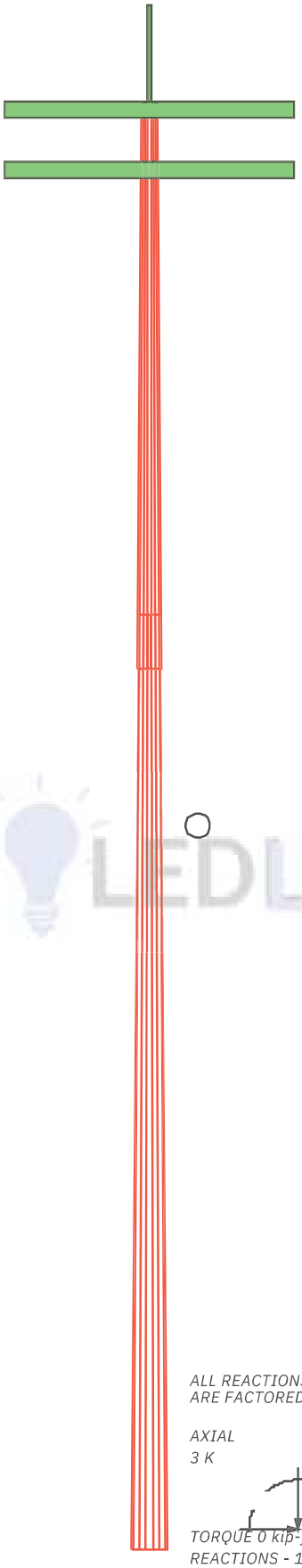

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)1.5
1	23.524	18	0.157	2.238	7.087	11.531		0.4
2	38.714	18	0.197		10.794	18.110		1.2

DESIG N ED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	6	Cross arm with (4) fixtures	57.5
Cross arm with (4) fixtures	0		

6

0

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Collier County, Florida.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 153 mph basic wind in accordance with the TIA-222-H Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
9. TOWER RATING: 86.1%

ALL REACTIONS ARE FACTORED

AXIAL
3 K

SHEAR MOMENT
6 K 261 kip-ft

TORQUE 0 kip-ft
REACTIONS - 153 mph WIND

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Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.
The following design criteria apply:
Tower is located in Collier County, Florida.
Tower base elevation above sea level: 0.000 ft.
Basic wind speed of 153 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Deflections calculated using a wind speed of 60 mph.
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
√ Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
√ Autocalc Torque Arm Areas
Add IBC .6D+W Combination
Sort Capacity Reports By Component
√ Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
√ All Leg Panels Have Same Allowable
Offset Girt At Foundation
Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist. Exemption
√ Use TIA-222-H Tension Splice Exemption

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	60.000-36.476	23.524	2	18	7.087	11.531	0.157	0.630	A572-65

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Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	36.476-0.000	38.714		18	10.794	18.110	0.197	0.787	(65 ksi) A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in2	I in4	r in	C in	I/C in3	J in4	It/Q in2	w in	w/t
L1	7.172 11.685	3.463 5.685	21.009 92.921	2.460 4.038	3.600 5.858	5.836 15.862	42.046 185.964	1.732 2.843	0.970 1.752	6.16 11.128
L2	11.359 18.359	6.621 11.192	93.933 453.747	3.762 6.359	5.483 9.200	17.131 49.320	187.989 908.091	3.311 5.597	1.553 2.841	7.89 14.432

Tower Elevation ft	Gusset Area (per face) ft2	Gusset Thickness in	Gusset Grade Adjust. Factor Af	Adjust. Factor Ar	Weight Mult. Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
L1 60.000-36.476			1	1	1		
L2 36.476-0.000			1	1	1		

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	√
Anchor bolt grade	F1554-55
Anchor bolt size	1.250 in
Number of bolts	12
Embedment length	43.307 in
f'c	4.00 ksi
Grout space	2.000 in
Base plate grade	A572-50
Base plate thickness	1.772 in
Bolt circle diameter	23.622 in
Outer diameter	27.559 in
Inner diameter	16.142 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude Torque Calculation	Component Type	Placement ft	Total Number		CAAA ft2/ft	Weight klf
LDF-50A (1 5/8 FOAM)	C	No	Yes	Inside Pole	60.000 - 0.000	1	No Ice	0.000	0.00

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Description	Face or Leg	Allow Shield Torque Calculation	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		CAAA ft2/ft	Weight klf
Step Bolts			C No Yes CaAa (Out Of Face)		60.000 - 0.000	1	No Ice	0.049	0.00
Safety cable			C No Yes CaAa (Out Of Face)		60.000 - 0.000	1	No Ice	0.037	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	AR ft2	AF ft2	CAAA In Face ft2	CAAA Out Face ft2	Weight K
L1	60.000-36.476	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.040	0.06
L2	36.476-0.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.163	0.09

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		CAAA Front ft2	CAAA Side ft2	Weight K
Lightning Rod	C	From Face	0.000	2	0.00	60.000	No Ice	3.000	3.000	0.05
****** Cross arm with (4) fixtures	B	None			0.00	60.000	No Ice	18.729	10.764	0.37
****** Cross arm with (4) fixtures	B	None			0.00	57.500	No Ice	18.729	10.764	0.37

Tower Pressures - No Ice

GH = 1.100

Section Elevation ft	z ft	KZ	qz ksf	AG ft2	Face	AF ft2	AR ft2	Aleg ft2	Leg %	CAAA In Face ft2	CAAA Out Face ft2
L1 60.000-36.476	47.302	1.081	0	18.482	A	0.000	18.482	18.482	100.00	0.000	0.000
					B	0.000	18.482		100.00	0.000	0.000
					C	0.000	18.482		100.00	0.000	2.040

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Section Elevation ft	z ft	KZ	qz ksf	AG ft2	Face	AF ft2	AR ft2	Aleg ft2	Leg %	CAAA In Face ft2	CAAA Out Face ft2
	17.356			45.168		0.000	45.168	45.168			
L2		0.875	0		A	0.000	45.168		100.00	0.000	0.000
36.476-0.000					B	0.000	45.168		100.00	0.000	0.000
					C				100.00	0.000	3.163

Tower Pressure - Service

GH = 1.100

Section Elevation ft	z ft	KZ	qz ksf	AG ft2	Face	AF ft2	AR ft2	Aleg ft2	Leg %	CAAA In Face ft2	CAAA Out Face ft2
	47.302			18.482		0.000	18.482	18.482			
L1		1.081	0		A	0.000	18.482		100.00	0.000	0.000
60.000-36.476					B	0.000	18.482		100.00	0.000	0.000
					C	0.000	18.482		100.00	0.000	2.040
L2	17.356	0.875	0	45.168	A	0.000	45.168	45.168	100.00	0.000	0.000
36.476-0.000					B	0.000	45.168		100.00	0.000	0.000
					C	0.000	45.168		100.00	0.000	3.163

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	CF	qz ksf	DF	DR	AE ft2	F K	w klf	Ctrl. Face
	0.06	0.37							18.482	1.05	0.04	
L1			A	1	0.73	0	1	1	18.482			C
60.000-36.476			B	1	0.73		1	1	18.482			
			C	1	0.73		1	1	45.168			
L2	0.09	1.17	A	1	0.73	0	1	1	45.168	2.03	0.06	C
36.476-0.000			B	1	0.73		1	1	45.168			
			C	1	0.73		1	1	85.03			
Sum Weight:	0.14	1.54						OTM	kip-ft	3.09		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	CF	qz ksf	DF	DR	AE ft2	F K	w klf	Ctrl. Face
	0.06	0.37							18.482	1.05	0.04	
L1			A	1	0.73	0	1	1	18.482			C
60.000-36.476			B	1	0.73		1	1	18.482			
			C	1	0.73		1	1	45.168			
L2	0.09	1.17	A	1	0.73	0	1	1	45.168	2.03	0.06	C
36.476-0.000			B	1	0.73		1	1	45.168			
			C	1	0.73		1	1	85.03			
Sum Weight:	0.14	1.54						OTM	kip-ft	3.09		

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Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	CF	qz ksf	DF	DR	AE ft2	F K	w klf	Ctrl. Face
	0.06	0.37							18.482	1.05	0.04	
L1			A	1	0.73	0	1	1	18.482			C
60.000-36.476			B	1	0.73		1	1	18.482			
			C	1	0.73		1	1	45.168			
L2	0.09	1.17	A	1	0.73	0	1	1	45.168	2.03	0.06	C
36.476-0.000			B	1	0.73		1	1	45.168			
Sum Weight:			C	1	0.73		1	1	85.03			
	0.14	1.54						OTM	kip-ft	3.09		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	CF	qz ksf	DF	DR	AE ft2	F K	w klf	Ctrl. Face
	0.06	0.37							18.482	0.19	0.01	
L1			A	1	1.019	0	1	1	18.482			C
60.000-36.476			B	1	1.019		1	1	18.482			
			C	1	1.019		1	1	45.168			
L2	0.09	1.17	A	1	0.793	0	1	1	45.168	0.30	0.01	C
36.476-0.000			B	1	0.793		1	1	45.168			
Sum Weight:			C	1	0.793		1	1	14.44			
	0.14	1.54						OTM	kip-ft	0.50		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	CF	qz ksf	DF	DR	AE ft2	F K	w klf	Ctrl. Face
	0.06	0.37							18.482	0.19	0.01	
L1			A	1	1.019	0	1	1	18.482			C
60.000-36.476			B	1	1.019		1	1	18.482			
			C	1	1.019		1	1	45.168			
L2	0.09	1.17	A	1	0.793	0	1	1	45.168	0.30	0.01	C
36.476-0.000			B	1	0.793		1	1	45.168			
Sum Weight:			C	1	0.793		1	1	14.44			
	0.14	1.54						OTM	kip-ft	0.50		

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Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	CF	qz ksf	DF	DR	AE ft2	F K	w klf	Ctrl. Face
L1									18.482	0.19	0.01	
60.000-36.476	0.06	0.37	A	1	1.019	0	1	1	18.482			C
			B	1	1.019		1	1	18.482			
			C	1	1.019		1	1	45.168			
L2			A	1	0.793	0	1	1	45.168	0.30	0.01	C
36.476-0.000	0.09	1.17	B	1	0.793		1	1	45.168			
			C	1	0.793		1	1	14.44			
Sum Weight:								OTM	kip-ft			
	0.14	1.54								0.50		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, Mx kip-ft	Sum of Overturning Moments, Mz kip-ft	Sum of Torques kip-ft
Leg Weight	1.54					
Bracing Weight	0.00					
Total Member Self-Weight	1.54					
Total Weight	2.48			0.01	0.00	
Wind 0 deg - No Ice		0.00	-5.95	0.01	0.00	0.00
Wind 30 deg - No Ice		2.98	-5.16	-254.30	0.00	0.03
Wind 60 deg - No Ice		5.16	-2.98	-220.23	-127.16	0.05
Wind 90 deg - No Ice		5.95	0.00	-127.14	-220.25	0.06
Wind 120 deg - No Ice		5.16	2.98	0.01	-254.32	0.05
Wind 150 deg - No Ice		2.98	5.16	127.17	-220.25	0.03
Wind 180 deg - No Ice		0.00	5.95	220.26	-127.16	0.00
Wind 210 deg - No Ice		-2.98	5.16	254.33	0.00	-0.03
Wind 240 deg - No Ice		-5.16	2.98	220.26	127.16	-0.05
Wind 270 deg - No Ice		-5.95	0.00	127.17	220.25	-0.06
Wind 300 deg - No Ice		-5.16	-2.98	0.01	254.32	-0.05
Wind 330 deg - No Ice		-2.98	-5.16	-127.14	220.25	-0.03
Total Weight	2.48			-220.23	127.16	
Wind 0 deg - Service		0.00	-0.89	0.01	0.00	0.00
Wind 30 deg - Service		0.45	-0.77	-37.72	0.00	0.00
Wind 60 deg - Service		0.77	-0.45	-32.66	-18.87	0.01
Wind 90 deg - Service		0.89	0.00	-18.85	-32.68	0.01
Wind 120 deg - Service		0.77	0.45	0.01	-37.73	0.01
Wind 150 deg - Service		0.45	0.77	18.88	-32.68	0.00
Wind 180 deg - Service		0.00	0.89	32.69	-18.87	0.00
Wind 210 deg - Service		-0.45	0.77	37.75	0.00	-0.00
Wind 240 deg - Service		-0.77	0.45	32.69	18.87	-0.01
Wind 270 deg - Service		-0.89	0.00	18.88	32.68	-0.01
Wind 300 deg - Service		-0.77	-0.45	0.01	37.73	-0.01
Wind 330 deg - Service		-0.45	-0.77	-18.85	32.68	-0.00
				-32.66	18.87	

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Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	Dead+Wind 0 deg - Service
27	Dead+Wind 30 deg - Service
28	Dead+Wind 60 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 120 deg - Service
31	Dead+Wind 150 deg - Service
32	Dead+Wind 180 deg - Service
33	Dead+Wind 210 deg - Service
34	Dead+Wind 240 deg - Service
35	Dead+Wind 270 deg - Service
36	Dead+Wind 300 deg - Service
37	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	60 - 36.4764	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	1	-1.17	0.00	-0.01
			Max. Mx	8	-0.90	-70.27	-0.01
			Max. My	14	-0.90	0.00	-70.29
			Max. Vy	8	3.95	-70.27	-0.01
			Max. Vx	14	3.95	0.00	-70.29
			Max. Torque	8			-0.07
L2	36.4764 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-2.95	0.00	261.28
			Max. Mx	8	-2.95	-261.30	-0.02
			Max. My	14	-2.95	0.00	-261.32
			Max. Vy	8	5.96	-261.30	-0.02
			Max. Vx	14	5.96	0.00	-261.32

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	8			-0.06

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	2	2.97	0.00	5.95
	Max. Hx	21	2.23	5.95	0.00
	Max. Hz	2	2.97	0.00	5.95
	Max. Mx	2	261.28	0.00	5.95
	Max. Mz	8	261.30	-5.95	0.00
	Max. Torsion	20	0.06	5.95	0.00
	Min. Vert	7	2.23	-5.16	2.98
	Min. Hx	9	2.23	-5.95	0.00
	Min. Hz	14	2.97	0.00	-5.95
	Min. Mx	14	-261.32	0.00	-5.95
	Min. Mz	20	-261.30	5.95	0.00
	Min. Torsion	8	-0.06	-5.95	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	Shearx K	Shearz K	Overturning Moment, Mx kip-ft	Overturning Moment, Mz kip-ft	Torque kip-ft
Dead Only	2.48	0.00	0.00	0.01	0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	2.97	0.00	-5.95	-261.28	0.00	0.00
0.9 Dead+1.0 Wind 0 deg - No Ice	2.23	0.00	-5.95	-259.17	0.00	0.00
1.2 Dead+1.0 Wind 30 deg - No Ice	2.97	2.98	-5.16	-226.27	-130.65	0.03
0.9 Dead+1.0 Wind 30 deg - No Ice	2.23	2.98	-5.16	-224.45	-129.59	0.03
1.2 Dead+1.0 Wind 60 deg - No Ice	2.97	5.16	-2.98	-130.63	-226.29	0.06
0.9 Dead+1.0 Wind 60 deg - No Ice	2.23	5.16	-2.98	-129.58	-224.46	0.05
1.2 Dead+1.0 Wind 90 deg - No Ice	2.97	5.95	0.00	0.02	-261.30	0.06
0.9 Dead+1.0 Wind 90 deg - No Ice	2.23	5.95	0.00	0.01	-259.18	0.06
1.2 Dead+1.0 Wind 120 deg - No Ice	2.97	5.16	2.98	130.67	-226.29	0.06
0.9 Dead+1.0 Wind 120 deg - No Ice	2.23	5.16	2.98	129.60	-224.46	0.05
1.2 Dead+1.0 Wind 150 deg - No Ice	2.97	2.98	5.16	226.31	-130.65	0.03
0.9 Dead+1.0 Wind 150 deg - No Ice	2.23	2.98	5.16	224.47	-129.59	0.03
1.2 Dead+1.0 Wind 180 deg - No Ice	2.97	0.00	5.95	261.32	0.00	0.00
0.9 Dead+1.0 Wind 180 deg -	2.23	0.00	5.95	259.20	0.00	0.00

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Load Combination	Vertical K	Shearx K	Shearz K	Overturning Moment, Mx kip-ft	Overturning Moment, Mz kip-ft	Torque kip-ft
No Ice 1.2 Dead+1.0 Wind 210 deg - No Ice	2.97	-2.98	5.16	226.31	130.65	-0.03
0.9 Dead+1.0 Wind 210 deg - No Ice	2.23	-2.98	5.16	224.47	129.59	-0.03
1.2 Dead+1.0 Wind 240 deg - No Ice	2.97	-5.16	2.98	130.67	226.29	-0.06
0.9 Dead+1.0 Wind 240 deg - No Ice	2.23	-5.16	2.98	129.60	224.46	-0.05
1.2 Dead+1.0 Wind 270 deg - No Ice	2.97	-5.95	0.00	0.02	261.30	-0.06
0.9 Dead+1.0 Wind 270 deg - No Ice	2.23	-5.95	0.00	0.01	259.18	-0.06
1.2 Dead+1.0 Wind 300 deg - No Ice	2.97	-5.16	-2.98	-130.63	226.29	-0.06
0.9 Dead+1.0 Wind 300 deg - No Ice	2.23	-5.16	-2.98	-129.58	224.46	-0.05
1.2 Dead+1.0 Wind 330 deg - No Ice	2.97	-2.98	-5.16	-226.27	130.65	-0.03
0.9 Dead+1.0 Wind 330 deg - No Ice	2.23	-2.98	-5.16	-224.45	129.59	-0.03
Dead+Wind 0 deg - Service	2.48	0.00	-0.89	-38.73	0.00	0.00
Dead+Wind 30 deg - Service	2.48	0.45	-0.77	-33.54	-19.37	0.00
Dead+Wind 60 deg - Service	2.48	0.77	-0.45	-19.36	-33.56	0.01
Dead+Wind 90 deg - Service	2.48	0.89	0.00	0.02	-38.75	0.01
Dead+Wind 120 deg - Service	2.48	0.77	0.45	19.39	-33.56	0.01
Dead+Wind 150 deg - Service	2.48	0.45	0.77	33.57	-19.37	0.00
Dead+Wind 180 deg - Service	2.48	0.00	0.89	38.76	0.00	0.00
Dead+Wind 210 deg - Service	2.48	-0.45	0.77	33.57	19.37	-0.00
Dead+Wind 240 deg - Service	2.48	-0.77	0.45	19.39	33.56	-0.01
Dead+Wind 270 deg - Service	2.48	-0.89	0.00	0.02	38.75	-0.01
Dead+Wind 300 deg - Service	2.48	-0.77	-0.45	-19.36	33.56	-0.01
Dead+Wind 330 deg - Service	2.48	-0.45	-0.77	-33.54	19.37	-0.00

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	-2.48	0.00	0.00	2.48	0.00	0.000%
2	0.00	-2.97	-5.95	0.00	2.97	5.95	0.000%
3	0.00	-2.23	-5.95	0.00	2.23	5.95	0.000%
4	2.98	-2.97	-5.16	-2.98	2.97	5.16	0.000%
5	2.98	-2.23	-5.16	-2.98	2.23	5.16	0.000%
6	5.16	-2.97	-2.98	-5.16	2.97	2.98	0.000%
7	5.16	-2.23	-2.98	-5.16	2.23	2.98	0.000%
8	5.95	-2.97	0.00	-5.95	2.97	0.00	0.000%
9	5.95	-2.23	0.00	-5.95	2.23	0.00	0.000%
10	5.16	-2.97	2.98	-5.16	2.97	-2.98	0.000%
11	5.16	-2.23	2.98	-5.16	2.23	-2.98	0.000%
12	2.98	-2.97	5.16	-2.98	2.97	-5.16	0.000%
13	2.98	-2.23	5.16	-2.98	2.23	-5.16	0.000%
14	0.00	-2.97	5.95	0.00	2.97	-5.95	0.000%
15	0.00	-2.23	5.95	0.00	2.23	-5.95	0.000%
16	-2.98	-2.97	5.16	2.98	2.97	-5.16	0.000%
17	-2.98	-2.23	5.16	2.98	2.23	-5.16	0.000%
18	-5.16	-2.97	2.98	5.16	2.97	-2.98	0.000%
19	-5.16	-2.23	2.98	5.16	2.23	-2.98	0.000%

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Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
20	-5.95	-2.97	0.00	5.95	2.97	0.00	0.000%
21	-5.95	-2.23	0.00	5.95	2.23	0.00	0.000%
22	-5.16	-2.97	-2.98	5.16	2.97	2.98	0.000%
23	-5.16	-2.23	-2.98	5.16	2.23	2.98	0.000%
24	-2.98	-2.97	-5.16	2.98	2.97	5.16	0.000%
25	-2.98	-2.23	-5.16	2.98	2.23	5.16	0.000%
26	0.00	-2.48	-0.89	0.00	2.48	0.89	0.000%
27	0.45	-2.48	-0.77	-0.45	2.48	0.77	0.000%
28	0.77	-2.48	-0.45	-0.77	2.48	0.45	0.000%
29	0.89	-2.48	0.00	-0.89	2.48	0.00	0.000%
30	0.77	-2.48	0.45	-0.77	2.48	-0.45	0.000%
31	0.45	-2.48	0.77	-0.45	2.48	-0.77	0.000%
32	0.00	-2.48	0.89	0.00	2.48	-0.89	0.000%
33	-0.45	-2.48	0.77	0.45	2.48	-0.77	0.000%
34	-0.77	-2.48	0.45	0.77	2.48	-0.45	0.000%
35	-0.89	-2.48	0.00	0.89	2.48	0.00	0.000%
36	-0.77	-2.48	-0.45	0.77	2.48	0.45	0.000%
37	-0.45	-2.48	-0.77	0.45	2.48	0.77	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance 0.00000001
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00002770
3	Yes	4	0.00000001	0.00000001
4	Yes	6	0.00000001	0.00014710
5	Yes	5	0.00000001	0.00000001
6	Yes	6	0.00000001	0.00014037
7	Yes	5	0.00000001	0.00000001
8	Yes	5	0.00000001	0.00000001
9	Yes	5	0.00000001	0.00000001
10	Yes	6	0.00000001	0.00014901
11	Yes	5	0.00000001	0.00000001
12	Yes	6	0.00000001	0.00014226
13	Yes	5	0.00000001	0.00000001
14	Yes	5	0.00000001	0.00002769
15	Yes	4	0.00000001	0.00000001
16	Yes	6	0.00000001	0.00014226
17	Yes	5	0.00000001	0.00000001
18	Yes	6	0.00000001	0.00014901
19	Yes	5	0.00000001	0.00000001
20	Yes	5	0.00000001	0.00000001
21	Yes	5	0.00000001	0.00000001
22	Yes	6	0.00000001	0.00014037
23	Yes	5	0.00000001	0.00000001
24	Yes	6	0.00000001	0.00014710
25	Yes	5	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00000001
28	Yes	5	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	5	0.00000001	0.00000001
31	Yes	5	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	5	0.00000001	

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34	Yes	5	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	5	0.00000001	0.00000001
37	Yes	5	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	60 - 36.4764	0.87	32	1.58	0.00
L2	38.7139 - 0	0.35	32	1.07	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
60.000	Lightning Rod	32	0.87	1.58	0.00	5690
57.500	Cross arm with (4) fixtures	32	0.80	1.52	0.00	5690

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	60 - 36.4764	5.89	14	10.84	0.02
L2	38.7139 - 0	2.40	14	7.24	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
60.000	Lightning Rod	14	5.89	10.84	0.02	873
57.500	Cross arm with (4) fixtures	14	5.43	10.42	0.01	873

Base Plate Design Data

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Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
in		in						
1.772	12	1.250	34.65 54.51 0.64	2.22 4.08 0.54	31.57 45.00 0.70		Plate	0.70 ✔

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	Lu	Kl/r	A	Pu	ϕPn	Ratio Pu / ϕPn
	ft		ft	ft		in2	K	K	
L1	60 - 36.4764 (1)	TP11.531x7.087x0.157	23.524	0.000	0.0	5.474	-0.90	320.22	0.003
L2	36.4764 - 0 (2)	TP18.11x10.794x0.197	38.714	0.000	0.0	11.192	-2.95	654.75	0.005

Pole Bending Design Data

Section No.	Elevation	Size	Mux	ϕMnx	Ratio Mux / ϕMnx	Muy	ϕMny	Ratio Muy / ϕMny
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	60 - 36.4764 (1)	TP11.531x7.087x0.157	70.29	90.99	0.772	0.00	90.99	0.000
L2	36.4764 - 0 (2)	TP18.11x10.794x0.197	261.32	305.35	0.856	0.00	305.35	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual Vu	ϕVn	Ratio Vu / ϕVn	Actual Tu	ϕTn	Ratio Tu / ϕTn
	ft		K	K		kip-ft	kip-ft	
L1	60 - 36.4764 (1)	TP11.531x7.087x0.157	3.95	96.07	0.041	0.03	92.13	0.000
L2	36.4764 - 0 (2)	TP18.11x10.794x0.197	5.96	196.43	0.030	0.00	308.15	0.000

Pole Interaction Design Data

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Section No.	Elevation ft	Ratio Pu / ϕPn	Ratio Mux / ϕMnx	Ratio Muy / ϕMny	Ratio Vu / ϕVn	Ratio Tu / ϕTn	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	60 - 36.4764 (1)	0.003	0.772	0.000	0.041	0.000	0.777 ✔	1.000	4.8.2 ✔
L2	36.4764 - 0 (2)	0.005	0.856	0.000	0.030	0.000	0.861 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øPallow % K Capacity	Pass Fail
L1	60 - 36.4764	Pole	TP11.531x7.087x0.157	1	-0.90	320.22 77.7	Pass
L2	36.4764 - 0	Pole	TP18.11x10.794x0.197	2	-2.95	654.75 86.1	Pass
						Summary	Pass
						Pole (L2) 86.1	Pass
						Base Plate 70.2	Pass
						RATING = 86.1	**Pass**

Program Version 8.1.1.0 - 6/4/2021 File:C:/Users/qd/Desktop/L20001041.250 Kelleher Street Naples.60ft 6~8L.153mph Vult/L20001041.250 Kelleher Str Naples.60ft 6~8L.153mph Vult.eri