Pass
		Horizontal	L76x76x6	541	-721.05	10530.75	31.1 (b) 6.8	Pass
T26	22 - 17	Inner Bracing	L102x102x6	566	-19.95	4042.86	0.8	Pass
		Leg	4L203x203x19	571	-227671.68	526387.63	43.3	Pass
		Diagonal	L127x127x10	574	-8110.01	29792.18	68.3 (b) 27.2	Pass
T27	17 - 11	Leg	4L203x203x19	587	-229784.52	534556.91	31.6 (b) 43.0	Pass
		Diagonal	L127x127x10	590	-9725.07	32890.96	68.9 (b) 29.6	Pass
		Horizontal	L76x76x6	573	-712.13	9313.31	36.6 (b) 7.6	Pass
T28	11 - 6	Inner Bracing	L102x102x6	597	-43.01	4501.95	1.0	Pass
		Leg	4L203x203x19	603	-249973.01	526387.63	47.5	Pass

75.0 (b)

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Section No.	Elevation m	Component Type	Size	Critical Element	P kg	SF*P _{allow} kg	% Capacity	Pass Fail
T29	6 - 0	Diagonal	L127x127x10	606	-8426.07	28272.61	29.8	Pass
		Leg	4L203x203x19	619	-252144.81	534556.91	32.0 (b)	Pass
		Diagonal	L127x127x10	622	-10149.77	31871.23	47.2	Pass
		Horizontal	L102x102x10	605	-733.43	22983.95	75.6 (b)	Pass
		Inner Bracing	L102x102x6	629	-39.36	3723.39	31.8	Pass
							38.2 (b)	Pass
							3.2	Pass
							3.7 (b)	Pass
							1.1	Pass
							Summary	
							Leg (T2)	Pass
							Diagonal (T3)	Pass
							Horizontal (T27)	Pass
							Top Girt (T9)	Pass
							Inner Bracing (T19)	Pass
							Bolt Checks	Pass
							RATING =	Pass
							94.5	

Elevation (m)



Feedline Distribution Chart

0.0000 - 155.0000

Round

Flat

App In Face

App Out Face

Truss Leg

Face A

Face B

Face C

Face D

Elevation (m)



BTESA BROAD TELECOM.
Calle 129 No. 8 - 08 - Oficina 204.
BOGOTA D.C. - COLOMBIA.
Phone: 57 (1) 2740536.
FAX: 57 (1) 2740536.

Job: **DIAGRAMA CABLES GUIA DE ONDA-TC155.0m PATA=13.00m V=120 KPH**
Project: **EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).**
Client: **RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.**
Cable: **TIA/EIA-222-F**
Patn:
Drawn by: **Ing. C. Londoño M.**
Date: **06/08/16**
App'd: **Scale: NTS**
Dwg No. **E-7**

Stress Distribution Chart

0.0000 - 155.0000

> 100% 90%-100% 75%-90% 50%-75% < 50% Overstress

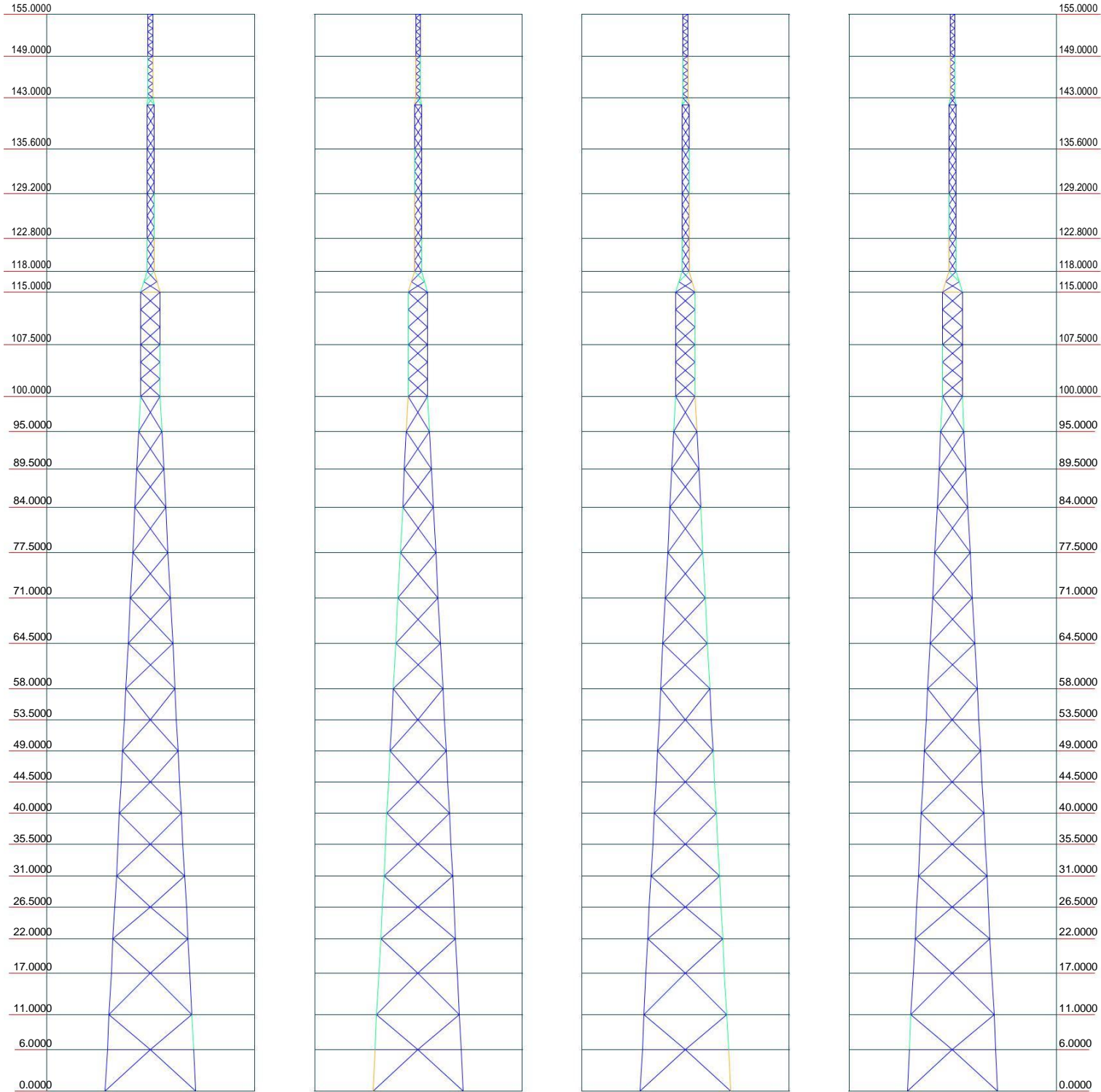
Face A

Face B

Face C

Face D

Elevation (m)



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Phone: 57 (1) 2740536.
FAX: 57 (1) 2740536.

Job: **DIAGRAMA DE ESFUERZOS-TC155.0m PATA=13.00m V=120 KPH**
Project: **EVALUACION ESTRUCTURAL ESTACION: MUNCHIQUE - CONDICION NUEVA (FUTURA).**
Client: RTVC - RADIO TELEVISION NACIONAL DE COLOMBIA.
Code: TIA/EIA-222-F
Date: 06/08/16
Scale: NTS
Dwg No. **F-8**

***CHEQUEO DE CIMENTACION.
ESTACION: CERRÓ MUNCHIQUE.***

7. Rev. DISEÑO DE CIMENTACION TIPO ZAPATA PARA TORRES

OBRA: TORRE COMUNICACIONES TC155m ESTACION: CERRO MUNCHIQUE - Rev.1

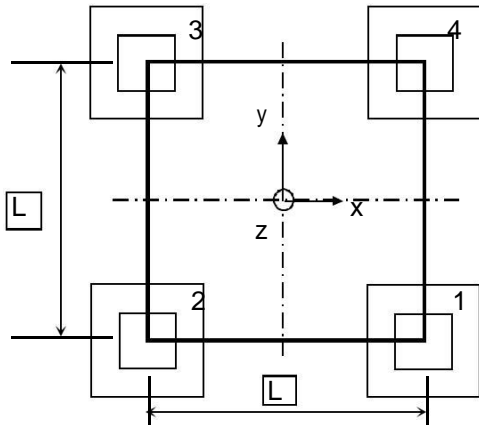
7.1. REACCIONES EN LA BASE DE LA TORRE

(Obtenidas del análisis de la torre)

Separación entre patas L= 13,000 m

Reacciones máximas en apoyos

Cargas de trabajo:



	Caso 1	Caso 2	Caso 3
	(Ton)	(Ton)	(Ton)
Apoyo 1 Rx=	3,342	-8,408	-15,904
Ry=	10,384	3,395	-7,852
Rz=	81,557	-44,771	-171,628
Apoyo 2 Rx=	-5,093	-14,552	-11,184
Ry=	10,112	12,609	3,804
Rz=	90,594	171,438	88,531
Apoyo 3 Rx=	9,138	-1,289	-9,076
Ry=	14,772	6,563	-4,491
Rz=	-172,253	-46,247	80,930
Apoyo 4 Rx=	-9,401	-17,526	-14,605
Ry=	15,968	19,537	10,553
Rz=	-181,288	-261,810	-179,224

Fuerza máxima de arrancamiento

Rz= 171,438 Ton (tensión)

RFZT= **171,438** Ton

Fuerza máxima de compresión

Rz= -261,810 Ton (compresión)

RFZC= **261,810** Ton

Fuerza máxima horizontal X

Rx= 17,526 Ton (absoluto)

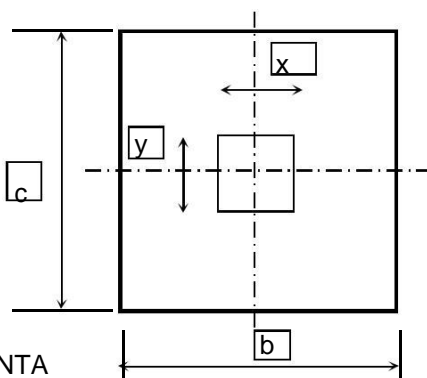
RFX= **17,526** Ton

Fuerza máxima horizontal Y

Ry= 19,537 Ton (absoluto)

RFY= **19,537** Ton

Con estos valores máximos se diseña la zapata

7.2. PREDIMENSIONAMIENTO GENERAL DE LA ZAPATA

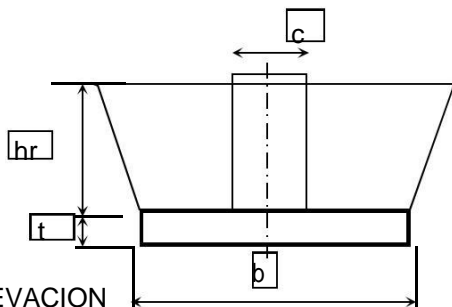
PLANTA

b= 4,00 m c= 4,00 m
 x= 1,50 m y= 1,50 m
 espesor zapata t= 0,80 m

Relleno sobre zapata hr= 3,50 m

Peso específico relleno γ_t = 1,80 Ton/m³

Altura del pedestal hp= hr+0.2= 3,70 m
 (El pedestal sobresale 10 cm por encima del terreno)



ELEVACION

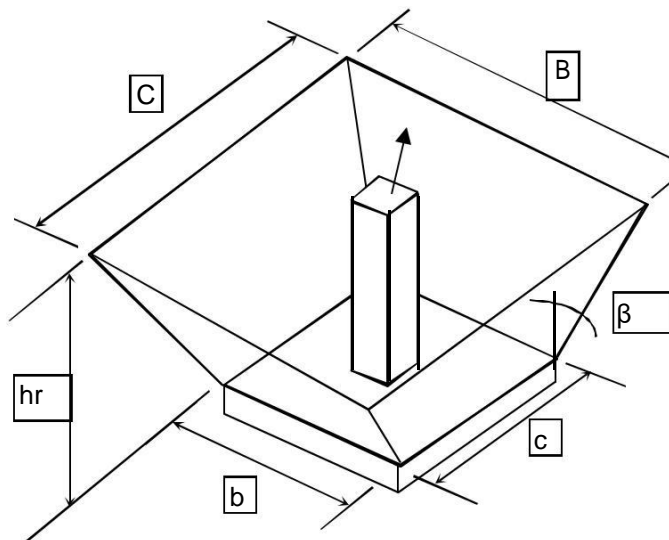
Cálculo del peso de zapata y pedestal

Zapata	w1=	30,72	Ton
Pedestal	w2=	19,98	Ton
TOTAL Wz=		50,70	Ton

Se evalúa el peso de la tierra sobre la zapata

7.3. SEGURIDAD AL ARRANCAMIENTO

Al aparecer una fuerza de tensión en la pata, la zapata trata de arrancar el suelo sobre ella, generando un tronco de pirámide cuyo peso se opone al arrancamiento, según el siguiente esquema:



$$\text{Profundidad de Relleno } hr = 3,50 \text{ m}$$

$$\text{Angulo } \beta = 30 \text{ grados}$$

$$B = b + 2hr \cdot \tan \beta = 8,04 \text{ m}$$

$$C = c + 2hr \cdot \tan \beta = 8,04 \text{ m}$$

$$V_t = hr/3 [BC + bc + (BCbc)^{1/2}] = 131,64 \text{ m}^3$$

Peso de tierra sobre area de la zapata

$$W_1 = V_t \cdot \gamma_t = 236,94 \text{ Ton}$$

Descontando tierra pedestal

$$W_p = 13,39 \text{ Ton}$$

$$W_t = W_1 - W_p = 223,56 \text{ Ton}$$

Seguridad al arrancamiento

$$K = (W_t + W_p) / RFZT \geq 1.50$$

$$K = 1,600 \text{ BIEN}$$

LAS DIMENSIONES Y PROFUNDIDAD DE CIMENTACION SON ADECUADAS POR ESTE EFECTO

7.4. ESFUERZOS SOBRE EL TERRENO

La máxima fuerza de compresión en la pata, en combinación con el efecto de vuelco generado por cargas horizontales, producen el mayor esfuerzo de compresión sobre el terreno. Este no debe exceder la capacidad portante del material de fundación, según el estudio de suelos.

$$\text{Capacidad Portante Neta del Terreno: } 25,00 \text{ Ton/m}^2$$

$$\text{Alivio de excavación } 7,31 \text{ Ton/m}^2$$

$$\text{Capacidad total disponible } 32,31 \text{ Ton/m}^2$$

$$\gamma_s (\text{Ton/m}^3) = 1,70$$

Presión media sobre el terreno

$$\sigma_{\text{media}} = (RFZC + W_t) / A_{\text{zapata}} = 30,34 \text{ Ton/m}^2$$

BIEN

Presión máxima sobre el terreno

$$\text{Se evalua con la fórmula: } \sigma_{\text{max}} = (\sigma_c + \sigma_t + \sigma_l)$$

σ_c = esfuerzo producido por compresión

σ_t = esfuerzo producido por flexión transversal

σ_l = esfuerzo producido por flexión longitudinal

Evaluación de las excentricidades por cargas horizontales

$$M_x = RF_X \cdot hr = 61,341 \text{ Ton-m} \quad e_x = M_x / RF_z C = 0,23 \text{ m}$$

$$M_y = RF_Y \cdot hr = 68,3795 \text{ Ton-m} \quad e_z = M_y / RF_z C = 0,26 \text{ m}$$

$$\sigma_c = P/A = 30,34 \text{ Ton/m}^2$$

$$\sigma_t = P/A(6e_x/L) = 10,66 \text{ Ton/m}^2$$

$$\sigma_l = P/A(6e_y/L) = 11,88 \text{ Ton/m}^2$$

$$\sigma_{\text{max}} = 52,88 \text{ Ton/m}^2$$

LAS DIMENSIONES ADOPTADAS PARA LA CIMENTACION SON ADECUADAS POR ESTE EFECTO

LAS DIMENSIONES DE LAS ZAPATAS Y PEDESTALES CUMPLEN PARA LOS CHEQUEOS DE ARRANCAMIENTO Y CAPACIDAD.



Bogotá, D.C., 08 de Junio de 2016.

MEMORIAL DE RESPONSABILIDAD.

Yo, CARLOS EDUARDO LONDOÑO MESA, Ingeniero Civil, debidamente Titulado e inscrito con matrícula profesional No. 25202-37439 CND, he realizado LA EVALUACION ESTRUCTUARAL PARA UNA TORRE CUADRADA DE SECCION VARIABLE de 155.0 metros de altura, con ancho entre patas de 13.00 metros, Localizada en **LA ESTACION BASE: CERRÓ MUNCHIQUE** – Municipio de El Tambo, Departamento del Cauca, para una velocidad de viento de 120 Kph, que soporta antenas de TV y MW.

La evaluación y recomendaciones han sido hechas siguiendo los parámetros establecidos en la NORMA TIA/EIA-222-F y las NORMAS COLOMBIANAS DE DISEÑO Y CONSTRUCCIÓN SISMO-RESISTENTE, NSR-10.

Por lo tanto, asumo la responsabilidad por los perjuicios que puedan ocasionar los diseños presentados y exonero a: Radio Televisión Nacional de Colombia (RTVC) de cualquier eventualidad referente a la evaluación de dicha estructura, bajo las condiciones anteriormente expuestas y descritas en la memoria de cálculo.

ATENTAMENTE.,


ING. Carlos Eduardo Londoño Mesa.
MAT.PROF. 25202 - 37439 CND.



