



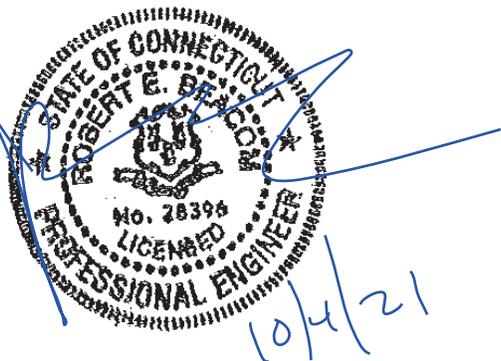
**Structural Design Report**

95' Monopine  
Site: Cheshire, CT  
Site Number: CT004

Prepared for: DIAMOND COMMUNICATIONS LLC  
by: Sabre Industries™

Job Number: 488746  
Revision A  
October 4, 2021

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## Designed Appurtenance Loading

Elev	Description	Tx-Line
90	3 THD V-Boom - 10ft Face - 3ft Standoff	
90	(1) 30,000 sq. in. antenna loading (below top)	(12) 1 5/8"
80	(1) 30,000 sq. in. antenna loading (below top)	(12) 1 5/8"
70	(1) 30,000 sq. in. antenna loading (below top)	(12) 1 5/8"
60	(1) 30,000 sq. in. antenna loading (below top)	(12) 1 5/8"

## Design Criteria - ANSI/TIA-222-G

ASCE 7-16 Ultimate Wind Speed (No Ice)	125 mph
Wind Speed (Ice)	50 mph
Design Ice Thickness	1.00 in
Structure Class	II
Risk Category	II
Exposure Category	C
Topographic Category	1
Seismic Importance Factor, I <sub>e</sub>	1.00
0.2-sec Spectral Response, S <sub>s</sub>	0.201 g
1-sec Spectral Response, S <sub>1</sub>	0.055 g
Site Class	C
0.2-sec Design Spectral Response, S <sub>ds</sub>	0.174 g
1-sec Design Spectral Response, S <sub>d1</sub>	0.055 g
Seismic Design Category	B
Basic Seismic Force-Resisting System	Telecommunication Tower (Pole: Steel)
Design Base Shear	1.20 kips
Seismic Response Coefficient, C <sub>s</sub>	0.03
Response Modification Coefficient, R	1.5
Analysis Procedure	Equivalent Lateral Force

## Limit State Load Combination Reactions

Load Combination	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
1.2 D + 1.0 W <sub>o</sub>	47.9	70.28	4711.92	4.74	5.37
0.9 D + 1.0 W <sub>o</sub>	35.93	70.24	4682.88	4.7	5.32
1.2 D + 1.0 D <sub>i</sub> + 1.0 W <sub>i</sub>	76.63	16.61	1124.09	1.15	1.3
1.2 D + 1.0 E <sub>v</sub> + 1.0 E <sub>h</sub>	49.26	1.2	89.21	0.1	0.12
0.9 D - 1.0 E <sub>v</sub> + 1.0 E <sub>h</sub>	34.52	1.2	88.48	0.1	0.11
1.0 D + 1.0 W <sub>o</sub> (Service @ 60 mph)	39.93	15.03	1006.35	1.02	1.15

## Base Plate Dimensions

Shape	Diameter	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Round	68.5"	2"	62.75"	16	2.25"

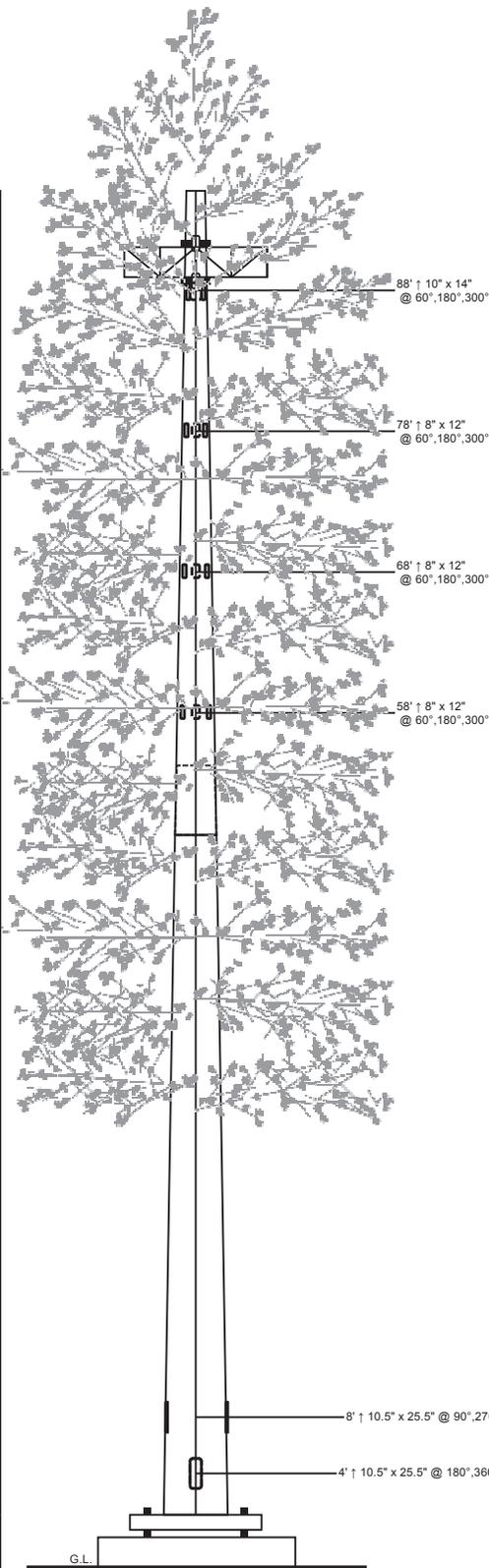
## Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	1937.6	A615-75	Galv

## Notes

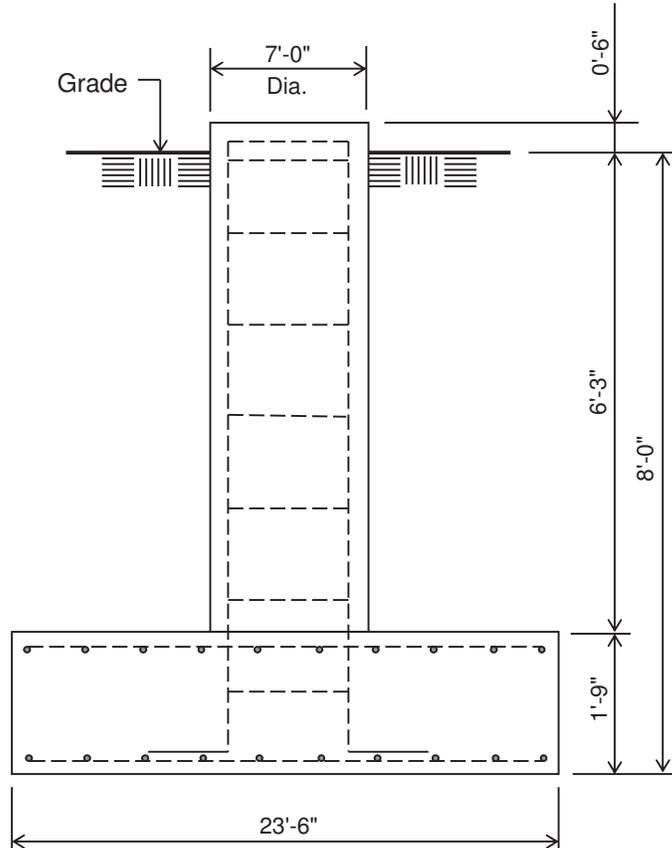
- 1) Antenna Feed Lines Run Inside Pole
- 2) All dimensions are above ground level, unless otherwise specified.
- 3) Weights shown are estimates. Final weights may vary.
- 4) Full Height Step Bolts
- 5) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2015 International Building Code.
- 6) Tower Rating: 98.4%
- 7) This structure is designed for a fall radius of 55'-0" at ground level.
- 8) This structure has been designed to support pine tree branches starting at the 30' elevation to an overall height of 99'.

Length (ft)	53'-3"	45'-9"
Number Of Sides	18	
Thickness (in)	3/8"	1/4"
Lap Splice (ft)	5'-0"	
Top Diameter (in)	33.06"	16"
Bottom Diameter (in)	56.01"	35.72"
Taper (in/ft)	0.431	
Grade	A572-65	
Weight (lbs)	111679	3778
Overall Steel Height (ft)	94	



 <p><b>Sabre Industries</b> 7101 Southbridge Drive P.O. Box 658 Sioux City, IA 51102-0658 Phone: (712) 258-6690 Fax: (712) 279-0814</p> <p><small>Information contained herein is the sole property of Sabre Communications Corporation, constitutes a trade secret as defined by Iowa Code Ch. 550 and shall not be reproduced, copied or used in whole or part for any purpose whatsoever without the prior written consent of Sabre Communications Corporation.</small></p>	Job:	<b>488746A</b>
	Customer:	DIAMOND COMMUNICATIONS LLC
	Site Name:	Cheshire, CT CT004
	Description:	95' Monopine
	Date:	10/4/2021

**Customer: DIAMOND COMMUNICATIONS LLC**  
**Site: Cheshire, CT CT004**  
95' Monopine



**ELEVATION VIEW**

(45.42 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 318-11.
- 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 Down to Earth Project No. 0032-054.00, Date: 08/13/2021
- 6) See the geotechnical report for compaction requirements, if specified.
- 7) 6.25 ft of soil cover is required over the entire area of the foundation slab.
- 8) The foundation is based on the following factored loads:  
Moment = 4,728.52 k-ft  
Axial = 51.93 k  
Shear = 71.24 k

Rebar Schedule for Pad and Pier	
Pier	(40) #8 vertical rebar w/ hooks at bottom w/ #5 ties, (2) within top 5" of pier, then 12" C/C
Pad	(54) #8 horizontal rebar evenly spaced each way top and bottom (216 total)

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(USA 222-G) - Monopole Spatial Analysis (c)2015 Guymast Inc.

Tel:(416)736-7453 Fax:(416)736-4372 Web:www.guymast.com

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95' Monopine / Cheshire, CT

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

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POLE GEOMETRY

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ELEV ft	SECTION NAME	No. SIDE	OUTSIDE DIAM in	THICK -NESS in	RESISTANCES ♦*Pn kip	♦*Mn ft-kip	SPLICE TYPE	...OVERLAP... LENGTH ft	RATIO	w/t
94.0	A	18	16.25	0.250	928.5	298.5				9.5
53.2	A/B	18	34.07	0.250	1799.0	1232.9	SLIP	5.00	1.70	
48.2	B	18	35.77	0.375	3081.8	2203.0				14.8
0.0			56.88	0.375	4320.8	4950.4				

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POLE ASSEMBLY

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SECTION NAME	BASE ELEV ft	BOLTS NUMBER	AT TYPE	BASE DIAM in	OF SECTION STRENGTH ksi	THREADS IN SHEAR PLANE	CALC BASE ELEV ft
A	48.250	0	A325	0.00	92.0	0	48.250
B	0.000	0	A325	0.00	92.0	0	0.000

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POLE SECTIONS

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SECTION NAME	No.of SIDES	LENGTH ft	OUTSIDE DIAMETER BOT in	TOP in	BEND RAD in	MAT- ERIAL ID	FLANGE.ID BOT	TOP	FLANGE.WELD ..GROUP.ID.. BOT	TOP
A	18	45.75	36.27	16.25	0.000	1	0	0	0	0
B	18	53.25	56.88	33.57	0.000	2	0	0	0	0

\* - Diameter of circumscribed circle

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MATERIAL TYPES

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TYPE OF SHAPE	TYPE NO	NO OF ELEM.	ORIENT & deg	HEIGHT in	WIDTH in	.THICKNESS. WEB	FLANGE	IRREGULARITY .PROJECTION. % OF AREA	ORIENT deg
PL	1	1	0.0	36.27	0.25	0.250	0.250	0.00	0.0
PL	2	1	0.0	56.88	0.38	0.375	0.375	0.00	0.0

& - with respect to vertical

MATERIAL PROPERTIES

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

125 mph Ultimate 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 AT AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	95.500	0.00	0.0	0.0	1.2648	0.3000	0.0000	0.0000
C	90.500	0.00	0.0	0.0	1.2507	0.3000	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	1.3329	0.0000	0.0000
C	89.000	0.00	0.0	0.0	9.0578	6.1716	0.0000	0.0000
C	85.500	0.00	0.0	0.0	2.4719	0.6000	0.0000	0.0000
C	80.500	0.00	0.0	0.0	2.4411	0.6000	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0000	1.1831	0.0000	0.0000
C	79.000	0.00	0.0	0.0	8.1055	4.8000	0.0000	0.0000
C	75.500	0.00	0.0	0.0	2.4088	0.6000	0.0000	0.0000
C	70.500	0.00	0.0	0.0	2.3748	0.6000	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0000	1.0333	0.0000	0.0000
C	69.000	0.00	0.0	0.0	7.8808	4.8000	0.0000	0.0000
C	65.500	0.00	0.0	0.0	2.3388	0.6000	0.0000	0.0000
C	60.500	0.00	0.0	0.0	2.3006	0.6000	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0000	0.8836	0.0000	0.0000
C	59.000	0.00	0.0	0.0	7.6291	4.8000	0.0000	0.0000
C	55.500	0.00	0.0	0.0	2.2599	0.6000	0.0000	0.0000
C	50.500	0.00	0.0	0.0	2.2163	0.6000	0.0000	0.0000
C	45.500	0.00	0.0	0.0	2.1691	0.6000	0.0000	0.0000
C	40.500	0.00	0.0	0.0	2.3533	0.6000	0.0000	0.0000
C	35.500	0.00	0.0	0.0	2.2905	0.6000	0.0000	0.0000
C	31.500	0.00	0.0	0.0	1.7882	0.4800	0.0000	0.0000
D	94.000	0.00	180.0	0.0	0.0517	0.0607	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0517	0.0607	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0653	0.0795	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0653	0.0795	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0774	0.0983	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0774	0.0983	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0845	0.2757	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0845	0.2757	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0889	0.1823	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0889	0.1823	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0943	0.2073	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0943	0.2073	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0954	0.2324	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0954	0.2324	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.1006	0.2574	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.1006	0.2574	0.0000	0.0000

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LOADING CONDITION M

125 mph Ultimate wind with no ice. Wind Azimuth: 0° (0.9 D + 1.0 wo)

LOADS ON POLE

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488746A

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AZI	AT AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
						HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	95.500	0.00	0.0	0.0	0.0	1.2648	0.2250	0.0000	0.0000
C	90.500	0.00	0.0	0.0	0.0	1.2507	0.2250	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0	0.0000	0.9996	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0	9.0578	4.6287	0.0000	0.0000
C	85.500	0.00	0.0	0.0	0.0	2.4719	0.4500	0.0000	0.0000
C	80.500	0.00	0.0	0.0	0.0	2.4411	0.4500	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0	0.0000	0.8873	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0	8.1055	3.6000	0.0000	0.0000
C	75.500	0.00	0.0	0.0	0.0	2.4088	0.4500	0.0000	0.0000
C	70.500	0.00	0.0	0.0	0.0	2.3748	0.4500	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0	0.0000	0.7750	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0	7.8808	3.6000	0.0000	0.0000
C	65.500	0.00	0.0	0.0	0.0	2.3388	0.4500	0.0000	0.0000
C	60.500	0.00	0.0	0.0	0.0	2.3006	0.4500	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0	0.0000	0.6627	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0	7.6291	3.6000	0.0000	0.0000
C	55.500	0.00	0.0	0.0	0.0	2.2599	0.4500	0.0000	0.0000
C	50.500	0.00	0.0	0.0	0.0	2.2163	0.4500	0.0000	0.0000
C	45.500	0.00	0.0	0.0	0.0	2.1691	0.4500	0.0000	0.0000
C	40.500	0.00	0.0	0.0	0.0	2.3533	0.4500	0.0000	0.0000
C	35.500	0.00	0.0	0.0	0.0	2.2905	0.4500	0.0000	0.0000
C	31.500	0.00	0.0	0.0	0.0	1.7882	0.3600	0.0000	0.0000
D	94.000	0.00	180.0	0.0	0.0	0.0517	0.0456	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0	0.0517	0.0456	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0	0.0653	0.0596	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0	0.0653	0.0596	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0	0.0774	0.0737	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0	0.0774	0.0737	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0	0.0845	0.2068	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0	0.0845	0.2068	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0	0.0889	0.1367	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0	0.0889	0.1367	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0	0.0943	0.1555	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0	0.0943	0.1555	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0	0.0954	0.1743	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0	0.0954	0.1743	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0	0.1006	0.1931	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0	0.1006	0.1931	0.0000	0.0000

LOADING CONDITION Y

50 mph wind with 1 ice. wind Azimuth: 0° (1.2 D + 1.0 Di + 1.0 Wi)

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AZI	AT AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
						HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	95.500	0.00	0.0	0.0	0.0	0.2474	0.7453	0.0000	0.0000
C	90.500	0.00	0.0	0.0	0.0	0.2445	0.7429	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0	0.0000	1.3329	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0	2.2536	11.6046	0.0000	0.0000
C	85.500	0.00	0.0	0.0	0.0	0.5190	1.0405	0.0000	0.0000
C	80.500	0.00	0.0	0.0	0.0	0.5119	1.0378	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0	0.0000	1.1831	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0	1.9344	9.1704	0.0000	0.0000
C	75.500	0.00	0.0	0.0	0.0	0.5044	1.0351	0.0000	0.0000
C	70.500	0.00	0.0	0.0	0.0	0.4966	1.0322	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0	0.0000	1.0333	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0	1.8732	9.1124	0.0000	0.0000
C	65.500	0.00	0.0	0.0	0.0	0.4884	1.0290	0.0000	0.0000
C	60.500	0.00	0.0	0.0	0.0	0.4796	1.0257	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0	0.0000	0.8836	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0	1.8050	9.0464	0.0000	0.0000
C	55.500	0.00	0.0	0.0	0.0	0.4703	1.0221	0.0000	0.0000
C	50.500	0.00	0.0	0.0	0.0	0.4604	1.0182	0.0000	0.0000
C	45.500	0.00	0.0	0.0	0.0	0.4497	1.0140	0.0000	0.0000
C	40.500	0.00	0.0	0.0	0.0	0.4772	1.0093	0.0000	0.0000
C	35.500	0.00	0.0	0.0	0.0	0.4634	1.0041	0.0000	0.0000

					488746A			
C	31.500	0.00	0.0	0.0	0.4512	0.9994	0.0000	0.0000
D	94.000	0.00	180.0	0.0	0.0177	0.0881	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0177	0.0881	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0218	0.1143	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0218	0.1143	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0254	0.1401	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0254	0.1401	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0275	0.3220	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0275	0.3220	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0287	0.2318	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0287	0.2318	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0302	0.2616	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0302	0.2616	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0304	0.2901	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0304	0.2901	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0318	0.3151	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0318	0.3151	0.0000	0.0000

LOADING CONDITION AK

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

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AZI	AT AZI	FORCES		MOMENTS	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	95.500	0.00	0.0	0.0	0.0141	0.3087	0.0000	0.0000
C	90.500	0.00	0.0	0.0	0.0130	0.3087	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.2606	6.3506	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0563	1.3715	0.0000	0.0000
C	85.500	0.00	0.0	0.0	0.0238	0.6174	0.0000	0.0000
C	80.500	0.00	0.0	0.0	0.0217	0.6174	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0416	1.2174	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.1687	4.9392	0.0000	0.0000
C	75.500	0.00	0.0	0.0	0.0197	0.6174	0.0000	0.0000
C	71.120	0.00	0.0	0.0	0.1132	3.8966	0.0000	0.0000
C	70.500	0.00	0.0	0.0	0.0177	0.6174	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0295	1.0633	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.1370	4.9392	0.0000	0.0000
C	65.500	0.00	0.0	0.0	0.0158	0.6174	0.0000	0.0000
C	60.500	0.00	0.0	0.0	0.0140	0.6174	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0198	0.9092	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.1076	4.9392	0.0000	0.0000
C	55.500	0.00	0.0	0.0	0.0122	0.6174	0.0000	0.0000
C	50.500	0.00	0.0	0.0	0.0106	0.6174	0.0000	0.0000
C	45.500	0.00	0.0	0.0	0.0090	0.6174	0.0000	0.0000
C	40.500	0.00	0.0	0.0	0.0075	0.6174	0.0000	0.0000
C	35.500	0.00	0.0	0.0	0.0062	0.6174	0.0000	0.0000
C	31.500	0.00	0.0	0.0	0.0051	0.6174	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0751	11.7311	0.0000	0.0000
D	94.000	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

LOADING CONDITION AL

Seismic - Azimuth: 0 (0.9 D - 1.0 Ev + 1.0 Eh)

LOADS ON POLE

LOAD TYPE	ELEV ft	APPLY. RADIUS ft	LOAD. AZI	AT AZI	FORCES		MOMENTS	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	95.500	0.00	0.0	0.0	0.0141	0.2163	0.0000	0.0000
C	90.500	0.00	0.0	0.0	0.0130	0.2163	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.2606	4.4497	0.0000	0.0000

488746A

C	89.000	0.00	0.0	0.0	0.0563	0.9609	0.0000	0.0000
C	85.500	0.00	0.0	0.0	0.0238	0.4326	0.0000	0.0000
C	80.500	0.00	0.0	0.0	0.0217	0.4326	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0416	0.8530	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.1687	3.4608	0.0000	0.0000
C	75.500	0.00	0.0	0.0	0.0197	0.4326	0.0000	0.0000
C	71.120	0.00	0.0	0.0	0.1132	2.7303	0.0000	0.0000
C	70.500	0.00	0.0	0.0	0.0177	0.4326	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0295	0.7450	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.1370	3.4608	0.0000	0.0000
C	65.500	0.00	0.0	0.0	0.0158	0.4326	0.0000	0.0000
C	60.500	0.00	0.0	0.0	0.0140	0.4326	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0198	0.6371	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.1076	3.4608	0.0000	0.0000
C	55.500	0.00	0.0	0.0	0.0122	0.4326	0.0000	0.0000
C	50.500	0.00	0.0	0.0	0.0106	0.4326	0.0000	0.0000
C	45.500	0.00	0.0	0.0	0.0090	0.4326	0.0000	0.0000
C	40.500	0.00	0.0	0.0	0.0075	0.4326	0.0000	0.0000
C	35.500	0.00	0.0	0.0	0.0062	0.4326	0.0000	0.0000
C	31.500	0.00	0.0	0.0	0.0051	0.4326	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0751	8.2198	0.0000	0.0000
D	94.000	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

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95' Monopine / Cheshire, CT

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

MAST ELEV ft	DEFLECTIONS (ft)			ROTATIONS (deg)		
	HORIZONTAL ALONG	ACROSS	DOWN	TILT ALONG	ACROSS	TWIST
94.0	4.74A	0.00L	0.33A	5.37A	0.00L	0.00X
80.4	3.49A	0.00L	0.21A	5.15A	0.00L	0.00X
66.8	2.36A	0.00L	0.12A	4.38A	0.00L	0.00X
53.2	1.45A	0.00L	0.06A	3.25A	0.00L	0.00X
48.2	1.18A	0.00L	0.04A	2.94A	0.00L	0.00X
36.2	0.65A	0.00L	0.02A	2.14A	0.00L	0.00X
24.1	0.28A	0.00L	0.00A	1.37A	0.00L	0.00X
12.1	0.07A	0.00L	0.00A	0.66A	0.00L	0.00X
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

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	
94.0	0.75 Z	1.27 H	0.00 E	-1.90 Q	0.00 H	0.00 H

				488746A		
80.4	17.70 Z	17.19 H	0.00 E	-133.25 D	0.00 E	0.00 X
	17.70 AF	17.19 M	0.00 F	-133.25 D	0.00 B	0.00 X
66.8	41.82 AF	38.84 M	0.00 F	-535.08 H	0.01 F	-0.01 X
	41.82 AF	38.84 M	0.00 H	-535.08 H	0.01 F	-0.01 X
53.2	56.73 AF	54.42 M	0.00 H	-1186.79 H	-0.03 H	0.01 C
	56.73 AJ	54.45 P	-0.01 Q	-1186.84 H	-0.07 H	-0.01 X
48.2	59.36 AJ	57.09 P	-0.01 Q	-1473.29 K	0.05 Q	-0.02 X
	59.36 AF	57.08 A	0.02 L	-1473.26 H	-0.06 O	-0.02 X
36.2	64.18 AF	62.68 A	0.02 L	-2216.80 A	-0.18 L	-0.02 X
	64.18 AF	62.68 A	-0.02 Q	-2216.79 A	-0.19 L	-0.03 X
24.1	69.33 AF	67.90 A	-0.02 Q	-3033.24 A	-0.40 L	-0.03 X
	69.33 AF	67.92 A	0.01 L	-3033.24 A	-0.40 L	-0.03 X
12.1	72.83 AF	69.07 A	0.01 L	-3868.33 A	-0.58 L	-0.04 X
	72.83 AF	69.07 A	0.01 L	-3868.34 A	-0.58 L	-0.04 X
	76.63 AF	70.28 A	0.01 L	-4711.92 A	-0.74 L	-0.04 X
base reaction	76.63 AF	-70.28 A	-0.01 L	4711.92 A	0.74 L	0.04 X

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
94.00	0.00Z	0.01Q	0.00H	0.01A	YES	9.52A	45.2
80.42	0.01Z	0.24D	0.03H	0.24D	YES	13.65A	45.2
	0.01AF	0.24D	0.03M	0.24D	YES	13.65A	45.2
66.83	0.03AF	0.60H	0.05M	0.62H	YES	17.78A	45.2
	0.03AF	0.60H	0.05M	0.62H	YES	17.78A	45.2
53.25	0.03AF	0.96H	0.06M	0.98H	YES	21.91A	45.2
	0.02AJ	0.59H	0.04P	0.61H	YES	14.02A	45.2
48.25	0.02AJ	0.65K	0.04P	0.66K	YES	15.03A	45.2
	0.02AF	0.67H	0.04A	0.68H	YES	14.80A	45.2
36.19	0.02AF	0.77A	0.04A	0.79A	YES	17.24A	45.2
	0.02AF	0.77A	0.04A	0.79A	YES	17.24A	45.2
24.12	0.02AF	0.86A	0.04A	0.87A	YES	19.69A	45.2
	0.02AF	0.86A	0.04A	0.87A	YES	19.69A	45.2
12.06	0.02AF	0.92A	0.03A	0.93A	YES	22.13A	45.2
	0.02AF	0.92A	0.03A	0.93A	YES	22.13A	45.2
0.00	0.02AF	0.95A	0.03A	0.96A	YES	24.58A	45.2

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

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

				488746A	
kip	ALONG	ACROSS	ALONG	ACROSS	ft-kip
	kip	kip	ft-kip	ft-kip	
76.63	70.28	0.01	-4711.92	-0.74	-0.04
AF	A	L	A	L	X

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95' Monopine / Cheshire, CT

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

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\* 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. RADIUS ft	LOAD. AZI	AT AZI	.....FORCES.....		.....MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	95.500	0.00	0.0	0.0	0.2706	0.2500	0.0000	0.0000
C	90.500	0.00	0.0	0.0	0.2676	0.2500	0.0000	0.0000
C	89.000	0.00	0.0	0.0	0.0000	1.1107	0.0000	0.0000
C	89.000	0.00	0.0	0.0	1.9380	5.1430	0.0000	0.0000
C	85.500	0.00	0.0	0.0	0.5289	0.5000	0.0000	0.0000
C	80.500	0.00	0.0	0.0	0.5223	0.5000	0.0000	0.0000
C	79.000	0.00	0.0	0.0	0.0000	0.9859	0.0000	0.0000
C	79.000	0.00	0.0	0.0	1.7343	4.0000	0.0000	0.0000
C	75.500	0.00	0.0	0.0	0.5154	0.5000	0.0000	0.0000
C	70.500	0.00	0.0	0.0	0.5081	0.5000	0.0000	0.0000
C	69.000	0.00	0.0	0.0	0.0000	0.8611	0.0000	0.0000
C	69.000	0.00	0.0	0.0	1.6862	4.0000	0.0000	0.0000
C	65.500	0.00	0.0	0.0	0.5004	0.5000	0.0000	0.0000
C	60.500	0.00	0.0	0.0	0.4922	0.5000	0.0000	0.0000
C	59.000	0.00	0.0	0.0	0.0000	0.7363	0.0000	0.0000
C	59.000	0.00	0.0	0.0	1.6323	4.0000	0.0000	0.0000
C	55.500	0.00	0.0	0.0	0.4835	0.5000	0.0000	0.0000
C	50.500	0.00	0.0	0.0	0.4742	0.5000	0.0000	0.0000
C	45.500	0.00	0.0	0.0	0.4641	0.5000	0.0000	0.0000
C	40.500	0.00	0.0	0.0	0.5035	0.5000	0.0000	0.0000
C	35.500	0.00	0.0	0.0	0.4901	0.5000	0.0000	0.0000
C	31.500	0.00	0.0	0.0	0.3826	0.4000	0.0000	0.0000
D	94.000	0.00	180.0	0.0	0.0111	0.0506	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0111	0.0506	0.0000	0.0000
D	80.417	0.00	180.0	0.0	0.0140	0.0663	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0140	0.0663	0.0000	0.0000
D	66.833	0.00	180.0	0.0	0.0166	0.0819	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0166	0.0819	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0181	0.2298	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0181	0.2298	0.0000	0.0000
D	48.250	0.00	180.0	0.0	0.0190	0.1519	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0190	0.1519	0.0000	0.0000
D	36.188	0.00	180.0	0.0	0.0202	0.1728	0.0000	0.0000

488746A								
D	24.125	0.00	180.0	0.0	0.0202	0.1728	0.0000	0.0000
D	24.125	0.00	180.0	0.0	0.0204	0.1937	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0204	0.1937	0.0000	0.0000
D	12.063	0.00	180.0	0.0	0.0215	0.2145	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0215	0.2145	0.0000	0.0000

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

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MAST ELEV ft	DEFLECTIONS (ft)			ROTATIONS (deg)			TWIST
	HORIZONTAL ALONG	ACROSS	DOWN	TILT ALONG	ACROSS		
94.0	1.02L	0.00H	0.02K	1.15L	0.00H	0.00E	
80.4	0.75L	0.00B	0.01K	1.10K	0.00H	0.00E	
66.8	0.51L	0.00B	0.01K	0.94K	0.00H	0.00K	
53.2	0.31L	0.00B	0.00K	0.69L	0.00K	0.00K	
48.2	0.25K	0.00B	0.00K	0.63L	0.00B	0.00K	
36.2	0.14K	0.00B	0.00K	0.46L	0.00B	0.00K	
24.1	0.06K	0.00B	0.00F	0.29K	0.00B	0.00K	
12.1	0.01K	0.00B	0.00A	0.14K	0.00B	0.00K	
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A	

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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	
94.0	0.25 K	0.27 H	0.00 C	-0.41 K	0.00 K	0.00 K
80.4	8.44 K	3.68 H	0.00 C	-28.48 E	0.00 H	0.00 F
	8.44 C	3.68 E	0.00 F	-28.48 L	0.00 B	0.00 F
66.8	20.19 C	8.31 E	0.00 F	-114.35 E	0.00 C	0.00 F
	20.19 H	8.31 B	0.00 C	-114.35 K	0.00 F	0.00 B
53.2	27.54 H	11.65 B	0.00 C	-253.50 B	0.01 C	0.00 F
	27.54 A	11.65 L	0.00 B	-253.52 K	0.01 B	0.00 F
48.2	29.19 A	12.22 L	0.00 B	-314.66 L	0.01 C	0.00 F
	29.19 A	12.21 K	-0.01 B	-314.66 B	0.01 C	0.00 B
36.2	32.02 A	13.41 K	-0.01 B	-473.35 L	0.07 B	0.00 K
	32.02 A	13.41 L	0.01 K	-473.35 L	0.07 B	0.00 K
24.1	35.00 A	14.53 L	0.01 K	-647.66 L	-0.14 K	0.00 K
	35.00 A	14.53 K	-0.01 B	-647.66 L	-0.14 K	0.00 K
12.1	37.34 A	14.77 K	-0.01 B	-826.01 K	0.20 B	0.00 K
	37.34 A	14.77 K	-0.01 H	-826.01 K	0.20 B	0.00 K
	39.93 A	15.03 K	-0.01 H	-1006.35 K	0.28 B	0.00 K

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base reaction	39.93 A	-15.03 K	0.01 H	1006.35 K	-0.28 B	0.00 K
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COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
94.00	0.00K	0.00K	0.00H	0.00K	YES	9.52A	45.2
80.42	0.01K	0.05E	0.01H	0.06E	YES	13.65A	45.2
	0.01C	0.05L	0.01E	0.06L	YES	13.65A	45.2
66.83	0.01C	0.13E	0.01E	0.14E	YES	17.78A	45.2
	0.01H	0.13K	0.01B	0.14K	YES	17.78A	45.2
53.25	0.02H	0.21B	0.01B	0.22B	YES	21.91A	45.2
	0.01A	0.13K	0.01L	0.14K	YES	14.02A	45.2
48.25	0.01A	0.14L	0.01L	0.15L	YES	15.03A	45.2
	0.01A	0.14B	0.01K	0.15B	YES	14.80A	45.2
36.19	0.01A	0.17L	0.01K	0.17L	YES	17.24A	45.2
	0.01A	0.17L	0.01L	0.17L	YES	17.24A	45.2
24.12	0.01A	0.18L	0.01L	0.19L	YES	19.69A	45.2
	0.01A	0.18L	0.01K	0.19L	YES	19.69A	45.2
12.06	0.01A	0.20K	0.01K	0.20K	YES	22.13A	45.2
	0.01A	0.20K	0.01K	0.20K	YES	22.13A	45.2
0.00	0.01A	0.20K	0.01K	0.21K	YES	24.58A	45.2

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

DOWN kip	SHEAR.w.r.t.WIND.DIR ALONG kip	ACROSS WIND.DIR kip	MOMENT.w.r.t.WIND.DIR ALONG ft-kip	ACROSS WIND.DIR ft-kip	TORSION ft-kip
39.93 A	15.03 K	-0.01 H	-1006.35 K	0.28 B	0.00 K

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

Parameters	Risk Category	Description	h <sub>i</sub> (ft.)	w <sub>i</sub> (kips)	Vertical Distribution of Seismic Forces				1.2 D + 1.0 E <sub>v</sub>	0.9 D - 1.0 E <sub>v</sub>	
					W <sub>i</sub> (kips)	w <sub>i</sub> <sup>ko</sup>	F <sub>sz</sub> or E <sub>b</sub> (kips)	E <sub>v</sub> (kips)			
II	II										
R	1.500										
S <sub>s</sub>	0.201	Branches Load	95.50	0.2500	0.0000	279.3542	0.0141	0.0087	0.3087	0.2163	
S <sub>1</sub>	0.055	Branches Load	90.50	0.2500	0.0000	257.1583	0.0130	0.0087	0.3087	0.2163	
Site Class	C	Line Deadload	89.00	1.1107	0.0000	1,113.4807	0.0563	0.0387	1.3715	0.9609	
T <sub>L</sub> (sec)	6.000	Mount/Antenna Load	89.00	5.1430	5.1430	5,155.8757	0.2606	0.1790	6.3506	4.4497	
F <sub>a</sub>	1.300	Branches Load	85.50	0.5000	0.0000	471.2288	0.0238	0.0174	0.6174	0.4326	
F <sub>v</sub>	1.500	Branches Load	80.50	0.5000	0.0000	429.4798	0.0217	0.0174	0.6174	0.4326	
S <sub>MS</sub>	0.261	Antenna Load	79.00	4.0000	4.0000	3,337.7738	0.1687	0.1392	4.9392	3.4608	
S <sub>M1</sub>	0.083	Line Deadload	79.00	0.9859	0.0000	822.6778	0.0416	0.0343	1.2174	0.8530	
S <sub>DS</sub>	0.174	Branches Load	75.50	0.5000	0.0000	389.1073	0.0197	0.0174	0.6174	0.4326	
S <sub>D1</sub>	0.055	Structure - Section 1	71.12	3.1557	0.0000	2,239.9432	0.1132	0.1098	3.8966	2.7303	
I <sub>e</sub>	1.000	Branches Load	70.50	0.5000	0.0000	350.1524	0.0177	0.0174	0.6174	0.4326	
C <sub>s</sub>	0.030	Antenna Load	69.00	4.0000	4.0000	2,709.9930	0.1370	0.1392	4.9392	3.4608	
E (ksi)	29,000	Line Deadload	69.00	0.8611	0.0000	583.3937	0.0295	0.0300	1.0633	0.7450	
I <sub>top</sub> (in <sup>4</sup> )	393	Branches Load	65.50	0.5000	0.0000	312.6608	0.0158	0.0174	0.6174	0.4326	
I <sub>bot</sub> (in <sup>4</sup> )	25,956	Branches Load	60.50	0.5000	0.0000	276.6830	0.0140	0.0174	0.6174	0.4326	
I <sub>avg</sub> (in <sup>4</sup> )	13,174	Antenna Load	59.00	4.0000	0.0000	2,129.5442	0.1076	0.1392	4.9392	3.4608	
g (in/s <sup>2</sup> )	386.4	Line Deadload	59.00	0.7363	0.0000	391.9959	0.0198	0.0256	0.9092	0.6371	
W <sub>t</sub> (kips)	39.993	Branches Load	55.50	0.5000	0.0000	242.2753	0.0122	0.0174	0.6174	0.4326	
W <sub>u</sub> (kips)	13.143	Branches Load	50.50	0.5000	0.0000	209.5015	0.0106	0.0174	0.6174	0.4326	
W <sub>L</sub> (kips)	26.850	Branches Load	45.50	0.5000	0.0000	178.4344	0.0090	0.0174	0.6174	0.4326	
L <sub>p</sub> (in)	1128	Branches Load	40.50	0.5000	0.0000	149.1582	0.0075	0.0174	0.6174	0.4326	
f <sub>1</sub> (Hertz)	0.633	Branches Load	35.50	0.5000	0.0000	121.7718	0.0062	0.0174	0.6174	0.4326	
T (sec)	1.579	Branches Load	31.50	0.5000	0.0000	101.3023	0.0051	0.0174	0.6174	0.4326	
k <sub>e</sub>	1.5395	Structure - Section 2	26.62	9.5004	0.0000	1,485.4214	0.0751	0.3306	11.7311	8.2198	
V <sub>s</sub> (kips)	1.200	Σ			39.99	13.1430	23,738.37	1.20	1.39	49.38	34.60
Seismic Design Category	B										

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

### Pole Data

Diameter: 56.010 in (flat to flat)  
Thickness: 0.375 in  
Yield (Fy): 65 ksi  
# of Sides: 18 "0" IF Round  
Strength (Fu): 80 ksi

### Reactions

Moment, Mu: 4711.92 ft-kips  
Axial, Pu: 47.9 kips  
Shear, Vu: 70.28 kips

### Anchor Rod Data

Quantity: 16  
Diameter: 2.25 in  
Rod Material: A615  
Strength (Fu): 100 ksi  
Yield (Fy): 75 ksi  
BC Diam. (in): 62.75 BC Override:

### Anchor Rod Results

Maximum Rod (Pu+ Vu/η): 237.0 Kips  
Allowable  $\Phi \cdot R_{nt}$ : 260.0 Kips (per 4.9.9)  
Anchor Rod Interaction Ratio: **91.2% Pass**

### Plate Data

Diameter (in): 68.5 Dia. Override:  
Thickness: 2 in  
Yield (Fy): 50 ksi  
Eff Width/Rod: 11.11 in  
Drain Hole: 2.625 in. diameter  
Drain Location: 25.75 in. center of pole to center of drain hole  
Center Hole: 43.5 in. diameter

### Base Plate Results

Base Plate (Mu/Z): 43.8 ksi  
Allowable  $\Phi \cdot F_y$ : 45.0 ksi (per AISC)  
Base Plate Interaction Ratio: **97.3% Pass**

**MAT FOUNDATION DESIGN BY SABRE INDUSTRIES**

95' Monopine DIAMOND COMMUNICATIONS LLC Cheshire, CT (488746) 10/04/21 DO

**Overall Loads:**

Factored Moment (ft-kips)	4728.52
Factored Axial (kips)	51.93
Factored Shear (kips)	71.24
Bearing Design Strength (ksf)	9
Water Table Below Grade (ft)	999
Width of Mat (ft)	23.5
Thickness of Mat (ft)	1.75
Depth to Bottom of Slab (ft)	8
Quantity of Bolts in Bolt Circle	18
Bolt Circle Diameter (in)	68
Top of Concrete to Top of Bottom Threads (in)	60
Diameter of Pier (ft)	7
Ht. of Pier Above Ground (ft)	0.5
Ht. of Pier Below Ground (ft)	6.25
Quantity of Bars in Mat	54
Bar Diameter in Mat (in)	1
Area of Bars in Mat (in <sup>2</sup> )	42.41
Spacing of Bars in Mat (in)	5.19
Quantity of Bars Pier	40
Bar Diameter in Pier (in)	1
Tie Bar Diameter in Pier (in)	0.625
Spacing of Ties (in)	12
Area of Bars in Pier (in <sup>2</sup> )	31.42
Spacing of Bars in Pier (in)	5.95
f'c (ksi)	4.5
fy (ksi)	60
Unit Wt. of Soil (kcf)	0.11
Unit Wt. of Concrete (kcf)	0.15

Max. Net Bearing Press. (ksf)	8.63
Allowable Bearing Pressure (ksf)	6.00
Safety Factor	2.00
Ultimate Bearing Pressure (ksf)	12.00
Bearing Φs	0.75

Minimum Pier Diameter (ft)	7.00
Equivalent Square b (ft)	6.20
Square Pier? (Y/N)	N

Recommended Spacing (in)	5 to 12
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Minimum Pier A <sub>s</sub> (in <sup>2</sup> )	27.71
Recommended Spacing (in)	5 to 12

Volume of Concrete (yd<sup>3</sup>) 45.42

**Two-Way Shear Action:**

Average d (in)	17
φv <sub>c</sub> (ksi)	0.228
φv <sub>c</sub> = φ(2 + 4/β <sub>c</sub> )f' <sub>c</sub> <sup>1/2</sup>	0.342
φv <sub>c</sub> = φ(α <sub>s</sub> d/b <sub>o</sub> +2)f' <sub>c</sub> <sup>1/2</sup>	0.236
φv <sub>c</sub> = φ4f' <sub>c</sub> <sup>1/2</sup>	0.228
Shear perimeter, b <sub>o</sub> (in)	317.30
β <sub>c</sub>	1

v <sub>u</sub> (ksi)	0.191
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**One-Way Shear:**

φV <sub>c</sub> (kips)	546.7
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V <sub>u</sub> (kips)	381.8
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**Stability:**

Overturning Design Strength (ft-k)	6137.9
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Total Applied M (ft-k)	5334.1
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**Pier-Slab Transfer by Flexure:**

b <sub>slab</sub> (ft)	12.25
ØM <sub>n</sub> (ft-kips)	3147.8

0.60M <sub>sc</sub> (ft-kips)	3125.6
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<b>Pier Design:</b>			
$\phi V_n$ (kips)	646.7	$V_u$ (kips)	71.2
$\phi V_c = \phi 2(1 + N_u / (2000 A_g)) f'_c{}^{1/2} b_w d$	646.7		
$V_s$ (kips)	0.0	*** $V_s \text{ max} = 4 f'_c{}^{1/2} b_w d$ (kips)	1514.7
Maximum Spacing (in)	8.71	(Only if Shear Ties are Required)	
Actual Hook Development (in)	16.00	Req'd Hook Development $l_{dh}$ (in)	12.52
		*** Ref. To Spacing Requirements ACI 11.5.4.3	

<b>Flexure in Slab:</b>			
$\phi M_n$ (ft-kips)	3019.4	$M_u$ (ft-kips)	2787.8
$a$ (in)	2.36		
Steel Ratio	0.00885		
$\beta_1$	0.825		
Maximum Steel Ratio ( $\rho_t$ )	0.0197		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	100.78	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
Overtopping	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1
Hook Development	1