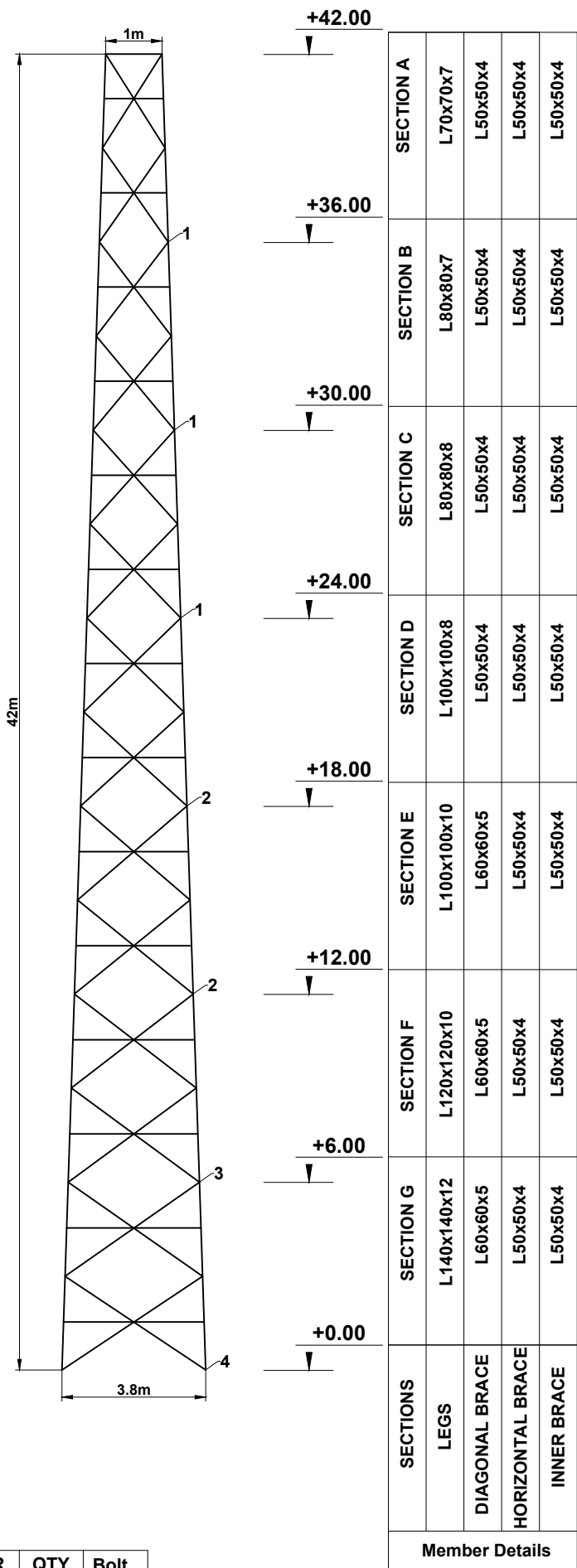


GENERAL TOWER VIEW

SELF SUPPORT TOWER 42 METER

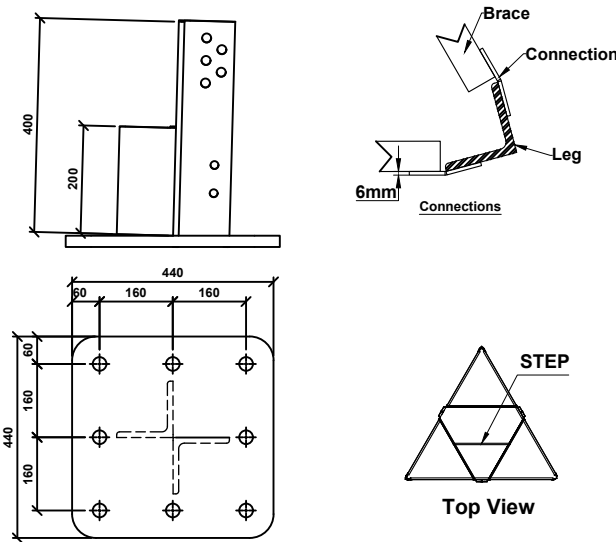
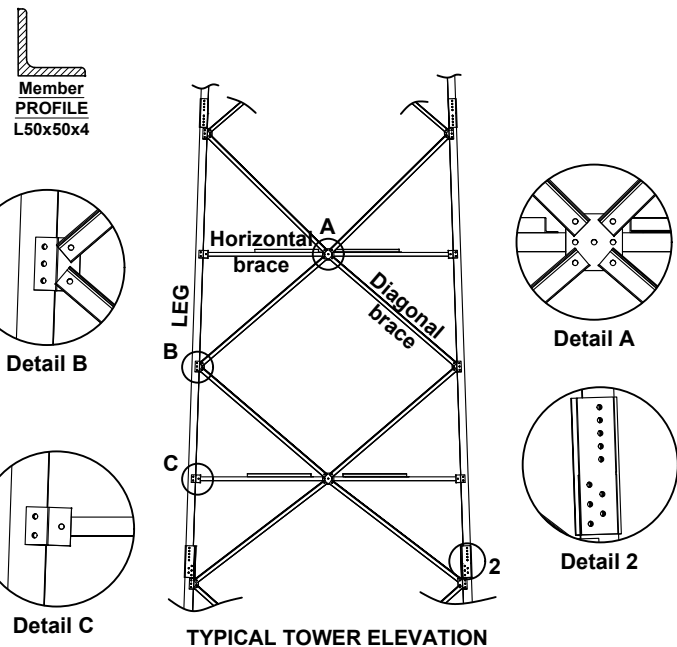
General Design Notes

1. Designed appurtenance loading : EPA 4 , ELEVATION 30-42m
2. All steel parts (Structural members,bolts, nuts and washers are hot - dip galvanized based on ASTM_A125
3. Tower designed for a 160 kph basic wind speed in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 120 kph basic wind with 15 mm ice.
6. All Bolts are grades 8.8 .



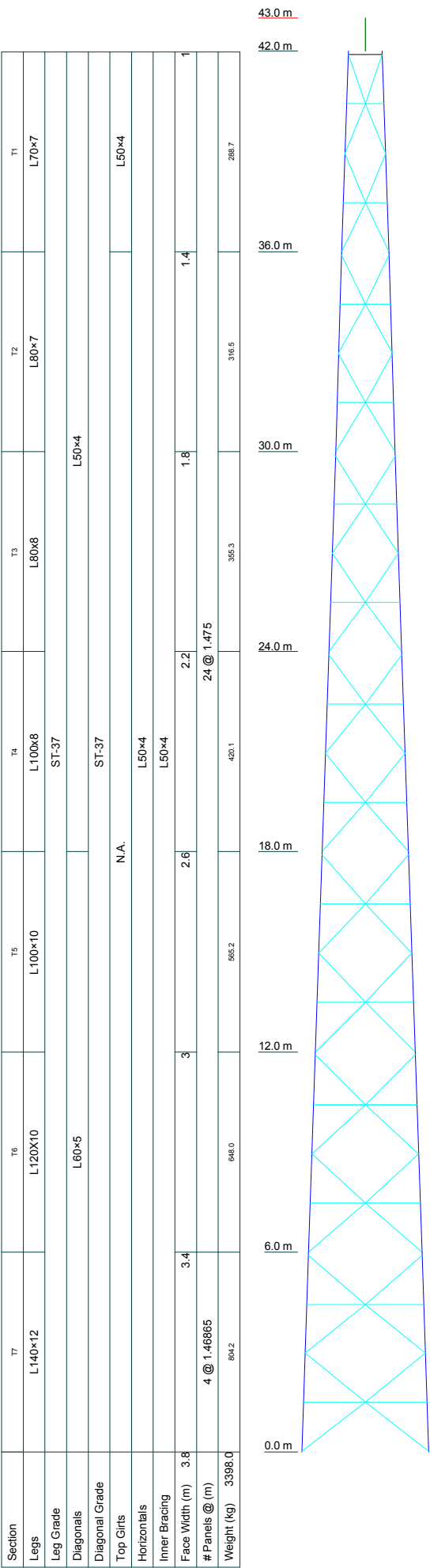
R	QTY	Bolt
1	6	M12
2	8	M14
3	8	M16
4	10	M16

Note:
All bracing members are connected using M12 bolts.
The quantity and type of bolts for each connection shall conform to the table below.



MATERIAL STRENGTH		
PROFILE	GRADE	Fy
L	ST-37	235 Mpa

	Name	Date	
Design	ARF	1405.02.10	
Drawn	ARF	1405.02.10	
Checked			
Approved			Title: GENERAL TOWER VIEW
Tower Type: (42METER 3 LEG Angle)			
DWG NO. SS3-GTV-01			
Scale: 1:250		Page: 1	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
EPA4	42 - 30		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
ST-37	235000 kPa	370000 kPa			

TOWER DESIGN NOTES

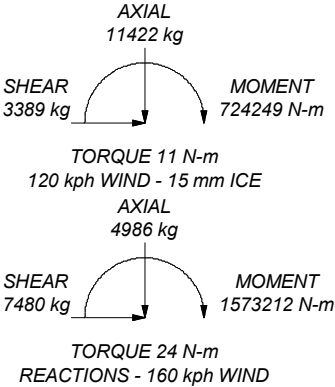
1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 160 kph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 120 kph basic wind with 15.00 mm ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 120 kph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.0000 m
7. TOWER RATING: 99.6%



ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 50280 kg
UPLIFT: -47445 kg
SHEAR: 4612 kg



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Tower Input Data

The main tower is a 3x free standing tower with an overall height of 42.0000 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 1.0000 m at the top and 3.8000 m at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 160 kph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.0000 m.

Nominal ice thickness of 15 mm.

Ice thickness is considered to increase with height.

Ice density of 8796.90 N/m³.

A wind speed of 120 kph is used in combination with ice.

Deflections calculated using a wind speed of 120 kph.

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

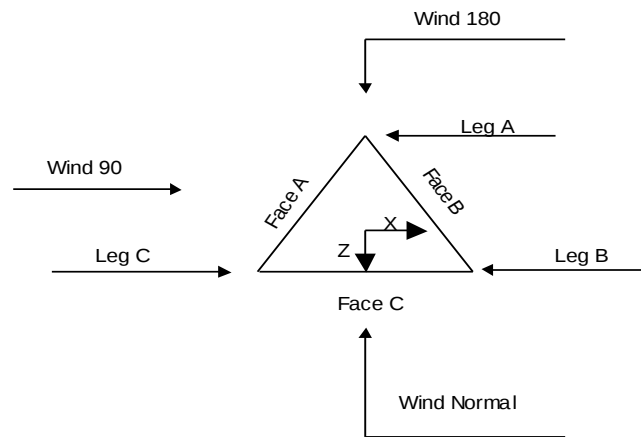
Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

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

Options

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> √ Consider Moments - Legs √ Consider Moments - Horizontals √ Consider Moments - Diagonals √ Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg √ Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> √ Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas √ SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder √ Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable √ Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check |
| | | <div style="background-color: #e0e0e0; text-align: center; padding: 2px;">Poles</div> <ul style="list-style-type: none"> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |

**Triangular Tower****Tower Section Geometry**

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	m			m		m
T1	42.0000-36.0000			1.0000	1	6.0000
T2	36.0000-30.0000			1.4000	1	6.0000
T3	30.0000-24.0000			1.8000	1	6.0000
T4	24.0000-18.0000			2.2000	1	6.0000
T5	18.0000-12.0000			2.6000	1	6.0000
T6	12.0000-6.0000			3.0000	1	6.0000
T7	6.0000-0.0000			3.4000	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	42.0000-36.0000	1.4750	Double K	No	Yes	100	0
T2	36.0000-30.0000	1.4750	Double K	No	Yes	100	0
T3	30.0000-24.0000	1.4750	Double K	No	Yes	100	0
T4	24.0000-18.0000	1.4750	Double K	No	Yes	100	0
T5	18.0000-12.0000	1.4750	Double K	No	Yes	100	0
T6	12.0000-6.0000	1.4750	Double K	No	Yes	100	0
T7	6.0000-0.0000	1.4687	Double K	No	Yes	100	25

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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 42.0000-36.0000	Equal Angle	L70×7	ST-37 (235000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T2 36.0000-30.0000	Equal Angle	L80×7	ST-37 (235000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T3 30.0000-24.0000	Equal Angle	L80x8	ST-37 (235000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T4 24.0000-18.0000	Equal Angle	L100x8	ST-37 (235000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T5 18.0000-12.0000	Equal Angle	L100×10	ST-37 (235000 kPa)	Equal Angle	L60×5	ST-37 (235000 kPa)
T6 12.0000-6.0000	Equal Angle	L120X10	ST-37 (235000 kPa)	Equal Angle	L60×5	ST-37 (235000 kPa)
T7 6.0000-0.0000	Equal Angle	L140×12	ST-37 (235000 kPa)	Equal Angle	L60×5	ST-37 (235000 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 42.0000-36.0000	Equal Angle	L50×4	ST-37 (235000 kPa)	Solid Round		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>
T1 42.0000-36.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T2 36.0000-30.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T3 30.0000-24.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T4 24.0000-18.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T5 18.0000-12.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T6 12.0000-6.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T7 6.0000-0.0000	None	Flat Bar		A36 (248211 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)

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Tower Section Geometry (cont'd)

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
<i>m</i>						
T1 42.0000-36.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T2 36.0000-30.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T3 30.0000-24.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T4 24.0000-18.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T5 18.0000-12.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T6 12.0000-6.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)
T7 6.0000-0.0000	Equal Angle		DIN17000 ST-37-2 (225000 kPa)	Equal Angle	L50×4	ST-37 (235000 kPa)

Tower Section Geometry (cont'd)

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	Double Angle Stitch Bolt Spacing Horizontals
<i>m</i>	<i>m</i> ²	<i>mm</i>					<i>mm</i>	<i>mm</i>
T1 42.0000-36.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0
T2 36.0000-30.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0
T3 30.0000-24.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0
T4 24.0000-18.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0
T5 18.0000-12.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0
T6 12.0000-6.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0
T7 6.0000-0.0000	0.0000	0	A36 (248211 kPa)	1	1	1	0	0

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Tower Section Geometry (cont'd)

Tower Elevation <i>m</i>	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹						
				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 42.0000-36.00 00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 36.0000-30.00 00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 30.0000-24.00 00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 24.0000-18.00 00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 18.0000-12.00 00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 12.0000-6.000 0	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 6.0000-0.0000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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.

Tower Section Geometry (cont'd)

Tower Elevation <i>m</i>	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 42.0000-36.00 00	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75
T2 36.0000-30.00 00	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75
T3 30.0000-24.00 00	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75
T4 24.0000-18.00 00	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75
T5 18.0000-12.00 00	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75
T6 12.0000-6.000 0	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75

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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
T7 6.0000-0.0000	0	1	0	1	0	0.75	0	0.75	0	0.75	0	1	0	0.75

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 42.0000-36.00 00	Sleeve DS	12 A325N	6	12 A325N	1	12 A325N	1	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1
T2 36.0000-30.00 00	Sleeve DS	12 A325N	6	12 A325N	1	16 A325N	0	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1
T3 30.0000-24.00 00	Sleeve DS	12 A325N	6	12 A325N	1	16 A325N	0	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1
T4 24.0000-18.00 00	Sleeve DS	14 A325N	8	12 A325N	1	16 A325N	0	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1
T5 18.0000-12.00 00	Sleeve DS	14 A325N	8	12 A325N	1	16 A325N	0	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1
T6 12.0000-6.000 0	Sleeve DS	16 A325N	8	12 A325N	1	16 A325N	0	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1
T7 6.0000-0.0000	Sleeve DS	16 A325N	10	12 A325N	1	16 A325N	0	16 A325N	0	16 A325N	0	12 A325N	1	12 A325N	1

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement m	Total Number		C _A A _A m ² /m	Weight N/m
STEP	C	No	CaAa (Out Of Face)	42.0000 - 0.0000	1	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	60.00 0.00 0.00

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
------------------	-------------------------	------	----------------------------------	----------------------------------	--	---	--------------

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<i>Tower Section</i>	<i>Tower Elevation m</i>	<i>Face</i>	<i>A_R</i> <i>m²</i>	<i>A_F</i> <i>m²</i>	<i>C_AA_A</i> <i>In Face m²</i>	<i>C_AA_A</i> <i>Out Face m²</i>	<i>Weight</i> <i>kg</i>
T1	42.0000-36.0000	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	36.71
T2	36.0000-30.0000	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	36.71
T3	30.0000-24.0000	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	36.71
T4	24.0000-18.0000	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	36.71
T5	18.0000-12.0000	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	36.71
T6	12.0000-6.0000	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	36.71
T7	6.0000-0.0000	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	36.71

Feed Line/Linear Appurtenances Section Areas - With Ice

<i>Tower Section</i>	<i>Tower Elevation m</i>	<i>Face or Leg</i>	<i>Ice Thickness mm</i>	<i>A_R</i> <i>m²</i>	<i>A_F</i> <i>m²</i>	<i>C_AA_A</i> <i>In Face m²</i>	<i>C_AA_A</i> <i>Out Face m²</i>	<i>Weight</i> <i>kg</i>
T1	42.0000-36.0000	A	34.354	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
T2	36.0000-30.0000	A	33.785	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
T3	30.0000-24.0000	A	33.113	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
T4	24.0000-18.0000	A	32.292	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
T5	18.0000-12.0000	A	31.223	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
T6	12.0000-6.0000	A	29.668	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	6.0000-0.0000	A	26.582	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

Feed Line Center of Pressure

<i>Section</i>	<i>Elevation</i>	<i>CP_x</i>	<i>CP_z</i>	<i>CP_x</i>	<i>CP_z</i>
	<i>m</i>	<i>mm</i>	<i>mm</i>	<i>Ice mm</i>	<i>Ice mm</i>

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Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	m	mm	mm	mm	mm
T1	42.0000-36.0000	0	0	0	0
T2	36.0000-30.0000	0	0	0	0
T3	30.0000-24.0000	0	0	0	0
T4	24.0000-18.0000	0	0	0	0
T5	18.0000-12.0000	0	0	0	0
T6	12.0000-6.0000	0	0	0	0
T7	6.0000-0.0000	0	0	0	0

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert m m m	Azimuth Adjustment °	Placement m	C _A A _A Front	C _A A _A Side	Weight kg
EPA4	C	None		0.0000	42.0000 -	No Ice	4.0000	500.00
					30.0000	1/2" Ice	4.2000	625.00
						1" Ice	4.4000	750.00

222-G Verification Constants

Constant	Value
Wind Importance Factor Without Ice	1
Wind Importance Factor With Ice Factor	1
Ice Importance Factor	1
K _d	0.85
Z _g	274.32
α	9.5
K _{zmin}	0.85
K _e	1
K _t	1
f	1

222-G Section Verification ArRr By Element

Section Elevation <i>m</i>	Elem. Num.	Size	<i>C</i>	<i>C</i> <i>w/Ice</i>	<i>F</i> <i>a</i> <i>c</i> <i>e</i>	<i>e</i>	<i>e</i> <i>w/Ice</i>	<i>A_r</i> <i>m</i> ²	<i>A_r</i> <i>w/Ice</i> <i>m</i> ²	<i>A_rR_r</i> <i>m</i> ²	<i>A_rR_r</i> <i>w/Ice</i> <i>m</i> ²
T1 42.0000-36.0000 0					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T2 36.0000-30.0000 0					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T3 30.0000-24.0000 0					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T4 24.0000-18.0000 0					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T5 18.0000-12.0000 0					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T6 12.0000-6.0000					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T7 6.0000-0.0000					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000

222-G Section Verification Tables - No Ice

Section Elevation <i>m</i>	<i>Z_{wind}</i> <i>m</i>	<i>Z_{ice}</i> <i>m</i>	<i>K_z</i>	<i>K_h</i>	<i>K_{zt}</i>	<i>t_z</i> <i>mm</i>	<i>q_z</i> <i>kPa</i>	<i>F</i> <i>a</i> <i>c</i> <i>e</i>	<i>e</i>	<i>A_rR_r</i> <i>m</i> ²
T1 42.0000-36.0000	39.0000		1.333	1	1		1.37	A	0.215	0.000
								B	0.215	0.000
								C	0.215	0.000
T2 36.0000-30.0000	33.0000		1.287	1	1		1.33	A	0.177	0.000
								B	0.177	0.000
								C	0.177	0.000
T3 30.0000-24.0000	27.0000		1.234	1	1		1.27	A	0.15	0.000
								B	0.15	0.000
								C	0.15	0.000
T4 24.0000-18.0000	21.0000		1.17	1	1		1.21	A	0.147	0.000
								B	0.147	0.000
								C	0.147	0.000
T5 18.0000-12.0000	15.0000		1.09	1	1		1.12	A	0.141	0.000
								B	0.141	0.000
								C	0.141	0.000
T6 12.0000-6.0000	9.0000		0.979	1	1		1.01	A	0.141	0.000
								B	0.141	0.000
								C	0.141	0.000
T7 6.0000-0.0000	3.0000		0.85	1	1		0.88	A	0.14	0.000
								B	0.14	0.000
								C	0.14	0.000

222-G Section Verification Tables - Ice

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Section Elevation	Z_{wind}	Z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_{ac}	e	$A_e R_r$
<i>m</i>	<i>m</i>	<i>m</i>				<i>mm</i>	<i>kPa</i>	<i>e</i>		<i>m</i> ²
T1 42.0000-36.0000	39.0000	39.0000	1.333	1	1	34	0.77	A B C	0.442 0.442 0.442	1.226 1.226 1.226
T2 36.0000-30.0000	33.0000	33.0000	1.287	1	1	34	0.75	A B C	0.353 0.353 0.353	1.161 1.161 1.161
T3 30.0000-24.0000	27.0000	27.0000	1.234	1	1	33	0.71	A B C	0.299 0.299 0.299	1.172 1.172 1.172
T4 24.0000-18.0000	21.0000	21.0000	1.17	1	1	32	0.68	A B C	0.276 0.276 0.276	1.193 1.193 1.193
T5 18.0000-12.0000	15.0000	15.0000	1.09	1	1	31	0.63	A B C	0.256 0.256 0.256	1.213 1.213 1.213
T6 12.0000-6.0000	9.0000	9.0000	0.979	1	1	30	0.57	A B C	0.242 0.242 0.242	1.209 1.209 1.209
T7 6.0000-0.0000	3.0000	3.0000	0.85	1	1	27	0.49	A B C	0.226 0.226 0.226	1.134 1.134 1.134

222-G Section Verification Tables - Service

Section Elevation	Z_{wind}	Z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_{ac}	e	$A_e R_r$
<i>m</i>	<i>m</i>	<i>m</i>				<i>mm</i>	<i>kPa</i>	<i>e</i>		<i>m</i> ²
T1 42.0000-36.0000	39.0000		1.333	1	1		0.77	A B C	0.215 0.215 0.215	0.000 0.000 0.000
T2 36.0000-30.0000	33.0000		1.287	1	1		0.75	A B C	0.177 0.177 0.177	0.000 0.000 0.000
T3 30.0000-24.0000	27.0000		1.234	1	1		0.71	A B C	0.15 0.15 0.15	0.000 0.000 0.000
T4 24.0000-18.0000	21.0000		1.17	1	1		0.68	A B C	0.147 0.147 0.147	0.000 0.000 0.000
T5 18.0000-12.0000	15.0000		1.09	1	1		0.63	A B C	0.141 0.141 0.141	0.000 0.000 0.000
T6 12.0000-6.0000	9.0000		0.979	1	1		0.57	A B C	0.141 0.141 0.141	0.000 0.000 0.000
T7 6.0000-0.0000	3.0000		0.85	1	1		0.49	A B C	0.14 0.14 0.14	0.000 0.000 0.000

Tower Pressures - No Ice

$$G_H = 0.850$$

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Section Elevation m	z m	K_z	q_z kPa	A_G m^2	F_{ace} m^2	A_F m^2	A_R m^2	A_{leg} m^2	Leg %	C_{AA} In Face m^2	C_{AA} Out Face m^2
T1	39.0000	1.333	1.37	7.441	A	1.601	0.000	0.841	52.50	0.000	0.000
42.0000-36.00					B	1.601	0.000		52.50	0.000	0.000
00					C	1.601	0.000		52.50	0.000	0.000
T2	33.0000	1.287	1.33	9.871	A	1.751	0.000	0.961	54.85	0.000	0.000
36.0000-30.00					B	1.751	0.000		54.85	0.000	0.000
00					C	1.751	0.000		54.85	0.000	0.000
T3	27.0000	1.234	1.27	12.276	A	1.838	0.000	0.961	52.27	0.000	0.000
30.0000-24.00					B	1.838	0.000		52.27	0.000	0.000
00					C	1.838	0.000		52.27	0.000	0.000
T4	21.0000	1.17	1.21	14.736	A	2.161	0.000	1.201	55.57	0.000	0.000
24.0000-18.00					B	2.161	0.000		55.57	0.000	0.000
00					C	2.161	0.000		55.57	0.000	0.000
T5	15.0000	1.09	1.12	17.144	A	2.413	0.000	1.201	49.76	0.000	0.000
18.0000-12.00					B	2.413	0.000		49.76	0.000	0.000
00					C	2.413	0.000		49.76	0.000	0.000
T6	9.0000	0.979	1.01	19.605	A	2.756	0.000	1.441	52.29	0.000	0.000
12.0000-6.000					B	2.756	0.000		52.29	0.000	0.000
0					C	2.756	0.000		52.29	0.000	0.000
T7	3.0000	0.85	0.88	22.073	A	3.100	0.000	1.681	54.23	0.000	0.000
6.0000-0.0000					B	3.100	0.000		54.23	0.000	0.000
					C	3.100	0.000		54.23	0.000	0.000

Tower Pressure - With Ice

$$G_H = 0.850$$

Section Elevation m	z m	K_z	q_z kPa	t_z mm	A_G m^2	F_{ace} m^2	A_F m^2	A_R m^2	A_{leg} m^2	Leg %	C_{AA} In Face m^2	C_{AA} Out Face m^2
T1	39.0000	1.333	0.77	34	7.854	A	1.601	1.870	1.666	47.99	0.000	0.000
42.0000-36.0000						B	1.601	1.870		47.99	0.000	0.000
						C	1.601	1.870		47.99	0.000	0.000
T2	33.0000	1.287	0.75	34	10.277	A	1.751	1.880	1.772	48.80	0.000	0.000
36.0000-30.0000						B	1.751	1.880		48.80	0.000	0.000
						C	1.751	1.880		48.80	0.000	0.000
T3	27.0000	1.234	0.71	33	12.673	A	1.838	1.957	1.756	46.27	0.000	0.000
30.0000-24.0000						B	1.838	1.957		46.27	0.000	0.000
						C	1.838	1.957		46.27	0.000	0.000
T4	21.0000	1.17	0.68	32	15.123	A	2.161	2.016	1.976	47.32	0.000	0.000
24.0000-18.0000						B	2.161	2.016		47.32	0.000	0.000
						C	2.161	2.016		47.32	0.000	0.000
T5	15.0000	1.09	0.63	31	17.519	A	2.413	2.068	1.951	43.53	0.000	0.000
18.0000-12.0000						B	2.413	2.068		43.53	0.000	0.000
						C	2.413	2.068		43.53	0.000	0.000
T6	9.0000	0.979	0.57	30	19.961	A	2.756	2.074	2.154	44.60	0.000	0.000
12.0000-6.0000						B	2.756	2.074		44.60	0.000	0.000
						C	2.756	2.074		44.60	0.000	0.000
T7	3.0000	0.85	0.49	27	22.393	A	3.100	1.957	2.320	45.87	0.000	0.000
6.0000-0.0000						B	3.100	1.957		45.87	0.000	0.000
						C	3.100	1.957		45.87	0.000	0.000

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Tower Pressure - Service

$$G_H = 0.850$$

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	39.0000	1.333	0.77	7.441	A	1.601	0.000	0.841	52.50	0.000	0.000
42.0000-36.00					B	1.601	0.000		52.50	0.000	0.000
00					C	1.601	0.000		52.50	0.000	0.000
T2	33.0000	1.287	0.75	9.871	A	1.751	0.000	0.961	54.85	0.000	0.000
36.0000-30.00					B	1.751	0.000		54.85	0.000	0.000
00					C	1.751	0.000		54.85	0.000	0.000
T3	27.0000	1.234	0.71	12.276	A	1.838	0.000	0.961	52.27	0.000	0.000
30.0000-24.00					B	1.838	0.000		52.27	0.000	0.000
00					C	1.838	0.000		52.27	0.000	0.000
T4	21.0000	1.17	0.68	14.736	A	2.161	0.000	1.201	55.57	0.000	0.000
24.0000-18.00					B	2.161	0.000		55.57	0.000	0.000
00					C	2.161	0.000		55.57	0.000	0.000
T5	15.0000	1.09	0.63	17.144	A	2.413	0.000	1.201	49.76	0.000	0.000
18.0000-12.00					B	2.413	0.000		49.76	0.000	0.000
00					C	2.413	0.000		49.76	0.000	0.000
T6	9.0000	0.979	0.57	19.605	A	2.756	0.000	1.441	52.29	0.000	0.000
12.0000-6.000					B	2.756	0.000		52.29	0.000	0.000
0					C	2.756	0.000		52.29	0.000	0.000
T7	3.0000	0.85	0.49	22.073	A	3.100	0.000	1.681	54.23	0.000	0.000
6.0000-0.0000					B	3.100	0.000		54.23	0.000	0.000
					C	3.100	0.000		54.23	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	e	C _F	q _z kPa	D _F	D _R	A _E m ²	F kg	w N/m	Ctrl. Face
T1	36.71	288.72	A	0.215	2.546	1.37	1	1	1.601	485.06	792.80	C
42.0000-36.00			B	0.215	2.546		1	1	1.601			
00			C	0.215	2.546		1	1	1.601			
T2	36.71	316.46	A	0.177	2.673	1.33	1	1	1.751	537.80	879.01	C
36.0000-30.00			B	0.177	2.673		1	1	1.751			
00			C	0.177	2.673		1	1	1.751			
T3	36.71	355.33	A	0.15	2.772	1.27	1	1	1.838	561.19	917.24	C
30.0000-24.00			B	0.15	2.772		1	1	1.838			
00			C	0.15	2.772		1	1	1.838			
T4	36.71	420.06	A	0.147	2.784	1.21	1	1	2.161	628.32	1026.95	C
24.0000-18.00			B	0.147	2.784		1	1	2.161			
00			C	0.147	2.784		1	1	2.161			
T5	36.71	565.17	A	0.141	2.806	1.12	1	1	2.413	658.89	1076.92	C
18.0000-12.00			B	0.141	2.806		1	1	2.413			
00			C	0.141	2.806		1	1	2.413			
T6	36.71	648.01	A	0.141	2.807	1.01	1	1	2.756	675.81	1104.58	C
12.0000-6.000			B	0.141	2.807		1	1	2.756			
0			C	0.141	2.807		1	1	2.756			
T7	36.71	804.23	A	0.14	2.807	0.88	1	1	3.100	660.20	1079.05	C
6.0000-0.0000			B	0.14	2.807		1	1	3.100			
			C	0.14	2.807		1	1	3.100			
Sum Weight:	256.97	3397.98						OTM	813540 N-m	4207.28		

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Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg				kPa			m ²	kg	Nlm	
T1	36.71	288.72	A	0.215	2.546	1.37	0.8	1	1.281	388.05	634.24	C
42.0000-36.00			B	0.215	2.546		0.8	1	1.281			
00			C	0.215	2.546		0.8	1	1.281			
T2	36.71	316.46	A	0.177	2.673	1.33	0.8	1	1.401	430.24	703.21	C
36.0000-30.00			B	0.177	2.673		0.8	1	1.401			
00			C	0.177	2.673		0.8	1	1.401			
T3	36.71	355.33	A	0.15	2.772	1.27	0.8	1	1.470	448.95	733.79	C
30.0000-24.00			B	0.15	2.772		0.8	1	1.470			
00			C	0.15	2.772		0.8	1	1.470			
T4	36.71	420.06	A	0.147	2.784	1.21	0.8	1	1.729	502.66	821.56	C
24.0000-18.00			B	0.147	2.784		0.8	1	1.729			
00			C	0.147	2.784		0.8	1	1.729			
T5	36.71	565.17	A	0.141	2.806	1.12	0.8	1	1.931	527.11	861.54	C
18.0000-12.00			B	0.141	2.806		0.8	1	1.931			
00			C	0.141	2.806		0.8	1	1.931			
T6	36.71	648.01	A	0.141	2.807	1.01	0.8	1	2.205	540.65	883.66	C
12.0000-6.000			B	0.141	2.807		0.8	1	2.205			
0			C	0.141	2.807		0.8	1	2.205			
T7	36.71	804.23	A	0.14	2.807	0.88	0.8	1	2.480	528.16	863.24	C
6.0000-0.0000			B	0.14	2.807		0.8	1	2.480			
			C	0.14	2.807		0.8	1	2.480			
Sum Weight:	256.97	3397.98						OTM	650832 N-m	3365.82		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg				kPa			m ²	kg	Nlm	
T1	36.71	288.72	A	0.215	2.546	1.37	0.85	1	1.361	412.30	673.88	C
42.0000-36.00			B	0.215	2.546		0.85	1	1.361			
00			C	0.215	2.546		0.85	1	1.361			
T2	36.71	316.46	A	0.177	2.673	1.33	0.85	1	1.489	457.13	747.16	C
36.0000-30.00			B	0.177	2.673		0.85	1	1.489			
00			C	0.177	2.673		0.85	1	1.489			
T3	36.71	355.33	A	0.15	2.772	1.27	0.85	1	1.562	477.01	779.65	C
30.0000-24.00			B	0.15	2.772		0.85	1	1.562			
00			C	0.15	2.772		0.85	1	1.562			
T4	36.71	420.06	A	0.147	2.784	1.21	0.85	1	1.837	534.07	872.91	C
24.0000-18.00			B	0.147	2.784		0.85	1	1.837			
00			C	0.147	2.784		0.85	1	1.837			
T5	36.71	565.17	A	0.141	2.806	1.12	0.85	1	2.051	560.06	915.38	C
18.0000-12.00			B	0.141	2.806		0.85	1	2.051			
00			C	0.141	2.806		0.85	1	2.051			
T6	36.71	648.01	A	0.141	2.807	1.01	0.85	1	2.342	574.44	938.89	C

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Section Elevation <i>m</i>	Add Weight <i>kg</i>	Self Weight <i>kg</i>	<i>F</i> <i>a</i> <i>c</i> <i>e</i>	<i>e</i>	<i>C_F</i>	<i>q_z</i> <i>kPa</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>m²</i>	<i>F</i> <i>kg</i>	<i>w</i> <i>Nlm</i>	<i>Ctrl.</i> <i>Face</i>
12.0000-6.0000			B	0.141	2.807		0.85	1	2.342			
0			C	0.141	2.807		0.85	1	2.342			
T7	36.71	804.23	A	0.14	2.807	0.88	0.85	1	2.635	561.17	917.19	C
6.0000-0.0000			B	0.14	2.807		0.85	1	2.635			
			C	0.14	2.807		0.85	1	2.635			
Sum Weight:	256.97	3397.98						OTM	691509 N-m	3576.19		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation <i>m</i>	Add Weight <i>kg</i>	Self Weight <i>kg</i>	<i>F</i> <i>a</i> <i>c</i> <i>e</i>	<i>e</i>	<i>C_F</i>	<i>q_z</i> <i>kPa</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>m²</i>	<i>F</i> <i>kg</i>	<i>w</i> <i>Nlm</i>	<i>Ctrl.</i> <i>Face</i>
T1	0.00	1051.41	A	0.442	1.987	0.77	1	1	2.827	375.91	614.39	C
42.0000-36.0000			B	0.442	1.987		1	1	2.827			
00			C	0.442	1.987		1	1	2.827			
T2	0.00	1113.16	A	0.353	2.164	0.75	1	1	2.912	407.13	665.43	C
36.0000-30.0000			B	0.353	2.164		1	1	2.912			
00			C	0.353	2.164		1	1	2.912			
T3	0.00	1190.71	A	0.299	2.297	0.71	1	1	3.010	428.36	700.13	C
30.0000-24.0000			B	0.299	2.297		1	1	3.010			
00			C	0.299	2.297		1	1	3.010			
T4	0.00	1335.78	A	0.276	2.361	0.68	1	1	3.354	465.29	760.49	C
24.0000-18.0000			B	0.276	2.361		1	1	3.354			
00			C	0.276	2.361		1	1	3.354			
T5	0.00	1564.09	A	0.256	2.42	0.63	1	1	3.626	480.36	785.12	C
18.0000-12.0000			B	0.256	2.42		1	1	3.626			
00			C	0.256	2.42		1	1	3.626			
T6	0.00	1690.76	A	0.242	2.462	0.57	1	1	3.965	479.77	784.16	C
12.0000-6.0000			B	0.242	2.462		1	1	3.965			
0			C	0.242	2.462		1	1	3.965			
T7	0.00	1809.29	A	0.226	2.512	0.49	1	1	4.234	453.90	741.87	C
6.0000-0.0000			B	0.226	2.512		1	1	4.234			
			C	0.226	2.512		1	1	4.234			
Sum Weight:	0.00	9755.20						OTM	611125 N-m	3090.72		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation <i>m</i>	Add Weight <i>kg</i>	Self Weight <i>kg</i>	<i>F</i> <i>a</i> <i>c</i> <i>e</i>	<i>e</i>	<i>C_F</i>	<i>q_z</i> <i>kPa</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>m²</i>	<i>F</i> <i>kg</i>	<i>w</i> <i>Nlm</i>	<i>Ctrl.</i> <i>Face</i>
T1	0.00	1051.41	A	0.442	1.987	0.77	0.8	1	2.507	333.32	544.80	C
42.0000-36.0000			B	0.442	1.987		0.8	1	2.507			
00			C	0.442	1.987		0.8	1	2.507			
T2	0.00	1113.16	A	0.353	2.164	0.75	0.8	1	2.562	358.16	585.38	C
36.0000-30.0000			B	0.353	2.164		0.8	1	2.562			

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Section Elevation m	Add Weight kg	Self Weight kg	F a c e	e	C _F	q _z kPa	D _F	D _R	A _E m ²	F kg	w Nlm	Ctrl. Face
00			C	0.353	2.164		0.8	1	2.562			
T3	0.00	1190.71	A	0.299	2.297	0.71	0.8	1	2.643	376.05	614.63	C
30.0000-24.00			B	0.299	2.297		0.8	1	2.643			
00			C	0.299	2.297		0.8	1	2.643			
T4	0.00	1335.78	A	0.276	2.361	0.68	0.8	1	2.922	405.33	662.49	C
24.0000-18.00			B	0.276	2.361		0.8	1	2.922			
00			C	0.276	2.361		0.8	1	2.922			
T5	0.00	1564.09	A	0.256	2.42	0.63	0.8	1	3.144	416.42	680.61	C
18.0000-12.00			B	0.256	2.42		0.8	1	3.144			
00			C	0.256	2.42		0.8	1	3.144			
T6	0.00	1690.76	A	0.242	2.462	0.57	0.8	1	3.414	413.08	675.16	C
12.0000-6.000			B	0.242	2.462		0.8	1	3.414			
0			C	0.242	2.462		0.8	1	3.414			
T7	0.00	1809.29	A	0.226	2.512	0.49	0.8	1	3.614	387.43	633.24	C
6.0000-0.0000			B	0.226	2.512		0.8	1	3.614			
			C	0.226	2.512		0.8	1	3.614			
Sum Weight:	0.00	9755.20						OTM	535544 N-m	2689.79		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation m	Add Weight kg	Self Weight kg	F a c e	e	C _F	q _z kPa	D _F	D _R	A _E m ²	F kg	w Nlm	Ctrl. Face
T1	0.00	1051.41	A	0.442	1.987	0.77	0.85	1	2.587	343.97	562.20	C
42.0000-36.00			B	0.442	1.987		0.85	1	2.587			
00			C	0.442	1.987		0.85	1	2.587			
T2	0.00	1113.16	A	0.353	2.164	0.75	0.85	1	2.649	370.40	605.39	C
36.0000-30.00			B	0.353	2.164		0.85	1	2.649			
00			C	0.353	2.164		0.85	1	2.649			
T3	0.00	1190.71	A	0.299	2.297	0.71	0.85	1	2.734	389.13	636.01	C
30.0000-24.00			B	0.299	2.297		0.85	1	2.734			
00			C	0.299	2.297		0.85	1	2.734			
T4	0.00	1335.78	A	0.276	2.361	0.68	0.85	1	3.030	420.32	686.99	C
24.0000-18.00			B	0.276	2.361		0.85	1	3.030			
00			C	0.276	2.361		0.85	1	3.030			
T5	0.00	1564.09	A	0.256	2.42	0.63	0.85	1	3.264	432.40	706.74	C
18.0000-12.00			B	0.256	2.42		0.85	1	3.264			
00			C	0.256	2.42		0.85	1	3.264			
T6	0.00	1690.76	A	0.242	2.462	0.57	0.85	1	3.551	429.75	702.41	C
12.0000-6.000			B	0.242	2.462		0.85	1	3.551			
0			C	0.242	2.462		0.85	1	3.551			
T7	0.00	1809.29	A	0.226	2.512	0.49	0.85	1	3.769	404.05	660.40	C
6.0000-0.0000			B	0.226	2.512		0.85	1	3.769			
			C	0.226	2.512		0.85	1	3.769			
Sum Weight:	0.00	9755.20						OTM	554439 N-m	2790.02		

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Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z kPa	D _F	D _R	A _E m ²	F kg	w Nlm	Ctrl. Face
m	kg	kg										
T1	36.71	288.72	A	0.215	2.546	0.77	1	1	1.601	272.85	445.95	C
42.0000-36.00			B	0.215	2.546		1	1	1.601			
00			C	0.215	2.546		1	1	1.601			
T2	36.71	316.46	A	0.177	2.673	0.75	1	1	1.751	302.52	494.44	C
36.0000-30.00			B	0.177	2.673		1	1	1.751			
00			C	0.177	2.673		1	1	1.751			
T3	36.71	355.33	A	0.15	2.772	0.71	1	1	1.838	315.67	515.95	C
30.0000-24.00			B	0.15	2.772		1	1	1.838			
00			C	0.15	2.772		1	1	1.838			
T4	36.71	420.06	A	0.147	2.784	0.68	1	1	2.161	353.43	577.66	C
24.0000-18.00			B	0.147	2.784		1	1	2.161			
00			C	0.147	2.784		1	1	2.161			
T5	36.71	565.17	A	0.141	2.806	0.63	1	1	2.413	370.63	605.77	C
18.0000-12.00			B	0.141	2.806		1	1	2.413			
00			C	0.141	2.806		1	1	2.413			
T6	36.71	648.01	A	0.141	2.807	0.57	1	1	2.756	380.14	621.32	C
12.0000-6.000			B	0.141	2.807		1	1	2.756			
0			C	0.141	2.807		1	1	2.756			
T7	36.71	804.23	A	0.14	2.807	0.49	1	1	3.100	371.36	606.97	C
6.0000-0.0000			B	0.14	2.807		1	1	3.100			
			C	0.14	2.807		1	1	3.100			
Sum Weight:	256.97	3397.98						OTM	457616 N-m	2366.59		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z kPa	D _F	D _R	A _E m ²	F kg	w Nlm	Ctrl. Face
m	kg	kg										
T1	36.71	288.72	A	0.215	2.546	0.77	0.8	1	1.281	218.28	356.76	C
42.0000-36.00			B	0.215	2.546		0.8	1	1.281			
00			C	0.215	2.546		0.8	1	1.281			
T2	36.71	316.46	A	0.177	2.673	0.75	0.8	1	1.401	242.01	395.55	C
36.0000-30.00			B	0.177	2.673		0.8	1	1.401			
00			C	0.177	2.673		0.8	1	1.401			
T3	36.71	355.33	A	0.15	2.772	0.71	0.8	1	1.470	252.54	412.76	C
30.0000-24.00			B	0.15	2.772		0.8	1	1.470			
00			C	0.15	2.772		0.8	1	1.470			
T4	36.71	420.06	A	0.147	2.784	0.68	0.8	1	1.729	282.74	462.13	C
24.0000-18.00			B	0.147	2.784		0.8	1	1.729			
00			C	0.147	2.784		0.8	1	1.729			
T5	36.71	565.17	A	0.141	2.806	0.63	0.8	1	1.931	296.50	484.61	C
18.0000-12.00			B	0.141	2.806		0.8	1	1.931			
00			C	0.141	2.806		0.8	1	1.931			
T6	36.71	648.01	A	0.141	2.807	0.57	0.8	1	2.205	304.12	497.06	C
12.0000-6.000			B	0.141	2.807		0.8	1	2.205			
0			C	0.141	2.807		0.8	1	2.205			
T7	36.71	804.23	A	0.14	2.807	0.49	0.8	1	2.480	297.09	485.57	C
6.0000-0.0000			B	0.14	2.807		0.8	1	2.480			
			C	0.14	2.807		0.8	1	2.480			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg				kPa			m ²	kg	Nlm	
Sum Weight:	256.97	3397.98						OTM	366093 N-m	1893.27		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
m	kg	kg				kPa			m ²	kg	Nlm	
T1 42.0000-36.0000	36.71	288.72	A	0.215	2.546	0.77	0.85	1	1.361	231.92	379.06	C
			B	0.215	2.546		0.85	1	1.361			
			C	0.215	2.546		0.85	1	1.361			
T2 36.0000-30.0000	36.71	316.46	A	0.177	2.673	0.75	0.85	1	1.489	257.14	420.28	C
			B	0.177	2.673		0.85	1	1.489			
			C	0.177	2.673		0.85	1	1.489			
T3 30.0000-24.0000	36.71	355.33	A	0.15	2.772	0.71	0.85	1	1.562	268.32	438.55	C
			B	0.15	2.772		0.85	1	1.562			
			C	0.15	2.772		0.85	1	1.562			
T4 24.0000-18.0000	36.71	420.06	A	0.147	2.784	0.68	0.85	1	1.837	300.42	491.01	C
			B	0.147	2.784		0.85	1	1.837			
			C	0.147	2.784		0.85	1	1.837			
T5 18.0000-12.0000	36.71	565.17	A	0.141	2.806	0.63	0.85	1	2.051	315.03	514.90	C
			B	0.141	2.806		0.85	1	2.051			
			C	0.141	2.806		0.85	1	2.051			
T6 12.0000-6.0000	36.71	648.01	A	0.141	2.807	0.57	0.85	1	2.342	323.12	528.13	C
			B	0.141	2.807		0.85	1	2.342			
			C	0.141	2.807		0.85	1	2.342			
T7 6.0000-0.0000	36.71	804.23	A	0.14	2.807	0.49	0.85	1	2.635	315.66	515.92	C
			B	0.14	2.807		0.85	1	2.635			
			C	0.14	2.807		0.85	1	2.635			
Sum Weight:	256.97	3397.98						OTM	388974 N-m	2011.60		

Mast Vectors - No Ice

Section No.	Section Elevation	Wind Azimuth	Directionality	F	V _x	V _z	OTM _x	OTM _z	Torque
	m	°		kg	kg	kg	N-m	N-m	N-m
T1	42.0000-36.0000	0	Wind Normal	485.06	0.00	-485.06	-185390	216	0
		90		412.30	412.30	0.00	125	-157472	0
		180	Wind Normal	485.06	0.00	485.06	185640	216	0
T2	36.0000-30.0000	0	Wind Normal	537.80	0.00	-537.80	-173878	288	0
		90		457.13	457.13	0.00	166	-147649	0
		180	Wind Normal	537.80	0.00	537.80	174210	288	0
T3	30.0000-24.0000	0	Wind Normal	561.19	0.00	-561.19	-148384	360	0
		90		477.01	477.01	0.00	208	-125943	0
		180	Wind Normal	561.19	0.00	561.19	148800	360	0
T4	24.0000-18.0000	0	Wind Normal	628.32	0.00	-628.32	-129147	432	0
		90		534.07	534.07	0.00	249	-109555	0

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Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
T5	18.0000-12.0000	180	Wind Normal	628.32	0.00	628.32	129645	432	0
		0	Wind Normal	658.89	0.00	-658.89	-96632	504	0
		90		560.06	560.06	0.00	291	-81880	0
T6	12.0000-6.0000	180	Wind Normal	658.89	0.00	658.89	97214	504	0
		0	Wind Normal	675.81	0.00	-675.81	-59315	576	0
		90		574.44	574.44	0.00	333	-50124	0
T7	6.0000-0.0000	180	Wind Normal	675.81	0.00	675.81	59980	576	0
		0	Wind Normal	660.20	0.00	-660.20	-19049	648	0
		90		561.17	561.17	0.00	374	-15861	0
		180	Wind Normal	660.20	0.00	660.20	19797	648	0

Mast Totals - No Ice

Wind Azimuth °	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
0	0.00	-4207.28	-811794	3024	0
90	3576.19	0.00	1746	-688485	0
180	0.00	4207.28	815286	3024	0

Mast Vectors - With Ice

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
T1	42.0000-36.0000	0	Wind Normal	375.91	0.00	-375.91	-143768	0	0
		90		343.97	343.97	0.00	0	-131554	0
		180	Wind Normal	375.91	0.00	375.91	143768	0	0
T2	36.0000-30.0000	0	Wind Normal	407.13	0.00	-407.13	-131755	0	0
		90		370.40	370.40	0.00	0	-119868	0
		180	Wind Normal	407.13	0.00	407.13	131755	0	0
T3	30.0000-24.0000	0	Wind Normal	428.36	0.00	-428.36	-113422	0	0
		90		389.13	389.13	0.00	0	-103033	0
		180	Wind Normal	428.36	0.00	428.36	113422	0	0
T4	24.0000-18.0000	0	Wind Normal	465.29	0.00	-465.29	-95821	0	0
		90		420.32	420.32	0.00	0	-86561	0
		180	Wind Normal	465.29	0.00	465.29	95821	0	0
T5	18.0000-12.0000	0	Wind Normal	480.36	0.00	-480.36	-70661	0	0
		90		432.40	432.40	0.00	0	-63607	0
		180	Wind Normal	480.36	0.00	480.36	70661	0	0
T6	12.0000-6.0000	0	Wind Normal	479.77	0.00	-479.77	-42345	0	0
		90		429.75	429.75	0.00	0	-37930	0
		180	Wind Normal	479.77	0.00	479.77	42345	0	0
T7	6.0000-0.0000	0	Wind Normal	453.90	0.00	-453.90	-13354	0	0
		90		404.05	404.05	0.00	0	-11887	0
		180	Wind Normal	453.90	0.00	453.90	13354	0	0

Mast Totals - With Ice

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Wind Azimuth °	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
0	0.00	-3090.72	-611125	0	0
90	2790.02	0.00	0	-554439	0
180	0.00	3090.72	611125	0	0

Mast Vectors - Service

Section No.	Section Elevation m	Wind Azimuth °	Directionality	F kg	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
T1	42.0000-36.0000	0	Wind Normal	272.85	0.00	-272.85	-104228	216	0
		90		231.92	231.92	0.00	125	-88483	0
		180	Wind Normal	272.85	0.00	272.85	104477	216	0
T2	36.0000-30.0000	0	Wind Normal	302.52	0.00	-302.52	-97734	288	0
		90		257.14	257.14	0.00	166	-82927	0
		180	Wind Normal	302.52	0.00	302.52	98066	288	0
T3	30.0000-24.0000	0	Wind Normal	315.67	0.00	-315.67	-83375	360	0
		90		268.32	268.32	0.00	208	-70686	0
		180	Wind Normal	315.67	0.00	315.67	83791	360	0
T4	24.0000-18.0000	0	Wind Normal	353.43	0.00	-353.43	-72536	432	0
		90		300.42	300.42	0.00	249	-61435	0
		180	Wind Normal	353.43	0.00	353.43	73035	432	0
T5	18.0000-12.0000	0	Wind Normal	370.63	0.00	-370.63	-54228	504	0
		90		315.03	315.03	0.00	291	-45837	0
		180	Wind Normal	370.63	0.00	370.63	54810	504	0
T6	12.0000-6.0000	0	Wind Normal	380.14	0.00	-380.14	-33219	576	0
		90		323.12	323.12	0.00	333	-27943	0
		180	Wind Normal	380.14	0.00	380.14	33884	576	0
T7	6.0000-0.0000	0	Wind Normal	371.36	0.00	-371.36	-10551	648	0
		90		315.66	315.66	0.00	374	-8639	0
		180	Wind Normal	371.36	0.00	371.36	11300	648	0

Mast Totals - Service

Wind Azimuth °	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
0	0.00	-2366.59	-455871	3024	0
90	2011.60	0.00	1746	-385950	0
180	0.00	2366.59	459362	3024	0

Discrete Appurtenance Pressures - No Ice $G_H = 0.850$

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
EPA4	0.0000	500.00	0.0000	0.0000	36.0000	1.311	1.35	4.0000	1.0000
	Sum	500.00							
	Weight:								

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Discrete Appurtenance Vectors - No Ice

EPA4 - Elevation 30.0000-42.0000 - None C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x N-m	OTM_z N-m	Torque N-m
0	467.99	0.00	0.00	-467.99	-165219	0	0
90	467.99	0.00	467.99	0.00	0	-165219	0
180	467.99	0.00	0.00	467.99	165219	0	0

Discrete Appurtenance Totals - No Ice

Wind Azimuth °	V_x kg	V_z kg	OTM_x N-m	OTM_z N-m	Torque N-m
0	0.00	-467.99	-165219	0	0
90	467.99	0.00	0	-165219	0
180	0.00	467.99	165219	0	0

Discrete Appurtenance Pressures - With Ice $G_H = 0.850$

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	t_z mm
EPA4	0.0000	835.43	0.0000	0.0000	36.0000	1.311	0.76	4.5367	1.5367	34
	Sum Weight:	835.43								

Discrete Appurtenance Vectors - With Ice

EPA4 - Elevation 30.0000-42.0000 - None C							
Wind Azimuth °	F_a kg	F_s kg	V_x kg	V_z kg	OTM_x N-m	OTM_z N-m	Torque N-m
0	298.57	0.00	0.00	-298.57	-105405	0	0
90	298.57	0.00	298.57	0.00	0	-105405	0
180	298.57	0.00	0.00	298.57	105405	0	0

Discrete Appurtenance Totals - With Ice

Wind Azimuth °	V_x kg	V_z kg	OTM_x N-m	OTM_z N-m	Torque N-m
0	0.00	-298.57	-105405	0	0
90	298.57	0.00	0	-105405	0

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Wind Azimuth °	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
180	0.00	298.57	105405	0	0

Discrete Appurtenance Pressures - Service $G_H = 0.850$

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
EPA4	0.0000	500.00	0.0000	0.0000	36.0000	1.311	0.76	4.0000	1.0000
	Sum Weight:	500.00							

Discrete Appurtenance Vectors - Service

EPA4 - Elevation 30.0000-42.0000 - None C							
Wind Azimuth °	F _a kg	F _s kg	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
0	263.24	0.00	0.00	-263.24	-92936	0	0
90	263.24	0.00	263.24	0.00	0	-92936	0
180	263.24	0.00	0.00	263.24	92936	0	0

Discrete Appurtenance Totals - Service

Wind Azimuth °	V _x kg	V _z kg	OTM _x N-m	OTM _z N-m	Torque N-m
0	0.00	-263.24	-92936	0	0
90	263.24	0.00	0	-92936	0
180	0.00	263.24	92936	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 N-m	Sum of Overturning Moments, M _z N-m	Sum of Torques N-m
Leg Weight	1720.69					
Bracing Weight	1677.29					
Total Member Self-Weight	3397.98			1746	3024	
Total Weight	4154.95			1746	3024	
Wind 0 deg - No Ice		0.00	-4675.27	-977014	3024	0
Wind 90 deg - No Ice		4044.18	0.00	1746	-853704	0
Wind 180 deg - No Ice		0.00	4675.27	980505	3024	0
Member Ice	6357.22					
Total Weight Ice	10590.63			0	0	

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Load Case	Vertical Forces kg	Sum of Forces X kg	Sum of Forces Z kg	Sum of Overturning Moments, M_x N-m	Sum of Overturning Moments, M_z N-m	Sum of Torques N-m
Wind 0 deg - Ice		0.00	-3389.28	-716531	0	0
Wind 90 deg - Ice		3088.59	0.00	0	-659844	0
Wind 180 deg - Ice		0.00	3389.28	716531	0	0
Total Weight	4154.95			1746	3024	
Wind 0 deg - Service		0.00	-2629.84	-550552	0	0
Wind 90 deg - Service		2274.85	0.00	0	-481910	0
Wind 180 deg - Service		0.00	2629.84	550552	0	0

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Axial kg	Major Axis Moment N-m	Minor Axis Moment N-m
T1	42 - 36	Leg	Max Tension	7	1556.31	63	64
			Max. Compression	2	-1836.44	90	91
			Max. Mx	4	-1435.48	-143	-70
			Max. My	5	1145.20	67	140
			Max. Vy	2	-55.88	140	-36
			Max. Vx	2	-55.65	-36	139
		Diagonal	Max Tension	7	669.05	0	0
			Max. Compression	2	-688.28	0	0
			Max. Mx	10	300.16	-20	0
			Max. My	9	11.18	0	-1
			Max. Vy	10	-4.89	0	0
			Max. Vx	9	-0.28	0	0
		Horizontal	Max Tension	7	123.89	0	-1
			Max. Compression	2	-125.77	1	1
			Max. Mx	9	-3.37	11	-1
			Max. My	3	61.46	-1	-2
			Max. Vy	9	-6.26	11	-1
			Max. Vx	2	0.45	-1	-2
		Top Girt	Max Tension	1	0.00	0	0
			Max. Compression	11	-8.49	0	0
			Max. Mx	8	-7.41	-17	0

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Axial kg	Major Axis Moment N-m	Minor Axis Moment N-m
T2	36 - 30	Inner Bracing	Max. My	8	-7.49	0	0
			Max. Vy	8	6.94	0	0
			Max. Vx	8	0.13	0	0
			Max Tension	2	1.04	0	0
			Max. Compression	11	-1.57	0	0
			Max. Mx	8	-0.72	-7	0
		Leg	Max. My	11	-1.57	0	0
			Max. Vy	8	4.49	0	0
			Max. Vx	11	-0.03	0	0
			Max Tension	7	6981.33	45	46
			Max. Compression	2	-7656.54	306	308
			Max. Mx	2	1805.34	315	-52
		Diagonal	Max. My	2	1840.87	-52	314
			Max. Vy	2	361.66	-263	-262
			Max. Vx	2	362.12	-263	-262
			Max Tension	7	1087.01	0	0
			Max. Compression	2	-1107.34	0	0
			Max. Mx	10	493.95	-26	0
		Horizontal	Max. My	9	15.29	0	-1
			Max. Vy	10	-6.16	0	0
			Max. Vx	9	-0.28	0	0
			Max Tension	2	132.69	0	0
			Max. Compression	2	-132.69	1	1
			Max. Mx	9	8.29	15	-1
		Inner Bracing	Max. My	2	15.36	8	-1
			Max. Vy	9	-7.57	15	-1
			Max. Vx	9	0.25	15	-1
			Max Tension	2	0.31	0	0
			Max. Compression	11	-1.50	0	0
			Max. Mx	8	-0.80	-12	0
T3	30 - 24	Leg	Max. My	11	-1.50	0	0
			Max. Vy	8	5.77	0	0
			Max. Vx	11	-0.03	0	0
			Max Tension	7	14086.01	0	1
			Max. Compression	2	-15055.56	329	331
			Max. Mx	2	4920.60	499	-137
		Diagonal	Max. My	6	-5017.06	135	-501
			Max. Vy	2	693.03	-372	-371
			Max. Vx	2	693.94	-372	-371
			Max Tension	7	1198.95	0	0
			Max. Compression	2	-1218.13	0	0
			Max. Mx	10	543.63	-33	0
		Horizontal	Max. My	9	19.30	0	-1
			Max. Vy	10	7.36	0	0
			Max. Vx	9	0.27	0	0
			Max Tension	2	260.91	0	0
			Max. Compression	2	-260.91	6	0
			Max. Mx	11	83.47	20	0
		Inner Bracing	Max. My	9	-15.35	19	-1
			Max. Vy	11	8.89	20	0
			Max. Vx	9	0.22	19	-1
			Max Tension	2	0.05	0	0
			Max. Compression	11	-1.37	0	0
			Max. Mx	8	-0.89	-18	0
T4	24 - 18	Leg	Max. My	11	-1.34	0	0
			Max. Vy	8	6.99	0	0
			Max. Vx	11	-0.03	0	0
			Max Tension	7	21436.54	-60	-57
			Max. Compression	2	-22702.30	553	556
			Max. Mx	6	-8927.35	-737	222
			Max. My	6	-8830.07	220	-740

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Axial kg	Major Axis Moment N-m	Minor Axis Moment N-m
T5	18 - 12	Diagonal	Max. Vy	2	877.49	-530	-529
			Max. Vx	2	878.78	-530	-529
			Max Tension	7	1375.69	0	0
			Max. Compression	2	-1399.31	0	0
		Horizontal	Max. Mx	10	600.99	-41	0
			Max. My	9	42.54	0	-1
			Max. Vy	10	8.47	0	0
			Max. Vx	9	-0.27	0	0
		Inner Bracing	Max Tension	2	393.43	0	0
			Max. Compression	2	-393.43	8	0
			Max. Mx	11	121.97	27	-1
			Max. My	11	121.97	27	-1
		Leg	Max. Vy	11	-10.29	27	0
			Max. Vx	9	0.23	26	-1
			Max Tension	1	0.00	0	0
			Max. Compression	11	-1.31	0	0
		Diagonal	Max. Mx	8	-0.96	-25	0
			Max. My	11	-1.31	0	0
			Max. Vy	8	8.12	0	0
			Max. Vx	11	-0.03	0	0
		Horizontal	Max Tension	7	29130.83	-85	-82
			Max. Compression	2	-30796.74	608	611
			Max. Mx	7	-12703.11	-912	404
			Max. My	6	-12822.37	403	-915
		Inner Bracing	Max. Vy	2	1097.28	-521	-520
			Max. Vx	2	1098.98	-521	-520
			Max Tension	7	1540.38	0	0
			Max. Compression	2	-1564.46	0	0
		Leg	Max. Mx	10	657.83	-61	0
			Max. My	9	52.95	0	-2
			Max. Vy	10	-11.74	0	0
			Max. Vx	9	-0.34	0	0
		Horizontal	Max Tension	2	533.71	0	0
			Max. Compression	2	-533.71	11	0
			Max. Mx	11	163.32	34	-1
			Max. My	6	277.86	4	-1
		Inner Bracing	Max. Vy	11	-11.55	34	-1
			Max. Vx	9	0.24	33	-1
			Max Tension	1	0.00	0	0
			Max. Compression	11	-1.46	0	0
		Leg	Max. Mx	8	-1.17	-32	0
			Max. My	11	-1.46	0	0
			Max. Vy	8	9.13	0	0
			Max. Vx	11	0.03	0	0
T6	12 - 6	Leg	Max Tension	7	37051.77	-175	-171
			Max. Compression	2	-39168.58	759	763
			Max. Mx	6	-18133.37	1176	-917
			Max. My	6	-18298.37	-913	1175
		Diagonal	Max. Vy	2	1327.43	-693	-691
			Max. Vx	2	1329.46	-693	-691
			Max Tension	7	1759.04	0	0
			Max. Compression	2	-1794.81	0	0
		Horizontal	Max. Mx	9	597.79	-70	0
			Max. My	9	99.92	0	2
			Max. Vy	9	12.75	0	0
			Max. Vx	9	-0.33	0	0
		Inner Bracing	Max Tension	2	678.80	0	0
			Max. Compression	2	-678.80	14	-1
			Max. Mx	11	-203.20	43	-1
			Max. My	6	353.17	7	-1
		Leg	Max. Vy	11	-12.55	43	-1
			Max Tension	7	37051.77	-175	-171
			Max. Compression	2	-39168.58	759	763
			Max. Mx	6	-18133.37	1176	-917
			Max. My	6	-18298.37	-913	1175

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Section No.	Elevation m	Component Type	Condition	Gov. Load Comb.	Axial kg	Major Axis Moment N-m	Minor Axis Moment N-m
T7	6 - 0	Inner Bracing	Max. Vx	11	-0.26	43	-1
			Max Tension	7	0.14	0	0
			Max. Compression	11	-1.40	0	0
			Max. Mx	8	-1.23	-40	0
			Max. My	11	-1.40	0	0
			Max. Vy	8	9.91	0	0
		Leg	Max. Vx	11	-0.02	0	0
			Max Tension	7	47584.00	-460	-460
			Max. Compression	2	-50417.90	0	0
			Max. Mx	6	-22614.79	1783	-1380
			Max. My	6	-22803.93	-1374	1782
			Max. Vy	2	1914.61	0	0
		Diagonal	Max. Vx	2	1917.89	0	0
			Max Tension	7	2023.54	0	0
			Max. Compression	2	-2081.46	0	0
			Max. Mx	10	155.05	-77	0
			Max. My	9	173.44	0	-2
			Max. Vy	10	13.07	0	0
		Horizontal	Max. Vx	9	0.32	0	0
			Max Tension	2	956.24	0	0
			Max. Compression	2	-956.24	18	0
			Max. Mx	11	-283.87	49	-1
			Max. My	6	496.99	9	-2
			Max. Vy	11	-12.80	49	-1
		Inner Bracing	Max. Vx	11	-0.27	38	-1
			Max Tension	7	0.53	0	0
			Max. Compression	10	-1.36	0	0
			Max. Mx	8	-1.23	-46	0
			Max. My	11	-1.28	0	0
			Max. Vy	8	10.09	0	0
			Max. Vx	11	-0.01	0	0

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical kg	Horizontal, X kg	Horizontal, Z kg
Leg C	Max. Vert	6	26133.45	1833.30	-1517.49
	Max. H _x	6	26133.45	1833.30	-1517.49
	Max. H _z	5	-35530.27	-2987.02	1502.98
	Min. Vert	5	-35530.27	-2987.02	1502.98
	Min. H _x	5	-35530.27	-2987.02	1502.98
	Min. H _z	6	26133.45	1833.30	-1517.49
Leg B	Max. Vert	4	38501.80	-3117.66	-1573.07
	Max. H _x	3	-23123.72	1717.01	1447.61
	Max. H _z	3	-23123.72	1717.01	1447.61
	Min. Vert	3	-23123.72	1717.01	1447.61
	Min. H _x	4	38501.80	-3117.66	-1573.07
	Min. H _z	4	38501.80	-3117.66	-1573.07
Leg A	Max. Vert	2	50279.60	-2.27	4611.96
	Max. H _x	7	-47444.66	-1.21	-4473.67
	Max. H _z	2	50279.60	-2.27	4611.96
	Min. Vert	7	-47444.66	-1.21	-4473.67
	Min. H _x	4	1596.74	-387.74	82.75
	Min. H _z	7	-47444.66	-1.21	-4473.67

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Tower Mast Reaction Summary

Load Combination	Vertical kg	Shear _x kg	Shear _z kg	Overturning Moment, M _x N-m	Overturning Moment, M _z N-m	Torque N-m
Dead Only	4154.95	-0.00	0.00	1746	3024	0
1.2 Dead+1.6 Wind 0 deg - No Ice	4985.93	0.00	-7479.88	-1569020	3639	-24
0.9 Dead+1.6 Wind 0 deg - No Ice	3739.45	0.00	-7480.03	-1568259	2727	-18
1.2 Dead+1.6 Wind 90 deg - No Ice	4985.93	6470.22	-0.00	2105	-1371630	11
0.9 Dead+1.6 Wind 90 deg - No Ice	3739.45	6470.34	0.01	1579	-1371406	8
1.2 Dead+1.6 Wind 180 deg - No Ice	4985.93	0.00	7479.92	1573207	3644	24
0.9 Dead+1.6 Wind 180 deg - No Ice	3739.45	0.00	7480.04	1571392	2730	18
1.2 Dead+1.0 Ice	11421.62	0.00	-0.00	2113	3660	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	11421.61	0.00	-3388.69	-720016	3660	-11
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	11421.61	3088.05	-0.01	2115	-661370	5
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	11421.61	0.00	3388.71	724239	3661	11
Dead+Wind 0 deg - Service	4154.95	0.00	-2629.68	-550305	3033	-7
Dead+Wind 90 deg - Service	4154.95	2274.71	-0.00	1752	-480202	3
Dead+Wind 180 deg - Service	4154.95	0.00	2629.68	553804	3034	7

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	-4154.95	0.00	0.00	4154.95	-0.00	0.000%
2	0.00	-4985.94	-7480.43	-0.00	4985.93	7479.88	0.006%
3	0.00	-3739.45	-7480.43	-0.00	3739.45	7480.03	0.005%
4	6470.68	-4985.94	0.00	-6470.22	4985.93	0.00	0.006%
5	6470.68	-3739.45	0.00	-6470.34	3739.45	-0.01	0.005%
6	0.00	-4985.94	7480.43	-0.00	4985.93	-7479.92	0.006%
7	0.00	-3739.45	7480.43	-0.00	3739.45	-7480.04	0.005%
8	0.00	-11421.62	0.00	-0.00	11421.62	0.00	0.000%
9	0.00	-11421.62	-3389.28	-0.00	11421.61	3388.69	0.005%
10	3088.59	-11421.62	0.00	-3088.05	11421.61	0.01	0.005%
11	0.00	-11421.62	3389.28	-0.00	11421.61	-3388.71	0.005%
12	0.00	-4154.95	-2629.84	-0.00	4154.95	2629.68	0.003%
13	2274.85	-4154.95	0.00	-2274.71	4154.95	0.00	0.003%
14	0.00	-4154.95	2629.84	-0.00	4154.95	-2629.68	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
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1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00028836
3	Yes	4	0.00000001	0.00021028
4	Yes	4	0.00000001	0.00030779
5	Yes	4	0.00000001	0.00022944
6	Yes	4	0.00000001	0.00032248
7	Yes	4	0.00000001	0.00024401
8	Yes	4	0.00000001	0.00001655
9	Yes	4	0.00000001	0.00071543
10	Yes	4	0.00000001	0.00072205
11	Yes	4	0.00000001	0.00073232
12	Yes	4	0.00000001	0.00024852
13	Yes	4	0.00000001	0.00025510
14	Yes	4	0.00000001	0.00026056

Maximum Tower Deflections - Service Wind

Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T1	42 - 36	124.30	14	0.2865	0.0001
T2	36 - 30	94.15	14	0.2795	0.0001
T3	30 - 24	65.57	14	0.2475	0.0001
T4	24 - 18	41.33	14	0.1957	0.0001
T5	18 - 12	22.75	14	0.1411	0.0000
T6	12 - 6	10.06	14	0.0880	0.0000
T7	6 - 0	2.73	14	0.0386	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation m	Appurtenance	Gov. Load Comb.	Deflection mm	Tilt °	Twist °	Radius of Curvature m
42.0000	EPA4	14	124.30	0.2865	0.0001	124027
40.2857	EPA4	14	115.64	0.2859	0.0001	110260
38.5714	EPA4	14	107.00	0.2845	0.0001	55130
36.8571	EPA4	14	98.42	0.2817	0.0001	36420
35.1429	EPA4	14	89.91	0.2766	0.0001	21481
33.4286	EPA4	14	81.55	0.2691	0.0001	13258
31.7143	EPA4	14	73.40	0.2593	0.0001	9565
30.0000	EPA4	14	65.57	0.2475	0.0001	7667

Maximum Tower Deflections - Design Wind

Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T1	42 - 36	353.13	6	0.8136	0.0005
T2	36 - 30	267.51	6	0.7938	0.0004
T3	30 - 24	186.31	6	0.7031	0.0003
T4	24 - 18	117.46	6	0.5560	0.0002

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Section No.	Elevation m	Horz. Deflection mm	Gov. Load Comb.	Tilt °	Twist °
T5	18 - 12	64.64	6	0.4008	0.0001
T6	12 - 6	28.59	6	0.2501	0.0001
T7	6 - 0	7.75	6	0.1096	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation m	Appurtenance	Gov. Load Comb.	Deflection mm	Tilt °	Twist °	Radius of Curvature m
42.0000	EPA4	6	353.13	0.8136	0.0005	44178
40.2857	EPA4	6	328.53	0.8119	0.0005	39274
38.5714	EPA4	6	304.00	0.8081	0.0005	19637
36.8571	EPA4	6	279.62	0.8001	0.0004	12970
35.1429	EPA4	6	255.47	0.7858	0.0004	7616
33.4286	EPA4	6	231.71	0.7644	0.0004	4683
31.7143	EPA4	6	208.57	0.7367	0.0003	3373
30.0000	EPA4	6	186.31	0.7031	0.0003	2701

Bolt Design Data

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
T1	42	Leg	A325N	12	6	612.15	5849.71	0.105 ✓	1	Bearing
		Diagonal	A325N	12	1	669.05	2670.34	0.251 ✓	1	Member Bearing
		Horizontal	A325N	12	1	123.89	2670.34	0.046 ✓	1	Member Bearing
		Top Girt	A325N	12	1	8.49	3220.37	0.003 ✓	1	Bolt Shear
T2	36	Leg	A325N	12	6	2552.18	5849.71	0.436 ✓	1	Bearing
		Diagonal	A325N	12	1	1087.01	2670.34	0.407 ✓	1	Member Bearing
		Horizontal	A325N	12	1	132.69	2670.34	0.050 ✓	1	Member Bearing
T3	30	Leg	A325N	12	6	5018.50	6440.74	0.779 ✓	1	Bolt DS
		Diagonal	A325N	12	1	1198.95	2670.34	0.449 ✓	1	Member Bearing
		Horizontal	A325N	12	1	260.91	2670.34	0.098 ✓	1	Member Bearing
T4	24	Leg	A325N	14	8	5675.58	7748.68	0.732 ✓	1	Bearing
		Diagonal	A325N	12	1	1375.69	2670.34	0.515 ✓	1	Member Bearing
		Horizontal	A325N	12	1	393.43	2670.34	0.147 ✓	1	Member Bearing
T5	18	Leg	A325N	14	8	7699.19	8766.58	0.878 ✓	1	Bolt DS
		Diagonal	A325N	12	1	1564.46	3220.37	0.486 ✓	1	Bolt Shear
		Horizontal	A325N	12	1	533.71	2670.34	0.200 ✓	1	Member Bearing
T6	12	Leg	A325N	16	8	9792.15	11218.39	0.873 ✓	1	Bearing
		Diagonal	A325N	12	1	1794.82	3220.37	0.557 ✓	1	Bolt Shear
		Horizontal	A325N	12	1	678.80	2670.34	0.254 ✓	1	Member Bearing

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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
T7	6	Leg	A325N	16	10	10083.59	11450.22	0.881 ✓	1	Bolt DS
		Diagonal	A325N	12	1	2081.46	3220.37	0.646 ✓	1	Bolt Shear
		Horizontal	A325N	12	1	956.24	2670.34	0.358 ✓	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation m	Size	L m	L_u m	Kl/r	A mm^2	P_u kg	ϕP_n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L70×7	6.0044	1.4761	107.3 K=1.00	931	-1800.22	11315.36	0.159
T2	36 - 30	L80×7	6.0044	1.4761	93.6 K=1.00	1071	-7656.55	14932.22	0.513
T3	30 - 24	L80x8	6.0044	1.4761	93.9 K=1.00	1216	-15042.44	16905.57	0.890
T4	24 - 18	L100x8	6.0044	1.4761	74.7 K=1.00	1536	-22702.30	25087.25	0.905
T5	18 - 12	L100×10	6.0044	1.4761	75.1 K=1.00	1900	-30796.75	30938.50	0.995
T6	12 - 6	L120X10	6.0044	1.4761	62.3 K=1.00	2300	-39168.57	40880.34	0.958 ¹
T7	6 - 0	L140×12	6.0044	1.4697	53.2 K=1.00	3216	-50417.71	60233.00	0.837 ¹

¹ $P_u / \phi P_n$ controls

Leg Bending Design Data (Compression)

Section No.	Elevation m	Size	M_{ux} N-m	ϕM_{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} N-m	ϕM_{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L70×7	0	4642	0.000	-200	2372	0.084
T2	36 - 30	L80×7	-1	6139	0.000	434	3121	0.139
T3	30 - 24	L80x8	1	6930	0.000	-474	3541	0.134
T4	24 - 18	L100x8	-2	11045	0.000	785	5599	0.140
T5	18 - 12	L100×10	-3	13535	0.000	862	6916	0.125
T6	12 - 6	L120X10	-3	19816	0.000	1076	10057	0.107
T7	6 - 0	L140×12	0	32289	0.000	0	16402	0.000

Leg Interaction Design Data (Compression)

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Section No.	Elevation m	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L70×7	0.159	0.000	0.084	0.164 ✓	1.000	4.9-4 ✓
T2	36 - 30	L80×7	0.513	0.000	0.139	0.580 ✓	1.000	4.9-3 ✓
T3	30 - 24	L80x8	0.890	0.000	0.134	0.910 ✓	1.000	4.9-3 ✓
T4	24 - 18	L100x8	0.905	0.000	0.140	0.929 ✓	1.000	4.9-3 ✓
T5	18 - 12	L100×10	0.995	0.000	0.125	0.996 ✓	1.000	4.9-3 ✓
T6	12 - 6	L120X10	0.958	0.000	0.107	0.958 ¹ ✓	1.000	4.9-3 ✓
T7	6 - 0	L140×12	0.837	0.000	0.000	0.837 ¹ ✓	1.000	4.9-3 ✓

¹ $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation m	Size	L m	L_u m	Kl/r	A mm ²	P_u kg	ϕP_n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L50×4	1.6329	1.4815	149.9 K=1.00	384	-688.29	2714.02	0.254 ¹
T2	36 - 30	L50×4	1.7281	1.5815	160.0 K=1.00	384	-1107.34	2381.59	0.465 ¹
T3	30 - 24	L50×4	1.8402	1.7035	172.4 K=1.00	384	-1218.14	2052.76	0.593 ¹
T4	24 - 18	L50×4	1.9663	1.8209	184.3 K=1.00	384	-1399.31	1796.62	0.779 ¹
T5	18 - 12	L60×5	2.1039	1.9639	165.8 K=1.00	575	-1564.46	3323.55	0.471 ¹
T6	12 - 6	L60×5	2.2509	2.1016	177.4 K=1.00	575	-1794.82	2902.44	0.618 ¹
T7	6 - 0	L60×5	2.4009	2.2426	189.3 K=1.00	575	-2081.46	2548.91	0.817 ¹

¹ $P_u / \phi P_n$ controls

Diagonal Bending Design Data

Section No.	Elevation m	Size	M_{ux} N-m	ϕM_{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} N-m	ϕM_{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L50×4	0	1381	0.000	0	700	0.000
T2	36 - 30	L50×4	0	1381	0.000	0	700	0.000
T3	30 - 24	L50×4	0	1381	0.000	0	700	0.000
T4	24 - 18	L50×4	0	1381	0.000	0	700	0.000

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Section No.	Elevation m	Size	M_{ux} N-m	ϕM_{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} N-m	ϕM_{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T5	18 - 12	L60×5	0	2477	0.000	0	1257	0.000
T6	12 - 6	L60×5	0	2477	0.000	0	1257	0.000
T7	6 - 0	L60×5	0	2477	0.000	0	1257	0.000

Diagonal Interaction Design Data

Section No.	Elevation m	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L50×4	0.254	0.000	0.000	0.254 ¹	1.000	4.9-3 ✓
T2	36 - 30	L50×4	0.465	0.000	0.000	0.465 ¹	1.000	4.9-3 ✓
T3	30 - 24	L50×4	0.593	0.000	0.000	0.593 ¹	1.000	4.9-3 ✓
T4	24 - 18	L50×4	0.779	0.000	0.000	0.779 ¹	1.000	4.9-3 ✓
T5	18 - 12	L60×5	0.471	0.000	0.000	0.471 ¹	1.000	4.9-3 ✓
T6	12 - 6	L60×5	0.618	0.000	0.000	0.618 ¹	1.000	4.9-3 ✓
T7	6 - 0	L60×5	0.817	0.000	0.000	0.817 ¹	1.000	4.9-3 ✓

¹ $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation m	Size	L m	L_u m	Kl/r	A mm ²	P_u kg	ϕP_n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L50×4	1.1050	0.4826	75.5	384	-125.77	6231.73	0.020 ¹
T2	36 - 30	L50×4	1.7017	0.7759	K=2.43 85.0	384	-63.76	5778.22	0.011
T3	30 - 24	L50×4	2.1017	0.9759	K=1.70 98.8	384	-260.91	5093.71	0.051 ¹
T4	24 - 18	L50×4	2.5017	1.1659	K=1.00 118.0	384	-393.43	4138.49	0.095 ¹
T5	18 - 12	L50×4	2.9017	1.3659	K=1.00 138.2	384	-533.71	3192.78	0.167 ¹
T6	12 - 6	L50×4	3.3017	1.5559	K=1.00 157.4	384	-678.80	2460.62	0.276 ¹
T7	6 - 0	L50×4	3.7004	1.7453	K=1.00 176.6	384	-956.24	1955.62	0.489 ¹

¹ $P_u / \phi P_n$ controls

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Horizontal Bending Design Data

Section No.	Elevation <i>m</i>	Size	M_{ux} <i>N-m</i>	ϕM_{nx} <i>N-m</i>	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} <i>N-m</i>	ϕM_{ny} <i>N-m</i>	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L50×4	0	1381	0.000	2	700	0.003
T2	36 - 30	L50×4	9	1381	0.007	9	700	0.013
T3	30 - 24	L50×4	4	1381	0.003	4	700	0.006
T4	24 - 18	L50×4	0	1381	0.000	0	700	0.000
T5	18 - 12	L50×4	0	1381	0.000	0	700	0.000
T6	12 - 6	L50×4	0	1381	0.000	0	700	0.000
T7	6 - 0	L50×4	13	1381	0.010	13	700	0.018

Horizontal Interaction Design Data

Section No.	Elevation <i>m</i>	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L50×4	0.020	0.000	0.003	0.020 ¹	1.000	4.9-4 ✓
T2	36 - 30	L50×4	0.011	0.007	0.013	0.025 ✓	1.000	4.9-4 ✓
T3	30 - 24	L50×4	0.051	0.003	0.006	0.051 ¹ ✓	1.000	4.9-4 ✓
T4	24 - 18	L50×4	0.095	0.004	0.008	0.095 ¹ ✓	1.000	4.9-4 ✓
T5	18 - 12	L50×4	0.167	0.006	0.011	0.167 ¹ ✓	1.000	4.9-4 ✓
T6	12 - 6	L50×4	0.276	0.008	0.014	0.276 ¹ ✓	1.000	4.9-3 ✓
T7	6 - 0	L50×4	0.489	0.010	0.018	0.489 ¹ ✓	1.000	4.9-3 ✓

¹ $P_u / \phi P_n$ controls

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>Kl/r</i>	<i>A</i> <i>mm</i> ²	<i>P_u</i> <i>kg</i>	ϕP_n <i>kg</i>	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L50×4	1.0067	0.8668	103.9 K=1.18	384	-8.49	4837.75	0.002

Top Girt Bending Design Data

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Section No.	Elevation m	Size	M_{ux} N-m	ϕM_{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} N-m	ϕM_{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L50×4	-12	1381	0.009	-12	700	0.017

Top Girt Interaction Design Data

Section No.	Elevation m	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L50×4	0.002	0.009	0.017	0.027 ✓	1.000	4.9-4 ✓

Inner Bracing Design Data (Compression)

Section No.	Elevation m	Size	L m	L_u m	Kl/r	A mm ²	P_u kg	ϕP_n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L50×4	0.6508	0.6508	92.9 K=1.41	384	-1.57	5385.05	0.000 ¹ ✓
T2	36 - 30	L50×4	0.8508	0.8508	103.0 K=1.20	384	-1.50	4878.25	0.000 ¹ ✓
T3	30 - 24	L50×4	1.0508	1.0508	113.2 K=1.06	384	-1.34	4374.29	0.000 ¹ ✓
T4	24 - 18	L50×4	1.2508	1.2508	126.6 K=1.00	384	-1.28	3726.94	0.000 ¹ ✓
T5	18 - 12	L50×4	1.4508	1.4508	146.8 K=1.00	384	-1.38	2829.94	0.000 ¹ ✓
T6	12 - 6	L50×4	1.6508	1.6508	167.0 K=1.00	384	-1.32	2185.78	0.001 ¹ ✓
T7	6 - 0	L50×4	1.8502	1.8502	187.2 K=1.00	384	-1.36	1740.10	0.001 ¹ ✓

¹ $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation m	Size	L m	L_u m	Kl/r	A mm ²	P_u kg	ϕP_n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L70×7	6.0044	1.4761	68.5	931	1535.88	20078.91	0.076
T2	36 - 30	L80×7	6.0044	1.4761	59.6	1071	6940.87	23098.24	0.300
T3	30 - 24	L80×8	6.0044	1.4761	59.9	1216	14067.72	26225.49	0.536
T4	24 - 18	L100×8	6.0044	1.4761	47.5	1536	21410.16	33126.95	0.646

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Section No.	Elevation m	Size	L m	L _u m	Kl/r	A mm ²	P _u kg	φP _n kg	Ratio $\frac{P_u}{\phi P_n}$
T5	18 - 12	L100×10	6.0044	1.4761	48.0	1900	29096.96	40977.32	0.710
T6	12 - 6	L120X10	6.0044	1.4761	39.7	2300	37008.52	49603.97	0.746
T7	6 - 0	L140×12	6.0044	1.4697	33.9	3216	47584.12	69359.28	0.686 ¹

¹ P_u / φP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation m	Size	M _{ux} N-m	φM _{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} N-m	φM _{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L70×7	0	4642	0.000	188	2372	0.079
T2	36 - 30	L80×7	-1	6139	0.000	-383	3121	0.123
T3	30 - 24	L80x8	-1	6930	0.000	-412	3541	0.116
T4	24 - 18	L100x8	-2	11045	0.000	-704	5599	0.126
T5	18 - 12	L100×10	-2	13535	0.000	-776	6916	0.112
T6	12 - 6	L120X10	-2	19816	0.000	-981	10057	0.098
T7	6 - 0	L140×12	0	32289	0.000	-651	16402	0.040

Leg Interaction Design Data (Tension)

Section No.	Elevation m	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L70×7	0.076	0.000	0.079	0.118	1.000	4.9-4 ✓
T2	36 - 30	L80×7	0.300	0.000	0.123	0.376	1.000	4.9-3 ✓
T3	30 - 24	L80x8	0.536	0.000	0.116	0.580	1.000	4.9-3 ✓
T4	24 - 18	L100x8	0.646	0.000	0.126	0.686	1.000	4.9-3 ✓
T5	18 - 12	L100×10	0.710	0.000	0.112	0.731	1.000	4.9-3 ✓
T6	12 - 6	L120X10	0.746	0.000	0.098	0.750	1.000	4.9-3 ✓
T7	6 - 0	L140×12	0.686	0.000	0.040	0.686 ¹	1.000	4.9-3 ✓

¹ P_u / φP_n controls

Diagonal Design Data (Tension)

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Section No.	Elevation m	Size	L m	L _u m	Kl/r	A mm ²	P _u kg	φP _n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L50×4	1.6329	1.4815	99.9	384	669.05	8281.74	0.081 ¹
T2	36 - 30	L50×4	1.7281	1.5815	106.3	384	1087.01	8281.74	0.131 ¹
T3	30 - 24	L50×4	1.8402	1.7035	114.2	384	1198.95	8281.74	0.145 ¹
T4	24 - 18	L50×4	1.9663	1.8209	121.8	384	1375.69	8281.74	0.166 ¹
T5	18 - 12	L60×5	2.1039	1.9639	109.3	575	1540.38	12401.04	0.124 ¹
T6	12 - 6	L60×5	2.2509	2.1016	116.7	575	1759.04	12401.04	0.142 ¹
T7	6 - 0	L60×5	2.4009	2.2426	124.3	575	2023.54	12401.04	0.163 ¹

¹ P_u / φP_n controls

Diagonal Bending Design Data

Section No.	Elevation m	Size	M _{ux} N-m	φM _{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} N-m	φM _{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L50×4	0	1381	0.000	0	700	0.000
T2	36 - 30	L50×4	0	1381	0.000	0	700	0.000
T3	30 - 24	L50×4	0	1381	0.000	0	700	0.000
T4	24 - 18	L50×4	0	1381	0.000	0	700	0.000
T5	18 - 12	L60×5	0	2477	0.000	0	1257	0.000
T6	12 - 6	L60×5	0	2477	0.000	0	1257	0.000
T7	6 - 0	L60×5	0	2477	0.000	0	1257	0.000

Diagonal Interaction Design Data

Section No.	Elevation m	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L50×4	0.081	0.000	0.000	0.081 ¹	1.000	4.9-4 ✓
T2	36 - 30	L50×4	0.131	0.000	0.000	0.131 ¹	1.000	4.9-4 ✓
T3	30 - 24	L50×4	0.145	0.000	0.000	0.145 ¹	1.000	4.9-4 ✓
T4	24 - 18	L50×4	0.166	0.000	0.000	0.166 ¹	1.000	4.9-4 ✓
T5	18 - 12	L60×5	0.124	0.000	0.000	0.124 ¹	1.000	4.9-4 ✓
T6	12 - 6	L60×5	0.142	0.000	0.000	0.142 ¹	1.000	4.9-4 ✓
T7	6 - 0	L60×5	0.163	0.000	0.000	0.163 ¹	1.000	4.9-4 ✓

¹ P_u / φP_n controls

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Horizontal Design Data (Tension)

Section No.	Elevation m	Size	L m	L _u m	Kl/r	A mm ²	P _u kg	φP _n kg	Ratio $\frac{P_u}{\phi P_n}$
T1	42 - 36	L50×4	1.3017	0.5809	39.7	384	46.86	8281.74	0.006
T2	36 - 30	L50×4	1.7017	0.7759	52.2	384	52.47	8281.74	0.006
T3	30 - 24	L50×4	2.1017	0.9759	65.1	384	139.52	8281.74	0.017
T4	24 - 18	L50×4	2.5017	1.1659	77.3	384	207.64	8281.74	0.025
T5	18 - 12	L50×4	2.9017	1.3659	90.2	384	280.12	8281.74	0.034
T6	12 - 6	L50×4	3.3017	1.5559	102.4	384	354.92	8281.74	0.043
T7	6 - 0	L50×4	3.7004	1.7453	114.6	384	956.24	8281.74	0.115 ¹

¹ P_u / φP_n controls

Horizontal Bending Design Data

Section No.	Elevation m	Size	M _{ux} N-m	φM _{nx} N-m	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} N-m	φM _{ny} N-m	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	42 - 36	L50×4	9	1381	0.007	6	700	0.009
T2	36 - 30	L50×4	10	1381	0.007	9	700	0.014
T3	30 - 24	L50×4	14	1381	0.010	13	700	0.019
T4	24 - 18	L50×4	19	1381	0.014	18	700	0.026
T5	18 - 12	L50×4	25	1381	0.018	23	700	0.034
T6	12 - 6	L50×4	30	1381	0.022	29	700	0.041
T7	6 - 0	L50×4	0	1381	0.000	0	700	0.000

Horizontal Interaction Design Data

Section No.	Elevation m	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	42 - 36	L50×4	0.006	0.007	0.009	0.019	1.000	4.9-4 ✓
T2	36 - 30	L50×4	0.006	0.007	0.014	0.024	1.000	4.9-4 ✓
T3	30 - 24	L50×4	0.017	0.010	0.019	0.038	1.000	4.9-4 ✓
T4	24 - 18	L50×4	0.025	0.014	0.026	0.052	1.000	4.9-4 ✓
T5	18 - 12	L50×4	0.034	0.018	0.034	0.068	1.000	4.9-4 ✓
T6	12 - 6	L50×4	0.043	0.022	0.041	0.085	1.000	4.9-4 ✓
T7	6 - 0	L50×4	0.115	0.000	0.000	0.115 ¹	1.000	4.9-4 ✓

¹ P_u / φP_n controls

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Section No.	Elevation m	Component Type	Size	Critical Element	P kg	ϕP_{allow} kg	% Capacity	Pass Fail
		Diagonal	L60×5	248	-2081.46	2548.91	81.7	Pass
		Horizontal	L50×4	244	-956.24	1955.62	48.9	Pass
		Inner Bracing	L50×4	250	-1.27	1740.10	0.4	Pass
							Summary	
						Leg (T5)	99.6	Pass
						Diagonal (T7)	81.7	Pass
						Horizontal (T7)	48.9	Pass
						Top Girt (T1)	2.7	Pass
						Inner Bracing (T7)	0.4	Pass
						Bolt Checks	88.1	Pass
						RATING =	99.6	Pass

Element Map

Section No.	Section Elevation m	Component Type	Element List
T1	42.0000-36.0000	Leg	1-3
		Diagonal	8-9,11-12,14-15,19-24,26-27,29-30,32-33,37-42
		Horizontal	7,10,13,25,28,31
		Top Girt	4-6
		Inner Bracing	16-18,34-36
T2	36.0000-30.0000	Leg	43-45
		Diagonal	47-48,50-51,53-54,58-63,65-66,68-69,71-72,76-81
		Horizontal	46,49,52,64,67,70
		Inner Bracing	55-57,73-75
T3	30.0000-24.0000	Leg	82-84
		Diagonal	86-87,89-90,92-93,97-102,104-105,107-108,110-111,115-120
		Horizontal	85,88,91,103,106,109
		Inner Bracing	94-96,112-114
T4	24.0000-18.0000	Leg	121-123
		Diagonal	125-126,128-129,131-132,136-141,143-144,146-147,149-150,154-159
		Horizontal	124,127,130,142,145,148
		Inner Bracing	133-135,151-153
T5	18.0000-12.0000	Leg	160-162
		Diagonal	164-165,167-168,170-171,175-180,182-183,185-186,188-189,193-198
		Horizontal	163,166,169,181,184,187
		Inner Bracing	172-174,190-192
T6	12.0000-6.0000	Leg	199-201
		Diagonal	203-204,206-207,209-210,214-219,221-222,224-225,227-228,232-237
		Horizontal	202,205,208,220,223,226
		Inner Bracing	211-213,229-231
T7	6.0000-0.0000	Leg	238-240
		Diagonal	242-243,245-246,248-249,253-258,260-261,263-264,266-267,271-276
		Horizontal	241,244,247,259,262,265
		Inner Bracing	250-252,268-270
			Total number of elements: 276