



Structural Design Report
120' Monopole
Site: Lee's Summit JOF, MO

Prepared for: MOTOROLA ISPO
by: Sabre Industries™

Job Number: 26-2169-RSS-R2 Opt. 2

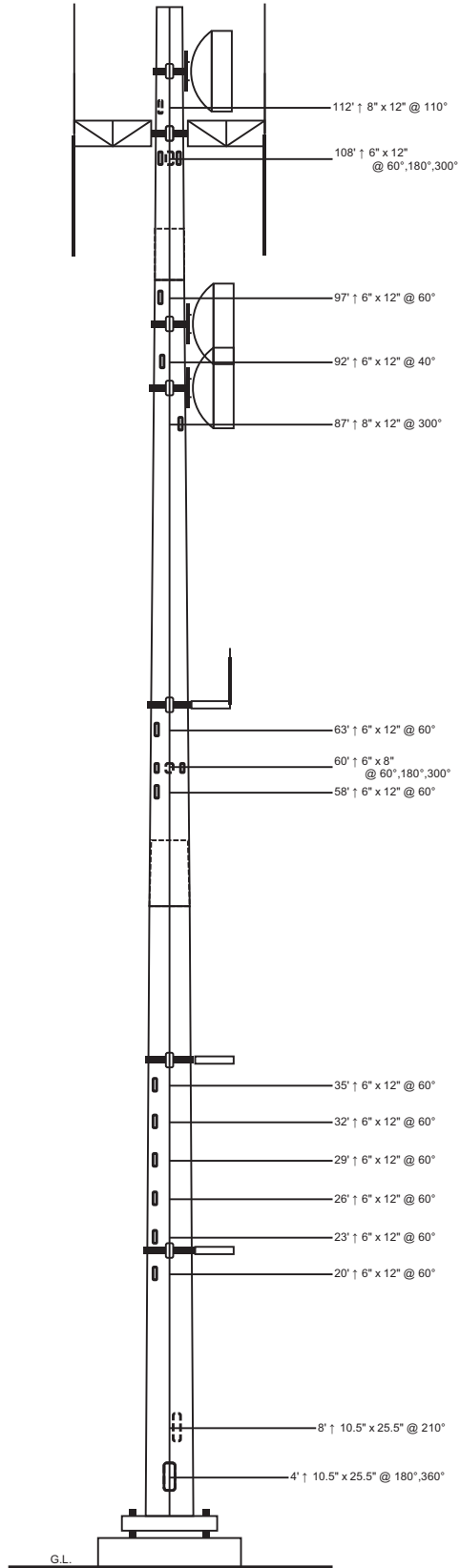
October 20, 2025

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10/20/25

Length (ft)	53'-3"	21'-6"
Number Of Sides	18	
Thickness (in)	5/16"	1/4"
Lap Splice (ft)	5'-3"	4'-0"
Top Diameter (in)	35.61"	24.25"
Bottom Diameter (in)	45.62"	28.25"
Taper (in/ft)	0.188	27.04"
Grade	A572-65	37.1"
Weight (lbs)	8612	5117
Overall Steel Height (ft)	119	1730



Design Criteria - ANSI/TIA-222-H

Wind Speed (No Ice)	117 mph
Wind Speed (Ice)	40 mph
Design Ice Thickness	1.50 in
Risk Category	III
Exposure Category	C
Topographic Factor Procedure	Method 1 (Simplified)
Topographic Category	1
Ground Elevation	1017 ft
Seismic Importance Factor, Ie	1.25
0.2-sec Spectral Response, Ss	0.099 g
1-sec Spectral Response, S1	0.068 g
Site Class	B
Seismic Design Category	A
Basic Seismic Force-Resisting System	Telecommunication Tower (Pole: Steel)

Limit State Load Combination Reactions

Load Combination	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
1.2 D + 1.0 Wo	22.6	19.03	1527.9	4.1	3.2
0.9 D + 1.0 Wo	16.96	19.13	1528.91	4.1	3.2
1.2 D + 1.0 Di + 1.0 Wi	39.94	4.43	333	0.87	0.68
1.2 D + 1.0 Ev + 1.0 Eh	24.23	0.6	55.59	0.16	0.12
0.9 D - 1.0 Ev + 1.0 Eh	17.76	0.6	55.58	0.16	0.12
1.0 D + 1.0 Wo (Service @ 60 mph)	18.83	4.48	357.93	0.96	0.75

Base Plate Dimensions

Shape	Diameter	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Round	53.5"	1.25"	50.25"	18	1.25"

Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
63"	1.25"	1.5"	487.8	F1554-105	Galv

Notes

- 1) Antenna Feed Lines Run Inside Pole
- 2) All dimensions are above ground level, unless otherwise specified.
- 3) Weights shown are estimates. Final weights may vary.
- 4) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2018 International Building Code.
- 5) Full Height Step Bolts
- 6) Tower Rating: 84.6%
- 7) This structure has been designed with a 50% increase in antenna and line loading.


 Sabre Industries 7101 Southbridge Drive P.O. Box 658 Sioux City, IA 51102-0658 Phone: (712) 258-6690 Fax: (712) 279-0814	Job:	26-2169-RSS-R2 Opt. 2
	Customer:	MOTOROLA ISPO
	Site Name:	Lee's Summit JOF, MO
	Description:	120' Monopole
	Date:	10/20/2025

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Designed Appurtenance Loading

Elev	Description	Tx-Line
115	(1) Dish Mount (Monopole Only) - Pipe Mount (8'-10' Dish)	
115	(1) VHLP6-6W-4GR/A	(1) EW63
114.76	(2) CC807-08	(2) 7/8"
110	Flush Mount (Monopole Only)	
110	(2) 6ft Sidearms	
110	(1) TTA (16" x 8" x 6")	(1) 1/2"
104.76	(2) CC807-08	(2) 7/8"
95	(1) Dish Mount (Monopole Only) - Pipe Mount (8'-10' Dish)	
95	(1) VHLPX6-6W-6WH	(2) EW63
90	(1) Dish Mount (Monopole Only) - Pipe Mount (8'-10' Dish)	
90	(1) VHLP6-6W-4GR/A	(1) EW63

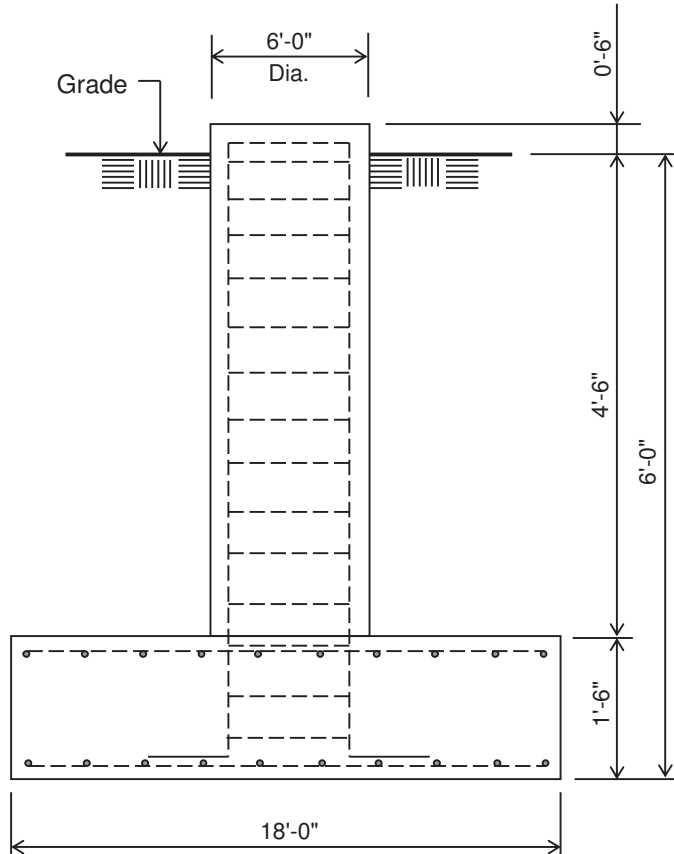
Elev	Description	Tx-Line
66.9	(1) DS1X00CS36UN	(1) 7/8"
65	3ft Standoff	
60	(1) Y1505	(1) 1/2"
37	3ft Standoff	
37	(1) Y8066	(1) 1/2"
34	(1) Y8066	(1) 1/2"
31	(1) Y8066	(1) 1/2"
28	(1) Y8066	(1) 1/2"
25	(1) Y8066	(1) 1/2"
22	3ft Standoff	
22	(1) Y8066	(1) 1/2"

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	Customer: MOTOROLA ISPO
	Site Name: Lee's Summit JOF, MO
	Description: 120' Monopole
	Date: 10/20/2025 By: KJT

Customer: MOTOROLA ISPO

Site: Lee's Summit JOF, MO

120' Monopole



ELEVATION VIEW

(23.24 Cu. Yds.)

(1 REQUIRED; NOT TO SCALE)

Notes:

- 1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
- 2) Rebar to conform to ASTM specification A615 Grade 60.
- 3) All rebar to have a minimum of 3" concrete cover.
- 4) All exposed concrete corners to be chamfered 3/4".
- 5) The foundation design is based on the geotechnical report by UES, Project No. J045326.01, dated May 21, 2024.
- 6) See the geotechnical report for compaction requirements, if specified.
- 7) 4.5 ft of soil cover is required over the entire area of the foundation slab.

- 8) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.

Rebar Schedule for Pad and Pier	
Pier	(34) #7 vertical rebar w/ hooks at bottom w/ #5 ties, (2) within top 5" of pier, then 4" C/C
Pad	(19) #8 horizontal rebar evenly spaced each way top and bottom (76 total)

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 (USA 222-H) - Monopole Spatial Analysis (c)2017 Guymast Inc.

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120' Monopole / Lee's Summit JOF, MO

* All pole diameters shown on the following pages are across corners.
 See profile drawing for widths across flats.

POLE GEOMETRY
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ELEV	SECTION No.	OUTSIDE	THICK	RESISTANCES		SPLICE	...OVERLAP...		w/t
ft	NAME	DIAM	-NESS	◆*Pn	◆*Mn	TYPE	LENGTH	RATIO	
		in	in	kip	ft-kip		ft		
119.0	.....	24.62	0.250	1414.9	696.7				
A	18	27.96	0.250	1558.9	873.7				15.9
101.5	.....	27.96	0.250	1558.9	873.7				
A/B	18	28.23	0.250	1569.8	888.5	SLIP	4.00	1.73	
97.5	.....	28.23	0.250	1569.8	888.5				
B	18	36.66	0.250	1866.6	1377.7				18.4
53.2	.....	36.66	0.250	1866.6	1377.7				
B/C	18	37.17	0.312	2538.4	1893.6	SLIP	5.25	1.72	
48.0	.....	37.17	0.312	2538.4	1893.6				
C	18	46.33	0.312	2927.0	2730.5				19.6
0.0	.....							

POLE ASSEMBLY
 =====

SECTION NAME	BASE ELEV	.....BOLTS AT BASE OF SECTION.....		CALC BASE ELEV
	ft	NUMBER	TYPE	ft
A	97.500	0	A325	97.500
B	48.000	0	A325	48.000
C	0.000	0	A325	0.000

POLE SECTIONS
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SECTION NAME	No. of SIDES	LENGTH	OUTSIDE.DIAMETER		BEND RAD	MAT-ERIAL ID	FLANGE.ID		FLANGE.WELD	
		ft	BOT *	TOP *	in		BOT	TOP	..GROUP.ID..	BOT TOP
			in	in					BOT TOP	
A	18	21.50	28.73	24.62	0.625	1	0	0	0	0
B	18	53.50	37.67	27.46	0.625	2	0	0	0	0
C	18	53.25	46.33	36.16	0.625	3	0	0	0	0

* - Diameter of circumscribed circle

MATERIAL TYPES

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TYPE OF SHAPE	TYPE NO	NO OF ELEM.	ORIENT	HEIGHT	WIDTH	.THICKNESS.		IRREGULARITY .PROJECTION.	
			& deg	in	in	in	in	% OF AREA	ORIENT deg
PL	1	1	0.0	28.73	0.25	0.250	0.250	0.00	0.0
PL	2	1	0.0	37.67	0.25	0.250	0.250	0.00	0.0
PL	3	1	0.0	46.33	0.31	0.312	0.312	0.00	0.0

& - With respect to vertical

MATERIAL PROPERTIES

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MATERIAL TYPE NO.	ELASTIC MODULUS ksi	UNIT WEIGHT pcf	.. STRENGTH ..		THERMAL COEFFICIENT /deg
			Fu ksi	Fy ksi	
1	29000.0	490.0	80.0	65.0	0.00001170
2	29000.0	490.0	80.0	65.0	0.00001170
3	29000.0	490.0	80.0	65.0	0.00001170

* Only 5 condition(s) shown in full

* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

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LOADING CONDITION A =====

117 mph wind with no ice. Wind Azimuth: 0° (1.2 D + 1.0 Wo)

LOADS ON POLE

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LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AZI	LOAD AZIFORCES.....	MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	114.500	0.00	0.0	0.0	0.0302	0.0151	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0000	0.1047	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.3978	0.0900	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0000	0.2211	0.0000	0.0000
C	109.000	0.00	0.0	0.0	1.7047	1.4287	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.1343	0.3078	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	0.0785	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0329	0.0168	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0000	0.2017	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.3902	0.0900	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0323	0.0168	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0000	0.1726	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.0817	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0315	0.0168	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0307	0.0168	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0461	0.0198	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0000	0.0641	0.0000	0.0000

C	65.000	0.00	0.0	0.0	0.0298	0.0168	0.0000	0.0000
C	64.000	0.00	0.0	0.0	0.3125	0.4622	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.1918	0.0546	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0000	0.0425	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0288	0.0168	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0276	0.0168	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.2938	0.4658	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0000	0.0259	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0261	0.0168	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0794	0.0402	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0000	0.0238	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0000	0.0216	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0779	0.0402	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0000	0.0194	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0762	0.0402	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0244	0.0168	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0000	0.0173	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0744	0.0402	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.1592	0.6100	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0000	0.0151	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0219	0.0168	0.0000	0.0000
D	119.000	0.00	180.0	0.0	0.0612	0.0797	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0649	0.0865	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0666	0.1777	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0666	0.1777	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0673	0.0913	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0757	0.1142	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0758	0.2628	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0758	0.2628	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0764	0.1494	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0704	0.1720	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0703	0.1766	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0721	0.1811	0.0000	0.0000

ANTENNA LOADING

=====

.....ANTENNA.....	ATTACHMENT				.....ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	89.0	217.0	1.9	217.0	-1.96	0.44	0.54	1.18
HP	94.0	310.0	1.9	310.0	2.20	0.61	0.54	-0.51
HP	114.0	24.0	1.8	24.0	2.71	-0.44	0.54	0.82

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LOADING CONDITION M

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117 mph wind with no ice. Wind Azimuth: 0° (0.9 D + 1.0 Wo)

LOADS ON POLE

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LOAD	ELEV	APPLY..	LOAD..	AT	LOADFORCES.....	MOMENTS.....	
TYPE	ft	RADIUS	ft	AZI	AZI	HORIZ	DOWN	VERTICAL	TORSNAL
		ft				kip	kip	ft-kip	ft-kip
C	114.500	0.00	0.0	0.0	0.0	0.0302	0.0113	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0	0.0000	0.0785	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0	0.3978	0.0675	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0	0.0000	0.1659	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0	1.7047	1.0715	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0	0.1343	0.2308	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0	0.0000	0.0589	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0	0.0329	0.0126	0.0000	0.0000

C	103.760	0.00	0.0	0.0	0.0000	0.1513	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.3902	0.0675	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0323	0.0126	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0000	0.1294	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.0613	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0315	0.0126	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0307	0.0126	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0461	0.0148	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0000	0.0480	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0298	0.0126	0.0000	0.0000
C	64.000	0.00	0.0	0.0	0.3125	0.3467	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.1918	0.0410	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0000	0.0319	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0288	0.0126	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0276	0.0126	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.2938	0.3494	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0000	0.0194	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0261	0.0126	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0794	0.0302	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0000	0.0178	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0000	0.0162	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0779	0.0302	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0000	0.0146	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0762	0.0302	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0244	0.0126	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0000	0.0130	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0744	0.0302	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.1592	0.4575	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0000	0.0113	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0219	0.0126	0.0000	0.0000
D	119.000	0.00	180.0	0.0	0.0612	0.0598	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0649	0.0649	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0666	0.1333	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0666	0.1333	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0673	0.0684	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0757	0.0856	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0758	0.1971	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0758	0.1971	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0764	0.1120	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0704	0.1290	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0703	0.1324	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0721	0.1358	0.0000	0.0000

ANTENNA LOADING

=====

.....ANTENNA.....	ATTACHMENT		.....ANTENNA FORCES.....					
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	89.0	217.0	1.9	217.0	-1.96	0.44	0.40	1.18
HP	94.0	310.0	1.9	310.0	2.20	0.61	0.40	-0.51
HP	114.0	24.0	1.8	24.0	2.71	-0.44	0.40	0.82

=====

LOADING CONDITION Y =====

40 mph wind with 1.5 ice. Wind Azimuth: 0° (1.2 D + 1.0 Di + 1.0 Wi)

LOADS ON POLE

=====

LOAD	ELEV	APPLY..LOAD..AT	LOAD	.....FORCES.....		.....MOMENTS.....	
TYPE	ft	RADIUS	AZI	HORIZ	DOWN	VERTICAL	TORSNAL
	ft	ft		kip	kip	ft-kip	ft-kip

C	114.500	0.00	0.0	0.0	0.0307	0.0271	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0000	0.1047	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.1081	0.2365	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0000	0.2211	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.4188	2.5961	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0433	0.3662	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	0.0785	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0333	0.0288	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0000	0.2017	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.1055	0.2352	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0323	0.0288	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0000	0.1726	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.0817	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0312	0.0288	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0301	0.0288	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0150	0.0503	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0000	0.0641	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0288	0.0288	0.0000	0.0000
C	64.000	0.00	0.0	0.0	0.0938	0.4899	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.2419	0.2744	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0000	0.0425	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0274	0.0288	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0258	0.0288	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.1157	0.4972	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0000	0.0259	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0240	0.0288	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0529	0.0454	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0000	0.0238	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0000	0.0216	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0515	0.0453	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0000	0.0194	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0500	0.0453	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0217	0.0288	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0000	0.0173	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0483	0.0452	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0708	0.6398	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0000	0.0151	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0187	0.0288	0.0000	0.0000
D	119.000	0.00	180.0	0.0	0.0144	0.1448	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0151	0.1559	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0154	0.2491	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0154	0.2491	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0156	0.1635	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0170	0.1989	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0170	0.3487	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0170	0.3487	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0171	0.2362	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0154	0.2612	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0153	0.2629	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0156	0.2616	0.0000	0.0000

ANTENNA LOADING

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.....ANTENNA.....	ATTACHMENT			ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	89.0	217.0	1.9	217.0	-0.25	0.06	2.44	0.16
HP	94.0	310.0	1.9	310.0	0.28	0.08	2.45	-0.07
HP	114.0	24.0	1.8	24.0	0.34	-0.05	2.49	0.11

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LOADING CONDITION AK =====

Seismic - Azimuth: 0° (1.2 D + 1.0 Ev + 1.0 Eh)

LOADS ON POLE

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LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD AZI	AT AZIFORCES.....	MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	114.500	0.00	0.0	0.0	0.0009	0.0152	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0061	0.1056	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0675	1.1692	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0052	0.0909	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0128	0.2234	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0769	1.4427	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0042	0.0793	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0166	0.3108	0.0000	0.0000
C	108.250	0.00	0.0	0.0	0.0962	1.8264	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0008	0.0170	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0100	0.2037	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0044	0.0909	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0007	0.0170	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0072	0.1743	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0304	0.7410	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0031	0.0825	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0436	1.1692	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0006	0.0170	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0005	0.0170	0.0000	0.0000
C	74.750	0.00	0.0	0.0	0.1522	5.5566	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0004	0.0200	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0014	0.0647	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0004	0.0170	0.0000	0.0000
C	64.000	0.00	0.0	0.0	0.0097	0.4667	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0010	0.0551	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0008	0.0429	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0003	0.0170	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0002	0.0170	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0002	0.0262	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0035	0.4704	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0001	0.0170	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0003	0.0406	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0002	0.0240	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0001	0.0218	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0002	0.0406	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0002	0.0406	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0001	0.0196	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0387	8.7536	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0001	0.0170	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0001	0.0406	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0001	0.0175	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0000	0.0152	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0018	0.6160	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0000	0.0170	0.0000	0.0000
D	119.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000
D	0.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000

ANTENNA LOADING

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.....ANTENNA..... TYPE	ELEV ft	AZI	ATTACHMENT	ANTENNA FORCES.....			
			RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip
HP	89.0	217.0	1.9	217.0	0.00	0.00	0.00	0.00
HP	94.0	310.0	1.9	310.0	0.00	0.00	0.00	0.00
HP	114.0	24.0	1.8	24.0	0.00	0.00	0.00	0.00

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LOADING CONDITION AL =====

Seismic - Azimuth: 00 (0.9 D - 1.0 Ev + 1.0 Eh)

LOADS ON POLE

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LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD.. AZI	AT AZI	LOAD AZIFORCES.....	MOMENTS.....	
						HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	114.500	0.00	0.0	0.0	0.0	0.0009	0.0112	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0	0.0061	0.0775	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0	0.0675	0.8569	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0	0.0052	0.0666	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0	0.0128	0.1637	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0	0.0769	1.0575	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0	0.0042	0.0581	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0	0.0166	0.2278	0.0000	0.0000
C	108.250	0.00	0.0	0.0	0.0	0.0962	1.3387	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0	0.0008	0.0124	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0	0.0100	0.1493	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0	0.0044	0.0666	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0	0.0007	0.0124	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0	0.0072	0.1277	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0	0.0304	0.5432	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0	0.0031	0.0605	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0	0.0436	0.8569	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0	0.0006	0.0124	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0	0.0005	0.0124	0.0000	0.0000
C	74.750	0.00	0.0	0.0	0.0	0.1522	4.0728	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0	0.0004	0.0146	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0	0.0014	0.0475	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0	0.0004	0.0124	0.0000	0.0000
C	64.000	0.00	0.0	0.0	0.0	0.0097	0.3422	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0	0.0010	0.0404	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0	0.0008	0.0315	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0	0.0003	0.0124	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0	0.0002	0.0124	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0	0.0002	0.0191	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0	0.0035	0.3448	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0	0.0001	0.0124	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0	0.0003	0.0298	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0	0.0002	0.0176	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0	0.0001	0.0160	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0	0.0002	0.0298	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0	0.0002	0.0298	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0	0.0001	0.0144	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0	0.0387	6.4161	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0	0.0001	0.0124	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0	0.0001	0.0298	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0	0.0001	0.0128	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0	0.0000	0.0112	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0	0.0018	0.4515	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0	0.0000	0.0124	0.0000	0.0000
D	119.000	0.00	180.0	180.0	0.0	0.0000	0.0000	0.0000	0.0000
D	0.000	0.00	180.0	180.0	0.0	0.0000	0.0000	0.0000	0.0000

ANTENNA LOADING

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.....ANTENNA..... TYPE	ELEV ft	AZI	ATTACHMENT	ANTENNA FORCES.....			
			RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip

HP	89.0	217.0	1.9	217.0	0.00	0.00	0.00	0.00
HP	94.0	310.0	1.9	310.0	0.00	0.00	0.00	0.00
HP	114.0	24.0	1.8	24.0	0.00	0.00	0.00	0.00

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120' Monopole / Lee's Summit JOF, MO

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

MAST ELEV ft	DEFLECTIONS (ft)			ROTATIONS (deg)		
	HORIZONTAL ALONG	ACROSS	DOWN	TILT ALONG	ACROSS	TWIST
119.0	4.10A	-0.58L	0.18A	3.20A	-0.49L	-0.04J
111.5	3.68A	-0.52L	0.16A	3.20A	-0.49L	-0.04I
106.5	3.40A	-0.48L	0.14A	3.19A	-0.49L	-0.03H
101.5	3.13A	-0.43L	0.13A	3.15A	-0.48L	-0.03H
97.5	2.91A	-0.40L	0.11A	3.11A	-0.47L	-0.03H
91.2	2.57A	-0.35L	0.10A	3.02A	-0.45L	-0.03H
84.9	2.25A	-0.30L	0.08A	2.90A	-0.42L	-0.03H
78.5	1.93A	-0.26L	0.06A	2.74A	-0.39L	-0.02H
72.2	1.64A	-0.22L	0.05A	2.56A	-0.36L	-0.02H
65.9	1.37A	-0.18L	0.04A	2.35A	-0.33L	-0.02H
59.6	1.13A	-0.15L	0.03A	2.13A	-0.29L	-0.01H
53.2	0.90A	-0.12L	0.02A	1.90A	-0.25L	-0.01H
48.0	0.74A	-0.09L	0.02A	1.73A	-0.23L	-0.01H
42.0	0.57M	-0.07L	0.01A	1.53A	-0.20L	-0.01H
36.0	0.42M	-0.05L	0.01A	1.32A	-0.17L	-0.01H
30.0	0.29M	-0.04L	0.00A	1.11A	-0.14L	-0.01H
24.0	0.19M	-0.02L	0.00A	0.89M	-0.11L	0.00H
18.0	0.11M	-0.01L	0.00A	0.67M	-0.08L	0.00H
12.0	0.05M	-0.01L	0.00A	0.45M	-0.05L	0.00H
6.0	0.01M	0.00L	0.00Y	0.22M	-0.03L	0.00H

0.0 0.00A 0.00A 0.00A 0.00A 0.00A 0.00A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS

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ELEV ft	ANT AZI	ANT TYPE BEAM DEFLECTIONS (deg)			
			ROLL	YAW	PITCH	TOTAL
114.0	24.0	HP	-2.781 K	0.100 C	3.177 B	3.178 B
94.0	310.0	HP	2.973 B	0.075 B	2.663 K	2.664 K
89.0	217.0	HP	2.615 K	0.073 C	-2.918 B	2.918 B

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

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MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION ft-kip
		ALONG kip	ACROSS kip	ALONG ft-kip	ACROSS ft-kip	
119.0	0.00 F	0.00 S	0.00 E	-0.02 M	0.01 E	0.00 E
	4.18 AA	3.65 N	-1.40 L	-9.39 H	4.47 AC	4.13 E
111.5	4.18 AE	3.67 B	-1.41 X	-9.40 H	4.47 AC	4.13 E
	7.98 AE	5.82 B	-1.41 X	-33.26 B	10.06 X	4.06 Q
106.5	7.98 AD	5.81 B	-1.44 X	-33.31 B	10.02 X	4.06 Q
	9.22 AD	6.56 B	-1.44 X	-65.22 B	17.35 X	4.00 Q
101.5	9.22 Y	6.59 B	-1.45 X	-65.18 B	17.31 X	4.00 Q
	10.21 Y	6.85 B	-1.45 X	-93.04 B	23.20 X	3.97 Q
97.5	10.21 AB	6.89 B	-1.44 X	-93.07 B	23.19 X	3.97 Q
	13.92 AB	9.13 M	-0.90 X	-143.25 B	31.25 X	4.64 Q
91.2	13.92 AB	9.14 M	-0.91 L	-143.25 B	31.25 X	4.64 Q
	17.55 AB	11.44 M	-1.68 R	-211.01 B	41.11 L	-4.48 H
84.9	17.55 AB	11.44 M	-1.66 R	-211.01 B	41.13 L	-4.48 H
	18.67 AB	11.88 M	-1.66 R	-286.01 A	51.80 L	-4.48 H
78.5	18.67 AB	11.89 M	-1.66 R	-286.02 A	51.81 L	-4.48 H
	19.84 AB	12.37 M	-1.66 R	-364.57 A	62.48 L	-4.49 H
72.2	19.84 AB	12.34 M	-1.66 R	-364.58 A	62.48 L	-4.49 H
	21.13 AB	12.85 M	-1.66 R	-445.98 A	73.13 L	-4.50 H
65.9	21.13 AB	12.86 M	-1.66 R	-445.97 A	73.12 L	-4.50 H
	22.86 AB	13.67 M	-1.66 R	-532.30 A	83.81 L	-4.51 H
59.6						

	22.86 AB	13.67 M	-1.66 R	-532.30 A	83.82 L	-4.51 H
	24.45 AB	14.36 M	-1.66 R	-623.22 A	94.43 L	-4.53 H
53.2	24.45 AB	14.37 M	-1.66 R	-623.23 A	94.44 L	-4.53 H
	26.28 AB	14.76 M	-1.66 R	-701.12 A	103.33 L	-4.54 H
48.0	26.28 AB	14.75 M	-1.66 R	-701.17 A	103.33 L	-4.54 H
	27.74 AB	15.23 M	-1.66 R	-792.78 A	113.47 L	-4.55 H
42.0	27.74 AG	15.26 M	-1.66 R	-792.79 A	113.46 L	-4.55 H
	29.19 AG	15.71 M	-1.66 R	-887.20 A	123.56 L	-4.57 H
36.0	29.72 AB	15.99 M	-1.66 R	-887.20 A	123.56 L	-4.57 H
	31.29 AB	16.54 M	-1.66 R	-986.33 A	133.56 L	-4.58 H
30.0	31.36 AG	16.62 M	-1.65 R	-986.34 A	133.56 L	-4.58 H
	32.96 AG	17.16 M	-1.65 R	-1088.80 A	143.55 L	-4.60 H
24.0	33.02 AB	17.24 M	-1.65 R	-1088.81 A	143.55 L	-4.60 H
	35.21 AB	17.83 M	-1.65 R	-1194.89 A	153.52 L	-4.61 H
18.0	35.21 AB	17.83 M	-1.66 R	-1194.89 A	153.52 L	-4.61 H
	36.79 AB	18.28 M	-1.66 R	-1303.75 M	163.44 L	-4.62 H
12.0	36.79 AB	18.28 M	-1.66 R	-1303.75 M	163.44 L	-4.62 H
	38.36 AB	18.70 M	-1.66 R	-1415.22 M	173.32 L	-4.63 H
6.0	38.36 AB	18.70 M	-1.66 R	-1415.22 M	173.32 L	-4.63 H
	39.94 AB	19.13 M	-1.66 R	-1528.91 M	183.14 L	-4.63 H

base	39.94 AB	-19.13 M	1.66 R	1528.91 M	-183.14 L	4.63 H
reaction						

COMPLIANCE WITH 4.8.2 & 4.5.4
=====

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
119.00	0.00F	0.00M	0.00S	0.00M	YES	15.87A	45.2
	0.00AA	0.01H	0.00N	0.01H	YES	16.86A	45.2
111.50	0.00AE	0.01H	0.00B	0.01H	YES	16.86A	45.2
	0.01AE	0.04B	0.01B	0.04B	YES	17.53A	45.2
106.50	0.01AD	0.04B	0.01B	0.04B	YES	17.53A	45.2
	0.01AD	0.07B	0.01B	0.08B	YES	18.19A	45.2
101.50	0.01Y	0.07B	0.01B	0.08B	YES	18.19A	45.2
	0.01Y	0.10B	0.01B	0.10B	YES	18.72A	45.2
97.50							

	0.01AB	0.10B	0.01B	0.11B	YES	18.37A	45.2
91.18	0.01AB	0.15B	0.01M	0.15B	YES	19.21A	45.2
	0.01AB	0.15B	0.01M	0.15B	YES	19.21A	45.2
84.86	0.01AB	0.21B	0.01M	0.21B	YES	20.04A	45.2
	0.01AB	0.21B	0.01M	0.21B	YES	20.04A	45.2
78.54	0.01AB	0.26A	0.01M	0.27A	YES	20.88A	45.2
	0.01AB	0.26A	0.01M	0.27A	YES	20.88A	45.2
72.21	0.01AB	0.31A	0.01M	0.32A	YES	21.72A	45.2
	0.01AB	0.31A	0.01M	0.32A	YES	21.72A	45.2
65.89	0.01AB	0.36A	0.01M	0.37A	YES	22.56A	45.2
	0.01AB	0.36A	0.01M	0.37A	YES	22.56A	45.2
59.57	0.01AB	0.41A	0.01M	0.41A	YES	23.40A	45.2
	0.01AB	0.41A	0.01M	0.41A	YES	23.40A	45.2
53.25	0.01AB	0.45A	0.02M	0.46A	YES	24.24A	45.2
	0.01AB	0.34A	0.01M	0.34A	YES	19.32A	45.2
48.00	0.01AB	0.36A	0.01M	0.37A	YES	19.87A	45.2
	0.01AB	0.37A	0.01M	0.38A	YES	19.59A	45.2
42.00	0.01AB	0.40A	0.01M	0.40A	YES	20.23A	45.2
	0.01AG	0.40A	0.01M	0.40A	YES	20.23A	45.2
36.00	0.01AG	0.42A	0.01M	0.43A	YES	20.87A	45.2
	0.01AB	0.42A	0.01M	0.43A	YES	20.87A	45.2
30.00	0.01AB	0.45A	0.01M	0.45A	YES	21.50A	45.2
	0.01AG	0.45A	0.01M	0.45A	YES	21.50A	45.2
24.00	0.01AG	0.47A	0.01M	0.48A	YES	22.14A	45.2
	0.01AB	0.47A	0.01M	0.48A	YES	22.14A	45.2
18.00	0.01AB	0.50A	0.01M	0.50A	YES	22.78A	45.2
	0.01AB	0.50A	0.01M	0.50A	YES	22.78A	45.2
12.00	0.01AB	0.52A	0.01M	0.53A	YES	23.41A	45.2
	0.01AB	0.52A	0.01M	0.53A	YES	23.41A	45.2
6.00	0.01AB	0.54M	0.01M	0.55A	YES	24.05A	45.2
	0.01AB	0.54M	0.01M	0.55A	YES	24.05A	45.2
0.00	0.01AB	0.56M	0.01M	0.57A	YES	24.68A	45.2

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

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DOWN SHEAR.w.r.t.WIND.DIR MOMENT.w.r.t.WIND.DIR TORSION

	ALONG	ACROSS	ALONG	ACROSS	
kip	kip	kip	ft-kip	ft-kip	ft-kip
39.94	19.13	-1.66	-1528.91	183.14	-4.63
AB	M	R	M	L	H

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120' Monopole / Lee's Summit JOF, MO

 ***** Service Load Condition *****

* Only 1 condition(s) shown in full
 * Some concentrated wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A =====

60 mph wind with no ice. Wind Azimuth: 0° (1.0 D + 1.0 Wo)

LOADS ON POLE
 =====

LOAD TYPE	ELEV ft	APPLY..LOAD..AT		LOAD AZI	.....FORCES.....		.....MOMENTS.....	
		RADIUS ft	AZI		HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	114.500	0.00	0.0	0.0	0.0071	0.0126	0.0000	0.0000
C	114.000	0.00	0.0	0.0	0.0000	0.0872	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0936	0.0750	0.0000	0.0000
C	113.760	0.00	0.0	0.0	0.0000	0.1843	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.4011	1.1906	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0316	0.2565	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	0.0654	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0078	0.0140	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0000	0.1681	0.0000	0.0000
C	103.760	0.00	0.0	0.0	0.0918	0.0750	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0076	0.0140	0.0000	0.0000
C	94.000	0.00	0.0	0.0	0.0000	0.1438	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	0.0681	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0074	0.0140	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0072	0.0140	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0108	0.0165	0.0000	0.0000
C	65.900	0.00	0.0	0.0	0.0000	0.0534	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0070	0.0140	0.0000	0.0000
C	64.000	0.00	0.0	0.0	0.0735	0.3852	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0451	0.0455	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0000	0.0354	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0068	0.0140	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0065	0.0140	0.0000	0.0000

C	36.000	0.00	0.0	0.0	0.0691	0.3882	0.0000	0.0000
C	36.000	0.00	0.0	0.0	0.0000	0.0216	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0062	0.0140	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0187	0.0335	0.0000	0.0000
C	33.000	0.00	0.0	0.0	0.0000	0.0198	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0000	0.0180	0.0000	0.0000
C	30.000	0.00	0.0	0.0	0.0183	0.0335	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0000	0.0162	0.0000	0.0000
C	27.000	0.00	0.0	0.0	0.0179	0.0335	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0057	0.0140	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0000	0.0144	0.0000	0.0000
C	24.000	0.00	0.0	0.0	0.0175	0.0335	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0375	0.5083	0.0000	0.0000
C	21.000	0.00	0.0	0.0	0.0000	0.0126	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0052	0.0140	0.0000	0.0000
D	119.000	0.00	180.0	0.0	0.0144	0.0664	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0153	0.0721	0.0000	0.0000
D	101.500	0.00	180.0	0.0	0.0157	0.1481	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0157	0.1481	0.0000	0.0000
D	97.500	0.00	180.0	0.0	0.0158	0.0761	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0178	0.0952	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0178	0.2190	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0178	0.2190	0.0000	0.0000
D	48.000	0.00	180.0	0.0	0.0180	0.1245	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0166	0.1434	0.0000	0.0000
D	12.000	0.00	180.0	0.0	0.0165	0.1471	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0170	0.1509	0.0000	0.0000

ANTENNA LOADING

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.....ANTENNA.....	ATTACHMENT			ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	89.0	217.0	1.9	217.0	-0.46	0.10	0.45	0.28
HP	94.0	310.0	1.9	310.0	0.52	0.14	0.45	-0.12
HP	114.0	24.0	1.8	24.0	0.64	-0.10	0.45	0.19

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MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

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MASTDEFLECTIONS (ft).....		ROTATIONS (deg).....		
ELEV HORIZONTAL		DOWN TILT		TWIST
ft	ALONG	ACROSS		ALONG	ACROSS	
119.0	0.96A	-0.14L	0.01A	0.75A	-0.12L	-0.01J
.....
111.5	0.86A	-0.12L	0.01A	0.75A	-0.12L	-0.01I
.....
106.5	0.80A	-0.11L	0.01A	0.74A	-0.11L	-0.01I
.....
101.5	0.73A	-0.10L	0.01A	0.73A	-0.11L	-0.01H
.....
97.5	0.68A	-0.09L	0.01A	0.73A	-0.11L	-0.01H
.....
91.2	0.60A	-0.08L	0.01A	0.70A	-0.11L	-0.01H
.....
84.9	0.53A	-0.07L	0.01A	0.68A	-0.10L	-0.01H
.....
78.5	0.45A	-0.06L	0.00A	0.64A	-0.09L	-0.01H
.....
72.2	0.38A	-0.05L	0.00A	0.60A	-0.08L	0.00H
.....
65.9	0.32A	-0.04L	0.00A	0.55A	-0.08L	0.00H

59.6	0.26A	-0.03L	0.00A	0.50A	-0.07L	0.00H
53.2	0.21A	-0.03L	0.00A	0.44A	-0.06L	0.00H
48.0	0.17A	-0.02L	0.00A	0.40A	-0.05L	0.00H
42.0	0.13A	-0.02L	0.00A	0.36A	-0.05L	0.00H
36.0	0.10A	-0.01L	0.00A	0.31A	-0.04L	0.00H
30.0	0.07A	-0.01L	0.00A	0.26A	-0.03L	0.00H
24.0	0.04A	-0.01L	0.00A	0.21A	-0.03L	0.00H
18.0	0.02A	0.00L	0.00A	0.16A	-0.02L	0.00H
12.0	0.01A	0.00L	0.00A	0.10A	-0.01L	0.00H
6.0	0.00A	0.00L	0.00A	0.05A	-0.01L	0.00H
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS

ELEV ft	ANT AZI	ANT TYPE	.... BEAM DEFLECTIONS (deg)			
			ROLL	YAW	PITCH	TOTAL
114.0	24.0	HP	-0.649 K	0.009 C	0.740 B	0.740 B
94.0	310.0	HP	0.695 B	0.009 B	0.622 K	0.622 K
89.0	217.0	HP	0.611 K	0.007 C	-0.682 B	0.682 B

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION ft-kip
		ALONG kip	ACROSS kip	ALONG ft-kip	ACROSS ft-kip	
119.0	0.00 C	0.00 A	0.00 E	-0.01 A	0.00 E	0.00 E
111.5	1.31 E	0.86 B	-0.33 L	-2.76 H	1.20 F	0.98 E
106.5	1.31 D	0.86 B	-0.33 L	-2.76 H	1.21 F	0.98 E
101.5	3.17 D	1.37 B	-0.33 L	-7.81 H	2.33 F	0.97 E
97.5	3.17 C	1.37 B	-0.33 L	-7.79 H	2.34 F	0.97 E
91.2	3.79 C	1.55 B	-0.33 L	-14.75 B	3.56 L	0.97 E
	3.79 K	1.53 B	-0.33 L	-14.75 B	3.57 L	0.97 E
	4.38 K	1.60 B	-0.33 L	-21.22 B	4.91 L	0.97 E
	4.38 D	1.61 B	-0.33 L	-21.24 B	4.92 L	0.97 E
	5.47 D	2.12 A	-0.20 L	-32.81 B	7.01 L	1.14 E

	5.47 D	2.12 A	-0.21 L	-32.81 B	7.00 L	1.14 E
	6.51 D	2.66 A	-0.39 F	-49.20 B	9.91 L	-1.05 H
84.9	.....	.....	.....	.....	.....	.....
	6.51 E	2.66 A	-0.39 F	-49.20 B	9.92 L	-1.05 H
	7.03 E	2.77 A	-0.39 F	-66.53 B	12.41 L	-1.05 H
78.5	.....	.....	.....	.....	.....	.....
	7.03 E	2.77 A	-0.39 F	-66.53 B	12.40 L	-1.05 H
	7.59 E	2.88 A	-0.39 F	-84.77 A	14.89 L	-1.05 H
72.2	.....	.....	.....	.....	.....	.....
	7.59 E	2.88 A	-0.39 F	-84.76 A	14.89 L	-1.05 H
	8.22 E	3.00 A	-0.39 F	-103.82 A	17.38 L	-1.05 H
65.9	.....	.....	.....	.....	.....	.....
	8.22 K	3.00 A	-0.38 F	-103.81 A	17.38 L	-1.05 H
	9.19 K	3.19 A	-0.38 F	-124.02 A	19.86 L	-1.05 H
59.6	.....	.....	.....	.....	.....	.....
	9.19 K	3.19 A	-0.38 F	-124.01 A	19.87 L	-1.05 H
	9.88 K	3.36 A	-0.38 F	-145.32 A	22.34 L	-1.05 H
53.2	.....	.....	.....	.....	.....	.....
	9.88 K	3.36 A	-0.39 F	-145.32 A	22.34 L	-1.05 H
	11.03 K	3.45 A	-0.39 F	-163.61 A	24.38 L	-1.05 H
48.0	.....	.....	.....	.....	.....	.....
	11.03 E	3.45 A	-0.38 F	-163.62 A	24.38 L	-1.05 H
	11.80 E	3.56 A	-0.38 F	-185.12 A	26.73 L	-1.05 H
42.0	.....	.....	.....	.....	.....	.....
	11.80 K	3.57 A	-0.38 F	-185.12 A	26.73 L	-1.05 H
	12.58 K	3.67 A	-0.38 F	-207.27 A	29.06 L	-1.05 H
36.0	.....	.....	.....	.....	.....	.....
	12.99 E	3.74 A	-0.38 F	-207.27 A	29.06 L	-1.05 H
	13.85 E	3.87 A	-0.38 F	-230.52 A	31.38 L	-1.05 H
30.0	.....	.....	.....	.....	.....	.....
	13.90 E	3.89 A	-0.38 F	-230.52 A	31.38 L	-1.05 H
	14.78 E	4.02 A	-0.38 F	-254.60 A	33.71 L	-1.05 H
24.0	.....	.....	.....	.....	.....	.....
	14.82 K	4.04 A	-0.38 L	-254.60 A	33.71 L	-1.05 H
	16.18 K	4.18 A	-0.38 L	-279.54 A	36.04 L	-1.05 H
18.0	.....	.....	.....	.....	.....	.....
	16.18 K	4.18 A	-0.38 L	-279.54 A	36.03 L	-1.05 H
	17.04 K	4.28 A	-0.38 L	-305.15 A	38.35 L	-1.05 H
12.0	.....	.....	.....	.....	.....	.....
	17.04 K	4.28 A	-0.38 L	-305.15 A	38.35 L	-1.05 H
	17.93 K	4.38 A	-0.38 L	-331.29 A	40.65 L	-1.05 H
6.0	.....	.....	.....	.....	.....	.....
	17.93 K	4.38 A	-0.38 L	-331.29 A	40.65 L	-1.05 H
	18.83 K	4.48 A	-0.38 L	-357.93 A	42.94 L	-1.05 H

base						
reaction	18.83 K	-4.48 A	0.38 L	357.93 A	-42.94 L	1.05 H

COMPLIANCE WITH 4.8.2 & 4.5.4
=====

ELEV AXIAL BENDING SHEAR + TOTAL SATISFIED D/t(w/t) MAX

ft	TORSIONAL					ALLOWED	
119.00	0.00C	0.00A	0.00A	0.00A	YES	15.87A	45.2
	0.00E	0.00H	0.00B	0.00H	YES	16.86A	45.2
111.50	0.00D	0.00H	0.00B	0.00H	YES	16.86A	45.2
	0.00D	0.01H	0.00B	0.01H	YES	17.53A	45.2
106.50	0.00C	0.01H	0.00B	0.01H	YES	17.53A	45.2
	0.00C	0.02B	0.00B	0.02B	YES	18.19A	45.2
101.50	0.00K	0.02B	0.00B	0.02B	YES	18.19A	45.2
	0.00K	0.02B	0.00B	0.03B	YES	18.72A	45.2
97.50	0.00D	0.02B	0.00B	0.03B	YES	18.37A	45.2
	0.00D	0.03B	0.00A	0.04B	YES	19.21A	45.2
91.18	0.00D	0.03B	0.00A	0.04B	YES	19.21A	45.2
	0.00D	0.05B	0.00A	0.05B	YES	20.04A	45.2
84.86	0.00E	0.05B	0.00A	0.05B	YES	20.04A	45.2
	0.00E	0.06A	0.00A	0.07A	YES	20.88A	45.2
78.54	0.00E	0.06A	0.00A	0.07A	YES	20.88A	45.2
	0.00E	0.07A	0.00A	0.08A	YES	21.72A	45.2
72.21	0.00E	0.07A	0.00A	0.08A	YES	21.72A	45.2
	0.00E	0.08A	0.00A	0.09A	YES	22.56A	45.2
65.89	0.00K	0.08A	0.00A	0.09A	YES	22.56A	45.2
	0.01K	0.10A	0.00A	0.10A	YES	23.40A	45.2
59.57	0.01K	0.10A	0.00A	0.10A	YES	23.40A	45.2
	0.01K	0.11A	0.00A	0.11A	YES	24.24A	45.2
53.25	0.00K	0.08A	0.00A	0.08A	YES	19.32A	45.2
	0.00K	0.08A	0.00A	0.09A	YES	19.87A	45.2
48.00	0.00E	0.09A	0.00A	0.09A	YES	19.59A	45.2
	0.00E	0.09A	0.00A	0.10A	YES	20.23A	45.2
42.00	0.00K	0.09A	0.00A	0.10A	YES	20.23A	45.2
	0.00K	0.10A	0.00A	0.10A	YES	20.87A	45.2
36.00	0.00E	0.10A	0.00A	0.10A	YES	20.87A	45.2
	0.01E	0.10A	0.00A	0.11A	YES	21.50A	45.2
30.00	0.01E	0.10A	0.00A	0.11A	YES	21.50A	45.2
	0.01E	0.11A	0.00A	0.12A	YES	22.14A	45.2
24.00	0.01K	0.11A	0.00A	0.12A	YES	22.14A	45.2

18.00	0.01K	0.12A	0.00A	0.12A	YES	22.78A	45.2
	0.01K	0.12A	0.00A	0.12A	YES	22.78A	45.2
12.00	0.01K	0.12A	0.00A	0.13A	YES	23.41A	45.2
	0.01K	0.12A	0.00A	0.13A	YES	23.41A	45.2
6.00	0.01K	0.13A	0.00A	0.13A	YES	24.05A	45.2
	0.01K	0.13A	0.00A	0.13A	YES	24.05A	45.2
0.00	0.01K	0.13A	0.00A	0.14A	YES	24.68A	45.2

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

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DOWN kip	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION ft-kip
	ALONG kip	ACROSS kip	ALONG ft-kip	ACROSS ft-kip	
18.83 K	4.48 A	-0.38 L	-357.93 A	42.94 L	-1.05 H

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Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Parameters	Risk Category	Description	h _i (ft.)	w _i (kips)	W _i (kips)	w _i /h _i ^{ke}	Vertical Distribution of Seismic Forces			
							F _{sp} or E _h (kips)	E _v (kips)	1.2D + 1.0E _v (kips)	0.9D - 1.0E _v (kips)
S _s	III	Step Bolts/Safety Climb Load	114.50	0.0126	0.0000	54.3490	0.0009	0.0001	0.0152	0.0112
S ₁	1.500	Line Deadload	114.00	0.0872	0.0000	373.2347	0.0061	0.0010	0.1056	0.0775
Site Class	R	Mount/Antenna Load	114.00	0.9648	0.9648	4,129.5508	0.0675	0.0114	1.1692	0.8569
T _L (sec)	0.099	Antenna Load	113.76	0.0750	0.0750	319.8239	0.0052	0.0009	0.0909	0.0666
	0.068	Line Deadload	113.76	0.1843	0.0000	785.9139	0.0128	0.0022	0.2234	0.1637
	B	Line Deadload	109.00	0.0654	0.0000	258.6153	0.0042	0.0008	0.0793	0.0581
	12.000	Mount Load	109.00	1.1906	1.1906	4,708.0640	0.0769	0.0140	1.4427	1.0575
F _a	0.900	Mount/Antenna Load	109.00	0.2565	0.2565	1,014.2940	0.0166	0.0030	0.3108	0.2278
F _v	0.800	Structure - Section 1	108.25	1.5072	0.0000	5,887.8041	0.0962	0.0178	1.8264	1.3387
S _{MS}	0.089	Step Bolts/Safety Climb Load	105.00	0.0140	0.0000	51.8248	0.0008	0.0002	0.0170	0.0124
S _{M1}	0.054	Antenna Load	103.76	0.0750	0.0750	271.8705	0.0044	0.0009	0.0909	0.0666
S _{PS}	0.059	Line Deadload	103.76	0.1681	0.0000	609.3525	0.0100	0.0020	0.2037	0.1493
S _{BT}	0.036	Step Bolts/Safety Climb Load	95.00	0.0140	0.0000	43.4309	0.0007	0.0002	0.0170	0.0124
T _s	0.610	Line Deadload	94.00	0.1438	0.0000	437.8407	0.0072	0.0017	0.1743	0.1277
I _e	1.250	Mount/Antenna Load	94.00	0.6115	0.6115	1,861.8886	0.0304	0.0072	0.7410	0.5432
Ω	1.500	Line Deadload	89.00	0.0681	0.0000	188.2761	0.0031	0.0008	0.0825	0.0605
C _s	0.030	Mount/Antenna Load	89.00	0.9648	0.9648	2,667.3828	0.0436	0.0114	1.1692	0.8569
E (ksi)	29,000	Step Bolts/Safety Climb Load	85.00	0.0140	0.0000	35.6876	0.0006	0.0002	0.0170	0.0124
I _{top} (in ⁴)	1,389	Step Bolts/Safety Climb Load	75.00	0.0140	0.0000	28.6120	0.0005	0.0002	0.0170	0.0124
I _{bot} (in ⁴)	11,682	Structure - Section 2	74.75	4.5854	0.0000	9,316.1784	0.1522	0.0541	5.5666	4.0728
I _{avg} (in ⁴)	6,536	Antenna Load	65.90	0.0165	0.0000	26.8365	0.0004	0.0002	0.0200	0.0146
g (in/s ²)	386.4	Line Deadload	65.90	0.0534	0.0000	86.8527	0.0014	0.0006	0.0647	0.0475
W _t (kips)	19,993	Step Bolts/Safety Climb Load	65.00	0.0140	0.0000	22.2242	0.0004	0.0002	0.0170	0.0124
W _u (kips)	4,138	Mount Load	64.00	0.3852	0.0000	594.9727	0.0097	0.0045	0.4667	0.3422
W _L (kips)	15,855	Antenna Load	59.00	0.0455	0.0000	60.8766	0.0010	0.0005	0.0551	0.0404
L _p (in)	1428	Line Deadload	59.00	0.0354	0.0000	47.3634	0.0008	0.0004	0.0429	0.0315
f ₁ (Hertz)	0.492	Step Bolts/Safety Climb Load	55.00	0.0140	0.0000	16.5477	0.0003	0.0002	0.0170	0.0124
T (sec)	2.031	Step Bolts/Safety Climb Load	45.00	0.0140	0.0000	11.6111	0.0002	0.0002	0.0170	0.0124
k _e	1.7655	Line Deadload	36.00	0.0216	0.0000	12.0811	0.0002	0.0003	0.0262	0.0191
V _s (kips)	0.600	Mount/Antenna Load	36.00	0.3882	0.0000	217.1239	0.0035	0.0046	0.4704	0.3448
Seismic Design Category	A	Step Bolts/Safety Climb Load	35.00	0.0140	0.0000	7.4504	0.0001	0.0002	0.0170	0.0124
		Antenna Load	33.00	0.0335	0.0000	16.0687	0.0003	0.0004	0.0406	0.0298
		Line Deadload	33.00	0.0198	0.0000	9.4973	0.0002	0.0002	0.0240	0.0176
		Antenna Load	30.00	0.0335	0.0000	13.5801	0.0002	0.0004	0.0406	0.0298
		Line Deadload	30.00	0.0180	0.0000	7.2968	0.0001	0.0002	0.0218	0.0160
		Antenna Load	27.00	0.0335	0.0000	11.2750	0.0002	0.0004	0.0406	0.0298
		Line Deadload	27.00	0.0162	0.0000	5.4524	0.0001	0.0002	0.0196	0.0144

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Description	h _i (ft.)	w _i (kips)	W _i (kips)	w _i ^{ke} / h _i	Vertical Distribution of Seismic Forces			
					F _{se} or E _{sh} (kips)	E _v (kips)	1.2D + 1.0E _v (kips)	0.9D - 1.0E _v (kips)
Structure - Section 3	26.62	7.2237	0.0000	2,371.1800	0.0387	0.0852	8.7536	6.4161
Step Bolts/Safety Climb Load	25.00	0.0140	0.0000	4.1133	0.0001	0.0002	0.0170	0.0124
Antenna Load	24.00	0.0335	0.0000	9.1582	0.0001	0.0004	0.0406	0.0298
Line Deadload	24.00	0.0144	0.0000	3.9366	0.0001	0.0002	0.0175	0.0128
Line Deadload	21.00	0.0126	0.0000	2.7211	0.0000	0.0001	0.0152	0.0112
Mount/Antenna Load	21.00	0.5083	0.0000	109.7737	0.0018	0.0060	0.6160	0.4515
Step Bolts/Safety Climb Load	15.00	0.0140	0.0000	1.6692	0.0000	0.0002	0.0170	0.0124
Σ		19.99	4.1382	36,713.66	0.60	0.24	24.23	17.76



SO#: 26-2169-RSS-R2 Opt. 2
 Site Name: Lee's Summit JOF, MO
 Date: 10/20/2025

Round Base Plate and Anchor Rods, per ANSI/TIA 222-H

Pole Data

Diameter: 45.620 in (flat to flat)
 Thickness: 0.3125 in
 Yield (Fy): 65 ksi
 # of Sides: 18 "0" IF Round
 Strength (Fu): 80 ksi

Reactions

Moment, Mu: 1528.91 ft-kips
 Axial, Pu: 16.96 kips
 Shear, Vu: 19.13 kips

Anchor Rod Data

Quantity: 18
 Diameter: 1.25 in
 Rod Material: F1554
 Strength (Fu): 125 ksi
 Yield (Fy): 105 ksi
 BC Diam. (in): 50.25 BC Override: []

Plate Data

Diameter (in): 53.5 Dia. Override: []
 Thickness: 1.25 in
 Yield (Fy): 50 ksi
 Eff Width/Rod: 8.04 in
 Drain Hole: 2.625 in. diameter
 Drain Location: 20.75 in. center of pole to center of drain hole
 Center Hole: 33.5 in. diameter

Anchor Rod Results

(per 4.9.9)

Maximum Put: 80.43 Kips
 $\Phi^t \cdot R_{nt}$: 90.84 Kips
 Vu: 1.06 Kips
 $\Phi^v \cdot R_{nv}$: 57.52 Kips
 Tension Interaction Ratio: 0.78
 Maximum Puc: 82.08 Kips
 $\Phi^c \cdot R_{nc}$: 115.97 Kips
 Vu: 1.06 Kips
 $\Phi^c \cdot R_{ncv}$: 52.19 Kips
 Compression Interaction Ratio: 0.71
 Maximum Interaction Ratio: **78.4% Pass**

Base Plate Results

Base Plate (Mu/Z): 38.1 ksi
 Allowable $\Phi \cdot F_y$: 45.0 ksi (per AISC)
 Base Plate Interaction Ratio: **84.6% Pass**

MAT FOUNDATION DESIGN BY SABRE INDUSTRIES

120' Monopole MOTOROLA ISPO Lee's Summit JOF, MO (26-2169-RSS-R2 Opt. 2) 10/20/25 KJT

Overall Loads:

Factored Moment (ft-kips)	1528.91
Factored Axial (kips)	16.96
Factored Shear (kips)	19.13
Bearing Design Strength (ksf)	4.5
Water Table Below Grade (ft)	10
Width of Mat (ft)	18
Thickness of Mat (ft)	1.5
Depth to Bottom of Slab (ft)	6
Quantity of Bolts in Bolt Circle	18
Bolt Circle Diameter (in)	50.25
Effective Anchor	
Bolt Embedment (in)	51.5
Diameter of Pier (ft)	6
Ht. of Pier Above Ground (ft)	0.5
Ht. of Pier Below Ground (ft)	4.5
Quantity of Bars in Mat	19
Bar Diameter in Mat (in)	1
Area of Bars in Mat (in ²)	14.92
Spacing of Bars in Mat (in)	11.61
Quantity of Bars Pier	34
Bar Diameter in Pier (in)	0.875
Tie Bar Diameter in Pier (in)	0.625
Spacing of Ties (in)	4
Area of Bars in Pier (in ²)	20.44
Spacing of Bars in Pier (in)	5.90
f'c (ksi)	4.5
fy (ksi)	60
Unit Wt. of Soil (kcf)	0.12
Unit Wt. of Concrete (kcf)	0.15

Max. Net Bearing Press. (ksf)	3.37
Allowable Bearing Pressure (ksf)	3.00
Safety Factor	2.00
Ultimate Bearing Pressure (ksf)	6.00
Bearing Φs	0.75

Minimum Pier Diameter (ft)	6.00
Equivalent Square b (ft)	5.32
Square Pier? (Y/N)	N

Recommended Spacing (in)	5 to 12
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Minimum Pier A _s (in ²)	20.36
Recommended Spacing (in)	5 to 12

Volume of Concrete (yd³) 23.24

Two-Way Shear Action:

Average d (in)	14
φv _c (ksi)	0.191
φv _c = φ(2 + 4/β _c)f' _c ^{1/2}	0.302
φv _c = φ(α _s d/b _o +2)f' _c ^{1/2}	0.191
φv _c = φ4f' _c ^{1/2}	0.201
Shear perimeter, b _o (in)	311.23
β _c	1

v _u (ksi)	0.072
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J (in ³)	4.432E+06
c + d (in)	77.81
0.40M _{sc} (ft-kips)	649.8

One-Way Shear:

φV _c (kips)	304.3
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V _u (kips)	163.7
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Stability:

Overturning Design Strength (ft-k)	2170.2
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Total Applied M (ft-k)	1653.3
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Pier-Slab Transfer by Flexure:

b_{slab} (ft)	10.50		
ϕM_n (ft-kips)	1054.4	$0.60M_{sc}$ (ft-kips)	974.7

Pier Design:

ϕV_n (kips)	815.8	V_u (kips)	19.1
$\phi V_c = \phi 2(1 + N_u / (2000A_g)) f'_c{}^{1/2} b_w d$	418.2		
V_s (kips)	530.1	$*** V_s \max = 4 f'_c{}^{1/2} b_w d$ (kips)	1112.8
Maximum Spacing (in)	10.16	(Only if Shear Ties are Required)	
Actual Hook Development (in)	13.00	Req'd Hook Development l_{dh} (in) - Tension	10.96
		Req'd Hook Development l_{dc} (in) - Compression	11.81

Flexure in Slab:

ϕM_n (ft-kips)	903.7	M_u (ft-kips)	689.6
a (in)	1.08		
Steel Ratio	0.00493		
β_1	0.825		
Maximum Steel Ratio (ρ_t)	0.0197		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	69.00	Required Development in Pad (in)	26.83

Condition	1 is OK, 0 Fails
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Interaction Diagram	1
Two-Way Shear Action	1
One-Way Shear Action	1
Overturning	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1
Hook Development	1
Anchor Bolt Pullout	1
Anchor Bolt Punching Shear	1