ALLSTATE TOWER

PITTSBURG TANK & TOWER GROUP

Since 1919

Tower & Foundation Calculations

150’ Self-Supporting Tower

St. Louis County, MO

Prepared For

Industrial Engineered Systems

251 Ridge Road

Boulder, CO 80303

AST Project Number ER-074528

5/31/2019

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Section 1

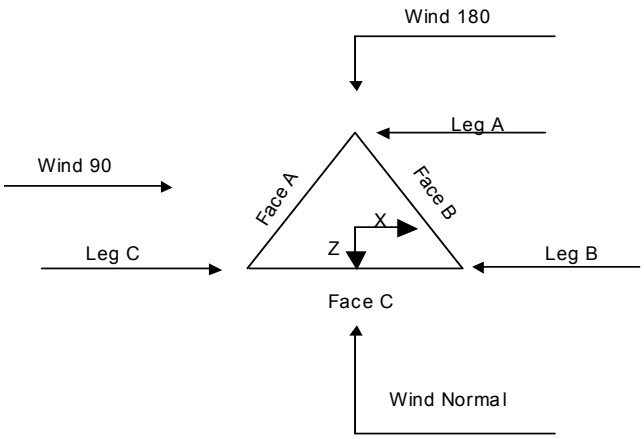
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.00 ft at the top and 12.75 ft at the base.
There is a 3 sided latticed pole with a face width of 3.00 ft.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 0.00 ft.
Basic wind speed of 120 mph.
Risk Category IV.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Deflections calculated using a wind speed of 60 mph.
Tower designed for Step Bolts..
Tower designed for feedlines to be supported with waveguide ladder(s)..
All bolted legs and/or weld together tower sections have flange connections..
Structural connections use galvanized A325 bolts and/or equivalent with nuts and/or nut 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..
All structural steel welding will be in compliance with AWS D1.1 latest revision and fabricated with ER-70S-6 electrodes..
All antenna and feedline loading is assumed to be placed symetrically about the centroid of the structure..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in latticed pole member design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

√ Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist. Exemption
Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
√ SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Triangular Tower

3 Sided Latticed Pole Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
L1	150.00-140.00			3.00	1	10.00
L2	140.00-120.00			3.00	1	20.00

3 Sided Latticed Pole 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
	ft	ft				in	in
L1	150.00-140.00	2.38	K Brace Left	No	Yes	3.0000	3.0000
L2	140.00-120.00	2.44	K Brace Left	No	Yes	3.0000	3.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
L1 150.00-140.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
L2 140.00-120.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
L1 150.00-140.00	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
L2 140.00-120.00	Solid Round	5/8	A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
L1 150.00-140.00	None	Solid Round		A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)
L2 140.00-120.00	None	Solid Round		A36 (36 ksi)	Solid Round	5/8	A36 (36 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-140.00	0.25	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
L2 140.00-120.00	0.25	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	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
L1	Yes	Yes	1	1	1	1	1	1	1	1
150.00-140.00				1	1	1	1	1	1	1
L2	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1

[1]*Note: 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.*

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
L1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
150.00-140.00														
L2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
140.00-120.00														

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	120.00-100.00			3.00	1	20.00
T2	100.00-80.00			4.00	1	20.00
T3	80.00-60.00			5.75	1	20.00
T4	60.00-40.00			7.50	1	20.00
T5	40.00-20.00			9.25	1	20.00
T6	20.00-0.00			11.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	120.00-100.00	2.44	K Brace Left	No	Yes	3.0000	3.0000
T2	100.00-80.00	4.84	X Brace	No	No	3.7500	3.7500
T3	80.00-60.00	4.84	X Brace	No	No	3.7500	3.7500
T4	60.00-40.00	4.80	X Brace	No	No	4.7500	4.7500
T5	40.00-20.00	6.40	X Brace	No	No	4.7500	4.7500
T6	20.00-0.00	6.40	X Brace	No	No	4.7500	4.7500

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-100.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 100.00-80.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A529-50 (50 ksi)
T3 80.00-60.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A529-50 (50 ksi)
T4 60.00-40.00	Solid Round	2 1/2	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A529-50 (50 ksi)
T5 40.00-20.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A529-50 (50 ksi)
T6 20.00-0.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A529-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 120.00-100.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 120.00-100.00	None	Solid Round		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 120.00-100.00	0.25	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 100.00-80.00	1.25	0.3750	A36 (36 ksi)	1	1	1.075	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T3 80.00-60.00	1.25	0.3750	A36 (36 ksi)	1	1	1.075	36.0000	36.0000	36.0000
T4 60.00-40.00	1.25	0.3750	A36 (36 ksi)	1	1	1.075	36.0000	36.0000	36.0000
T5 40.00-20.00	1.00	0.3750	A36 (36 ksi)	1	1	1.075	36.0000	36.0000	36.0000
T6 20.00-0.00	1.00	0.3750	A36 (36 ksi)	1	1	1.075	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1

[1]*Note: 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 ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 120.00-100.00	Flange	0.7500 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T2 100.00-80.00	Flange	0.7500 A325N	0	0.5000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T3 80.00-60.00	Flange	0.7500 A325N	0	0.5000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T4 60.00-40.00	Flange	0.7500 A325N	0	0.5000 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T5 40.00-20.00	Flange	0.7500 A325N	0	0.6250 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0
T6 20.00-0.00	Flange	0.7500 A325N	0	0.6250 A325N	1	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LC - Lighting Cable / SO Cord	C	No	No	Ar (CaAa)	150.00 - 8.00	1.5000	-0.5	1	1	1.0900	1.0900		0.00
Safety Line 3/8" (Ar)	C	No	No	Ar (CaAa)	150.00 - 0.00	4.0000	-0.5	1	1	0.3750	0.3750		0.00
Feedline Ladder - AST	B	No	No	Af (CaAa)	150.00 - 0.00	1.0000	0	1	1	1.5000	1.5000		0.01
1-5/8" Heliax	B	No	No	Ar (CaAa)	120.00 - 8.00	2.5000	-0.03	12	6	0.3750	1.9800		0.00
7/8" Heliax	B	No	No	Ar (CaAa)	130.00 - 8.00	2.5000	0.1	4	2	0.3750	1.0900		0.00
7/8" Heliax	B	No	No	Ar (CaAa)	145.00 - 130.00	2.5000	0.1	3	2	0.3750	1.0900		0.00
7/8" Heliax	B	No	No	Ar (CaAa)	148.00 - 145.00	2.5000	0.1	2	2	0.3750	1.0900		0.00
7/8" Heliax	B	No	No	Ar (CaAa)	150.00 - 148.00	2.5000	0.1	1	1	0.3750	1.0900		0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.995	0.000	0.07
		C	0.000	0.000	1.465	0.000	0.01
L2	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	12.630	0.000	0.14
		C	0.000	0.000	2.930	0.000	0.01
T1	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	61.240	0.000	0.34
		C	0.000	0.000	2.930	0.000	0.01
T2	100.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	61.240	0.000	0.34
		C	0.000	0.000	2.930	0.000	0.01
T3	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	61.240	0.000	0.34
		C	0.000	0.000	2.930	0.000	0.01
T4	60.00-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	61.240	0.000	0.34
		C	0.000	0.000	2.930	0.000	0.01
T5	40.00-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	61.240	0.000	0.34
		C	0.000	0.000	2.930	0.000	0.01
T6	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	38.744	0.000	0.25
		C	0.000	0.000	2.058	0.000	0.01

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-140.00	4.3574	0.0306	4.3574	0.0306
L2	140.00-120.00	4.9861	-0.1639	4.9861	-0.1639
T1	120.00-100.00	7.7258	-4.1235	7.7258	-4.1235
T2	100.00-80.00	6.5113	-3.8883	6.5113	-3.8883
T3	80.00-60.00	7.6688	-4.6205	7.6688	-4.6205
T4	60.00-40.00	8.4874	-5.1667	8.4874	-5.1667
T5	40.00-20.00	8.8250	-5.4454	8.8250	-5.4454
T6	20.00-0.00	5.7688	-3.6412	5.7688	-3.6412

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	LC - Lighting Cable / SO Cord	140.00 - 150.00	0.6000	0.6000
L1	2	Safety Line 3/8" (Ar)	140.00 - 150.00	0.6000	0.6000
L1	3	Feedline Ladder - AST	140.00 - 150.00	0.6000	0.6000
L1	6	7/8" Heliax	140.00 - 145.00	0.6000	0.6000
L1	7	7/8" Heliax	145.00 - 148.00	0.6000	0.6000
L1	8	7/8" Heliax	148.00 - 150.00	0.6000	0.6000
L2	1	LC - Lighting Cable / SO	120.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		Cord	140.00		
L2	2	Safety Line 3/8" (Ar)	120.00 - 140.00	0.6000	0.6000
L2	3	Feedline Ladder - AST	120.00 - 140.00	0.6000	0.6000
L2	5	7/8" Heliax	120.00 - 130.00	0.6000	0.6000
L2	6	7/8" Heliax	130.00 - 140.00	0.6000	0.6000
T1	1	LC - Lighting Cable / SO Cord	100.00 - 120.00	0.6000	0.6000
T1	2	Safety Line 3/8" (Ar)	100.00 - 120.00	0.6000	0.6000
T1	3	Feedline Ladder - AST	100.00 - 120.00	0.6000	0.6000
T1	4	1-5/8" Heliax	100.00 - 120.00	0.6000	0.6000
T1	5	7/8" Heliax	100.00 - 120.00	0.6000	0.6000
T2	1	LC - Lighting Cable / SO Cord	80.00 - 100.00	0.6000	0.6000
T2	2	Safety Line 3/8" (Ar)	80.00 - 100.00	0.6000	0.6000
T2	3	Feedline Ladder - AST	80.00 - 100.00	0.6000	0.6000
T2	4	1-5/8" Heliax	80.00 - 100.00	0.6000	0.6000
T2	5	7/8" Heliax	80.00 - 100.00	0.6000	0.6000
T3	1	LC - Lighting Cable / SO Cord	60.00 - 80.00	0.6000	0.6000
T3	2	Safety Line 3/8" (Ar)	60.00 - 80.00	0.6000	0.6000
T3	3	Feedline Ladder - AST	60.00 - 80.00	0.6000	0.6000
T3	4	1-5/8" Heliax	60.00 - 80.00	0.6000	0.6000
T3	5	7/8" Heliax	60.00 - 80.00	0.6000	0.6000
T4	1	LC - Lighting Cable / SO Cord	40.00 - 60.00	0.6000	0.6000
T4	2	Safety Line 3/8" (Ar)	40.00 - 60.00	0.6000	0.6000
T4	3	Feedline Ladder - AST	40.00 - 60.00	0.6000	0.6000
T4	4	1-5/8" Heliax	40.00 - 60.00	0.6000	0.6000
T4	5	7/8" Heliax	40.00 - 60.00	0.6000	0.6000
T5	1	LC - Lighting Cable / SO Cord	20.00 - 40.00	0.6000	0.6000
T5	2	Safety Line 3/8" (Ar)	20.00 - 40.00	0.6000	0.6000
T5	3	Feedline Ladder - AST	20.00 - 40.00	0.6000	0.6000
T5	4	1-5/8" Heliax	20.00 - 40.00	0.6000	0.6000
T5	5	7/8" Heliax	20.00 - 40.00	0.6000	0.6000
T6	1	LC - Lighting Cable / SO Cord	8.00 - 20.00	0.6000	0.6000
T6	2	Safety Line 3/8" (Ar)	0.00 - 20.00	0.6000	0.6000
T6	3	Feedline Ladder - AST	0.00 - 20.00	0.6000	0.6000
T6	4	1-5/8" Heliax	8.00 - 20.00	0.6000	0.6000
T6	5	7/8" Heliax	8.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
10' Lightning Rod Ext. = 14' O.H. Inc. 4' Rod	B	From Leg	0.00 0.00 7.00	0.0000	150.00	No Ice	2.57	2.57	0.04
L-Lighting Beacon	C	From Leg	0.00 0.00 0.00	0.0000	150.00	No Ice	1.18	1.18	0.05
L-Side Light / Obstruction Light	A	From Leg	0.50 0.00 0.00	0.0000	75.00	No Ice	0.27	0.27	0.01
L-Side Light / Obstruction Light	B	From Leg	0.50 0.00 0.00	0.0000	75.00	No Ice	0.27	0.27	0.01
L-Side Light / Obstruction Light	C	From Leg	0.50 0.00 0.00	0.0000	75.00	No Ice	0.27	0.27	0.01
10' Typ. Omni/Whip Antenna(s) (7/8" Heliax)	C	From Leg	3.00 0.00 1.00	0.0000	150.00	No Ice	3.50	3.50	0.04
3' Sidearm(s)	C	From Leg	1.50 0.00 -2.00	0.0000	150.00	No Ice	2.75	4.65	0.17
10' Typ. Omni/Whip Antenna(s) (7/8" Heliax)	C	From Leg	3.00 0.00 3.00	0.0000	130.00	No Ice	3.50	3.50	0.04
3' Sidearm(s)	C	From Leg	1.50 0.00 0.00	0.0000	130.00	No Ice	2.75	4.65	0.17
(4) 72" x 12" x 3" Typ. Flat Panel Antenna(s) (1-5/8" Heliax)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	8.13	2.95	0.03
(4) 72" x 12" x 3" Typ. Flat Panel Antenna(s) (1-5/8" Heliax)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	8.13	2.95	0.03
(4) 72" x 12" x 3" Typ. Flat Panel Antenna(s) (1-5/8" Heliax)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	8.13	2.95	0.03
12' STD Gate Mount(s)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	10.25	6.75	0.35
12' STD Gate Mount(s)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	10.25	6.75	0.35
12' STD Gate Mount(s)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice	10.25	6.75	0.35

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
2' Std. Dish w/Radome (7/8" Heliax)	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		148.00	2.10	No Ice	3.46	0.04
2' Std. Dish w/Radome (7/8" Heliax)	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		145.00	2.10	No Ice	3.46	0.04

222-H Verification Constants

Constant	Value
K_d	0.85
Ice Thickness Importance Factor	1.25
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	n/a
K_t	1
f	1
K_e	1

222-H Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft²	A_r w/Ice ft²	A_rR_r ft²	A_rR_r w/Ice ft²
L1 150.00-140.00	1	1 1/4	14.623	3.656	C	0.124	0.124	1.042	1.042	0.589	0.589
	1	1 1/4	14.623	3.656	A	0.124	0.124	1.042	1.042	0.589	0.589
	2	1 1/4	14.623	3.656	C	0.124	0.124	1.042	1.042	0.589	0.589
	2	1 1/4	14.623	3.656	B	0.124	0.124	1.042	1.042	0.589	0.589
	3	1 1/4	14.623	3.656	B	0.124	0.124	1.042	1.042	0.589	0.589
	3	1 1/4	14.623	3.656	A	0.124	0.124	1.042	1.042	0.589	0.589
	4	5/8	7.312	1.828	C	0.124	0.124	0.151	0.151	0.085	0.085
	5	5/8	7.312	1.828	B	0.124	0.124	0.151	0.151	0.085	0.085
	6	5/8	7.312	1.828	A	0.124	0.124	0.151	0.151	0.085	0.085
	7	5/8	7.312	1.828	C	0.124	0.124	0.151	0.151	0.085	0.085
	8	5/8	7.312	1.828	B	0.124	0.124	0.151	0.151	0.085	0.085
	9	5/8	7.312	1.828	A	0.124	0.124	0.151	0.151	0.085	0.085
	10	5/8	7.312	1.828	C	0.124	0.124	0.192	0.192	0.109	0.109
	11	5/8	7.312	1.828	B	0.124	0.124	0.192	0.192	0.109	0.109
	12	5/8	7.312	1.828	A	0.124	0.124	0.192	0.192	0.109	0.109
	13	5/8	7.312	1.828	C	0.124	0.124	0.151	0.151	0.085	0.085
	14	5/8	7.312	1.828	B	0.124	0.124	0.151	0.151	0.085	0.085
	15	5/8	7.312	1.828	A	0.124	0.124	0.151	0.151	0.085	0.085
	16	5/8	7.312	1.828	C	0.124	0.124	0.192	0.192	0.109	0.109
	17	5/8	7.312	1.828	B	0.124	0.124	0.192	0.192	0.109	0.109
	18	5/8	7.312	1.828	A	0.124	0.124	0.192	0.192	0.109	0.109
	19	5/8	7.312	1.828	C	0.124	0.124	0.151	0.151	0.085	0.085
	20	5/8	7.312	1.828	B	0.124	0.124	0.151	0.151	0.085	0.085
	21	5/8	7.312	1.828	A	0.124	0.124	0.151	0.151	0.085	0.085
	22	5/8	7.312	1.828	C	0.124	0.124	0.192	0.192	0.109	0.109
	23	5/8	7.312	1.828	B	0.124	0.124	0.192	0.192	0.109	0.109

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft²	A_r w/Ice ft²	A_rR_r ft²	A_rR_r w/Ice ft²
	24	5/8	7.312	1.828	A	0.124	0.124	0.192	0.192	0.109	0.109
	25	5/8	7.312	1.828	C	0.124	0.124	0.151	0.151	0.085	0.085
	26	5/8	7.312	1.828	B	0.124	0.124	0.151	0.151	0.085	0.085
	27	5/8	7.312	1.828	A	0.124	0.124	0.151	0.151	0.085	0.085
	28	5/8	7.312	1.828	C	0.124	0.124	0.192	0.192	0.109	0.109
	29	5/8	7.312	1.828	B	0.124	0.124	0.192	0.192	0.109	0.109
	30	5/8	7.312	1.828	A	0.124	0.124	0.192	0.192	0.109	0.109
					A		Sum:	3.607	3.607	2.039	2.039
					B			3.607	3.607	2.039	2.039
					C			3.607	3.607	2.039	2.039
L2	31	1 1/4	14.456	3.614	C	0.123	0.123	2.083	2.083	1.178	1.178
140.00-120.00											
	31	1 1/4	14.456	3.614	A	0.123	0.123	2.083	2.083	1.178	1.178
	32	1 1/4	14.456	3.614	C	0.123	0.123	2.083	2.083	1.178	1.178
	32	1 1/4	14.456	3.614	B	0.123	0.123	2.083	2.083	1.178	1.178
	33	1 1/4	14.456	3.614	B	0.123	0.123	2.083	2.083	1.178	1.178
	33	1 1/4	14.456	3.614	A	0.123	0.123	2.083	2.083	1.178	1.178
	34	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	35	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	36	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	37	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	38	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	39	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	40	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	41	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	42	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	43	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	44	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	45	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	46	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	47	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	48	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	49	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	50	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	51	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	52	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	53	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	54	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	55	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	56	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	57	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	58	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	59	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	60	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	61	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	62	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	63	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	64	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	65	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	66	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	67	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	68	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	69	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	70	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	71	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	72	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	73	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	74	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	75	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	76	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	77	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	78	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
	79	5/8	7.228	1.807	C	0.123	0.123	0.151	0.151	0.085	0.085
	80	5/8	7.228	1.807	B	0.123	0.123	0.151	0.151	0.085	0.085
	81	5/8	7.228	1.807	A	0.123	0.123	0.151	0.151	0.085	0.085
	82	3/4	8.674	2.168	C	0.123	0.123	0.233	0.233	0.132	0.132
	83	3/4	8.674	2.168	B	0.123	0.123	0.233	0.233	0.132	0.132
	84	3/4	8.674	2.168	A	0.123	0.123	0.233	0.233	0.132	0.132
					A		Sum:	7.390	7.390	4.178	4.178
					B			7.390	7.390	4.178	4.178
					C			7.390	7.390	4.178	4.178
T1 120.00-100.00	85	1 1/2	17.045	4.261	C	0.132	0.132	2.501	2.501	1.415	1.415
	85	1 1/2	17.045	4.261	A	0.132	0.132	2.501	2.501	1.415	1.415
	86	1 1/2	17.045	4.261	C	0.132	0.132	2.501	2.501	1.415	1.415
	86	1 1/2	17.045	4.261	B	0.132	0.132	2.501	2.501	1.415	1.415
	87	1 1/2	17.045	4.261	B	0.132	0.132	2.501	2.501	1.415	1.415
	87	1 1/2	17.045	4.261	A	0.132	0.132	2.501	2.501	1.415	1.415
	88	3/4	8.523	2.131	C	0.132	0.132	0.180	0.180	0.102	0.102
	89	3/4	8.523	2.131	B	0.132	0.132	0.180	0.180	0.102	0.102
	90	3/4	8.523	2.131	A	0.132	0.132	0.180	0.180	0.102	0.102
	91	3/4	8.523	2.131	C	0.132	0.132	0.241	0.241	0.137	0.137
	92	3/4	8.523	2.131	B	0.132	0.132	0.241	0.241	0.137	0.137
	93	3/4	8.523	2.131	A	0.132	0.132	0.241	0.241	0.137	0.137
	94	7/8	9.943	2.486	C	0.132	0.132	0.326	0.326	0.185	0.185
	95	7/8	9.943	2.486	B	0.132	0.132	0.326	0.326	0.185	0.185
	96	7/8	9.943	2.486	A	0.132	0.132	0.326	0.326	0.185	0.185
	97	3/4	8.523	2.131	C	0.132	0.132	0.234	0.234	0.132	0.132
	98	3/4	8.523	2.131	B	0.132	0.132	0.234	0.234	0.132	0.132
	99	3/4	8.523	2.131	A	0.132	0.132	0.234	0.234	0.132	0.132
	100	7/8	9.943	2.486	C	0.132	0.132	0.319	0.319	0.180	0.180
	101	7/8	9.943	2.486	B	0.132	0.132	0.319	0.319	0.180	0.180
	102	7/8	9.943	2.486	A	0.132	0.132	0.319	0.319	0.180	0.180
	103	3/4	8.523	2.131	C	0.132	0.132	0.226	0.226	0.128	0.128
	104	3/4	8.523	2.131	B	0.132	0.132	0.226	0.226	0.128	0.128
	105	3/4	8.523	2.131	A	0.132	0.132	0.226	0.226	0.128	0.128
	106	7/8	9.943	2.486	C	0.132	0.132	0.311	0.311	0.176	0.176
	107	7/8	9.943	2.486	B	0.132	0.132	0.311	0.311	0.176	0.176
	108	7/8	9.943	2.486	A	0.132	0.132	0.311	0.311	0.176	0.176
	109	3/4	8.523	2.131	C	0.132	0.132	0.219	0.219	0.124	0.124
	110	3/4	8.523	2.131	B	0.132	0.132	0.219	0.219	0.124	0.124
	111	3/4	8.523	2.131	A	0.132	0.132	0.219	0.219	0.124	0.124
	112	7/8	9.943	2.486	C	0.132	0.132	0.304	0.304	0.172	0.172
	113	7/8	9.943	2.486	B	0.132	0.132	0.304	0.304	0.172	0.172
	114	7/8	9.943	2.486	A	0.132	0.132	0.304	0.304	0.172	0.172
	115	3/4	8.523	2.131	C	0.132	0.132	0.211	0.211	0.119	0.119
	116	3/4	8.523	2.131	B	0.132	0.132	0.211	0.211	0.119	0.119
	117	3/4	8.523	2.131	A	0.132	0.132	0.211	0.211	0.119	0.119
	118	7/8	9.943	2.486	C	0.132	0.132	0.296	0.296	0.168	0.168
	119	7/8	9.943	2.486	B	0.132	0.132	0.296	0.296	0.168	0.168
	120	7/8	9.943	2.486	A	0.132	0.132	0.296	0.296	0.168	0.168
	121	3/4	8.523	2.131	C	0.132	0.132	0.203	0.203	0.115	0.115
	122	3/4	8.523	2.131	B	0.132	0.132	0.203	0.203	0.115	0.115
	123	3/4	8.523	2.131	A	0.132	0.132	0.203	0.203	0.115	0.115
	124	7/8	9.943	2.486	C	0.132	0.132	0.289	0.289	0.163	0.163
	125	7/8	9.943	2.486	B	0.132	0.132	0.289	0.289	0.163	0.163
	126	7/8	9.943	2.486	A	0.132	0.132	0.289	0.289	0.163	0.163
	127	3/4	8.523	2.131	C	0.132	0.132	0.196	0.196	0.111	0.111
	128	3/4	8.523	2.131	B	0.132	0.132	0.196	0.196	0.111	0.111
	129	3/4	8.523	2.131	A	0.132	0.132	0.196	0.196	0.111	0.111

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	130	7/8	9.943	2.486	C	0.132	0.132	0.282	0.282	0.159	0.159
	131	7/8	9.943	2.486	B	0.132	0.132	0.282	0.282	0.159	0.159
	132	7/8	9.943	2.486	A	0.132	0.132	0.282	0.282	0.159	0.159
	133	3/4	8.523	2.131	C	0.132	0.132	0.188	0.188	0.106	0.106
	134	3/4	8.523	2.131	B	0.132	0.132	0.188	0.188	0.106	0.106
	135	3/4	8.523	2.131	A	0.132	0.132	0.188	0.188	0.106	0.106
	136	7/8	9.943	2.486	C	0.132	0.132	0.274	0.274	0.155	0.155
	137	7/8	9.943	2.486	B	0.132	0.132	0.274	0.274	0.155	0.155
	138	7/8	9.943	2.486	A	0.132	0.132	0.274	0.274	0.155	0.155
					A		Sum:	9.301	9.301	5.264	5.264
					B			9.301	9.301	5.264	5.264
					C			9.301	9.301	5.264	5.264
T2 100.00-80.00	139	2 1/4	25.033	6.258	C	0.152	0.152	3.755	3.755	2.132	2.132
	139	2 1/4	25.033	6.258	A	0.152	0.152	3.755	3.755	2.132	2.132
	140	2 1/4	25.033	6.258	C	0.152	0.152	3.755	3.755	2.132	2.132
	140	2 1/4	25.033	6.258	B	0.152	0.152	3.755	3.755	2.132	2.132
	141	2 1/4	25.033	6.258	B	0.152	0.152	3.755	3.755	2.132	2.132
	141	2 1/4	25.033	6.258	A	0.152	0.152	3.755	3.755	2.132	2.132
					A		Sum:	7.510	7.510	4.263	4.263
					B			7.510	7.510	4.263	4.263
					C			7.510	7.510	4.263	4.263
T3 80.00-60.00	166	2 1/4	24.38	6.095	C	0.123	0.123	3.755	3.755	2.123	2.123
	166	2 1/4	24.38	6.095	A	0.123	0.123	3.755	3.755	2.123	2.123
	167	2 1/4	24.38	6.095	C	0.123	0.123	3.755	3.755	2.123	2.123
	167	2 1/4	24.38	6.095	B	0.123	0.123	3.755	3.755	2.123	2.123
	168	2 1/4	24.38	6.095	B	0.123	0.123	3.755	3.755	2.123	2.123
	168	2 1/4	24.38	6.095	A	0.123	0.123	3.755	3.755	2.123	2.123
					A		Sum:	7.510	7.510	4.245	4.245
					B			7.510	7.510	4.245	4.245
					C			7.510	7.510	4.245	4.245
T4 60.00-40.00	193	2 1/2	26.146	6.536	C	0.111	0.111	4.172	4.172	2.356	2.356
	193	2 1/2	26.146	6.536	A	0.111	0.111	4.172	4.172	2.356	2.356
	194	2 1/2	26.146	6.536	C	0.111	0.111	4.172	4.172	2.356	2.356
	194	2 1/2	26.146	6.536	B	0.111	0.111	4.172	4.172	2.356	2.356
	195	2 1/2	26.146	6.536	B	0.111	0.111	4.172	4.172	2.356	2.356
	195	2 1/2	26.146	6.536	A	0.111	0.111	4.172	4.172	2.356	2.356
					A		Sum:	8.344	8.344	4.712	4.712
					B			8.344	8.344	4.712	4.712
					C			8.344	8.344	4.712	4.712
T5 40.00-20.00	220	3	29.733	7.433	C	0.109	0.109	5.006	5.006	2.827	2.827
	220	3	29.733	7.433	A	0.109	0.109	5.006	5.006	2.827	2.827
	221	3	29.733	7.433	C	0.109	0.109	5.006	5.006	2.827	2.827
	221	3	29.733	7.433	B	0.109	0.109	5.006	5.006	2.827	2.827
	222	3	29.733	7.433	B	0.109	0.109	5.006	5.006	2.827	2.827
	222	3	29.733	7.433	A	0.109	0.109	5.006	5.006	2.827	2.827
					A		Sum:	10.013	10.013	5.654	5.654
					B			10.013	10.013	5.654	5.654
					C			10.013	10.013	5.654	5.654
T6 20.00-0.00	241	3	27.659	6.915	C	0.114	0.114	5.006	5.006	2.828	2.828
	241	3	27.659	6.915	A	0.114	0.114	5.006	5.006	2.828	2.828
	242	3	27.659	6.915	C	0.114	0.114	5.006	5.006	2.828	2.828
	242	3	27.659	6.915	B	0.114	0.114	5.006	5.006	2.828	2.828
	243	3	27.659	6.915	B	0.114	0.114	5.006	5.006	2.828	2.828
	243	3	27.659	6.915	A	0.114	0.114	5.006	5.006	2.828	2.828
					A		Sum:	10.013	10.013	5.656	5.656
					B			10.013	10.013	5.656	5.656
					C			10.013	10.013	5.656	5.656

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
L1 150.00-140.00	145.00		1.369	1	1		43	A	0.124	2.039
								B	0.124	2.039
								C	0.124	2.039
L2 140.00-120.00	130.00		1.337	1	1		42	A	0.123	4.178
								B	0.123	4.178
								C	0.123	4.178
T1 120.00-100.00	110.00		1.291	1	1		40	A	0.132	5.264
								B	0.132	5.264
								C	0.132	5.264
T2 100.00-80.00	90.00		1.238	1	1		39	A	0.152	4.263
								B	0.152	4.263
								C	0.152	4.263
T3 80.00-60.00	70.00		1.174	1	1		37	A	0.123	4.245
								B	0.123	4.245
								C	0.123	4.245
T4 60.00-40.00	50.00		1.094	1	1		34	A	0.111	4.712
								B	0.111	4.712
								C	0.111	4.712
T5 40.00-20.00	30.00		0.982	1	1		31	A	0.109	5.654
								B	0.109	5.654
								C	0.109	5.654
T6 20.00-0.00	10.00		0.85	1	1		27	A	0.114	5.656
								B	0.114	5.656
								C	0.114	5.656

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
L1 150.00-140.00	145.00		1.369	1	1		11	A	0.124	2.039
								B	0.124	2.039
								C	0.124	2.039
L2 140.00-120.00	130.00		1.337	1	1		10	A	0.123	4.178
								B	0.123	4.178
								C	0.123	4.178
T1 120.00-100.00	110.00		1.291	1	1		10	A	0.132	5.264
								B	0.132	5.264
								C	0.132	5.264
T2 100.00-80.00	90.00		1.238	1	1		10	A	0.152	4.263
								B	0.152	4.263
								C	0.152	4.263
T3 80.00-60.00	70.00		1.174	1	1		9	A	0.123	4.245
								B	0.123	4.245
								C	0.123	4.245
T4 60.00-40.00	50.00		1.094	1	1		9	A	0.111	4.712
								B	0.111	4.712
								C	0.111	4.712
T5 40.00-20.00	30.00		0.982	1	1		8	A	0.109	5.654

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
T6 20.00-0.00	10.00		0.85	1	1		7	B	0.109	5.654
								C	0.109	5.654
								A	0.114	5.656
								B	0.114	5.656
								C	0.114	5.656

Mast Vectors - No Ice

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
L1	150.00-140.00	0	Wind Normal	0.34	0.00	-0.34	-49.80	-0.07	0.12
		30	Wind 90	0.36	0.18	-0.31	-44.65	-25.84	0.12
		60	Wind 60	0.36	0.31	-0.18	-26.19	-45.39	0.07
		90	Wind 90	0.36	0.36	0.00	-0.02	-51.60	0.00
		120	Wind Normal	0.34	0.30	0.17	24.87	-43.18	-0.06
		150	Wind 90	0.33	0.16	0.29	41.36	-23.96	-0.09
		180	Wind 60	0.34	0.00	0.34	49.00	-0.07	-0.12
		210	Wind 90	0.36	-0.18	0.31	44.61	25.70	-0.12
		240	Wind Normal	0.37	-0.32	0.18	26.52	45.91	-0.07
		270	Wind 90	0.36	-0.36	0.00	-0.02	51.47	-0.00
		300	Wind 60	0.34	-0.29	-0.17	-24.53	42.39	0.06
		330	Wind 90	0.33	-0.16	-0.29	-41.40	23.82	0.09
L2	140.00-120.00	0	Wind Normal	0.69	0.00	-0.69	-90.06	-0.14	0.29
		30	Wind 90	0.72	0.36	-0.62	-80.58	-46.64	0.26
		60	Wind 60	0.73	0.63	-0.36	-47.33	-82.03	0.15
		90	Wind 90	0.72	0.72	0.00	-0.05	-93.13	-0.01
		120	Wind Normal	0.69	0.60	0.35	44.96	-78.10	-0.14
		150	Wind 90	0.68	0.34	0.58	75.97	-44.03	-0.23
		180	Wind 60	0.69	0.00	0.69	89.30	-0.14	-0.29
		210	Wind 90	0.72	-0.36	0.62	80.48	46.35	-0.26
		240	Wind Normal	0.73	-0.63	0.37	47.56	82.32	-0.15
		270	Wind 90	0.72	-0.72	0.00	-0.05	92.84	0.01
		300	Wind 60	0.69	-0.60	-0.34	-44.72	77.23	0.14
		330	Wind 90	0.68	-0.34	-0.58	-76.06	43.74	0.23
T1	120.00-100.00	0	Wind Normal	1.11	0.00	-1.11	-122.82	-0.40	0.72
		30	Wind 90	1.38	0.69	-1.19	-131.65	-76.28	0.65
		60	Wind 60	1.51	1.31	-0.76	-83.42	-144.52	0.09
		90	Wind 90	1.38	1.38	0.00	-0.21	-152.17	-0.47
		120	Wind Normal	1.11	0.97	0.56	61.09	-106.58	-0.59
		150	Wind 90	0.98	0.49	0.85	92.82	-54.11	-0.57
		180	Wind 60	1.11	0.00	1.11	121.86	-0.40	-0.72
		210	Wind 90	1.38	-0.69	1.19	131.22	75.49	-0.65
		240	Wind Normal	1.52	-1.31	0.76	83.27	144.19	-0.09
		270	Wind 90	1.38	-1.38	0.00	-0.21	151.37	0.47
		300	Wind 60	1.11	-0.96	-0.55	-61.25	105.32	0.59
		330	Wind 90	0.98	-0.49	-0.85	-93.24	53.31	0.57
T2	100.00-80.00	0	Wind Normal	1.66	0.00	-1.66	-149.48	-0.52	0.90
		30	Wind 90	1.81	0.90	-1.57	-141.19	-81.88	0.81
		60	Wind 60	1.90	1.65	-0.95	-85.82	-148.68	0.11
		90	Wind 90	1.81	1.81	0.00	-0.28	-163.24	-0.59
		120	Wind Normal	1.66	1.44	0.83	74.33	-129.74	-0.73
		150	Wind 90	1.42	0.71	1.23	110.51	-64.49	-0.72
		180	Wind 60	1.51	0.00	1.51	136.02	-0.52	-0.90
		210	Wind 90	1.81	-0.90	1.57	140.64	80.83	-0.81
		240	Wind Normal	2.04	-1.77	1.02	91.72	158.82	-0.11
		270	Wind 90	1.81	-1.81	0.00	-0.28	162.19	0.59

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
		300	Wind 60	1.51	-1.31	-0.76	-68.43	117.52	0.73
		330	Wind 90	1.42	-0.71	-1.23	-111.07	63.44	0.72
T3	80.00-60.00	0	Wind Normal	1.73	0.00	-1.73	-121.79	-0.68	1.11
		30	Wind 90	1.85	0.93	-1.61	-112.80	-65.60	1.00
		60	Wind 60	1.94	1.68	-0.97	-68.10	-118.01	0.14
		90	Wind 90	1.85	1.85	0.00	-0.36	-130.51	-0.71
		120	Wind Normal	1.73	1.50	0.87	60.36	-105.85	-0.90
		150	Wind 90	1.49	0.74	1.29	89.86	-52.77	-0.88
		180	Wind 60	1.57	0.00	1.57	109.46	-0.68	-1.11
		210	Wind 90	1.85	-0.93	1.61	112.08	64.24	-1.00
		240	Wind Normal	2.10	-1.82	1.05	73.19	126.71	-0.14
		270	Wind 90	1.85	-1.85	0.00	-0.36	129.15	0.71
		300	Wind 60	1.57	-1.36	-0.78	-55.27	94.43	0.90
		330	Wind 90	1.49	-0.74	-1.29	-90.58	51.41	0.88
T4	60.00-40.00	0	Wind Normal	1.80	0.00	-1.80	-90.28	-0.84	1.27
		30	Wind 90	1.89	0.94	-1.64	-82.21	-48.04	1.15
		60	Wind 60	1.96	1.69	-0.98	-49.36	-85.56	0.17
		90	Wind 90	1.89	1.89	0.00	-0.44	-95.25	-0.81
		120	Wind Normal	1.80	1.56	0.90	44.48	-78.64	-1.03
		150	Wind 90	1.55	0.77	1.34	66.53	-39.51	-1.01
		180	Wind 60	1.62	0.00	1.62	80.32	-0.84	-1.27
		210	Wind 90	1.89	-0.94	1.64	81.32	46.37	-1.15
		240	Wind Normal	2.14	-1.85	1.07	53.01	91.75	-0.17
		270	Wind 90	1.89	-1.89	0.00	-0.44	93.57	0.81
		300	Wind 60	1.62	-1.40	-0.81	-40.82	69.10	1.03
		330	Wind 90	1.55	-0.77	-1.34	-67.42	37.83	1.01
T5	40.00-20.00	0	Wind Normal	1.84	0.00	-1.84	-55.80	-0.99	1.35
		30	Wind 90	1.90	0.95	-1.65	-49.92	-29.51	1.22
		60	Wind 60	1.95	1.69	-0.98	-29.85	-51.78	0.18
		90	Wind 90	1.90	1.90	0.00	-0.53	-58.03	-0.86
		120	Wind Normal	1.84	1.60	0.92	27.11	-48.86	-1.09
		150	Wind 90	1.59	0.80	1.38	40.90	-24.91	-1.08
		180	Wind 60	1.65	0.00	1.65	48.92	-0.99	-1.35
		210	Wind 90	1.90	-0.95	1.65	48.87	27.52	-1.22
		240	Wind Normal	2.15	-1.86	1.07	31.71	54.84	-0.18
		270	Wind 90	1.90	-1.90	0.00	-0.53	56.04	0.86
		300	Wind 60	1.65	-1.43	-0.82	-25.25	41.83	1.09
		330	Wind 90	1.59	-0.80	-1.38	-41.95	22.92	1.08
T6	20.00-0.00	0	Wind Normal	1.77	0.00	-1.77	-18.11	-0.84	0.85
		30	Wind 90	1.71	0.85	-1.48	-15.22	-9.38	0.78
		60	Wind 60	1.71	1.48	-0.85	-8.96	-15.62	0.13
		90	Wind 90	1.71	1.71	0.00	-0.43	-17.92	-0.52
		120	Wind Normal	1.77	1.53	0.88	8.41	-16.15	-0.67
		150	Wind 90	1.54	0.77	1.33	12.90	-8.53	-0.67
		180	Wind 60	1.54	0.00	1.54	14.95	-0.84	-0.85
		210	Wind 90	1.71	-0.85	1.48	14.36	7.70	-0.78
		240	Wind Normal	1.94	-1.68	0.97	9.26	15.94	-0.13
		270	Wind 90	1.71	-1.71	0.00	-0.43	16.24	0.52
		300	Wind 60	1.54	-1.33	-0.77	-8.12	12.48	0.67
		330	Wind 90	1.54	-0.77	-1.33	-13.75	6.86	0.67

Mast Totals - No Ice

Wind Azimuth °	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	-10.95	-698.15	-4.48	6.61

Wind Azimuth °	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
30	5.81	-10.06	-658.21	-383.17	5.99
60	10.44	-6.03	-399.03	-691.61	1.04
90	11.61	0.00	-2.32	-761.85	-3.98
120	9.48	5.48	345.60	-607.09	-5.21
150	4.79	8.29	530.85	-312.31	-5.25
180	0.00	10.02	649.82	-4.48	-6.61
210	-5.81	10.06	653.58	374.20	-5.99
240	-11.25	6.49	416.24	720.48	-1.04
270	-11.61	0.00	-2.32	752.88	3.98
300	-8.68	-5.01	-328.38	560.28	5.21
330	-4.79	-8.29	-535.48	303.34	5.25

Mast Vectors - Service

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
L1	150.00-140.00	0	Wind Normal	0.09	0.00	-0.09	-12.47	-0.07	0.03
		30	Wind 90	0.09	0.04	-0.08	-11.18	-6.51	0.03
		60	Wind 60	0.09	0.08	-0.05	-6.56	-11.40	0.02
		90	Wind 90	0.09	0.09	0.00	-0.02	-12.95	0.00
		120	Wind Normal	0.09	0.07	0.04	6.20	-10.85	-0.01
		150	Wind 90	0.08	0.04	0.07	10.32	-6.04	-0.02
		180	Wind 60	0.08	0.00	0.08	12.23	-0.07	-0.03
		210	Wind 90	0.09	-0.04	0.08	11.14	6.37	-0.03
		240	Wind Normal	0.09	-0.08	0.05	6.61	11.43	-0.02
		270	Wind 90	0.09	-0.09	0.00	-0.02	12.82	-0.00
		300	Wind 60	0.08	-0.07	-0.04	-6.15	10.55	0.01
		330	Wind 90	0.08	-0.04	-0.07	-10.37	5.91	0.02
L2	140.00-120.00	0	Wind Normal	0.17	0.00	-0.17	-22.55	-0.14	0.07
		30	Wind 90	0.18	0.09	-0.15	-20.18	-11.77	0.07
		60	Wind 60	0.18	0.16	-0.09	-11.87	-20.62	0.04
		90	Wind 90	0.18	0.18	0.00	-0.05	-23.39	-0.00
		120	Wind Normal	0.17	0.15	0.09	11.20	-19.63	-0.04
		150	Wind 90	0.17	0.08	0.15	18.96	-11.12	-0.06
		180	Wind 60	0.17	0.00	0.17	22.29	-0.14	-0.07
		210	Wind 90	0.18	-0.09	0.15	20.08	11.48	-0.07
		240	Wind Normal	0.18	-0.16	0.09	11.86	20.47	-0.04
		270	Wind 90	0.18	-0.18	0.00	-0.05	23.10	0.00
		300	Wind 60	0.17	-0.15	-0.09	-11.22	19.20	0.04
		330	Wind 90	0.17	-0.08	-0.15	-19.05	10.83	0.06
T1	120.00-100.00	0	Wind Normal	0.28	0.00	-0.28	-30.86	-0.40	0.18
		30	Wind 90	0.34	0.17	-0.30	-33.07	-19.37	0.16
		60	Wind 60	0.38	0.33	-0.19	-21.01	-36.43	0.02
		90	Wind 90	0.34	0.34	0.00	-0.21	-38.34	-0.12
		120	Wind Normal	0.28	0.24	0.14	15.11	-26.94	-0.15
		150	Wind 90	0.24	0.12	0.21	23.05	-13.83	-0.14
		180	Wind 60	0.28	0.00	0.28	30.31	-0.40	-0.18
		210	Wind 90	0.34	-0.17	0.30	32.65	18.57	-0.16
		240	Wind Normal	0.38	-0.33	0.19	20.66	35.75	-0.02
		270	Wind 90	0.34	-0.34	0.00	-0.21	37.54	0.12
		300	Wind 60	0.28	-0.24	-0.14	-15.47	26.03	0.15
		330	Wind 90	0.24	-0.12	-0.21	-23.47	13.03	0.14
T2	100.00-80.00	0	Wind Normal	0.41	0.00	-0.41	-37.58	-0.52	0.22
		30	Wind 90	0.45	0.23	-0.39	-35.51	-20.86	0.20
		60	Wind 60	0.48	0.41	-0.24	-21.66	-37.56	0.03
		90	Wind 90	0.45	0.45	0.00	-0.28	-41.20	-0.15

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
		120	Wind Normal	0.41	0.36	0.21	18.37	-32.83	-0.18
		150	Wind 90	0.36	0.18	0.31	27.42	-16.51	-0.18
		180	Wind 60	0.38	0.00	0.38	33.80	-0.52	-0.22
		210	Wind 90	0.45	-0.23	0.39	34.95	19.82	-0.20
		240	Wind Normal	0.51	-0.44	0.26	22.72	39.31	-0.03
		270	Wind 90	0.45	-0.45	0.00	-0.28	40.16	0.15
		300	Wind 60	0.38	-0.33	-0.19	-17.31	28.99	0.18
		330	Wind 90	0.36	-0.18	-0.31	-27.97	15.47	0.18
T3	80.00-60.00	0	Wind Normal	0.43	0.00	-0.43	-30.72	-0.68	0.28
		30	Wind 90	0.46	0.23	-0.40	-28.47	-16.91	0.25
		60	Wind 60	0.48	0.42	-0.24	-17.29	-30.01	0.04
		90	Wind 90	0.46	0.46	0.00	-0.36	-33.14	-0.18
		120	Wind Normal	0.43	0.38	0.22	14.82	-26.97	-0.22
		150	Wind 90	0.37	0.19	0.32	22.19	-13.70	-0.22
		180	Wind 60	0.39	0.00	0.39	27.10	-0.68	-0.28
		210	Wind 90	0.46	-0.23	0.40	27.75	15.55	-0.25
		240	Wind Normal	0.53	-0.45	0.26	18.03	31.17	-0.04
		270	Wind 90	0.46	-0.46	0.00	-0.36	31.78	0.18
		300	Wind 60	0.39	-0.34	-0.20	-14.09	23.10	0.22
		330	Wind 90	0.37	-0.19	-0.32	-22.91	12.34	0.22
T4	60.00-40.00	0	Wind Normal	0.45	0.00	-0.45	-22.90	-0.84	0.32
		30	Wind 90	0.47	0.24	-0.41	-20.88	-12.64	0.29
		60	Wind 60	0.49	0.42	-0.24	-12.67	-22.02	0.04
		90	Wind 90	0.47	0.47	0.00	-0.44	-24.44	-0.20
		120	Wind Normal	0.45	0.39	0.22	10.79	-20.29	-0.26
		150	Wind 90	0.39	0.19	0.33	16.30	-10.50	-0.25
		180	Wind 60	0.40	0.00	0.40	19.75	-0.84	-0.32
		210	Wind 90	0.47	-0.24	0.41	20.00	10.96	-0.29
		240	Wind Normal	0.53	-0.46	0.27	12.92	22.31	-0.04
		270	Wind 90	0.47	-0.47	0.00	-0.44	22.77	0.20
		300	Wind 60	0.40	-0.35	-0.20	-10.54	16.65	0.26
		330	Wind 90	0.39	-0.19	-0.33	-17.19	8.83	0.25
T5	40.00-20.00	0	Wind Normal	0.46	0.00	-0.46	-14.34	-0.99	0.34
		30	Wind 90	0.48	0.24	-0.41	-12.87	-8.12	0.31
		60	Wind 60	0.49	0.42	-0.24	-7.86	-13.69	0.04
		90	Wind 90	0.48	0.48	0.00	-0.53	-15.25	-0.22
		120	Wind Normal	0.46	0.40	0.23	6.38	-12.96	-0.27
		150	Wind 90	0.40	0.20	0.35	9.83	-6.97	-0.27
		180	Wind 60	0.41	0.00	0.41	11.84	-0.99	-0.34
		210	Wind 90	0.48	-0.24	0.41	11.82	6.13	-0.31
		240	Wind Normal	0.54	-0.47	0.27	7.53	12.96	-0.04
		270	Wind 90	0.48	-0.48	0.00	-0.53	13.26	0.22
		300	Wind 60	0.41	-0.36	-0.21	-6.71	9.71	0.27
		330	Wind 90	0.40	-0.20	-0.35	-10.88	4.98	0.27
T6	20.00-0.00	0	Wind Normal	0.44	0.00	-0.44	-4.85	-0.84	0.21
		30	Wind 90	0.43	0.21	-0.37	-4.13	-2.97	0.19
		60	Wind 60	0.43	0.37	-0.21	-2.56	-4.53	0.03
		90	Wind 90	0.43	0.43	0.00	-0.43	-5.11	-0.13
		120	Wind Normal	0.44	0.38	0.22	1.78	-4.67	-0.17
		150	Wind 90	0.38	0.19	0.33	2.90	-2.76	-0.17
		180	Wind 60	0.38	0.00	0.38	3.42	-0.84	-0.21
		210	Wind 90	0.43	-0.21	0.37	3.27	1.30	-0.19
		240	Wind Normal	0.48	-0.42	0.24	1.99	3.36	-0.03
		270	Wind 90	0.43	-0.43	0.00	-0.43	3.43	0.13
		300	Wind 60	0.38	-0.33	-0.19	-2.35	2.49	0.17
		330	Wind 90	0.38	-0.19	-0.33	-3.76	1.09	0.17

Mast Totals - Service

Wind Azimuth °	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	-2.74	-176.27	-4.48	1.65
30	1.45	-2.51	-166.29	-99.15	1.50
60	2.61	-1.51	-101.49	-176.27	0.26
90	2.90	0.00	-2.32	-193.83	-0.99
120	2.37	1.37	84.66	-155.14	-1.30
150	1.20	2.07	130.98	-81.44	-1.31
180	0.00	2.50	160.72	-4.48	-1.65
210	-1.45	2.51	161.66	90.19	-1.50
240	-2.81	1.62	102.32	176.76	-0.26
270	-2.90	0.00	-2.32	184.86	0.99
300	-2.17	-1.25	-83.83	136.71	1.30
330	-1.20	-2.07	-135.61	72.47	1.31

Discrete Appurtenance Vectors - No Ice

10' Lightning Rod Ext. = 14' O.H. Inc. 4' Rod - Elevation 157 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.05	0.08	0.00	-0.10	-14.94	-0.06	0.14
30	0.00	0.10	0.05	-0.08	-12.93	-7.55	0.17
60	0.05	0.08	0.08	-0.05	-7.45	-13.03	0.14
90	0.08	0.05	0.10	0.00	0.03	-15.03	0.08
120	0.10	0.00	0.08	0.05	7.52	-13.03	0.00
150	0.08	0.05	0.05	0.08	13.00	-7.55	-0.08
180	0.05	0.08	0.00	0.10	15.01	-0.06	-0.14
210	0.00	0.10	-0.05	0.08	13.00	7.43	-0.17
240	0.05	0.08	-0.08	0.05	7.52	12.91	-0.14
270	0.08	0.05	-0.10	0.00	0.03	14.91	-0.08
300	0.10	0.00	-0.08	-0.05	-7.45	12.91	0.00
330	0.08	0.05	-0.05	-0.08	-12.93	7.43	0.08

L-Lighting Beacon - Elevation 150 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.04	0.00	-0.04	-6.45	0.07	-0.06
30	0.04	0.02	0.02	-0.04	-5.58	-3.17	-0.04
60	0.04	0.00	0.04	-0.02	-3.21	-5.55	0.00
90	0.04	0.02	0.04	0.00	0.04	-6.42	0.04
120	0.02	0.04	0.04	0.02	3.29	-5.55	0.06
150	0.00	0.04	0.02	0.04	5.67	-3.17	0.08
180	0.02	0.04	0.00	0.04	6.54	0.07	0.06
210	0.04	0.02	-0.02	0.04	5.67	3.32	0.04
240	0.04	0.00	-0.04	0.02	3.29	5.70	0.00
270	0.04	0.02	-0.04	0.00	0.04	6.57	-0.04
300	0.02	0.04	-0.04	-0.02	-3.21	5.70	-0.06
330	0.00	0.04	-0.02	-0.04	-5.58	3.32	-0.08

L-Side Light / Obstruction Light - Elevation 75 - From Leg A

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.00	0.00	-0.01	-0.67	0.00	0.00
30	0.01	0.00	0.00	-0.01	-0.58	-0.32	-0.02
60	0.00	0.01	0.01	-0.00	-0.35	-0.56	-0.03
90	0.00	0.01	0.01	0.00	-0.03	-0.64	-0.03
120	0.00	0.01	0.01	0.00	0.29	-0.56	-0.03
150	0.01	0.00	0.00	0.01	0.53	-0.32	-0.02
180	0.01	0.00	0.00	0.01	0.61	0.00	0.00
210	0.01	0.00	-0.00	0.01	0.53	0.32	0.02
240	0.00	0.01	-0.01	0.00	0.29	0.56	0.03
270	0.00	0.01	-0.01	0.00	-0.03	0.64	0.03
300	0.00	0.01	-0.01	-0.00	-0.35	0.56	0.03
330	0.01	0.00	-0.00	-0.01	-0.58	0.32	0.02

L-Side Light / Obstruction Light - Elevation 75 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.01	0.00	-0.01	-0.63	-0.02	0.03
30	0.00	0.01	0.00	-0.01	-0.54	-0.35	0.03
60	0.00	0.01	0.01	-0.00	-0.31	-0.58	0.03
90	0.01	0.00	0.01	0.00	0.01	-0.67	0.02
120	0.01	0.00	0.01	0.00	0.34	-0.58	0.00
150	0.01	0.00	0.00	0.01	0.57	-0.35	-0.02
180	0.00	0.01	0.00	0.01	0.66	-0.02	-0.03
210	0.00	0.01	-0.00	0.01	0.57	0.30	-0.03
240	0.00	0.01	-0.01	0.00	0.34	0.53	-0.03
270	0.01	0.00	-0.01	0.00	0.01	0.62	-0.02
300	0.01	0.00	-0.01	-0.00	-0.31	0.53	0.00
330	0.01	0.00	-0.00	-0.01	-0.54	0.30	0.02

L-Side Light / Obstruction Light - Elevation 75 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.01	0.00	-0.01	-0.63	0.02	-0.03
30	0.01	0.00	0.00	-0.01	-0.54	-0.30	-0.02
60	0.01	0.00	0.01	-0.00	-0.31	-0.53	0.00
90	0.01	0.00	0.01	0.00	0.01	-0.62	0.02
120	0.00	0.01	0.01	0.00	0.34	-0.53	0.03
150	0.00	0.01	0.00	0.01	0.57	-0.30	0.03
180	0.00	0.01	0.00	0.01	0.66	0.02	0.03
210	0.01	0.00	-0.00	0.01	0.57	0.35	0.02
240	0.01	0.00	-0.01	0.00	0.34	0.58	0.00
270	0.01	0.00	-0.01	0.00	0.01	0.67	-0.02
300	0.00	0.01	-0.01	-0.00	-0.31	0.58	-0.03
330	0.00	0.01	-0.00	-0.01	-0.54	0.35	-0.03

10' Typ. Omni/Whip Antenna(s) - Elevation 151 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.06	0.11	0.00	-0.13	-19.34	0.16	-0.53
30	0.11	0.06	0.06	-0.11	-16.73	-9.55	-0.30
60	0.13	0.00	0.11	-0.06	-9.62	-16.66	0.00
90	0.11	0.06	0.13	0.00	0.09	-19.27	0.30

10' Typ. Omni/Whip Antenna(s) - Elevation 151 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
120	0.06	0.11	0.11	0.06	9.81	-16.66	0.53
150	0.00	0.13	0.06	0.11	16.92	-9.55	0.61
180	0.06	0.11	0.00	0.13	19.52	0.16	0.53
210	0.11	0.06	-0.06	0.11	16.92	9.88	0.30
240	0.13	0.00	-0.11	0.06	9.81	16.99	0.00
270	0.11	0.06	-0.13	0.00	0.09	19.59	-0.30
300	0.06	0.11	-0.11	-0.06	-9.62	16.99	-0.53
330	0.00	0.13	-0.06	-0.11	-16.73	9.88	-0.61

3' Sidearm(s) - Elevation 148 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.05	0.15	-0.03	-0.15	-22.34	4.95	-0.48
30	0.09	0.09	0.03	-0.12	-17.08	-4.39	-0.28
60	0.10	0.00	0.09	-0.05	-7.17	-12.41	0.00
90	0.09	0.09	0.12	0.03	4.74	-16.98	0.28
120	0.05	0.15	0.12	0.10	15.45	-16.87	0.48
150	0.00	0.17	0.09	0.15	22.10	-12.11	0.55
180	0.05	0.15	0.03	0.15	22.90	-3.97	0.48
210	0.09	0.09	-0.03	0.12	17.64	5.37	0.28
240	0.10	0.00	-0.09	0.05	7.73	13.39	0.00
270	0.09	0.09	-0.12	-0.03	-4.17	17.96	-0.28
300	0.05	0.15	-0.12	-0.10	-14.89	17.85	-0.48
330	0.00	0.17	-0.09	-0.15	-21.54	13.09	-0.55

10' Typ. Omni/Whip Antenna(s) - Elevation 133 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.06	0.11	0.00	-0.13	-16.57	0.16	-0.51
30	0.11	0.06	0.06	-0.11	-14.34	-8.17	-0.30
60	0.13	0.00	0.11	-0.06	-8.24	-14.27	0.00
90	0.11	0.06	0.13	0.00	0.09	-16.50	0.30
120	0.06	0.11	0.11	0.06	8.43	-14.27	0.51
150	0.00	0.13	0.06	0.11	14.52	-8.17	0.59
180	0.06	0.11	0.00	0.13	16.76	0.16	0.51
210	0.11	0.06	-0.06	0.11	14.52	8.50	0.30
240	0.13	0.00	-0.11	0.06	8.43	14.59	0.00
270	0.11	0.06	-0.13	0.00	0.09	16.83	-0.30
300	0.06	0.11	-0.11	-0.06	-8.24	14.59	-0.51
330	0.00	0.13	-0.06	-0.11	-14.34	8.50	-0.59

3' Sidearm(s) - Elevation 130 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.05	0.14	-0.03	-0.15	-19.05	4.30	-0.46
30	0.08	0.08	0.03	-0.11	-14.56	-3.68	-0.27
60	0.10	0.00	0.08	-0.05	-6.08	-10.54	0.00
90	0.08	0.08	0.11	0.03	4.09	-14.45	0.27
120	0.05	0.14	0.11	0.10	13.25	-14.35	0.46
150	0.00	0.17	0.08	0.14	18.93	-10.28	0.54
180	0.05	0.14	0.03	0.15	19.62	-3.32	0.46

3' Sidearm(s) - Elevation 130 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
210	0.08	0.08	-0.03	0.11	15.12	4.66	0.27
240	0.10	0.00	-0.08	0.05	6.65	11.52	0.00
270	0.08	0.08	-0.11	-0.03	-3.53	15.42	-0.27
300	0.05	0.14	-0.11	-0.10	-12.68	15.33	-0.46
330	0.00	0.17	-0.08	-0.14	-18.37	11.26	-0.54

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.91	0.00	0.00	-0.91	-109.90	0.00	0.00
30	0.79	0.17	0.17	-0.79	-95.24	-19.84	-0.78
60	0.46	0.29	0.29	-0.46	-55.22	-34.36	-1.36
90	0.00	0.33	0.33	0.00	-0.54	-39.68	-1.56
120	0.46	0.29	0.29	0.46	54.14	-34.36	-1.36
150	0.79	0.17	0.17	0.79	94.16	-19.84	-0.78
180	0.91	0.00	0.00	0.91	108.81	0.00	0.00
210	0.79	0.17	-0.17	0.79	94.16	19.84	0.78
240	0.46	0.29	-0.29	0.46	54.14	34.36	1.36
270	0.00	0.33	-0.33	0.00	-0.54	39.68	1.56
300	0.46	0.29	-0.29	-0.46	-55.22	34.36	1.36
330	0.79	0.17	-0.17	-0.79	-95.24	19.84	0.78

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.46	0.29	-0.25	-0.48	-56.83	29.70	1.36
30	0.00	0.33	0.17	-0.29	-34.09	-20.31	1.56
60	0.46	0.29	0.54	-0.02	-2.15	-65.00	1.36
90	0.79	0.17	0.77	0.25	30.44	-92.40	0.78
120	0.91	0.00	0.79	0.46	54.95	-95.17	0.00
150	0.79	0.17	0.60	0.54	64.80	-72.56	-0.78
180	0.46	0.29	0.25	0.48	57.37	-30.64	-1.36
210	0.00	0.33	-0.17	0.29	34.63	19.37	-1.56
240	0.46	0.29	-0.54	0.02	2.69	64.06	-1.36
270	0.79	0.17	-0.77	-0.25	-29.90	91.47	-0.78
300	0.91	0.00	-0.79	-0.46	-54.41	94.23	0.00
330	0.79	0.17	-0.60	-0.54	-64.26	71.63	0.78

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.46	0.29	0.25	-0.48	-56.83	-29.70	-1.36
30	0.79	0.17	0.60	-0.54	-64.26	-71.63	-0.78
60	0.91	0.00	0.79	-0.46	-54.41	-94.23	0.00
90	0.79	0.17	0.77	-0.25	-29.90	-91.47	0.78
120	0.46	0.29	0.54	0.02	2.69	-64.06	1.36
150	0.00	0.33	0.17	0.29	34.63	-19.37	1.56
180	0.46	0.29	-0.25	0.48	57.37	30.64	1.36
210	0.79	0.17	-0.60	0.54	64.80	72.56	0.78
240	0.91	0.00	-0.79	0.46	54.95	95.17	0.00
270	0.79	0.17	-0.77	0.25	30.44	92.40	-0.78

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
300	0.46	0.29	-0.54	-0.02	-2.15	65.00	-1.36
330	0.00	0.33	-0.17	-0.29	-34.09	20.31	-1.56

12' STD Gate Mount(s) - Elevation 120 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.27	0.00	0.00	-0.27	-33.97	0.00	0.00
30	0.23	0.09	0.09	-0.23	-29.64	-10.64	-0.42
60	0.13	0.15	0.15	-0.13	-17.81	-18.43	-0.73
90	0.00	0.18	0.18	0.00	-1.66	-21.28	-0.84
120	0.13	0.15	0.15	0.13	14.50	-18.43	-0.73
150	0.23	0.09	0.09	0.23	26.33	-10.64	-0.42
180	0.27	0.00	0.00	0.27	30.66	0.00	0.00
210	0.23	0.09	-0.09	0.23	26.33	10.64	0.42
240	0.13	0.15	-0.15	0.13	14.50	18.43	0.73
270	0.00	0.18	-0.18	0.00	-1.66	21.28	0.84
300	0.13	0.15	-0.15	-0.13	-17.81	18.43	0.73
330	0.23	0.09	-0.09	-0.23	-29.64	10.64	0.42

12' STD Gate Mount(s) - Elevation 120 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.13	0.15	-0.04	-0.20	-23.21	3.34	0.73
30	0.00	0.18	0.09	-0.15	-17.60	-12.07	0.84
60	0.13	0.15	0.19	-0.07	-7.05	-24.64	0.73
90	0.23	0.09	0.25	0.04	5.61	-30.99	0.42
120	0.27	0.00	0.23	0.13	16.98	-29.42	0.00
150	0.23	0.09	0.16	0.19	24.03	-20.35	-0.42
180	0.13	0.15	0.04	0.20	24.87	-6.21	-0.73
210	0.00	0.18	-0.09	0.15	19.26	9.21	-0.84
240	0.13	0.15	-0.19	0.07	8.71	21.77	-0.73
270	0.23	0.09	-0.25	-0.04	-3.95	28.12	-0.42
300	0.27	0.00	-0.23	-0.13	-15.33	26.55	0.00
330	0.23	0.09	-0.16	-0.19	-22.38	17.48	0.42

12' STD Gate Mount(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.13	0.15	0.04	-0.20	-23.21	-3.34	-0.73
30	0.23	0.09	0.16	-0.19	-22.38	-17.48	-0.42
60	0.27	0.00	0.23	-0.13	-15.33	-26.55	0.00
90	0.23	0.09	0.25	-0.04	-3.95	-28.12	0.42
120	0.13	0.15	0.19	0.07	8.71	-21.77	0.73
150	0.00	0.18	0.09	0.15	19.26	-9.21	0.84
180	0.13	0.15	-0.04	0.20	24.87	6.21	0.73
210	0.23	0.09	-0.16	0.19	24.03	20.35	0.42
240	0.27	0.00	-0.23	0.13	16.98	29.42	0.00
270	0.23	0.09	-0.25	0.04	5.61	30.99	-0.42
300	0.13	0.15	-0.19	-0.07	-7.05	24.64	-0.73
330	0.00	0.18	-0.09	-0.15	-17.60	12.07	-0.84

Discrete Appurtenance Totals - No Ice

Wind Azimuth °	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	-0.06	-3.25	-404.55	9.59	-1.90
30	1.54	-2.79	-346.11	-189.44	-1.02
60	2.73	-1.57	-194.70	-337.35	0.14
90	3.18	0.06	9.10	-394.52	1.26
120	2.79	1.68	210.69	-345.62	2.05
150	1.64	2.85	356.04	-203.76	2.28
180	0.06	3.25	406.22	-6.95	1.90
210	-1.54	2.79	347.77	192.08	1.02
240	-2.73	1.57	196.37	339.99	-0.14
270	-3.18	-0.06	-7.43	397.16	-1.26
300	-2.79	-1.68	-209.02	348.26	-2.05
330	-1.64	-2.85	-354.37	206.40	-2.28

Discrete Appurtenance Vectors - Service

10' Lightning Rod Ext. = 14' O.H. Inc. 4' Rod - Elevation 157 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.02	0.00	-0.02	-3.71	-0.06	0.04
30	0.00	0.02	0.01	-0.02	-3.21	-1.93	0.04
60	0.01	0.02	0.02	-0.01	-1.84	-3.30	0.04
90	0.02	0.01	0.02	0.00	0.03	-3.80	0.02
120	0.02	0.00	0.02	0.01	1.91	-3.30	0.00
150	0.02	0.01	0.01	0.02	3.28	-1.93	-0.02
180	0.01	0.02	0.00	0.02	3.78	-0.06	-0.04
210	0.00	0.02	-0.01	0.02	3.28	1.81	-0.04
240	0.01	0.02	-0.02	0.01	1.91	3.18	-0.04
270	0.02	0.01	-0.02	0.00	0.03	3.68	-0.02
300	0.02	0.00	-0.02	-0.01	-1.84	3.18	0.00
330	0.02	0.01	-0.01	-0.02	-3.21	1.81	0.02

L-Lighting Beacon - Elevation 150 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.01	0.00	-0.01	-1.58	0.07	-0.02
30	0.01	0.01	0.01	-0.01	-1.36	-0.74	-0.01
60	0.01	0.00	0.01	-0.01	-0.77	-1.33	0.00
90	0.01	0.01	0.01	0.00	0.04	-1.55	0.01
120	0.01	0.01	0.01	0.01	0.86	-1.33	0.02
150	0.00	0.01	0.01	0.01	1.45	-0.74	0.02
180	0.01	0.01	0.00	0.01	1.67	0.07	0.02
210	0.01	0.01	-0.01	0.01	1.45	0.89	0.01
240	0.01	0.00	-0.01	0.01	0.86	1.48	0.00
270	0.01	0.01	-0.01	0.00	0.04	1.70	-0.01
300	0.01	0.01	-0.01	-0.01	-0.77	1.48	-0.02
330	0.00	0.01	-0.01	-0.01	-1.36	0.89	-0.02

L-Side Light / Obstruction Light - Elevation 75 - From Leg A

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.00	0.00	-0.00	-0.19	0.00	0.00
30	0.00	0.00	0.00	-0.00	-0.17	-0.08	-0.00
60	0.00	0.00	0.00	-0.00	-0.11	-0.14	-0.01
90	0.00	0.00	0.00	0.00	-0.03	-0.16	-0.01
120	0.00	0.00	0.00	0.00	0.05	-0.14	-0.01
150	0.00	0.00	0.00	0.00	0.11	-0.08	-0.00
180	0.00	0.00	0.00	0.00	0.13	0.00	0.00
210	0.00	0.00	-0.00	0.00	0.11	0.08	0.00
240	0.00	0.00	-0.00	0.00	0.05	0.14	0.01
270	0.00	0.00	-0.00	0.00	-0.03	0.16	0.01
300	0.00	0.00	-0.00	-0.00	-0.11	0.14	0.01
330	0.00	0.00	-0.00	-0.00	-0.17	0.08	0.00

L-Side Light / Obstruction Light - Elevation 75 - From Leg B

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.00	0.00	-0.00	-0.15	-0.02	0.01
30	0.00	0.00	0.00	-0.00	-0.12	-0.10	0.01
60	0.00	0.00	0.00	-0.00	-0.07	-0.16	0.01
90	0.00	0.00	0.00	0.00	0.01	-0.19	0.00
120	0.00	0.00	0.00	0.00	0.09	-0.16	0.00
150	0.00	0.00	0.00	0.00	0.15	-0.10	-0.00
180	0.00	0.00	0.00	0.00	0.17	-0.02	-0.01
210	0.00	0.00	-0.00	0.00	0.15	0.06	-0.01
240	0.00	0.00	-0.00	0.00	0.09	0.11	-0.01
270	0.00	0.00	-0.00	0.00	0.01	0.14	-0.00
300	0.00	0.00	-0.00	-0.00	-0.07	0.11	0.00
330	0.00	0.00	-0.00	-0.00	-0.12	0.06	0.00

L-Side Light / Obstruction Light - Elevation 75 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.00	0.00	0.00	-0.00	-0.15	0.02	-0.01
30	0.00	0.00	0.00	-0.00	-0.12	-0.06	-0.00
60	0.00	0.00	0.00	-0.00	-0.07	-0.11	0.00
90	0.00	0.00	0.00	0.00	0.01	-0.14	0.00
120	0.00	0.00	0.00	0.00	0.09	-0.11	0.01
150	0.00	0.00	0.00	0.00	0.15	-0.06	0.01
180	0.00	0.00	0.00	0.00	0.17	0.02	0.01
210	0.00	0.00	-0.00	0.00	0.15	0.10	0.00
240	0.00	0.00	-0.00	0.00	0.09	0.16	0.00
270	0.00	0.00	-0.00	0.00	0.01	0.19	-0.00
300	0.00	0.00	-0.00	-0.00	-0.07	0.16	-0.01
330	0.00	0.00	-0.00	-0.00	-0.12	0.10	-0.01

10' Typ. Omni/Whip Antenna(s) - Elevation 151 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.03	0.00	-0.03	-4.76	0.16	-0.13
30	0.03	0.02	0.02	-0.03	-4.11	-2.26	-0.08

10' Typ. Omni/Whip Antenna(s) - Elevation 151 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
60	0.03	0.00	0.03	-0.02	-2.33	-4.04	0.00
90	0.03	0.02	0.03	0.00	0.09	-4.69	0.08
120	0.02	0.03	0.03	0.02	2.52	-4.04	0.13
150	0.00	0.03	0.02	0.03	4.30	-2.26	0.15
180	0.02	0.03	0.00	0.03	4.95	0.16	0.13
210	0.03	0.02	-0.02	0.03	4.30	2.59	0.08
240	0.03	0.00	-0.03	0.02	2.52	4.37	0.00
270	0.03	0.02	-0.03	0.00	0.09	5.02	-0.08
300	0.02	0.03	-0.03	-0.02	-2.33	4.37	-0.13
330	0.00	0.03	-0.02	-0.03	-4.11	2.59	-0.15

3' Sidearm(s) - Elevation 148 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.04	-0.01	-0.04	-5.37	1.60	-0.12
30	0.02	0.02	0.01	-0.03	-4.06	-0.73	-0.07
60	0.03	0.00	0.02	-0.01	-1.58	-2.74	0.00
90	0.02	0.02	0.03	0.01	1.40	-3.88	0.07
120	0.01	0.04	0.03	0.03	4.08	-3.85	0.12
150	0.00	0.04	0.02	0.04	5.74	-2.66	0.14
180	0.01	0.04	0.01	0.04	5.94	-0.62	0.12
210	0.02	0.02	-0.01	0.03	4.62	1.71	0.07
240	0.03	0.00	-0.02	0.01	2.15	3.72	0.00
270	0.02	0.02	-0.03	-0.01	-0.83	4.86	-0.07
300	0.01	0.04	-0.03	-0.03	-3.51	4.83	-0.12
330	0.00	0.04	-0.02	-0.04	-5.17	3.64	-0.14

10' Typ. Omni/Whip Antenna(s) - Elevation 133 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.02	0.03	0.00	-0.03	-4.07	0.16	-0.13
30	0.03	0.02	0.02	-0.03	-3.51	-1.92	-0.07
60	0.03	0.00	0.03	-0.02	-1.99	-3.44	0.00
90	0.03	0.02	0.03	0.00	0.09	-4.00	0.07
120	0.02	0.03	0.03	0.02	2.18	-3.44	0.13
150	0.00	0.03	0.02	0.03	3.70	-1.92	0.15
180	0.02	0.03	0.00	0.03	4.26	0.16	0.13
210	0.03	0.02	-0.02	0.03	3.70	2.25	0.07
240	0.03	0.00	-0.03	0.02	2.18	3.77	0.00
270	0.03	0.02	-0.03	0.00	0.09	4.33	-0.07
300	0.02	0.03	-0.03	-0.02	-1.99	3.77	-0.13
330	0.00	0.03	-0.02	-0.03	-3.51	2.25	-0.15

3' Sidearm(s) - Elevation 130 - From Leg C

Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.01	0.04	-0.01	-0.04	-4.55	1.44	-0.12
30	0.02	0.02	0.01	-0.03	-3.43	-0.55	-0.07
60	0.02	0.00	0.02	-0.01	-1.31	-2.27	0.00
90	0.02	0.02	0.03	0.01	1.24	-3.24	0.07
120	0.01	0.04	0.03	0.02	3.52	-3.22	0.12

3' Sidearm(s) - Elevation 130 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
150	0.00	0.04	0.02	0.04	4.95	-2.20	0.13
180	0.01	0.04	0.01	0.04	5.12	-0.46	0.12
210	0.02	0.02	-0.01	0.03	3.99	1.53	0.07
240	0.02	0.00	-0.02	0.01	1.87	3.25	0.00
270	0.02	0.02	-0.03	-0.01	-0.67	4.22	-0.07
300	0.01	0.04	-0.03	-0.02	-2.96	4.20	-0.12
330	0.00	0.04	-0.02	-0.04	-4.38	3.18	-0.13

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.23	0.00	0.00	-0.23	-27.88	0.00	0.00
30	0.20	0.04	0.04	-0.20	-24.22	-4.96	-0.20
60	0.11	0.07	0.07	-0.11	-14.21	-8.59	-0.34
90	0.00	0.08	0.08	0.00	-0.54	-9.92	-0.39
120	0.11	0.07	0.07	0.11	13.13	-8.59	-0.34
150	0.20	0.04	0.04	0.20	23.13	-4.96	-0.20
180	0.23	0.00	0.00	0.23	26.80	0.00	0.00
210	0.20	0.04	-0.04	0.20	23.13	4.96	0.20
240	0.11	0.07	-0.07	0.11	13.13	8.59	0.34
270	0.00	0.08	-0.08	0.00	-0.54	9.92	0.39
300	0.11	0.07	-0.07	-0.11	-14.21	8.59	0.34
330	0.20	0.04	-0.04	-0.20	-24.22	4.96	0.20

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.11	0.07	-0.06	-0.12	-14.00	7.07	0.34
30	0.00	0.08	0.04	-0.07	-8.32	-5.43	0.39
60	0.11	0.07	0.13	-0.01	-0.33	-16.60	0.34
90	0.20	0.04	0.19	0.06	7.81	-23.45	0.20
120	0.23	0.00	0.20	0.11	13.94	-24.14	0.00
150	0.20	0.04	0.15	0.13	16.40	-18.49	-0.20
180	0.11	0.07	0.06	0.12	14.55	-8.01	-0.34
210	0.00	0.08	-0.04	0.07	8.86	4.49	-0.39
240	0.11	0.07	-0.13	0.01	0.88	15.66	-0.34
270	0.20	0.04	-0.19	-0.06	-7.27	22.52	-0.20
300	0.23	0.00	-0.20	-0.11	-13.40	23.21	0.00
330	0.20	0.04	-0.15	-0.13	-15.86	17.56	0.20

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.11	0.07	0.06	-0.12	-14.00	-7.07	-0.34
30	0.20	0.04	0.15	-0.13	-15.86	-17.56	-0.20
60	0.23	0.00	0.20	-0.11	-13.40	-23.21	0.00
90	0.20	0.04	0.19	-0.06	-7.27	-22.52	0.20
120	0.11	0.07	0.13	0.01	0.88	-15.66	0.34
150	0.00	0.08	0.04	0.07	8.86	-4.49	0.39
180	0.11	0.07	-0.06	0.12	14.55	8.01	0.34
210	0.20	0.04	-0.15	0.13	16.40	18.49	0.20

72" x 12" x 3" Typ. Flat Panel Antenna(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
240	0.23	0.00	-0.20	0.11	13.94	24.14	0.00
270	0.20	0.04	-0.19	0.06	7.81	23.45	-0.20
300	0.11	0.07	-0.13	-0.01	-0.33	16.60	-0.34
330	0.00	0.08	-0.04	-0.07	-8.32	5.43	-0.39

12' STD Gate Mount(s) - Elevation 120 - From Leg A							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.07	0.00	0.00	-0.07	-9.73	0.00	0.00
30	0.06	0.02	0.02	-0.06	-8.65	-2.66	-0.10
60	0.03	0.04	0.04	-0.03	-5.70	-4.61	-0.18
90	0.00	0.04	0.04	0.00	-1.66	-5.32	-0.21
120	0.03	0.04	0.04	0.03	2.38	-4.61	-0.18
150	0.06	0.02	0.02	0.06	5.34	-2.66	-0.10
180	0.07	0.00	0.00	0.07	6.42	0.00	0.00
210	0.06	0.02	-0.02	0.06	5.34	2.66	0.10
240	0.03	0.04	-0.04	0.03	2.38	4.61	0.18
270	0.00	0.04	-0.04	0.00	-1.66	5.32	0.21
300	0.03	0.04	-0.04	-0.03	-5.70	4.61	0.18
330	0.06	0.02	-0.02	-0.06	-8.65	2.66	0.10

12' STD Gate Mount(s) - Elevation 120 - From Leg B							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.03	0.04	-0.01	-0.05	-5.18	-0.24	0.18
30	0.00	0.04	0.02	-0.04	-3.78	-4.09	0.21
60	0.03	0.04	0.05	-0.02	-1.14	-7.24	0.18
90	0.06	0.02	0.06	0.01	2.02	-8.82	0.10
120	0.07	0.00	0.06	0.03	4.87	-8.43	0.00
150	0.06	0.02	0.04	0.05	6.63	-6.16	-0.10
180	0.03	0.04	0.01	0.05	6.84	-2.63	-0.18
210	0.00	0.04	-0.02	0.04	5.44	1.23	-0.21
240	0.03	0.04	-0.05	0.02	2.80	4.37	-0.18
270	0.06	0.02	-0.06	-0.01	-0.37	5.95	-0.10
300	0.07	0.00	-0.06	-0.03	-3.21	5.56	0.00
330	0.06	0.02	-0.04	-0.05	-4.97	3.29	0.10

12' STD Gate Mount(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	0.03	0.04	0.01	-0.05	-5.18	0.24	-0.18
30	0.06	0.02	0.04	-0.05	-4.97	-3.29	-0.10
60	0.07	0.00	0.06	-0.03	-3.21	-5.56	0.00
90	0.06	0.02	0.06	-0.01	-0.37	-5.95	0.10
120	0.03	0.04	0.05	0.02	2.80	-4.37	0.18
150	0.00	0.04	0.02	0.04	5.44	-1.23	0.21
180	0.03	0.04	-0.01	0.05	6.84	2.63	0.18
210	0.06	0.02	-0.04	0.05	6.63	6.16	0.10
240	0.07	0.00	-0.06	0.03	4.87	8.43	0.00
270	0.06	0.02	-0.06	0.01	2.02	8.82	-0.10
300	0.03	0.04	-0.05	-0.02	-1.14	7.24	-0.18

12' STD Gate Mount(s) - Elevation 120 - From Leg C							
Wind Azimuth °	F_a K	F_s K	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
330	0.00	0.04	-0.02	-0.04	-3.78	4.09	-0.21

Discrete Appurtenance Totals - Service

Wind Azimuth °	V_x K	V_z K	OTM_x kip-ft	OTM_z kip-ft	Torque kip-ft
0	-0.01	-0.81	-100.51	3.39	-0.48
30	0.39	-0.70	-85.90	-46.37	-0.25
60	0.68	-0.39	-48.05	-83.35	0.04
90	0.80	0.01	2.90	-97.64	0.32
120	0.70	0.42	53.30	-85.41	0.51
150	0.41	0.71	89.63	-49.95	0.57
180	0.01	0.81	102.18	-0.74	0.48
210	-0.39	0.70	87.57	49.01	0.25
240	-0.68	0.39	49.72	85.99	-0.04
270	-0.80	-0.01	-1.23	100.28	-0.32
300	-0.70	-0.42	-51.63	88.06	-0.51
330	-0.41	-0.71	-87.97	52.59	-0.57

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	1.2D+1.0W (pattern 1) 0 deg - No Ice
4	1.2D+1.0W (pattern 2) 0 deg - No Ice
5	0.9 Dead+1.0 Wind 0 deg - No Ice
6	1.2 Dead+1.0 Wind 30 deg - No Ice
7	1.2D+1.0W (pattern 1) 30 deg - No Ice
8	1.2D+1.0W (pattern 2) 30 deg - No Ice
9	0.9 Dead+1.0 Wind 30 deg - No Ice
10	1.2 Dead+1.0 Wind 60 deg - No Ice
11	1.2D+1.0W (pattern 1) 60 deg - No Ice
12	1.2D+1.0W (pattern 2) 60 deg - No Ice
13	0.9 Dead+1.0 Wind 60 deg - No Ice
14	1.2 Dead+1.0 Wind 90 deg - No Ice
15	1.2D+1.0W (pattern 1) 90 deg - No Ice
16	1.2D+1.0W (pattern 2) 90 deg - No Ice
17	0.9 Dead+1.0 Wind 90 deg - No Ice
18	1.2 Dead+1.0 Wind 120 deg - No Ice
19	1.2D+1.0W (pattern 1) 120 deg - No Ice
20	1.2D+1.0W (pattern 2) 120 deg - No Ice
21	0.9 Dead+1.0 Wind 120 deg - No Ice
22	1.2 Dead+1.0 Wind 150 deg - No Ice
23	1.2D+1.0W (pattern 1) 150 deg - No Ice
24	1.2D+1.0W (pattern 2) 150 deg - No Ice
25	0.9 Dead+1.0 Wind 150 deg - No Ice
26	1.2 Dead+1.0 Wind 180 deg - No Ice
27	1.2D+1.0W (pattern 1) 180 deg - No Ice

Comb. No.	Description
28	1.2D+1.0W (pattern 2) 180 deg - No Ice
29	0.9 Dead+1.0 Wind 180 deg - No Ice
30	1.2 Dead+1.0 Wind 210 deg - No Ice
31	1.2D+1.0W (pattern 1) 210 deg - No Ice
32	1.2D+1.0W (pattern 2) 210 deg - No Ice
33	0.9 Dead+1.0 Wind 210 deg - No Ice
34	1.2 Dead+1.0 Wind 240 deg - No Ice
35	1.2D+1.0W (pattern 1) 240 deg - No Ice
36	1.2D+1.0W (pattern 2) 240 deg - No Ice
37	0.9 Dead+1.0 Wind 240 deg - No Ice
38	1.2 Dead+1.0 Wind 270 deg - No Ice
39	1.2D+1.0W (pattern 1) 270 deg - No Ice
40	1.2D+1.0W (pattern 2) 270 deg - No Ice
41	0.9 Dead+1.0 Wind 270 deg - No Ice
42	1.2 Dead+1.0 Wind 300 deg - No Ice
43	1.2D+1.0W (pattern 1) 300 deg - No Ice
44	1.2D+1.0W (pattern 2) 300 deg - No Ice
45	0.9 Dead+1.0 Wind 300 deg - No Ice
46	1.2 Dead+1.0 Wind 330 deg - No Ice
47	1.2D+1.0W (pattern 1) 330 deg - No Ice
48	1.2D+1.0W (pattern 2) 330 deg - No Ice
49	0.9 Dead+1.0 Wind 330 deg - No Ice
50	Dead+Wind 0 deg - Service
51	Dead+Wind 30 deg - Service
52	Dead+Wind 60 deg - Service
53	Dead+Wind 90 deg - Service
54	Dead+Wind 120 deg - Service
55	Dead+Wind 150 deg - Service
56	Dead+Wind 180 deg - Service
57	Dead+Wind 210 deg - Service
58	Dead+Wind 240 deg - Service
59	Dead+Wind 270 deg - Service
60	Dead+Wind 300 deg - Service
61	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 140	Latticed Pole Leg	Max Tension	45	2.86	-0.09	-0.01
			Max. Compression	34	-3.36	0.00	-0.00
			Max. Mx	38	-3.08	-0.12	-0.04
			Max. My	46	-0.58	-0.07	-0.10
			Max. Vy	38	-0.48	0.00	-0.00
			Max. Vx	46	-0.39	0.00	0.00
		Latticed Pole Diagonal	Max Tension	14	1.34	0.00	0.00
			Max. Compression	38	-1.42	0.00	0.00
			Max. Mx	38	0.84	0.00	0.00
			Max. My	42	-0.53	0.00	0.00
			Max. Vy	38	-0.00	0.00	0.00
			Max. Vx	42	-0.00	0.00	0.00
		Latticed Pole Horizontal	Max Tension	42	0.13	0.00	0.00
			Max. Compression	18	-0.12	0.00	0.00
			Max. Mx	35	0.03	0.00	0.00
			Max. My	46	0.04	0.00	-0.00
			Max. Vy	35	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	46	0.00	0.00	0.00
		Latticed Pole Top Girt	Max Tension	22	0.44	0.00	0.00
			Max. Compression	46	-0.44	0.00	0.00
			Max. Mx	36	0.05	0.00	0.00
			Max. My	46	-0.06	0.00	-0.00
			Max. Vy	36	-0.00	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
		Latticed Pole Bottom Girt	Max Tension	38	0.50	0.00	0.00
			Max. Compression	22	-0.47	0.00	0.00
			Max. Mx	35	-0.06	0.00	0.00
			Max. My	46	-0.14	0.00	-0.00
			Max. Vy	35	-0.00	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
L2	140 - 120	Latticed Pole Leg	Max Tension	45	14.19	-0.15	-0.05
			Max. Compression	34	-14.87	0.04	-0.01
			Max. Mx	38	-13.36	-0.21	-0.05
			Max. My	2	-14.27	0.07	-0.18
			Max. Vy	38	-1.05	0.05	-0.01
			Max. Vx	2	-0.87	-0.02	0.04
		Latticed Pole Diagonal	Max Tension	14	2.58	0.00	0.00
			Max. Compression	38	-2.66	0.00	0.00
			Max. Mx	38	1.51	0.00	0.00
			Max. My	42	-0.51	0.00	0.00
			Max. Vy	38	-0.00	0.00	0.00
			Max. Vx	42	-0.00	0.00	0.00
		Latticed Pole Horizontal	Max Tension	23	0.33	0.00	0.00
			Max. Compression	47	-0.33	0.00	0.00
			Max. Mx	43	0.13	0.00	0.00
			Max. My	46	0.20	0.00	-0.00
			Max. Vy	43	-0.00	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
		Latticed Pole Top Girt	Max Tension	14	0.49	0.00	0.00
			Max. Compression	38	-0.53	0.00	0.00
			Max. Mx	35	0.07	0.00	0.00
			Max. My	46	0.18	0.00	-0.00
			Max. Vy	35	-0.00	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
		Latticed Pole Bottom Girt	Max Tension	38	0.90	0.00	0.00
			Max. Compression	22	-0.80	0.00	0.00
			Max. Mx	35	-0.10	0.00	0.00
			Max. My	46	-0.20	0.00	-0.00
			Max. Vy	35	-0.00	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
T1	120 - 100	Leg	Max Tension	45	38.92	0.19	-0.00
			Max. Compression	34	-42.09	-0.25	-0.06
			Max. Mx	2	-14.86	0.36	0.10
			Max. My	46	-1.80	0.06	0.43
			Max. Vy	34	-2.21	0.30	-0.01
			Max. Vx	46	-1.69	0.06	0.43
		Diagonal	Max Tension	38	4.55	0.00	0.00
			Max. Compression	14	-4.54	0.00	0.00
			Max. Mx	14	3.83	0.01	0.00
			Max. My	34	0.41	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Horizontal	Max Tension	34	0.70	0.00	0.00
			Max. Compression	34	-0.70	0.00	0.00
			Max. Mx	12	0.28	0.00	0.00
			Max. My	7	0.57	0.00	-0.00
			Max. Vy	12	-0.00	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
		Top Girt	Max Tension	26	1.74	0.00	0.00
			Max. Compression	2	-1.88	0.00	0.00
			Max. Mx	12	-0.45	0.00	0.00
			Max. My	18	1.02	0.00	0.00
			Max. Vy	12	-0.00	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	38	1.53	0.00	0.00
			Max. Compression	14	-1.52	0.00	0.00
			Max. Mx	12	-0.08	0.00	0.00
			Max. My	7	1.30	0.00	-0.00
			Max. Vy	12	-0.00	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
T2	100 - 80	Leg	Max Tension	13	53.08	0.45	0.03
			Max. Compression	34	-58.44	0.05	-0.00
			Max. Mx	34	-42.13	0.70	0.04
			Max. My	22	-1.81	-0.03	-0.34
			Max. Vy	34	-1.93	0.05	-0.00
			Max. Vx	46	-0.83	0.03	0.34
		Diagonal	Max Tension	41	1.82	0.00	0.00
			Max. Compression	14	-2.01	0.00	0.00
			Max. Mx	34	1.36	0.01	0.00
			Max. My	38	-1.86	-0.00	0.01
			Max. Vy	34	-0.00	0.01	0.00
			Max. Vx	38	-0.00	0.00	0.00
T3	80 - 60	Leg	Max Tension	13	66.94	0.53	0.02
			Max. Compression	34	-73.78	0.11	0.00
			Max. Mx	34	-73.78	-0.69	-0.03
			Max. My	31	-2.52	-0.00	0.30
			Max. Vy	34	-2.55	0.11	0.00
			Max. Vx	31	-0.98	-0.00	0.08
		Diagonal	Max Tension	34	1.90	0.00	0.00
			Max. Compression	34	-1.84	0.00	0.00
			Max. Mx	34	1.50	0.01	-0.00
			Max. My	34	-1.79	-0.00	0.00
			Max. Vy	10	0.00	0.01	-0.00
			Max. Vx	34	-0.00	0.00	0.00
T4	60 - 40	Leg	Max Tension	13	80.16	0.65	0.02
			Max. Compression	34	-88.88	0.39	0.01
			Max. Mx	34	-73.79	1.11	0.04
			Max. My	31	-3.23	-0.01	0.47
			Max. Vy	34	-3.08	0.39	0.01
			Max. Vx	31	-1.16	0.00	0.18
		Diagonal	Max Tension	34	2.13	0.00	0.00
			Max. Compression	34	-2.09	0.00	0.00
			Max. Mx	10	1.75	0.01	-0.00
			Max. My	3	-1.88	0.00	-0.00
			Max. Vy	10	0.01	0.01	-0.00
			Max. Vx	3	0.00	0.00	0.00
T5	40 - 20	Leg	Max Tension	13	93.00	1.06	0.02
			Max. Compression	34	-104.27	0.08	0.00
			Max. Mx	34	-88.89	1.61	0.05
			Max. My	31	-3.99	0.01	0.64
			Max. Vy	34	-3.70	0.08	0.00
			Max. Vx	31	-1.32	-0.01	0.14
		Diagonal	Max Tension	34	2.52	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	34	-2.57	0.00	0.00
			Max. Mx	38	1.38	0.02	0.00
			Max. My	3	-2.36	0.01	-0.00
			Max. Vy	38	0.01	0.02	0.00
			Max. Vx	3	0.00	0.00	0.00
T6	20 - 0	Leg	Max Tension	13	105.33	1.28	0.02
			Max. Compression	34	-119.47	0.00	0.00
			Max. Mx	34	-119.46	-1.75	-0.03
			Max. My	30	-5.18	0.00	0.67
			Max. Vy	34	-4.41	0.00	0.00
			Max. Vx	31	-1.35	-0.00	-0.00
		Diagonal	Max Tension	34	2.74	0.00	0.00
			Max. Compression	34	-2.88	0.00	0.00
			Max. Mx	34	2.38	0.03	-0.00
			Max. My	3	-2.56	0.00	-0.00
			Max. Vy	10	0.02	0.03	-0.00
			Max. Vx	3	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	34	119.14	8.59	-4.88
	Max. H_x	34	119.14	8.59	-4.88
	Max. H_z	13	-105.00	-7.76	4.40
	Min. Vert	13	-105.00	-7.76	4.40
	Min. H_x	13	-105.00	-7.76	4.40
	Min. H_z	34	119.14	8.59	-4.88
Leg B	Max. Vert	18	108.40	-7.55	-4.53
	Max. H_x	41	-89.30	6.78	3.38
	Max. H_z	45	-94.62	6.73	4.05
	Min. Vert	45	-94.62	6.73	4.05
	Min. H_x	18	108.40	-7.55	-4.53
	Min. H_z	18	108.40	-7.55	-4.53
Leg A	Max. Vert	2	108.14	0.23	8.79
	Max. H_x	39	6.44	1.21	0.36
	Max. H_z	2	108.14	0.23	8.79
	Min. Vert	29	-93.07	-0.23	-7.78
	Min. H_x	15	5.13	-1.20	0.29
	Min. H_z	29	-93.07	-0.23	-7.78

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	14.08	0.00	0.00	-1.37	-3.35	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	16.90	-0.09	-14.37	-1131.90	8.48	5.06
1.2D+1.0W (pattern 1) 0 deg - No Ice	16.90	-0.07	-14.27	-1117.94	5.83	5.18
1.2D+1.0W (pattern 2) 0 deg -	16.90	-0.07	-10.09	-804.99	6.12	5.38

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
No Ice						
0.9 Dead+1.0 Wind 0 deg - No Ice	12.67	-0.09	-14.37	-1130.16	9.46	5.06
1.2 Dead+1.0 Wind 30 deg - No Ice	16.90	7.37	-12.95	-1024.68	-579.35	5.34
1.2D+1.0W (pattern 1) 30 deg - No Ice	16.90	7.35	-12.88	-1014.53	-576.72	5.38
1.2D+1.0W (pattern 2) 30 deg - No Ice	16.90	5.40	-9.50	-754.74	-426.40	5.49
0.9 Dead+1.0 Wind 30 deg - No Ice	12.67	7.37	-12.95	-1023.08	-577.68	5.34
1.2 Dead+1.0 Wind 60 deg - No Ice	16.90	13.25	-7.66	-604.75	-1046.28	1.51
1.2D+1.0W (pattern 1) 60 deg - No Ice	16.90	13.20	-7.63	-600.09	-1038.69	1.45
1.2D+1.0W (pattern 2) 60 deg - No Ice	16.90	9.89	-5.72	-452.14	-782.42	1.45
0.9 Dead+1.0 Wind 60 deg - No Ice	12.67	13.25	-7.66	-603.64	-1044.07	1.51
1.2 Dead+1.0 Wind 90 deg - No Ice	16.90	14.94	0.07	7.54	-1184.40	-2.49
1.2D+1.0W (pattern 1) 90 deg - No Ice	16.90	14.87	0.05	5.57	-1172.93	-2.65
1.2D+1.0W (pattern 2) 90 deg - No Ice	16.90	10.96	0.05	5.84	-872.82	-2.76
0.9 Dead+1.0 Wind 90 deg - No Ice	12.67	14.94	0.07	7.93	-1182.02	-2.49
1.2 Dead+1.0 Wind 120 deg - No Ice	16.90	12.42	7.24	571.62	-980.30	-3.16
1.2D+1.0W (pattern 1) 120 deg - No Ice	16.90	12.34	7.18	562.89	-968.78	-3.35
1.2D+1.0W (pattern 2) 120 deg - No Ice	16.90	8.72	5.09	406.65	-697.64	-3.55
0.9 Dead+1.0 Wind 120 deg - No Ice	12.67	12.42	7.24	571.35	-978.14	-3.16
1.2 Dead+1.0 Wind 150 deg - No Ice	16.90	6.51	11.26	909.46	-531.05	-3.19
1.2D+1.0W (pattern 1) 150 deg - No Ice	16.90	6.46	11.18	896.92	-523.61	-3.37
1.2D+1.0W (pattern 2) 150 deg - No Ice	16.90	4.50	7.79	637.40	-373.78	-3.60
0.9 Dead+1.0 Wind 150 deg - No Ice	12.67	6.51	11.26	908.77	-529.41	-3.19
1.2 Dead+1.0 Wind 180 deg - No Ice	16.90	0.05	13.37	1075.14	-11.18	-5.04
1.2D+1.0W (pattern 1) 180 deg - No Ice	16.90	0.04	13.29	1063.14	-9.62	-5.16
1.2D+1.0W (pattern 2) 180 deg - No Ice	16.90	0.04	9.47	767.67	-9.88	-5.36
0.9 Dead+1.0 Wind 180 deg - No Ice	12.67	0.05	13.37	1074.27	-10.16	-5.04
1.2 Dead+1.0 Wind 210 deg - No Ice	16.90	-7.43	12.91	1016.45	579.86	-5.34
1.2D+1.0W (pattern 1) 210 deg - No Ice	16.90	-7.40	12.85	1007.30	575.50	-5.38
1.2D+1.0W (pattern 2) 210 deg - No Ice	16.90	-5.44	9.47	747.49	425.22	-5.49
0.9 Dead+1.0 Wind 210 deg - No Ice	12.67	-7.43	12.91	1015.68	580.19	-5.34
1.2 Dead+1.0 Wind 240 deg - No Ice	16.90	-14.13	8.12	623.57	1087.21	-1.54

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2D+1.0W (pattern 1) 240 deg - No Ice	16.90	-14.06	8.09	618.87	1077.39	-1.47
1.2D+1.0W (pattern 2) 240 deg - No Ice	16.90	-10.44	6.00	462.15	805.99	-1.47
0.9 Dead+1.0 Wind 240 deg - No Ice	12.67	-14.13	8.12	623.26	1086.97	-1.53
1.2 Dead+1.0 Wind 270 deg - No Ice	16.90	-15.01	-0.07	-10.93	1186.72	2.48
1.2D+1.0W (pattern 1) 270 deg - No Ice	16.90	-14.92	-0.05	-8.94	1173.15	2.64
1.2D+1.0W (pattern 2) 270 deg - No Ice	16.90	-11.01	-0.05	-9.21	873.09	2.75
0.9 Dead+1.0 Wind 270 deg - No Ice	12.67	-15.01	-0.07	-10.50	1186.34	2.48
1.2 Dead+1.0 Wind 300 deg - No Ice	16.90	-11.65	-6.80	-556.21	939.85	3.16
1.2D+1.0W (pattern 1) 300 deg - No Ice	16.90	-11.57	-6.73	-546.83	927.21	3.35
1.2D+1.0W (pattern 2) 300 deg - No Ice	16.90	-8.27	-4.83	-399.37	671.27	3.55
0.9 Dead+1.0 Wind 300 deg - No Ice	12.67	-11.65	-6.80	-555.13	939.73	3.16
1.2 Dead+1.0 Wind 330 deg - No Ice	16.90	-6.54	-11.32	-921.68	528.27	3.20
1.2D+1.0W (pattern 1) 330 deg - No Ice	16.90	-6.49	-11.23	-907.33	519.76	3.37
1.2D+1.0W (pattern 2) 330 deg - No Ice	16.90	-4.53	-7.84	-647.86	369.96	3.60
0.9 Dead+1.0 Wind 330 deg - No Ice	12.67	-6.54	-11.32	-920.16	528.63	3.20
Dead+Wind 0 deg - Service	14.08	-0.02	-3.59	-283.72	-0.23	1.27
Dead+Wind 30 deg - Service	14.08	1.84	-3.24	-256.94	-147.08	1.34
Dead+Wind 60 deg - Service	14.08	3.31	-1.91	-152.03	-263.72	0.38
Dead+Wind 90 deg - Service	14.08	3.74	0.02	0.92	-298.22	-0.62
Dead+Wind 120 deg - Service	14.08	3.11	1.81	141.84	-247.23	-0.79
Dead+Wind 150 deg - Service	14.08	1.63	2.82	226.23	-135.01	-0.80
Dead+Wind 180 deg - Service	14.08	0.01	3.34	267.62	-5.14	-1.26
Dead+Wind 210 deg - Service	14.08	-1.86	3.23	252.96	142.51	-1.34
Dead+Wind 240 deg - Service	14.08	-3.53	2.03	154.82	269.25	-0.38
Dead+Wind 270 deg - Service	14.08	-3.75	-0.02	-3.69	294.11	0.62
Dead+Wind 300 deg - Service	14.08	-2.91	-1.70	-139.90	232.43	0.79
Dead+Wind 330 deg - Service	14.08	-1.64	-2.83	-231.20	129.61	0.80

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-14.08	0.00	0.00	14.08	0.00	0.000%
2	-0.09	-16.90	-14.37	0.09	16.90	14.37	0.001%
3	-0.07	-16.90	-14.27	0.07	16.90	14.27	0.001%
4	-0.07	-16.90	-10.09	0.07	16.90	10.09	0.000%
5	-0.09	-12.67	-14.37	0.09	12.67	14.37	0.001%
6	7.37	-16.90	-12.95	-7.37	16.90	12.95	0.000%
7	7.35	-16.90	-12.88	-7.35	16.90	12.88	0.000%
8	5.40	-16.90	-9.50	-5.40	16.90	9.50	0.000%
9	7.37	-12.67	-12.95	-7.37	12.67	12.95	0.001%
10	13.25	-16.90	-7.66	-13.25	16.90	7.66	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
11	13.20	-16.90	-7.63	-13.20	16.90	7.63	0.001%
12	9.89	-16.90	-5.72	-9.89	16.90	5.72	0.000%
13	13.25	-12.67	-7.66	-13.25	12.67	7.66	0.001%
14	14.94	-16.90	0.07	-14.94	16.90	-0.07	0.001%
15	14.87	-16.90	0.05	-14.87	16.90	-0.05	0.001%
16	10.96	-16.90	0.05	-10.96	16.90	-0.05	0.000%
17	14.94	-12.67	0.07	-14.94	12.67	-0.07	0.001%
18	12.42	-16.90	7.24	-12.42	16.90	-7.24	0.001%
19	12.34	-16.90	7.18	-12.34	16.90	-7.18	0.001%
20	8.72	-16.90	5.09	-8.72	16.90	-5.09	0.000%
21	12.42	-12.67	7.24	-12.42	12.67	-7.24	0.001%
22	6.51	-16.90	11.26	-6.51	16.90	-11.26	0.000%
23	6.46	-16.90	11.18	-6.46	16.90	-11.18	0.000%
24	4.50	-16.90	7.79	-4.50	16.90	-7.79	0.000%
25	6.51	-12.67	11.26	-6.51	12.67	-11.26	0.000%
26	0.05	-16.90	13.37	-0.05	16.90	-13.37	0.000%
27	0.04	-16.90	13.29	-0.04	16.90	-13.29	0.000%
28	0.04	-16.90	9.47	-0.04	16.90	-9.47	0.000%
29	0.05	-12.67	13.37	-0.05	12.67	-13.37	0.000%
30	-7.43	-16.90	12.91	7.43	16.90	-12.91	0.000%
31	-7.40	-16.90	12.85	7.40	16.90	-12.85	0.000%
32	-5.44	-16.90	9.47	5.44	16.90	-9.47	0.000%
33	-7.43	-12.67	12.91	7.43	12.67	-12.91	0.001%
34	-14.13	-16.90	8.13	14.13	16.90	-8.12	0.001%
35	-14.06	-16.90	8.09	14.06	16.90	-8.09	0.001%
36	-10.44	-16.90	6.00	10.44	16.90	-6.00	0.000%
37	-14.13	-12.67	8.13	14.13	12.67	-8.12	0.001%
38	-15.01	-16.90	-0.07	15.01	16.90	0.07	0.001%
39	-14.92	-16.90	-0.05	14.92	16.90	0.05	0.001%
40	-11.01	-16.90	-0.05	11.01	16.90	0.05	0.000%
41	-15.01	-12.67	-0.07	15.01	12.67	0.07	0.001%
42	-11.65	-16.90	-6.80	11.65	16.90	6.80	0.000%
43	-11.57	-16.90	-6.73	11.57	16.90	6.73	0.000%
44	-8.27	-16.90	-4.83	8.27	16.90	4.83	0.000%
45	-11.65	-12.67	-6.80	11.65	12.67	6.80	0.000%
46	-6.54	-16.90	-11.32	6.54	16.90	11.32	0.000%
47	-6.49	-16.90	-11.23	6.49	16.90	11.23	0.000%
48	-4.53	-16.90	-7.84	4.53	16.90	7.84	0.000%
49	-6.54	-12.67	-11.32	6.54	12.67	11.32	0.000%
50	-0.02	-14.08	-3.59	0.02	14.08	3.59	0.000%
51	1.84	-14.08	-3.24	-1.84	14.08	3.24	0.000%
52	3.31	-14.08	-1.91	-3.31	14.08	1.91	0.000%
53	3.74	-14.08	0.02	-3.74	14.08	-0.02	0.000%
54	3.11	-14.08	1.81	-3.11	14.08	-1.81	0.000%
55	1.63	-14.08	2.82	-1.63	14.08	-2.82	0.000%
56	0.01	-14.08	3.34	-0.01	14.08	-3.34	0.000%
57	-1.86	-14.08	3.23	1.86	14.08	-3.23	0.000%
58	-3.53	-14.08	2.03	3.53	14.08	-2.03	0.000%
59	-3.75	-14.08	-0.02	3.75	14.08	0.02	0.000%
60	-2.91	-14.08	-1.70	2.91	14.08	1.70	0.000%
61	-1.64	-14.08	-2.83	1.64	14.08	2.83	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance

1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000676
3	Yes	4	0.00000001	0.00000655
4	Yes	4	0.00000001	0.00000258
5	Yes	4	0.00000001	0.00000653
6	Yes	4	0.00000001	0.00000571
7	Yes	4	0.00000001	0.00000568
8	Yes	4	0.00000001	0.00000249
9	Yes	4	0.00000001	0.00000569
10	Yes	4	0.00000001	0.00000637
11	Yes	4	0.00000001	0.00000622
12	Yes	4	0.00000001	0.00000268
13	Yes	4	0.00000001	0.00000644
14	Yes	4	0.00000001	0.00000578
15	Yes	4	0.00000001	0.00000560
16	Yes	4	0.00000001	0.00000242
17	Yes	4	0.00000001	0.00000567
18	Yes	4	0.00000001	0.00000684
19	Yes	4	0.00000001	0.00000660
20	Yes	4	0.00000001	0.00000260
21	Yes	4	0.00000001	0.00000659
22	Yes	4	0.00000001	0.00000425
23	Yes	4	0.00000001	0.00000405
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000412
26	Yes	4	0.00000001	0.00000462
27	Yes	4	0.00000001	0.00000445
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000465
30	Yes	4	0.00000001	0.00000571
31	Yes	4	0.00000001	0.00000557
32	Yes	4	0.00000001	0.00000242
33	Yes	4	0.00000001	0.00000561
34	Yes	4	0.00000001	0.00000930
35	Yes	4	0.00000001	0.00000909
36	Yes	4	0.00000001	0.00000395
37	Yes	4	0.00000001	0.00000900
38	Yes	4	0.00000001	0.00000593
39	Yes	4	0.00000001	0.00000572
40	Yes	4	0.00000001	0.00000248
41	Yes	4	0.00000001	0.00000582
42	Yes	4	0.00000001	0.00000488
43	Yes	4	0.00000001	0.00000464
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000499
46	Yes	4	0.00000001	0.00000426
47	Yes	4	0.00000001	0.00000403
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000416
50	Yes	4	0.00000001	0.00000001
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 140	4.002	58	0.2764	0.1171
L2	140 - 120	3.421	58	0.2708	0.0868
T1	120 - 100	2.335	58	0.2292	0.0355
T2	100 - 80	1.486	58	0.1530	0.0244
T3	80 - 60	0.907	58	0.1119	0.0188
T4	60 - 40	0.494	58	0.0724	0.0126
T5	40 - 20	0.220	58	0.0418	0.0060
T6	20 - 0	0.065	58	0.0207	0.0026

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	10' Lightning Rod Ext. = 14' O.H. Inc. 4' Rod	58	4.002	0.2764	0.1171	147272
148.00	2' Std. Dish w/Radome	58	3.885	0.2757	0.1109	147272
145.00	2' Std. Dish w/Radome	58	3.710	0.2743	0.1017	147272
130.00	10' Typ. Omni/Whip Antenna(s)	58	2.857	0.2563	0.0594	29328
120.00	(4) 72" x 12" x 3" Typ. Flat Panel Antenna(s)	58	2.335	0.2292	0.0355	18506
75.00	L-Side Light / Obstruction Light	58	0.790	0.1025	0.0173	34590

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 140	15.888	34	1.0716	0.4708
L2	140 - 120	13.628	34	1.0562	0.3491
T1	120 - 100	9.367	34	0.9078	0.1420
T2	100 - 80	5.980	34	0.6136	0.1072
T3	80 - 60	3.653	34	0.4502	0.0800
T4	60 - 40	1.990	34	0.2917	0.0527
T5	40 - 20	0.886	34	0.1685	0.0249
T6	20 - 0	0.263	34	0.0838	0.0107

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	10' Lightning Rod Ext. = 14' O.H. Inc. 4' Rod	34	15.888	1.0716	0.4708	45838

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.00	2' Std. Dish w/Radome	34	15.434	1.0697	0.4460	45838
145.00	2' Std. Dish w/Radome	34	14.755	1.0663	0.4091	45838
130.00	10' Typ. Omni/Whip Antenna(s)	34	11.425	1.0071	0.2386	7990
120.00	(4) 72" x 12" x 3" Typ. Flat Panel Antenna(s)	34	9.367	0.9078	0.1420	4925
75.00	L-Side Light / Obstruction Light	34	3.184	0.4124	0.0731	8624

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	100	Diagonal	A325N	0.5000	1	1.82	6.83	0.266 ✔	1	Member Block Shear
T3	80	Diagonal	A325N	0.5000	1	1.90	6.83	0.278 ✔	1	Member Block Shear
T4	60	Diagonal	A325N	0.5000	1	2.13	6.83	0.312 ✔	1	Member Block Shear
T5	40	Diagonal	A325N	0.6250	1	2.52	11.95	0.211 ✔	1	Member Block Shear
T6	20	Diagonal	A325N	0.6250	1	2.88	13.81	0.208 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	1 1/4	10.00	2.38	91.2 K=1.00	1.2272	1.00	-3.08	30.06	0.102
L2	140 - 120	1 1/4	20.00	2.44	93.6 K=1.00	1.2272	1.00	-14.87	29.10	0.511
T1	120 - 100	1 1/2	20.01	2.44	78.0 K=1.00	1.7672	1.00	-42.09	50.95	0.826
T2	100 - 80	2 1/4	20.03	4.85	103.5 K=1.00	3.9761	1.00	-58.44	81.80	0.714 [1]
T3	80 - 60	2 1/4	20.03	4.85	103.5 K=1.00	3.9761	1.00	-73.78	81.80	0.902 [1]
T4	60 - 40	2 1/2	20.03	4.81	92.3 K=1.00	4.9087	1.00	-88.88	118.46	0.750 [1]
T5	40 - 20	3	20.03	6.41	102.6 K=1.00	7.0686	1.00	-104.27	147.38	0.707 [1]
T6	20 - 0	3	20.03	6.41	102.6 K=1.00	7.0686	1.00	-119.46	147.38	0.811

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 140	1 1/4	0.12	1.22	0.101	0.00	1.22	0.000
L2	140 - 120	1 1/4	0.18	1.22	0.148	0.00	1.22	0.000
T1	120 - 100	1 1/2	0.30	2.11	0.144	0.00	2.11	0.000
T2	100 - 80	2 1/4	0.05	7.12	0.007	0.00	7.12	0.000
T3	80 - 60	2 1/4	0.11	7.12	0.015	0.00	7.12	0.000
T4	60 - 40	2 1/2	0.39	9.77	0.040	0.00	9.77	0.000
T5	40 - 20	3	0.08	16.88	0.004	0.00	16.88	0.000
T6	20 - 0	3	1.75	16.88	0.104	0.00	16.88	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	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
L1	150 - 140	1 1/4	0.102	0.101	0.000	0.152 ✔	1.000	4.8.1 ✔
L2	140 - 120	1 1/4	0.511	0.148	0.000	0.586 ✔	1.000	4.8.1 ✔
T1	120 - 100	1 1/2	0.826	0.144	0.000	0.862 ✔	1.000	4.8.1 ✔
T2	100 - 80	2 1/4	0.714	0.007	0.000	0.714 [1] ✔	1.000	4.8.1 ✔
T3	80 - 60	2 1/4	0.902	0.015	0.000	0.902 [1] ✔	1.000	4.8.1 ✔
T4	60 - 40	2 1/2	0.750	0.040	0.000	0.750 [1] ✔	1.000	4.8.1 ✔
T5	40 - 20	3	0.707	0.004	0.000	0.707 [1] ✔	1.000	4.8.1 ✔
T6	20 - 0	3	0.811	0.104	0.000	0.813 ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.83	3.69	198.6 K=0.70	0.3068	-1.42	1.76	0.809 [1] ✔
L2	140 - 120	3/4	3.87	3.73	167.2 K=0.70	0.4418	-2.66	3.57	0.744 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8	4.62	4.47	171.8 K=0.70	0.6013	-3.82	4.60	0.830 [1] ✔
T2	100 - 80	L1 1/2x1 1/2x1/8	7.34	3.50	141.7 K=1.00	0.3594	-1.72	5.12	0.336 [1] ✔
T3	80 - 60	L1 1/2x1 1/2x1/8	8.73	4.19	169.8 K=1.00	0.3594	-1.80	3.57	0.504 [1] ✔
T4	60 - 40	L1 1/2x1 1/2x1/8	10.21	4.92	199.2 K=1.00	0.3594	-2.07	2.59	0.799 [1] ✔
T5	40 - 20	L2x2x3/16	12.46	6.06	184.5 K=1.00	0.7150	-2.57	6.01	0.427 [1] ✔
T6	20 - 0	L2 1/2x2 1/2x3/16	13.99	6.82	165.4 K=1.00	0.9020	-2.88	9.44	0.305 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.00	2.90	155.7 K=0.70	0.3068	-0.12	2.86	0.044 [1] ✔
L2	140 - 120	5/8	3.00	2.90	155.7 K=0.70	0.3068	-0.33	2.86	0.115 [1] ✔
T1	120 - 100	3/4	3.87	3.74	167.6 K=0.70	0.4418	-0.70	3.55	0.196 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.00	2.90	155.7 K=0.70	0.3068	-0.44	2.86	0.153 [1] ✔
L2	140 - 120	5/8	3.00	2.90	155.7 K=0.70	0.3068	-0.53	2.86	0.186 [1] ✔
T1	120 - 100	3/4	3.01	2.89	129.4 K=0.70	0.4418	-1.88	5.96	0.315 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.00	2.90	155.7 K=0.70	0.3068	-0.47	2.86	0.163 [1] ✔
L2	140 - 120	5/8	3.00	2.90	155.7 K=0.70	0.3068	-0.80	2.86	0.279 [1] ✔
T1	120 - 100	3/4	3.99	3.86	173.0 K=0.70	0.4418	-1.52	3.33	0.457 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	1 1/4	10.00	2.38	91.2	1.2272	0.96	55.22	0.017
L2	140 - 120	1 1/4	20.00	2.44	93.6	1.2272	14.19	55.22	0.257
T1	120 - 100	1 1/2	20.01	2.44	78.0	1.7672	38.92	79.52	0.489
T2	100 - 80	2 1/4	20.03	4.85	103.5	3.9761	53.08	178.92	0.297
T3	80 - 60	2 1/4	20.03	4.85	103.5	3.9761	66.94	178.92	0.374
T4	60 - 40	2 1/2	20.03	4.81	92.3	4.9087	80.16	220.89	0.363
T5	40 - 20	3	20.03	6.41	102.6	7.0686	93.00	318.09	0.292
T6	20 - 0	3	20.03	6.41	102.6	7.0686	105.33	318.09	0.331

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 140	1 1/4	0.13	1.22	0.104	0.00	1.22	0.000
L2	140 - 120	1 1/4	0.16	1.22	0.133	0.00	1.22	0.000
T1	120 - 100	1 1/2	0.26	2.11	0.124	0.00	2.11	0.000
T2	100 - 80	2 1/4	0.45	7.12	0.063	0.00	7.12	0.000
T3	80 - 60	2 1/4	0.53	7.12	0.074	0.00	7.12	0.000
T4	60 - 40	2 1/2	0.65	9.77	0.067	0.00	9.77	0.000
T5	40 - 20	3	1.06	16.88	0.063	0.00	16.88	0.000
T6	20 - 0	3	1.28	16.88	0.076	0.00	16.88	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	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
L1	150 - 140	1 1/4	0.017	0.104	0.000	0.112 ✔	1.000	4.8.1 ✔
L2	140 - 120	1 1/4	0.257	0.133	0.000	0.347 ✔	1.000	4.8.1 ✔
T1	120 - 100	1 1/2	0.489	0.124	0.000	0.545 ✔	1.000	4.8.1 ✔
T2	100 - 80	2 1/4	0.297	0.063	0.000	0.320 ✔	1.000	4.8.1 ✔
T3	80 - 60	2 1/4	0.374	0.074	0.000	0.398 ✔	1.000	4.8.1 ✔
T4	60 - 40	2 1/2	0.363	0.067	0.000	0.382 ✔	1.000	4.8.1 ✔
T5	40 - 20	3	0.292	0.063	0.000	0.316 ✔	1.000	4.8.1 ✔
T6	20 - 0	3	0.331	0.076	0.000	0.362 ✔	1.000	4.8.1 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.83	3.69	283.7	0.3068	1.34	9.94	0.135 [1] ✔
L2	140 - 120	3/4	3.87	3.73	238.8	0.4418	2.58	19.88	0.130 [1] ✔
T1	120 - 100	7/8	3.92	3.78	207.1	0.6013	4.55	27.06	0.168 [1] ✔
T2	100 - 80	L1 1/2x1 1/2x1/8	6.44	3.07	84.0	0.2109	1.82	10.28	0.177 [1] ✔
T3	80 - 60	L1 1/2x1 1/2x1/8	8.73	4.19	113.0	0.2109	1.90	10.28	0.184 [1] ✔
T4	60 - 40	L1 1/2x1 1/2x1/8	10.21	4.92	131.7	0.2109	2.13	10.28	0.207 [1] ✔
T5	40 - 20	L2x2x3/16	12.46	6.06	121.5	0.4308	2.52	21.00	0.120 [1] ✔
T6	20 - 0	L2 1/2x2 1/2x3/16	13.99	6.82	108.1	0.5710	2.74	27.84	0.099 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.00	2.90	222.4	0.3068	0.13	9.94	0.013 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L2	140 - 120	5/8	3.00	2.90	222.4	0.3068	0.33	9.94	0.034 [1]
T1	120 - 100	3/4	3.87	3.74	239.4	0.4418	0.70	19.88	0.035 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.00	2.90	222.4	0.3068	0.44	9.94	0.044 [1]
L2	140 - 120	5/8	3.00	2.90	222.4	0.3068	0.49	9.94	0.049 [1]
T1	120 - 100	3/4	3.01	2.89	184.8	0.4418	1.74	19.88	0.087 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 140	5/8	3.00	2.90	222.4	0.3068	0.50	9.94	0.050 [1]
L2	140 - 120	5/8	3.00	2.90	222.4	0.3068	0.90	9.94	0.090 [1]
T1	120 - 100	3/4	3.99	3.86	247.2	0.4418	1.53	19.88	0.077 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 140	Latticed Pole Leg	1 1/4	1	-3.08	30.06	15.2	Pass
L2	140 - 120	Latticed Pole Leg	1 1/4	31	-14.87	29.10	58.6	Pass
L1	150 - 140	Latticed Pole Diagonal	5/8	10	-1.42	1.76	80.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L2	140 - 120	Latticed Pole Diagonal	3/4	40	-2.66	3.57	74.4	Pass
L1	150 - 140	Latticed Pole Horizontal	5/8	13	-0.12	2.86	4.4	Pass
L2	140 - 120	Latticed Pole Horizontal	5/8	63	-0.33	2.86	11.5	Pass
L1	150 - 140	Latticed Pole Top Girt	5/8	6	-0.44	2.86	15.3	Pass
L2	140 - 120	Latticed Pole Top Girt	5/8	34	-0.53	2.86	18.6	Pass
L1	150 - 140	Latticed Pole Bottom Girt	5/8	9	-0.47	2.86	16.3	Pass
L2	140 - 120	Latticed Pole Bottom Girt	5/8	39	-0.80	2.86	27.9	Pass
T1	120 - 100	Leg	1 1/2	85	-42.09	50.95	86.2	Pass
T2	100 - 80	Leg	2 1/4	139	-58.44	81.80	71.4	Pass
T3	80 - 60	Leg	2 1/4	166	-73.78	81.80	90.2	Pass
T4	60 - 40	Leg	2 1/2	193	-88.88	118.46	75.0	Pass
T5	40 - 20	Leg	3	220	-104.27	147.38	70.7	Pass
T6	20 - 0	Leg	3	241	-119.46	147.38	81.3	Pass
T1	120 - 100	Diagonal	7/8	94	-3.82	4.60	83.0	Pass
T2	100 - 80	Diagonal	L1 1/2x1 1/2x1/8	142	-1.72	5.12	33.6	Pass
T3	80 - 60	Diagonal	L1 1/2x1 1/2x1/8	169	-1.80	3.57	50.4	Pass
T4	60 - 40	Diagonal	L1 1/2x1 1/2x1/8	196	-2.07	2.59	79.9	Pass
T5	40 - 20	Diagonal	L2x2x3/16	223	-2.57	6.01	42.7	Pass
T6	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	244	-2.88	9.44	30.5	Pass
T1	120 - 100	Horizontal	3/4	97	-0.70	3.55	19.6	Pass
T1	120 - 100	Top Girt	3/4	90	-1.88	5.96	31.5	Pass
T1	120 - 100	Bottom Girt	3/4	91	-1.52	3.33	45.7	Pass
							Summary	
						Latticed Pole Leg (L2)	58.6	Pass
						Latticed Pole Diagonal (L1)	80.9	Pass
						Latticed Pole Horizontal (L2)	11.5	Pass
						Latticed Pole Top Girt (L2)	18.6	Pass
						Latticed Pole Bottom Girt (L2)	27.9	Pass
						Leg (T3)	90.2	Pass
						Diagonal (T1)	83.0	Pass
						Horizontal (T1)	19.6	Pass
						Top Girt (T1)	31.5	Pass
						Bottom Girt (T1)	45.7	Pass
						Bolt Checks	31.2	Pass
						RATING =	**90.2**	**Pass**

Section 2

Allstate Tower, Inc.

Henderson, Kentucky

MAT/PIER FOUNDATION DESIGN for TOWER ***ER-074528*** 10/3/2018

Project No.: -074528 ***Client: IES*** RF

Site Name: St. Louis, MO

150' Tall x 12.75' Triangular Tower ***BASE REACTIONS PER TIA-222-H***

TOTAL BASE SHEAR	=	16	kips		
TOTAL AXIAL DEAD + LIVE LOAD	=	17	kips		
DESIGN WIND OTM @ TOWER BASE	=	1253	ft-kips		
MAX DOWN LOAD PER LEG Po1	=	119	kips	NO. BAYS	
MAX UPLIFT PER LEG Uo1	=	105	kips	3	
TOWER HEIGHT	=	150	ft		
BASE WIDTH OF TOWER = W	=	12.75	ft	LEG SIZE	
NUMBER OF TOWER LEGS	=	3		3" - 3-1/4"	
FROST DEPTH	=	3.0	ft		
TOTAL THICKNESS of MAT = T	=	1.50	ft		
HEIGHT of PIERS ABOVE GRADE	=	0.5	ft		
DEPTH of MAT BELOW GRADE	=	5.00	ft		
SQUARE SIDE DIMENSION of MAT = L	=	22.00	ft		
SIDE DIMENSION/DIAMETER of PIER = Sp	=	-2.5	ft		
HEIGHT of PIER	=	4	ft		
DESIGN STRENGTH (ØRs)	=	2.6	ksf	**FROM SOILS REPORT**	
SAFETY FACTOR REQUIRED	=	1			
Fy of RE-BARS	=	60	ksi	Calculate As, req	
F'c of CONCRETE	=	4	ksi		

***** MAT FOUNDATION DESIGN *****

TOTAL APPLIED MOMENT	=	1333.0	ft-kips
ALLOWABLE RESISTING MOMENT	=	3282.5	ft-kips
TOTAL AXIAL LOAD DOWN Po	=	315.4	kips
ULTIMATE AXIAL LOAD DOWN Pu	=	378.5	kips
ECCENTRICITY e	=	4.23	ft
L/6	=	3.67	ft
AXIAL BEARING PRESSURE qa	=	0.6517	ksf
WIND MOMENT BP qw	=	0.7511	ksf
MAX. SOIL BEARING PRESSURE qmax	=	1.41	ksf
MIN. SOIL BEARING PRESSURE qmin	=	0.00	ksf
WIND LOAD %	=	53.2	%
LOAD FACTOR for WIND	=	0.75	
LOAD FACTOR for AXIAL LOAD	=	1.2	
U BP WIND @ TOE of MAT	=	0.56	ksf
U BP LOAD @ TOE of MAT	=	1.63	ksf
ULTIMATE BP @ TOE of MAT qu	=	2.20	ksf
ULTIMATE MOMENT in MAT UNDER TOWER	=	301.18	in-kips/ft
MOMENT CAPACITY REQ"D. = Mu/.9	=	334.64	in-kips/ft
a = Muc/.85*F'c*12*(D*12)	=	0.46	in
d DEPTH of MAT	=	14.50	in
EFFECTIVE d = d -a/2	=	14.27	in
C = T = Muc/d	=	23.45	kips/ft
AREA of RE-BARS REQ'D. FROM LD & MOM = As = T/Fy	=	0.391	sqin/ft
0.0018*A = MIN.TEMPERATURE STEEL As-min	=	0.194	sqin/ft

Allstate Tower, Inc.

Henderson, Kentucky

MAT/PIER FOUNDATION DESIGN for TOWER ***ER-074528*** 10/3/2018
Project No.: -074528 ***Client: IES*** RF
Project: St. Louis, MO
150' Tall x 12.75' Triangular Tower ***BASE REACTIONS PER TIA-222-H***

Check 2 Way Punching Shear from Max. Col. Load

SIDE of SQUARE OR DIAMETER @ d from PIER FACE	=	4.8787	ft
SHEAR LOAD Vu = Po1-(A2*AVGBp)	=	365.30	kips
SHEAR STRESS Va	=	139.16	psi
ALLOWABLE SHEAR STRESS Vu = .85*4*SQRT(f'c)	=	215.03	psi

Check Ultimate Moment @ Pier Face from Overhanging BP

ULTIMATE MOMENT Mu = 0.0625*L*(qu+qf)*(L-l)	=	37.58	kips/ft
AREA of RE-BARS REQ'D. FROM LD & MOM = As = T/Fy	=	0.626	sqin/ft

USE # 5 BARS @ 12 " OC EA. WAY in BOTTOM FACE
USE 21 BARS by 21.50 ft LONG
Weight 1.04 942 lbs

USE # 5 12 " OC EA. WAY in TOP FACE
USE 21 21.50 ft LONG
Weight 1.04 942 lbs

TOTAL MAT STEEL	**84**	**BARS by**	**21.5**	**ft LG.**	**=**	**1884 lbs**
DOWEL STEEL PIERS	**10**	**w/ 6" Hook #**	**6**	**Bars Eq. Sp.**	**=**	**259 lbs**
HOOP STEEL PIERS	**5**	**w/ 6" Hook #**	**4**	**Bars Eq. Sp.**	**=**	**63 lbs**
TOTAL RESTEEL					**=**	**2206 lbs**
TOTAL CONCRETE	**F'c =**	**4**	**ksi**		**=**	**29.1 cu-yds**

***USE EMBEDDED BEARING PLATE AT BOTTOM OF ANCHOR BOLT CLUSTER – BEARING PLATE THICKNESS TO BE A MINIMUM THICKNESS EQUAL TO ½ THE DIAMETER OF ANCHOR BOLT**

***USE 6 - 1.125" DIA. ANCHOR BOLTS BOLTED TO BASE PLATE PER REFERENCE CHART**

***MINIMUM 36" ANCHOR BOLT EMBEDMENT**

Allstate Tower, Inc.

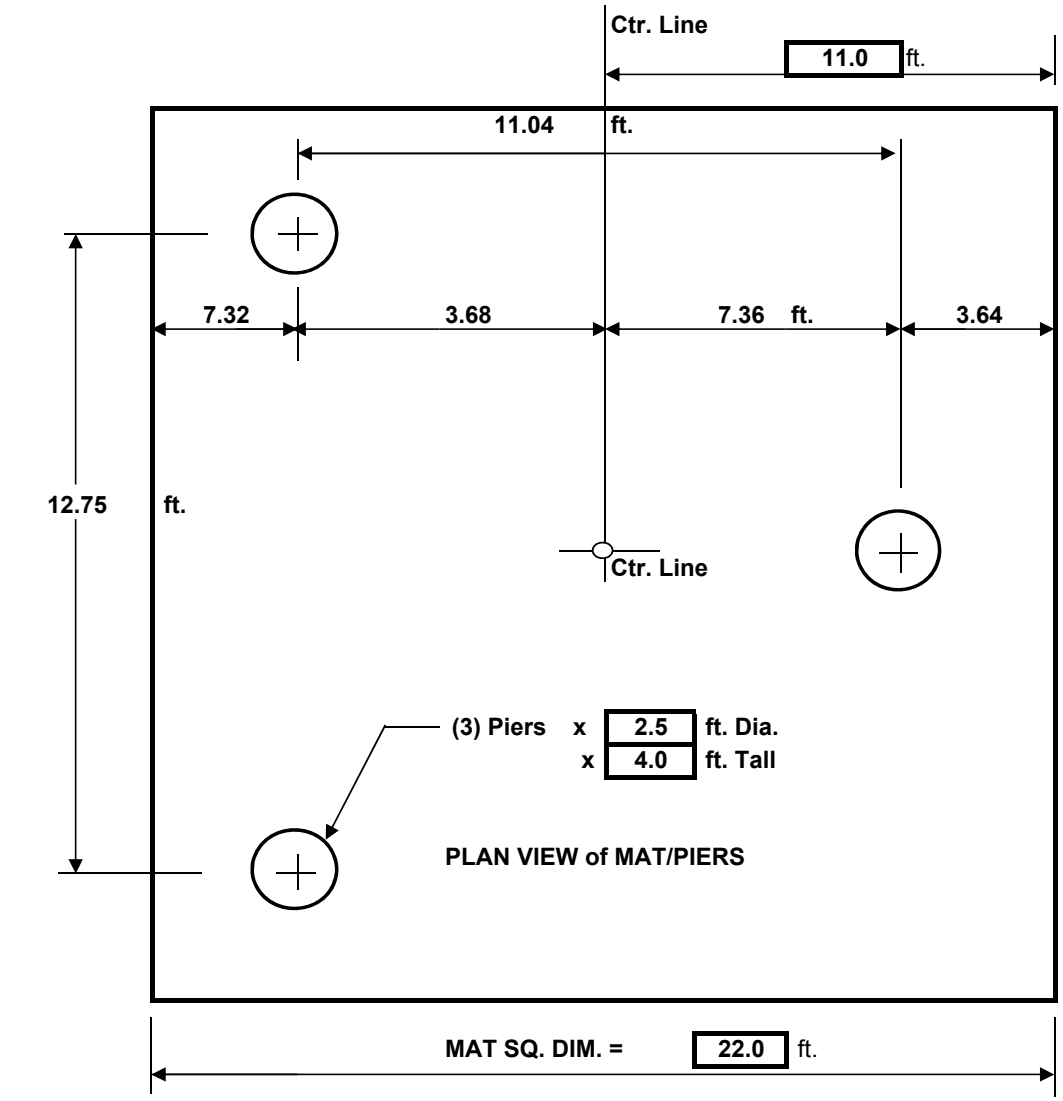
Henderson, Kentucky

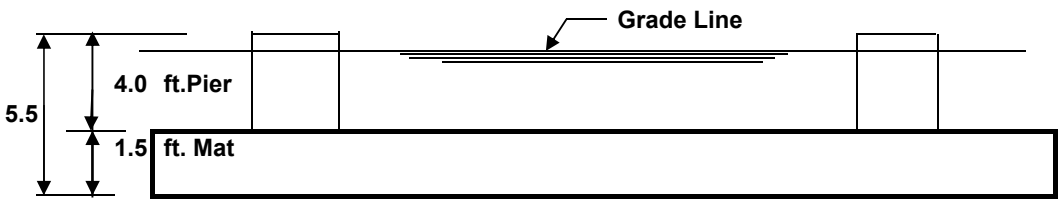
MAT/PIER FOUNDATION DESIGN for TOWER ***ER-074528*** 10/3/2018

Project No.: -074528 ***Client: IES*** RF

Project: ***St. Louis, MO***

150' Tall x 12.75' Triangular Tower ***BASE REACTIONS PER TIA-222-H***





SECTION VIEW of MAT/PIERS