MASER CONSULTING
CONNECTICUT

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at&t

550 Cochituate Road
Framingham, MA 01701

Multi-Carrier
Monopole Structural Analysis

Site Name:	*Willimantic T6*
FA #:	*10035388*
Site ID:	*CTL01051*
Pace ID:	*MRCTB019370*
Site Address:	*83 Windham Street* *Willimantic, CT 06226* *Windham County*
Maser Project Number:	*16946011A*

December 30, 2016

Analysis Type	*Monopole Structure*
Pass/Fail	*Pass*
Utilization	***65.2%***

STATE OF CONNECTICUT
FRANK E. PAZDEN
No. 28188
LICENSED
PROFESSIONAL ENGINEER

Frank E. Pazden, P.E.
Connecticut Professional Engineer
PE License # 28188

Objective:

In accordance with your request, Maser Consulting Connecticut has evaluated the structural adequacy of the existing monopole structure at the above referenced address for the addition of the proposed **AT&T** wireless telecommunications equipment, together with the existing loading.

Introduction:

Maser Consulting Connecticut has reviewed the following documents in completing this report:

- RFDS 1323718, provided by Smartlink, dated November 10, 2016
- Structural Tower Mapping report provided by High Tower Solutions dated on February 24, 2016
- Structural Tower Mapping photos provided by High Tower Solutions dated on February 24, 2016
- Previous Structural Modification Design report prepared by Maser Consulting Connecticut, dated June 21, 2016
- Previous Failing Structural Analysis report prepared by Maser Consulting Connecticut, dated April 8, 2016
- Construction Drawings prepared by Maser Consulting Connecticut, dated June 21, 2016
- Detail Foundation Drawings provided by Smartlink dated July 28, 2003
- Limited Visual Site Visit performed by Maser Consulting Connecticut on August 31, 2015

The existing AT&T antennas and equipment is supported on monopole approximately at a centerline of 138' above ground level for LTE/WCS, LTE GSM antennas and 137' for UMTS antenna in the Alpha, Beta and Gamma sectors.

Discrete and Linear Appurtenances:

Maser Consulting Connecticut understands the existing & proposed **AT&T** loading to be as follows:

- **(3) CCI TPA-65R-LCUUUU-H8 RET Antennas (Proposed)**
- *(3) CCI OPA-65R-LCUU-H8 Antennas (Existing)*
- *(3) Powerwave 7770 Antennas (Existing)*
- *(3) RRUS-11 (Existing)*
- **(3) RRUS-32 B2 (Proposed)**
- *(3) RRUS-32 (Existing)*
- *(2) Raycap DC6-48-60-18-8F (Existing)*
- *(12) TMA's (Existing)*

The existing loading from other carriers are found in the TNX software output in the Appendix A

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 CT State Building Code and all applicable amendments, Incorporating IBC 2012
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Basic Wind Speed – 105 mph
    - Service Wind Speed – 60 mph
    - Ice Wind Speed – 50 mph (0.75" Ice)
    - Topographic Category – 1
    - Exposure Category – B
    - Structure Class – II

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing monopole structure is structurally adequate to support the proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure is deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. TNX tower, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the monopole structure to the existing and proposed loading.

The following assumptions were utilized in this report:

- Base plate and anchor bolt details are considered from the foundation drawings provided by Smartlink performed by Engineered Endeavors Incorporated and the previous modification detail per the report submitted by Hudson Design Group, LLC.
- The existing monopole tower details are considered from the previous structural analysis performed by GDP Group.
- The tower modifications have been installed as intended per the referenced construction drawings.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- Proposed equipment and locations should not deviate from the proposed locations noted herein and shown on the associated Maser Consulting Connecticut final Construction Drawings.
- All modifications have been installed as intended per the previous construction drawings.

Calculations:

The calculations are found in Appendix of this report.

Conclusion:

Maser Consulting P.A. has determined the existing monopole has **ADEQUATE** structural capacity to support the proposed and existing loading.

The existing monopole has been analyzed per the applicable codes and standards, and has been determined to be stressed to a maximum of **65.2%** of its structural capacity with the maximum usage occurring at elevations 100'-0"–128'-8". The existing base plate with the referenced modifications has been determined to be stressed to a maximum of **31.3%** of its structural capacity. Therefore, the proposed AT&T installation **CAN** be installed as intended.

It should be noted that the proposed **AT&T** installation cannot be commenced until all previously proposed modifications to the monopole have been installed as intended. This analysis has been performed and is only valid with the above assumption holding true.

Maser Consulting P.A. reserves the right to amend this report if additional information about the structure is provided. The conclusions reached by Maser Consulting P.A. in this report are only valid for the discrete and linear appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,
Maser Consulting Connecticut

Frank Pazden, P.E.
Telecommunications Department Manager

Lauren Luzier
Engineer

APPENDIX
Calculations

Check of Base Plate:

Base Plate Loading:

Axial: $P_a := 74985.lbf$ (From TNX)

Shear: $V_a := 45391 \cdot lbf$ (From TNX)

Moment: $M_a := 5407534 ft \cdot lbf$ (From TNX)

Loading in Model:

Height of Model: $h := 64ft$

Axial: $P_a := 74985.lbf$

Shear: $V_a := 45391 \cdot lbf$

Moment as a concentated force in RISA model: $M := \frac{M_a}{h} = 84.493 \cdot kip$

Applied Von Mises Stress: $\sigma := 16.81 \cdot ksi$

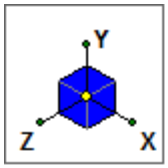
Yield Stress: $F_y := 60 \cdot ksi$

Strength Reduction Factor: $\Phi := 0.9$

Design Stress for Base Plate: $\sigma_d := \Phi \cdot F_y = 54\,ksi$

Plate Usage: $Usage := \frac{\sigma}{\sigma_d}$ $Usage = 31.1 \cdot \%$

Risa Model:



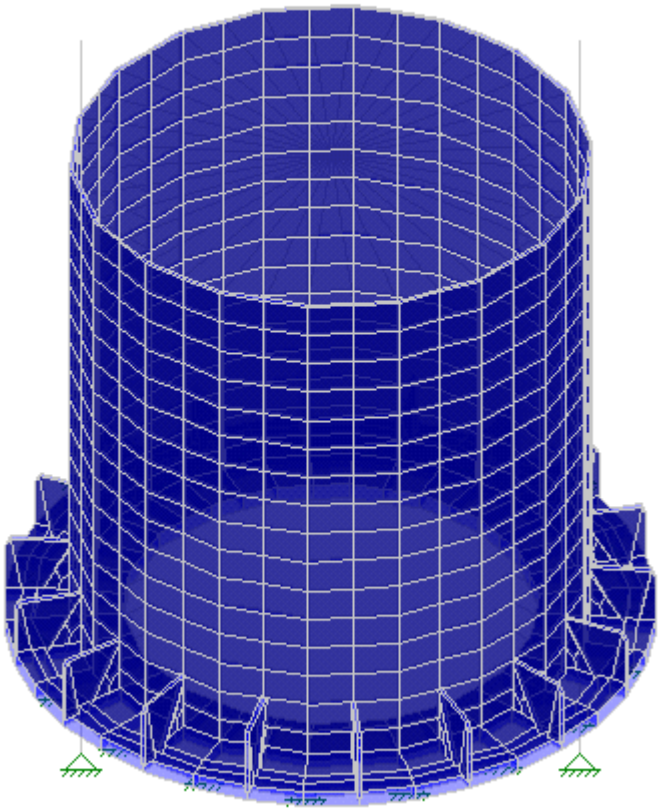
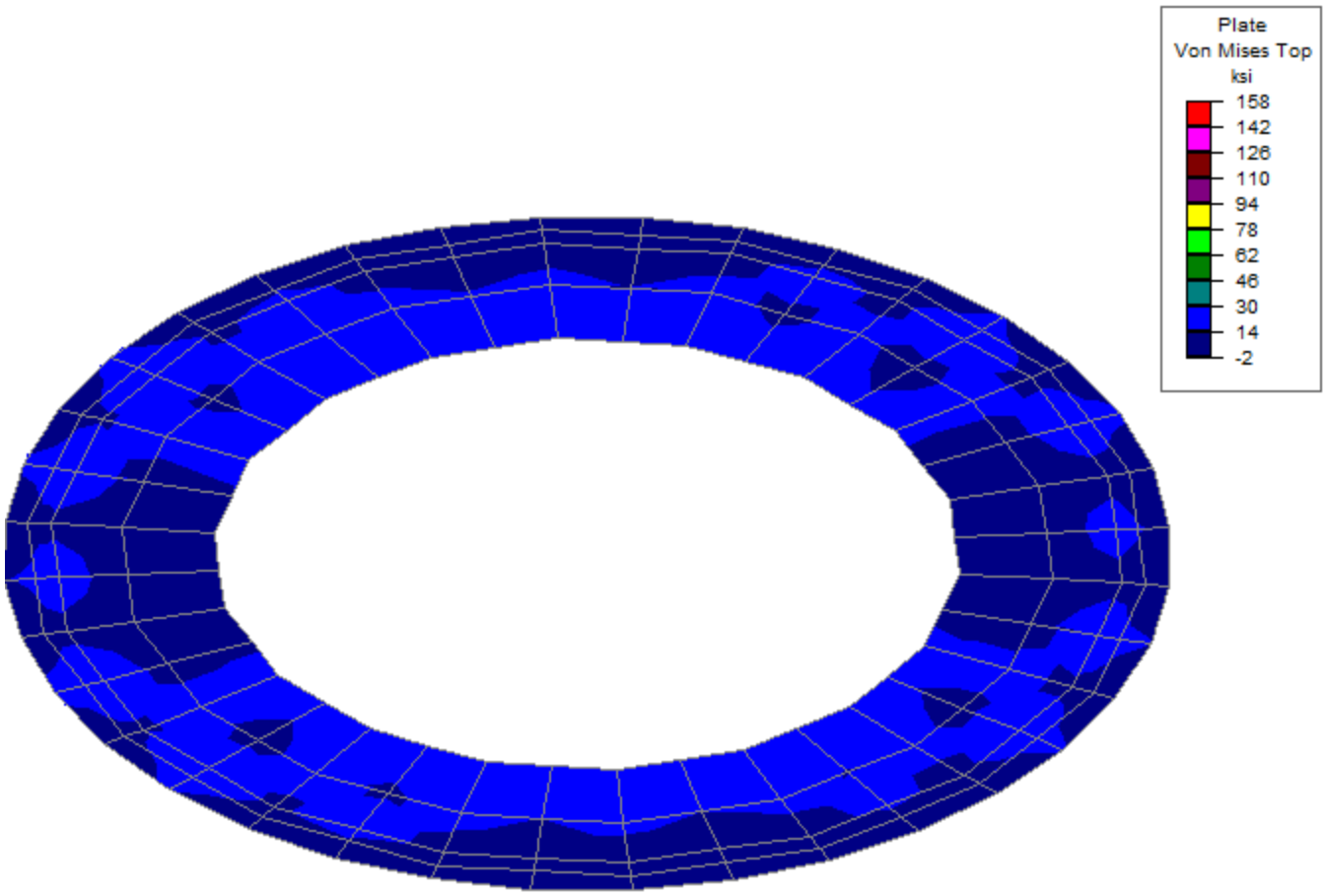
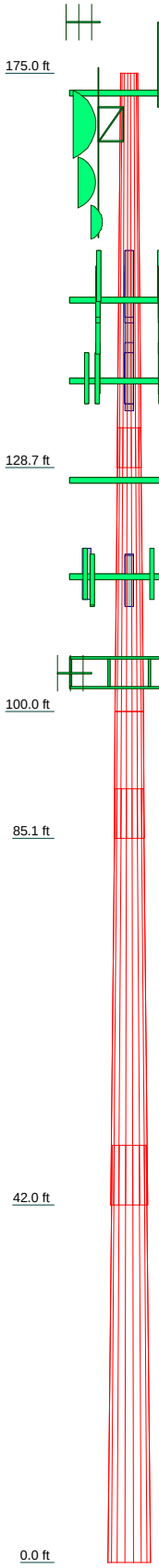


Plate Principal Stresses

	LC	Plate Label	Loc	Sigma1[ksi]	Sigma2[ksi]	Tau Max[ksi]	Angle[rad]	Von Mises[ksi]
1	1	P165	T	7.22	-11.99	9.6	2.33	16.81
2			B	11.93	-6.97	9.45	.77	16.55



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	46.34	18	0.2500	4.68	23.0000	33.3750	A572-65	3495.6
2	33.34	18	0.3125		31.8272	39.1450		3958.0
3	14.91	18	0.5428	5.82	39.1450	42.5625		3523.6
4	48.88	18	0.5470	6.94	40.1429	51.4688		13069.7
5	48.97	18	0.5725		48.7667	60.0000		16293.6
								40340.5



ALL REACTIONS ARE FACTORED

AXIAL 117616 lb

SHEAR 11907 lb

MOMENT 1413430 lb-ft

TORQUE 5717 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL 74985 lb

SHEAR 45391 lb

MOMENT 5407534 lb-ft

TORQUE 27192 lb-ft
REACTIONS - 105 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Pirod 6' Side Mount Standoff (1)	185.667	CCI-OPA-65R-LCUU-H8 (ATI)	139.2
Typical Yagi (School)	178	CCI-OPA-65R-LCUU-H8 (ATI)	139.2
ERI---A-1 Lightning Spur (N/A)	175	RRUS 32 (ATI)	139.2
8'x 1" whip antenna (School)	173.5	RRUS 32 (ATI)	139.2
10" dipole antenna (School)	173	CCI-OPA-65R-LCUU-H8 (ATI)	139.2
PiROD 13'/14' Platform w/handrail (School)	173	TPA-65R-LCUUUU-H8 (ATI)	139.2 - 139.15
		TPA-65R-LCUUUU-H8 (ATI)	139.2 - 139.15
5'3"x4" Pipe Mount (School)	169	Powerwave 7770 (ATI)	139.2
8' Mw with Radome (School)	169	Powerwave 7770 (ATI)	139.2
5'3"x4" Pipe Mount (Sprint)	162.667 - 162.167	Powerwave 7770 (ATI)	139.2
6' Grid antenna (Sprint)	162.2	TPA-65R-LCUUUU-H8 (ATI)	139.2 - 139.15
4'x16" grid antenna (School)	157.5	Nudd 14' Boom (3) (ATI)	139.2
20'x2" whip antenna (School)	155.667	RRUS 32 (ATI)	139.2
MISC RRH16"X13"X10" (SPRINT)	151.2	RRUS 32 B2 (ATI)	139.2
MISC RRH16"X13"X10" (SPRINT)	151.2	RRUS 32 B2 (ATI)	139.2
MISC RRH16"X13"X10" (SPRINT)	151.2	RRUS 32 B2 (ATI)	139.2
Alcatel-Lucent RRH19004X45 (SPRINT)	151.2	(2) ray cap squid DC6 (ATI)	138.33
Alcatel-Lucent RRH19004X45 (SPRINT)	151.2	PiROD 13'/14' Platform w/handrail (n/a)	127.5
Alcatel-Lucent RRH19004X45 (SPRINT)	151.2	PiROD 13'/14' Platform w/handrail (T-Mobile)	116.2
RFS Panel (SPRINT)	149.35	(2) AIR21B2AB2P (T-Mobile)	116.16
RFS Panel (SPRINT)	149.35	(2) AIR21B2AB2P (T-Mobile)	116.16
RFS Panel (SPRINT)	149.35	(2) AIR21B2AB2P (T-Mobile)	116.16
Capstan Panel CT33XC614 (SPRINT)	148.667	RRUS 11B2 (T-Mobile)	115.5
Capstan Panel CT33XC614 (SPRINT)	148.667	RRUS 11B2 (T-Mobile)	115.5
Capstan Panel CT33XC614 (SPRINT)	148.667	RRUS 11B2 (T-mobile)	115.5
PiROD 13'/14' Platform w/handrail (Sprint)	148.667	LNX-6515D5-A1M (T-Mobile)	115.33
		LNX-6515D5-A1M (T-MOBILE)	115.33
RRU 2'2"X1'6"x7" (SPRINT)	145	LNX-6515D5-A1M (T-Mobile)	115.33
RRU 2'2"X1'6"x7" (SPRINT)	145	PiROD 13'/14' Platform w/handrail (School)	104.5
RRU 2'2"X1'6"x7" (SPRINT)	145	Typical Yagi (SCHOOL)	104.5
RRUS-11 (ATI)	140.33	Pirod 6' Side Mount Standoff (1)	78.66
RRUS-11 (ATI)	140.33	Gps Antenna (SCHOOL)	78.58
RRUS-11 (ATI)	140.33		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 65.2%

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2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ
Phone: 856 797-0412
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Job:		
Project:		
Client:	Drawn by:	App'd:
Code: TIA-222-G	Date: 12/29/16	Scale: NTS
Path: \\maserconsulting.com\lu\Projects\2016\16946000A\16946011A\Structural\Rev 0\Tower analysis\TNX\monopole.eri		Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Basic wind speed of 105 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- 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

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-G Bracing Resist. Exemption
Use TIA-222-G Tension Splice Exemption

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets

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	175.00-128.66	46.34	4.68	18	23.0000	33.3750	0.2500	1.0000	A572-65 (65 ksi)
L2	128.66-100.00	33.34	0.00	18	31.8272	39.1450	0.3125	1.2500	A572-65 (65 ksi)

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
L3	100.00-85.09	14.91	5.82	18	39.1450	42.5625	0.5428	2.1712	A572-65 (65 ksi)
L4	85.09-42.03	48.88	6.94	18	40.1429	51.4688	0.5470	2.1880	A572-65 (65 ksi)
L5	42.03-0.00	48.97		18	48.7667	60.0000	0.5725	2.2900	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	23.3548	18.0521	1180.3983	8.0762	11.6840	101.0269	2362.3498	9.0278	3.6080	14.432
	33.8899	26.2847	3643.7791	11.7594	16.9545	214.9152	7292.3528	13.1448	5.4340	21.736
L2	33.3612	31.2586	3922.2382	11.1877	16.1682	242.5894	7849.6374	15.6323	5.0516	16.165
	39.7489	38.5170	7338.0463	13.7855	19.8857	369.0120	14685.7482	19.2622	6.3395	20.286
L3	39.7489	66.5057	12520.4628	13.7038	19.8857	629.6227	25057.4003	33.2592	5.9342	10.933
	43.2191	72.3935	16148.9040	14.9170	21.6217	746.8824	32319.0572	36.2036	6.5357	12.041
L4	42.1315	68.7455	13617.0350	14.0565	20.3926	667.7441	27251.9876	34.3793	6.1024	11.156
	52.2628	88.4093	28962.9597	18.0772	26.1462	1107.7332	57964.0295	44.2131	8.0958	14.8
L5	51.1356	87.5745	25698.3599	17.1090	24.7735	1037.3324	51430.5344	43.7956	7.5753	13.232
	60.9256	107.9866	48181.7140	21.0968	30.4800	1580.7649	96426.8268	54.0036	9.5524	16.685

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 175.00-128.66				1	1	1			
L2 128.66-100.00				1	1	1			
L3 100.00-85.09				1	1	1			
L4 85.09-42.03				1	1	1			
L5 42.03-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***									
SWITCHBLADE (Reinforcement)	A	Surface Af (CaAa)	100.00 - 0.00	1	1	0.000 0.000	3.5000	20.0000	0.00
SWITCHBLADE (Reinforcement)	B	Surface Af (CaAa)	100.00 - 0.00	1	1	0.000 0.000	3.5000	20.0000	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.82
(School)						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	104.50 - 0.00	1	No Ice	0.00	0.15
(School)						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
1 1/2" Rigid Conduit	A	No	Inside Pole	115.40 - 0.00	1	No Ice	0.00	1.00
(T-Mobile)						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
1 1/2" Rigid Conduit	C	No	Inside Pole	115.60 - 0.00	1	No Ice	0.00	1.00
(T-Mobile)						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
FLC 158-50J (1-5/8 FOAM)	A	No	Inside Pole	116.20 - 0.00	4	No Ice	0.00	0.92
(T-Mobile)						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
2" Rigid Conduit	A	No	Inside Pole	139.20 - 0.00	1	No Ice	0.00	2.80
(AT&T)						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
FLC 158-50J (1-5/8 FOAM)	A	No	Inside Pole	139.20 - 0.00	4	No Ice	0.00	0.92
(AT&T)						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
2" Rigid Conduit	C	No	Inside Pole	138.40 - 0.00	1	No Ice	0.00	2.80
(AT&T)						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
2" Rigid Conduit	B	No	Inside Pole	140.40 - 0.00	1	No Ice	0.00	2.80
(AT&T)						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
FLC 114-50J (1-1/4 FOAM)	A	No	Inside Pole	145.00 - 0.00	3	No Ice	0.00	0.70
(Sprint)						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM)	B	No	Inside Pole	148.80 - 0.00	3	No Ice	0.00	0.70
(Sprint)						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM)	C	No	Inside Pole	149.40 - 0.00	3	No Ice	0.00	0.70
(Sprint)						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM)	B	No	Inside Pole	151.20 - 0.00	3	No Ice	0.00	0.70
(Sprint)						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM)	B	No	Inside Pole	151.20 - 0.00	3	No Ice	0.00	0.70
(Sprint)						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
VXL6-50 (1-1/4 FOAM)	C	No	Inside Pole	157.60 - 0.00	1	No Ice	0.00	0.50
(School)						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
VXL6-50 (1-1/4 FOAM)	C	No	Inside Pole	157.60 - 0.00	1	No Ice	0.00	0.50
(School)						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
FLC 12-50J (1/2 FOAM)	C	No	Inside Pole	162.20 - 0.00	1	No Ice	0.00	0.17
(Sprint)						1/2" Ice	0.00	0.17
						1" Ice	0.00	0.17
E65 (ELLIPTICAL AIR)	C	No	Inside Pole	169.00 - 0.00	1	No Ice	0.00	0.67
(School)						1/2" Ice	0.00	0.67
						1" Ice	0.00	0.67
VXL6-50 (1-1/4 FOAM)	C	No	Inside Pole	173.00 - 0.00	1	No Ice	0.00	0.50
(School)						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
VXL6-50 (1-1/4 FOAM)	C	No	Inside Pole	173.60 - 0.00	1	No Ice	0.00	0.50
(School)						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
VXL7-50 (1-5/8 FOAM)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.75

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
(School)						1/2" Ice	0.00	0.75
						1" Ice	0.00	0.75
VXL7-50 (1-5/8 FOAM)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.75
(School)						1/2" Ice	0.00	0.75
						1" Ice	0.00	0.75
VXL6-50 (1-1/4 FOAM)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.50
(N/A)						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
FLC 158-50J (1-5/8	B	No	Inside Pole	116.20 - 0.00	4	No Ice	0.00	0.92
FOAM)						1/2" Ice	0.00	0.92
(T-Mobile)						1" Ice	0.00	0.92
FLC 158-50J (1-5/8	C	No	Inside Pole	116.20 - 0.00	4	No Ice	0.00	0.92
FOAM)						1/2" Ice	0.00	0.92
(T-Mobile)						1" Ice	0.00	0.92
FLC 158-50J (1-5/8	B	No	Inside Pole	139.20 - 0.00	4	No Ice	0.00	0.92
FOAM)						1/2" Ice	0.00	0.92
(AT&T)						1" Ice	0.00	0.92
FLC 158-50J (1-5/8	C	No	Inside Pole	139.20 - 0.00	4	No Ice	0.00	0.92
FOAM)						1/2" Ice	0.00	0.92
(AT&T)						1" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	175.00-128.66	A	0.000	0.000	0.000	0.000	102.61
		B	0.000	0.000	0.000	0.000	208.62
		C	0.000	0.000	0.000	0.000	346.60
L2	128.66-100.00	A	0.000	0.000	0.000	0.000	320.92
		B	0.000	0.000	0.000	0.000	425.89
		C	0.000	0.000	0.000	0.000	484.01
L3	100.00-85.09	A	0.000	0.000	8.697	0.000	197.71
		B	0.000	0.000	8.697	0.000	245.42
		C	0.000	0.000	0.000	0.000	284.33
L4	85.09-42.03	A	0.000	0.000	25.118	0.000	570.98
		B	0.000	0.000	25.118	0.000	708.77
		C	0.000	0.000	0.000	0.000	821.15
L5	42.03-0.00	A	0.000	0.000	24.517	0.000	557.32
		B	0.000	0.000	24.517	0.000	691.81
		C	0.000	0.000	0.000	0.000	801.51

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	175.00-128.66	A	1.746	0.000	0.000	0.000	0.000	102.61
		B		0.000	0.000	0.000	0.000	208.62
		C		0.000	0.000	0.000	0.000	346.60
L2	128.66-100.00	A	1.698	0.000	0.000	0.000	0.000	320.92
		B		0.000	0.000	0.000	0.000	425.89
		C		0.000	0.000	0.000	0.000	484.01
L3	100.00-85.09	A	1.663	0.000	0.000	13.656	0.000	451.21
		B		0.000	0.000	13.656	0.000	498.92

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		0.000	0.000	0.000	0.000	284.33
L4	85.09-42.03	A	1.601	0.000	0.000	39.438	0.000	1303.10
		B		0.000	0.000	39.438	0.000	1440.89
		C		0.000	0.000	0.000	0.000	821.15
L5	42.03-0.00	A	1.430	0.000	0.000	37.975	0.000	1239.28
		B		0.000	0.000	37.975	0.000	1373.77
		C		0.000	0.000	0.000	0.000	801.51

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L3	29	SWITCHBLADE	85.09 - 100.00	1.0000	1.0000
L3	30	SWITCHBLADE	85.09 - 100.00	1.0000	1.0000
L4	29	SWITCHBLADE	42.03 - 85.09	1.0000	1.0000
L4	30	SWITCHBLADE	42.03 - 85.09	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Gps Antenna	A	From Leg	4.00	0.0000	78.58	No Ice	0.05	0.05	2.00
(SCHOOL)			0.00			1/2" Ice	0.09	0.09	2.94
			0.00			1" Ice	0.14	0.14	4.49
Typical Yagi	C	From Leg	3.50	0.0000	104.50	No Ice	3.21	3.21	35.00
(SCHOOL)			0.00			1/2" Ice	3.21	3.21	40.00
			0.00			1" Ice	3.21	3.21	52.00
LNX-6515D5-A1M	A	From Leg	3.50	0.0000	115.33	No Ice	11.82	9.56	156.22
(T-MOBILE)			0.00			1/2" Ice	12.53	11.02	250.42
			0.00			1" Ice	13.22	12.16	356.64
LNX-6515D5-A1M	B	From Leg	3.50	0.0000	115.33	No Ice	11.82	9.56	156.22
(T-Mobile)			0.00			1/2" Ice	12.53	11.02	250.42
			0.00			1" Ice	13.22	12.16	356.64
LNX-6515D5-A1M	C	From Leg	3.50	0.0000	115.33	No Ice	11.82	9.56	156.22
(T-Mobile)			0.00			1/2" Ice	12.53	11.02	250.42
			0.00			1" Ice	13.22	12.16	356.64
RRUS 11B2	A	From Leg	3.50	0.0000	115.50	No Ice	2.89	1.57	52.30
(T-mobile)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
RRUS 11B2	B	From Leg	3.50	0.0000	115.50	No Ice	2.89	1.57	52.30
(T-Mobile)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
RRUS 11B2	C	From Leg	3.50	0.0000	115.50	No Ice	2.89	1.57	52.30
(T-Mobile)			0.00			1/2" Ice	3.14	1.87	76.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.42	2.20	103.77
(2) AIR21B2AB2P	A	From Leg	4.50	0.0000	116.16	No Ice	6.70	5.71	85.55
(T-Mobile)			0.00			1/2" Ice	7.40	6.83	143.22
			0.00			1" Ice	7.99	7.66	207.64
(2) AIR21B2AB2P	B	From Leg	4.50	0.0000	116.16	No Ice	6.70	5.71	85.55
(T-Mobile)			0.00			1/2" Ice	7.40	6.83	143.22
			0.00			1" Ice	7.99	7.66	207.64
(2) AIR21B2AB2P	C	From Leg	4.50	0.0000	116.16	No Ice	6.70	5.71	85.55
(T-Mobile)			0.00			1/2" Ice	7.40	6.83	143.22
			0.00			1" Ice	7.99	7.66	207.64
TPA-65R-LCUUUU-H8	A	From Leg	4.50	0.0000	139.15 - 139.20	No Ice	13.30	8.82	75.00
(AT&T)			0.00			1/2" Ice	13.90	9.42	154.46
			0.00			1" Ice	14.50	10.03	241.82
TPA-65R-LCUUUU-H8	B	From Leg	4.50	0.0000	139.15 - 139.20	No Ice	13.30	8.82	75.00
(AT&T)			0.00			1/2" Ice	13.90	9.42	154.46
			0.00			1" Ice	14.50	10.03	241.82
TPA-65R-LCUUUU-H8	C	From Leg	4.50	0.0000	139.15 - 139.20	No Ice	13.30	8.82	75.00
(AT&T)			0.00			1/2" Ice	13.90	9.42	154.46
			0.00			1" Ice	14.50	10.03	241.82
Powerwave 7770	A	From Leg	4.50	0.0000	139.20	No Ice	5.51	2.93	27.00
(AT&T)			0.00			1/2" Ice	5.87	3.27	59.63
			0.00			1" Ice	6.23	3.63	97.06
Powerwave 7770	B	From Leg	4.50	0.0000	139.20	No Ice	5.51	2.93	27.00
(AT&T)			0.00			1/2" Ice	5.87	3.27	59.63
			0.00			1" Ice	6.23	3.63	97.06
Powerwave 7770	C	From Leg	4.50	0.0000	139.20	No Ice	5.51	2.93	27.00
(AT&T)			0.00			1/2" Ice	5.87	3.27	59.63
			0.00			1" Ice	6.23	3.63	97.06
(2) ray cap squid DC6	A	From Leg	3.00	0.0000	138.33	No Ice	0.90	0.90	50.00
(AT&T)			0.00			1/2" Ice	1.06	1.06	61.25
			0.00			1" Ice	1.22	1.22	74.49
RRUS-11	A	From Leg	3.00	0.0000	140.33	No Ice	2.52	1.02	55.00
(AT&T)			0.00			1/2" Ice	2.72	1.16	74.32
			0.00			1" Ice	2.92	1.30	96.56
RRUS-11	B	From Leg	3.00	0.0000	140.33	No Ice	2.52	1.02	55.00
(AT&T)			0.00			1/2" Ice	2.72	1.16	74.32
			0.00			1" Ice	2.92	1.30	96.56
RRUS-11	C	From Leg	3.00	0.0000	140.33	No Ice	2.52	1.02	55.00
(AT&T)			0.00			1/2" Ice	2.72	1.16	74.32
			0.00			1" Ice	2.92	1.30	96.56
CCI-OPA-65R-LCUU-H8	A	From Leg	3.00	0.0000	139.20	No Ice	13.28	9.38	120.85
(AT&T)			0.00			1/2" Ice	14.11	10.88	215.84
			0.00			1" Ice	14.95	12.41	320.70
CCI-OPA-65R-LCUU-H8	B	From Leg	3.00	0.0000	139.20	No Ice	13.28	9.38	120.85
(AT&T)			0.00			1/2" Ice	14.11	10.88	215.84
			0.00			1" Ice	14.95	12.41	320.70
CCI-OPA-65R-LCUU-H8	C	From Leg	3.00	0.0000	139.20	No Ice	13.28	9.38	120.85
(AT&T)			0.00			1/2" Ice	14.11	10.88	215.84
			0.00			1" Ice	14.95	12.41	320.70
RRUS 32	A	From Leg	3.00	0.0000	139.20	No Ice	3.31	2.42	92.00
(AT&T)			0.00			1/2" Ice	3.56	2.64	119.93
			0.00			1" Ice	3.81	2.86	151.47
RRUS 32	B	From Leg	3.00	0.0000	139.20	No Ice	3.31	2.42	92.00
(AT&T)			0.00			1/2" Ice	3.56	2.64	119.93
			0.00			1" Ice	3.81	2.86	151.47
RRUS 32	C	From Leg	3.00	0.0000	139.20	No Ice	3.31	2.42	92.00
(AT&T)			0.00			1/2" Ice	3.56	2.64	119.93

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.81	2.86	151.47
RRU 2'2"X1'6"x7"	A	From Leg	3.00	0.0000	145.00	No Ice	4.55	1.77	50.00
(SPRINT)			0.00			1/2" Ice	4.84	1.99	76.83
			0.00			1" Ice	5.14	2.21	107.17
RRU 2'2"X1'6"x7"	B	From Leg	3.00	0.0000	145.00	No Ice	4.55	1.77	50.00
(SPRINT)			0.00			1/2" Ice	4.84	1.99	76.83
			0.00			1" Ice	5.14	2.21	107.17
RRU 2'2"X1'6"x7"	C	From Leg	3.00	0.0000	145.00	No Ice	4.55	1.77	50.00
(SPRINT)			0.00			1/2" Ice	4.84	1.99	76.83
			0.00			1" Ice	5.14	2.21	107.17
Capstan Panel CT33XC614	A	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
(SPRINT)			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.22	6.43	187.36
Capstan Panel CT33XC614	B	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
(SPRINT)			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.22	6.43	187.36
Capstan Panel CT33XC614	C	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
(SPRINT)			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.22	6.43	187.36
RFS Panel	A	From Leg	3.00	0.0000	149.35	No Ice	0.93	0.70	50.00
(SPRINT)			0.00			1/2" Ice	1.07	0.82	57.88
			0.00			1" Ice	1.21	0.95	67.63
RFS Panel	B	From Leg	3.00	0.0000	149.35	No Ice	0.93	0.70	50.00
(SPRINT)			0.00			1/2" Ice	1.07	0.82	57.88
			0.00			1" Ice	1.21	0.95	67.63
RFS Panel	C	From Leg	3.00	0.0000	149.35	No Ice	0.93	0.70	50.00
(SPRINT)			0.00			1/2" Ice	1.07	0.82	57.88
			0.00			1" Ice	1.21	0.95	67.63
MISC RRH16"X13"X10"	A	From Leg	3.00	0.0000	151.20	No Ice	2.02	1.56	40.00
(SPRINT)			0.00			1/2" Ice	2.21	1.73	57.44
			0.00			1" Ice	2.42	1.91	77.59
MISC RRH16"X13"X10"	B	From Leg	3.00	0.0000	151.20	No Ice	2.02	1.56	40.00
(SPRINT)			0.00			1/2" Ice	2.21	1.73	57.44
			0.00			1" Ice	2.42	1.91	77.59
MISC RRH16"X13"X10"	C	From Leg	3.00	0.0000	151.20	No Ice	2.02	1.56	40.00
(SPRINT)			0.00			1/2" Ice	2.21	1.73	57.44
			0.00			1" Ice	2.42	1.91	77.59
Alcatel-Lucent	A	From Leg	3.00	0.0000	151.20	No Ice	3.03	3.03	44.00
RRH19004X45			0.00			1/2" Ice	3.28	3.28	70.54
(SPRINT)			0.00			1" Ice	3.54	3.54	100.52
Alcatel-Lucent	B	From Leg	3.00	0.0000	151.20	No Ice	3.03	3.03	44.00
RRH19004X45			0.00			1/2" Ice	3.28	3.28	70.54
(SPRINT)			0.00			1" Ice	3.54	3.54	100.52
Alcatel-Lucent	C	From Leg	3.00	0.0000	151.20	No Ice	3.03	3.03	44.00
RRH19004X45			0.00			1/2" Ice	3.28	3.28	70.54
(SPRINT)			0.00			1" Ice	3.54	3.54	100.52
20'x2" whip antenna	C	From Leg	3.00	0.0000	155.67	No Ice	4.00	4.00	80.00
(School)			0.00			1/2" Ice	6.03	6.03	110.77
			10.00			1" Ice	8.07	8.07	154.12
10" dipole antenna	B	From Leg	3.00	0.0000	173.00	No Ice	2.00	2.00	70.00
(School)			0.00			1/2" Ice	3.02	3.02	85.50
			3.00			1" Ice	4.07	4.07	107.47
8'x 1" whip antenna	A	From Leg	3.00	0.0000	173.50	No Ice	0.80	0.80	50.00
(School)			0.00			1/2" Ice	1.62	1.62	57.43
			3.00			1" Ice	2.45	2.45	70.01
Typical Yagi	C	From Leg	3.00	0.0000	178.00	No Ice	3.21	3.21	35.00
(School)			0.00			1/2" Ice	3.21	3.21	40.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			3.00			1" Ice	3.21	3.21	52.00
ERI---A-1 Lightning Spur (N/A)	A	None		0.0000	175.00	No Ice	2.00	2.00	50.00
						1/2" Ice	4.00	4.00	75.00
						1" Ice	6.00	6.00	100.00
Nudd 14' Boom (3) (AT&T)	C	None		0.0000	139.20	No Ice	47.00	47.00	1600.00
						1/2" Ice	67.00	67.00	2050.00
						1" Ice	87.00	87.00	2500.00
PiROD 13'/14' Platform w/handrail (Sprint)	C	None		0.0000	148.67	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
PiROD 13'/14' Platform w/handrail (n/a)	C	None		0.0000	127.50	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
PiROD 13'/14' Platform w/handrail (T-Mobile)	C	None		0.0000	116.20	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
PiROD 13'/14' Platform w/handrail (School)	C	None		0.0000	173.00	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
Pirod 6' Side Mount Standoff (1)	C	None		0.0000	78.66	No Ice	4.97	4.97	70.00
						1/2" Ice	6.12	6.12	130.00
						1" Ice	7.27	7.27	190.00
PiROD 13'/14' Platform w/handrail (School)	C	None		0.0000	104.50	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
Pirod 6' Side Mount Standoff (1)	C	None		0.0000	185.67	No Ice	4.97	4.97	70.00
						1/2" Ice	6.12	6.12	130.00
						1" Ice	7.27	7.27	190.00
5'3"x4" Pipe Mount (Sprint)	C	From Leg	1.50	0.0000	162.67 - 162.17	No Ice	1.56	1.56	57.00
			0.00			1/2" Ice	2.21	2.21	73.81
			0.00			1" Ice	2.54	2.54	94.43
5'3"x4" Pipe Mount (School)	C	From Leg	1.50	0.0000	169.00	No Ice	1.55	1.55	57.00
			0.00			1/2" Ice	2.21	2.21	73.81
			0.00			1" Ice	2.54	2.54	94.43
RRUS 32 B2 (AT&T)	A	From Leg	3.00	0.0000	139.20	No Ice	2.59	1.53	53.00
			0.00			1/2" Ice	2.81	1.71	72.54
			0.00			1" Ice	3.03	1.90	95.17
RRUS 32 B2 (AT&T)	B	From Leg	3.00	0.0000	139.20	No Ice	2.59	1.53	53.00
			0.00			1/2" Ice	2.81	1.71	72.54
			0.00			1" Ice	3.03	1.90	95.17
RRUS 32 B2 (AT&T)	C	From Leg	3.00	0.0000	139.20	No Ice	2.59	1.53	53.00
			0.00			1/2" Ice	2.81	1.71	72.54
			0.00			1" Ice	3.03	1.90	95.17

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft^2	Weight lb

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
8' Mw with Radome (School)	C	Paraboloid w/o Radome	From Leg	3.50 0.00 0.00	Worst		169.00	8.00	No Ice 1/2" Ice 1" Ice	50.27 51.32 52.37	500.00 763.44 1026.89
6' Grid antenna (Sprint)	C	Grid	From Leg	3.50 0.00 0.00	Worst		162.20	6.00	No Ice 1/2" Ice 1" Ice	28.27 29.07 29.86	250.00 399.23 548.45
4'x16" grid antenna (School)	C	Grid	From Leg	2.50 0.00 0.00	Worst		157.50	4.00	No Ice 1/2" Ice 1" Ice	5.31 5.66 6.00	70.00 99.05 128.11

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	40340.49					
Bracing Weight	0.00					
Total Member Self-Weight	40340.49			1795.46	3736.57	
Total Weight	62487.43			1795.46	3736.57	
Wind 0 deg - No Ice		0.00	-28299.89	-3248869.21	3736.57	-14904.70
Wind 30 deg - No Ice		14184.71	-24568.63	-2816443.29	-1623374.33	-8651.18
Wind 60 deg - No Ice		22490.69	-12985.01	-1540292.10	-2667237.42	-79.58
Wind 90 deg - No Ice		25963.67	0.00	1795.46	-3079852.85	8513.34
Wind 120 deg - No Ice		22490.69	12985.01	1543883.02	-2667237.42	14825.13
Wind 150 deg - No Ice		14184.71	24568.63	2820034.21	-1623374.33	17164.53
Wind 180 deg - No Ice		0.00	28299.89	3252460.13	3736.57	14904.70
Wind 210 deg - No Ice		-14184.71	24568.63	2820034.21	1630847.48	8651.18
Wind 240 deg - No Ice		-22490.69	12985.01	1543883.02	2674710.57	79.58
Wind 270 deg - No Ice		-25963.67	0.00	1795.46	3087325.99	-8513.34
Wind 300 deg - No Ice		-22490.69	-12985.01	-1540292.10	2674710.57	-14825.13
Wind 330 deg - No Ice		-14184.71	-24568.63	-2816443.29	1630847.48	-17164.53
Member Ice	14846.00					
Total Weight Ice	103502.20			5428.90	10573.61	
Wind 0 deg - Ice		0.00	-11906.91	-1303448.82	10573.61	-4955.39
Wind 30 deg - Ice		5776.95	-10005.97	-1111793.16	-634454.85	-2873.56
Wind 60 deg - Ice		9335.52	-5389.86	-621264.75	-1074891.62	-21.76
Wind 90 deg - Ice		10669.06	0.00	5428.90	-1232583.01	2835.86
Wind 120 deg - Ice		9335.52	5389.86	632122.55	-1074891.62	4933.62
Wind 150 deg - Ice		5776.95	10005.97	1122650.96	-634454.85	5709.42
Wind 180 deg - Ice		0.00	11906.91	1314306.62	10573.61	4955.39
Wind 210 deg - Ice		-5776.95	10005.97	1122650.96	655602.07	2873.56
Wind 240 deg - Ice		-9335.52	5389.86	632122.55	1096038.85	21.76
Wind 270 deg - Ice		-10669.06	0.00	5428.90	1253730.24	-2835.86
Wind 300 deg - Ice		-9335.52	-5389.86	-621264.75	1096038.85	-4933.62
Wind 330 deg - Ice		-5776.95	-10005.97	-1111793.16	655602.07	-5709.42
Total Weight	62487.43			1795.46	3736.57	
Wind 0 deg - Service		0.00	-8268.07	-947915.38	3736.57	-4354.54
Wind 30 deg - Service		4144.19	-7177.95	-821578.27	-471638.47	-2527.52
Wind 60 deg - Service		6570.86	-3793.69	-448739.25	-776612.44	-23.25
Wind 90 deg - Service		7585.52	0.00	1795.46	-897161.73	2487.25
Wind 120 deg - Service		6570.86	3793.69	452330.17	-776612.44	4331.29
Wind 150 deg - Service		4144.19	7177.95	825169.19	-471638.47	5014.77
Wind 180 deg - Service		0.00	8268.07	951506.30	3736.57	4354.54
Wind 210 deg - Service		-4144.19	7177.95	825169.19	479111.62	2527.52
Wind 240 deg - Service		-6570.86	3793.69	452330.17	784085.58	23.25

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 270 deg - Service		-7585.52	0.00	1795.46	904634.88	-2487.25
Wind 300 deg - Service		-6570.86	-3793.69	-448739.25	784085.58	-4331.29
Wind 330 deg - Service		-4144.19	-7177.95	-821578.27	479111.62	-5014.77

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service

Comb. No.	Description
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	175 - 128.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30906.29	11583.67	-5966.48
			Max. Mx	20	-13076.19	469512.29	-1402.79
			Max. My	14	-13040.66	3115.26	-467683.94
			Max. Vy	20	-22115.53	469512.29	-1402.79
			Max. Vx	14	22136.52	3115.26	-467683.94
			Max. Torque	12			-26786.92
L2	128.66 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57834.07	12418.18	-6412.47
			Max. Mx	20	-27806.58	1373395.35	-1909.88
			Max. My	14	-27752.71	4014.41	-1372594.25
			Max. Vy	20	-32669.25	1373395.35	-1909.88
			Max. Vx	14	32715.07	4014.41	-1372594.25
			Max. Torque	12			-27292.24
L3	100 - 85.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62003.73	12541.22	-6475.62
			Max. Mx	20	-31002.71	1674379.22	-1988.61
			Max. My	14	-30884.92	4158.44	-1679451.16
			Max. Vy	20	-33585.38	1674379.22	-1988.61
			Max. Vx	14	34842.31	4158.44	-1679451.16
			Max. Torque	12			-27283.08
L4	85.09 - 42.03	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85577.70	12910.89	-6615.90
			Max. Mx	20	-49112.65	3178533.55	-2194.54
			Max. My	14	-48987.69	4583.84	-3284045.69
			Max. Vy	20	-37873.32	3178533.55	-2194.54
			Max. Vx	14	40836.81	4583.84	-3284045.69
			Max. Torque	12			-27266.08
L5	42.03 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-117615.90	12868.03	-6593.47
			Max. Mx	20	-74960.44	5128478.93	-2209.98
			Max. My	14	-74956.83	4624.24	-5399624.49
			Max. Vy	20	-41585.84	5128478.93	-2209.98
			Max. Vx	14	45326.11	4624.24	-5399624.49
			Max. Torque	12			-27210.91

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	117615.90	-0.66	0.35
	Max. H_x	20	74984.90	41541.72	-0.00
	Max. H_z	3	56238.68	0.00	45279.72
	Max. M_x	2	5395003.24	0.00	45279.66
	Max. M_z	8	5118874.75	-41541.72	-0.00
	Max. Torsion	25	27192.22	22695.52	39309.78
	Min. Vert	21	56238.67	41541.57	-0.01
	Min. H_x	8	74984.90	-41541.72	-0.00
	Min. H_z	15	56238.68	0.00	-45279.72
	Min. M_x	14	-5399624.49	0.00	-45279.66
	Min. M_z	20	-5128478.93	41541.72	-0.00
	Min. Torsion	13	-27192.39	-22695.51	-39309.78

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	62487.43	0.96	-0.48	1796.26	3738.73	-0.11
1.2 Dead+1.6 Wind 0 deg - No Ice	74984.90	-0.00	-45279.66	-5395003.24	4620.64	-23600.11
0.9 Dead+1.6 Wind 0 deg - No Ice	56238.68	-0.00	-45279.72	-5343428.67	3398.66	-23603.48
1.2 Dead+1.6 Wind 30 deg - No Ice	74984.91	22695.50	-39309.77	-4676887.75	-2696855.08	-13683.26
0.9 Dead+1.6 Wind 30 deg - No Ice	56238.68	22695.51	-39309.78	-4632287.30	-2671990.02	-13689.16
1.2 Dead+1.6 Wind 60 deg - No Ice	74984.91	35985.05	-20775.98	-2560017.33	-4433278.06	-99.61
0.9 Dead+1.6 Wind 60 deg - No Ice	56238.68	35985.07	-20775.99	-2535391.44	-4390836.10	-106.60
1.2 Dead+1.6 Wind 90 deg - No Ice	74984.90	41541.72	0.00	2208.46	-5118874.75	13515.99
0.9 Dead+1.6 Wind 90 deg - No Ice	56238.67	41541.57	0.01	1624.38	-5069653.96	13509.62
1.2 Dead+1.6 Wind 120 deg - No Ice	74984.91	35985.05	20775.98	2564485.28	-4433367.93	23508.89
0.9 Dead+1.6 Wind 120 deg - No Ice	56238.68	35985.07	20775.99	2538676.49	-4390901.69	23505.07
1.2 Dead+1.6 Wind 150 deg - No Ice	74984.91	22695.50	39309.77	4681456.03	-2696947.54	27192.17
0.9 Dead+1.6 Wind 150 deg - No Ice	56238.68	22695.51	39309.78	4635645.74	-2672057.45	27192.39
1.2 Dead+1.6 Wind 180 deg - No Ice	74984.90	-0.00	45279.66	5399624.49	4619.82	23597.19
0.9 Dead+1.6 Wind 180 deg - No Ice	56238.68	-0.00	45279.72	5346825.90	3398.21	23601.38
1.2 Dead+1.6 Wind 210 deg - No Ice	74984.91	-22695.51	39309.76	4681612.34	2706276.77	13680.11
0.9 Dead+1.6 Wind 210 deg - No Ice	56238.68	-22695.52	39309.78	4635760.18	2678919.36	13686.90
1.2 Dead+1.6 Wind 240 deg - No Ice	74984.91	-35985.05	20775.98	2564637.50	4442883.86	99.28
0.9 Dead+1.6 Wind 240 deg - No Ice	56238.68	-35985.07	20775.99	2538787.98	4397900.07	106.41
1.2 Dead+1.6 Wind 270 deg - No Ice	74984.90	-41541.72	0.00	2207.59	5128478.93	-13513.24

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
0.9 Dead+1.6 Wind 270 deg - No Ice	56238.67	-41541.57	0.01	1623.91	5076716.78	-13507.54
1.2 Dead+1.6 Wind 300 deg - No Ice	74984.91	-35985.06	-20775.98	-2560170.69	4442794.16	-23505.88
0.9 Dead+1.6 Wind 300 deg - No Ice	56238.68	-35985.07	-20775.99	-2535503.50	4397834.46	-23502.80
1.2 Dead+1.6 Wind 330 deg - No Ice	74984.91	-22695.51	-39309.76	-4677044.27	2706185.35	-27192.01
0.9 Dead+1.6 Wind 330 deg - No Ice	56238.68	-22695.52	-39309.78	-4632401.74	2678852.42	-27192.22
1.2 Dead+1.0 Ice+1.0 Temp	117615.90	0.66	-0.35	6593.47	12868.03	-0.82
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	117615.90	0.01	-11906.61	-1399834.20	13186.93	-4955.36
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	117615.90	5776.81	-10005.71	-1194428.00	-680317.05	-2865.90
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	117615.90	9335.27	-5389.72	-667746.50	-1155086.93	-8.69
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	117615.90	10668.77	-0.00	6757.40	-1325047.29	2850.64
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	117615.90	9335.27	5389.71	681266.30	-1155096.72	4945.87
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	117615.90	5776.80	10005.71	1207957.77	-680327.37	5715.49
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	117615.90	0.01	11906.60	1413368.62	13185.71	4953.31
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	117615.90	-5776.79	10005.70	1207972.72	706708.28	2863.83
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	117615.90	-9335.25	5389.71	681280.66	1181496.38	7.04
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	117615.90	-10668.75	-0.00	6756.15	1351456.57	-2851.86
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	117615.90	-9335.25	-5389.72	-667763.02	1181487.78	-4947.07
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	117615.90	-5776.79	-10005.71	-1194444.19	706700.05	-5717.10
Dead+Wind 0 deg - Service	62487.42	0.00	-8267.51	-978236.40	3982.60	-4354.83
Dead+Wind 30 deg - Service	62487.41	4143.45	-7176.65	-847718.03	-486554.19	-2525.32
Dead+Wind 60 deg - Service	62487.41	6569.60	-3792.96	-463267.75	-801738.51	-19.23
Dead+Wind 90 deg - Service	62487.41	7584.07	-0.00	1915.30	-926209.41	2492.04
Dead+Wind 120 deg - Service	62487.42	6570.39	3793.41	467165.45	-801853.54	4335.50
Dead+Wind 150 deg - Service	62487.42	4143.91	7177.46	851669.77	-486623.35	5017.26
Dead+Wind 180 deg - Service	62487.42	0.00	8267.50	982072.80	3982.50	4354.54
Dead+Wind 210 deg - Service	62487.42	-4143.90	7177.46	851673.70	494590.65	2525.02
Dead+Wind 240 deg - Service	62487.41	-6569.57	3792.95	467102.79	809710.23	19.00
Dead+Wind 270 deg - Service	62487.41	-7584.04	-0.00	1915.20	934181.08	-2492.18
Dead+Wind 300 deg - Service	62487.42	-6570.38	-3793.41	-463336.87	809823.39	-4335.63
Dead+Wind 330 deg - Service	62487.42	-4143.91	-7177.46	-847838.71	494588.39	-5017.48

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-62487.43	0.00	-0.96	62487.43	0.48	0.002%
2	0.00	-74984.91	-45279.83	0.00	74984.90	45279.66	0.000%
3	0.00	-56238.68	-45279.83	0.00	56238.68	45279.72	0.000%
4	22695.53	-74984.91	-39309.81	-22695.50	74984.91	39309.77	0.000%
5	22695.53	-56238.68	-39309.81	-22695.51	56238.68	39309.78	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
6	35985.10	-74984.91	-20776.01	-35985.05	74984.91	20775.98	0.000%
7	35985.10	-56238.68	-20776.01	-35985.07	56238.68	20775.99	0.000%
8	41541.88	-74984.91	0.00	-41541.72	74984.90	-0.00	0.000%
9	41541.88	-56238.68	0.00	-41541.57	56238.67	-0.01	0.000%
10	35985.10	-74984.91	20776.01	-35985.05	74984.91	-20775.98	0.000%
11	35985.10	-56238.68	20776.01	-35985.07	56238.68	-20775.99	0.000%
12	22695.53	-74984.91	39309.81	-22695.50	74984.91	-39309.77	0.000%
13	22695.53	-56238.68	39309.81	-22695.51	56238.68	-39309.78	0.000%
14	0.00	-74984.91	45279.83	0.00	74984.90	-45279.66	0.000%
15	0.00	-56238.68	45279.83	0.00	56238.68	-45279.72	0.000%
16	-22695.53	-74984.91	39309.81	22695.51	74984.91	-39309.76	0.000%
17	-22695.53	-56238.68	39309.81	22695.52	56238.68	-39309.78	0.000%
18	-35985.10	-74984.91	20776.01	35985.05	74984.91	-20775.98	0.000%
19	-35985.10	-56238.68	20776.01	35985.07	56238.68	-20775.99	0.000%
20	-41541.88	-74984.91	0.00	41541.72	74984.90	-0.00	0.000%
21	-41541.88	-56238.68	0.00	41541.57	56238.67	-0.01	0.000%
22	-35985.10	-74984.91	-20776.01	35985.06	74984.91	20775.98	0.000%
23	-35985.10	-56238.68	-20776.01	35985.07	56238.68	20775.99	0.000%
24	-22695.53	-74984.91	-39309.81	22695.51	74984.91	39309.76	0.000%
25	-22695.53	-56238.68	-39309.81	22695.52	56238.68	39309.78	0.000%
26	0.00	-117615.91	0.00	-0.66	117615.90	0.35	0.001%
27	0.00	-117615.91	-11906.91	-0.01	117615.90	11906.61	0.000%
28	5776.95	-117615.91	-10005.97	-5776.81	117615.90	10005.71	0.000%
29	9335.52	-117615.91	-5389.86	-9335.27	117615.90	5389.72	0.000%
30	10669.06	-117615.91	0.00	-10668.77	117615.90	0.00	0.000%
31	9335.52	-117615.91	5389.86	-9335.27	117615.90	-5389.71	0.000%
32	5776.95	-117615.91	10005.97	-5776.80	117615.90	-10005.71	0.000%
33	0.00	-117615.91	11906.91	-0.01	117615.90	-11906.60	0.000%
34	-5776.95	-117615.91	10005.97	5776.79	117615.90	-10005.70	0.000%
35	-9335.52	-117615.91	5389.86	9335.25	117615.90	-5389.71	0.000%
36	-10669.06	-117615.91	0.00	10668.75	117615.90	0.00	0.000%
37	-9335.52	-117615.91	-5389.86	9335.25	117615.90	5389.72	0.000%
38	-5776.95	-117615.91	-10005.97	5776.79	117615.90	10005.71	0.000%
39	0.00	-62487.43	-8268.07	-0.00	62487.42	8267.51	0.001%
40	4144.19	-62487.43	-7177.95	-4143.45	62487.41	7176.65	0.002%
41	6570.86	-62487.43	-3793.69	-6569.60	62487.41	3792.96	0.002%
42	7585.52	-62487.43	0.00	-7584.07	62487.41	0.00	0.002%
43	6570.86	-62487.43	3793.69	-6570.39	62487.42	-3793.41	0.001%
44	4144.19	-62487.43	7177.95	-4143.91	62487.42	-7177.46	0.001%
45	0.00	-62487.43	8268.07	-0.00	62487.42	-8267.50	0.001%
46	-4144.19	-62487.43	7177.95	4143.90	62487.42	-7177.46	0.001%
47	-6570.86	-62487.43	3793.69	6569.57	62487.41	-3792.95	0.002%
48	-7585.52	-62487.43	0.00	7584.04	62487.41	0.00	0.002%
49	-6570.86	-62487.43	-3793.69	6570.38	62487.42	3793.41	0.001%
50	-4144.19	-62487.43	-7177.95	4143.91	62487.42	7177.46	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00001035
2	Yes	16	0.00000001	0.00012097
3	Yes	16	0.00000001	0.00009300
4	Yes	17	0.00000001	0.00008405
5	Yes	17	0.00000001	0.00006132
6	Yes	17	0.00000001	0.00008762

7	Yes	17	0.00000001	0.00006453
8	Yes	16	0.00000001	0.00006877
9	Yes	15	0.00000001	0.00014463
10	Yes	17	0.00000001	0.00011715
11	Yes	17	0.00000001	0.00008726
12	Yes	17	0.00000001	0.00008301
13	Yes	17	0.00000001	0.00006102
14	Yes	16	0.00000001	0.00012117
15	Yes	16	0.00000001	0.00009311
16	Yes	17	0.00000001	0.00011019
17	Yes	17	0.00000001	0.00008083
18	Yes	17	0.00000001	0.00008846
19	Yes	17	0.00000001	0.00006494
20	Yes	16	0.00000001	0.00006901
21	Yes	15	0.00000001	0.00014499
22	Yes	17	0.00000001	0.00007755
23	Yes	17	0.00000001	0.00005727
24	Yes	17	0.00000001	0.00012903
25	Yes	17	0.00000001	0.00009540
26	Yes	10	0.00000001	0.00007493
27	Yes	15	0.00000001	0.00010064
28	Yes	15	0.00000001	0.00011161
29	Yes	15	0.00000001	0.00011016
30	Yes	15	0.00000001	0.00009289
31	Yes	15	0.00000001	0.00012099
32	Yes	15	0.00000001	0.00011725
33	Yes	15	0.00000001	0.00010310
34	Yes	15	0.00000001	0.00012359
35	Yes	15	0.00000001	0.00011782
36	Yes	15	0.00000001	0.00009738
37	Yes	15	0.00000001	0.00011671
38	Yes	15	0.00000001	0.00012765
39	Yes	13	0.00000001	0.00008385
40	Yes	12	0.00014462	0.00009226
41	Yes	12	0.00014489	0.00006499
42	Yes	12	0.00014499	0.00011005
43	Yes	13	0.00000001	0.00009654
44	Yes	13	0.00000001	0.00008281
45	Yes	13	0.00000001	0.00008469
46	Yes	13	0.00000001	0.00007027
47	Yes	12	0.00014507	0.00006765
48	Yes	12	0.00014516	0.00011236
49	Yes	13	0.00000001	0.00006975
50	Yes	13	0.00000001	0.00011384

Compression Checks

Pole Design Data

Section No.	*Elevation*	*Size*	*L*	L_u	*Kl/r*	*A*	P_u	ϕP_n	*Ratio* $\frac{P_u}{\phi P_n}$
	ft		*ft*	*ft*		in^2	*lb*	*lb*	
L1	175 - 128.66 (1)	TP33.375x23x0.25	46.34	0.00	0.0	25.4533	-13075.50	1757100.00	0.007
L2	128.66 - 100 (2)	TP39.145x31.8272x0.3125	33.34	0.00	0.0	38.5170	-27750.40	2687950.00	0.010
L3	100 - 85.09 (3)	TP42.5625x39.145x0.5428	14.91	0.00	0.0	70.0953	-30882.30	5207730.00	0.006

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L4	85.09 - 42.03 (4)	TP51.4688x40.1429x0.547	48.88	0.00	0.0	85.6174	-48984.60	6360950.00	0.008
L5	42.03 - 0 (5)	TP60x48.7667x0.5725	48.97	0.00	0.0	107.9870	-74956.70	7947590.00	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	175 - 128.66 (1)	TP33.375x23x0.25	469981.67	1159083.33	0.405	0.00	1159083.33	0.000
L2	128.66 - 100 (2)	TP39.145x31.8272x0.3125	1374650.00	2145991.67	0.641	0.00	2145991.67	0.000
L3	100 - 85.09 (3)	TP42.5625x39.145x0.5428	1681566.67	4333383.33	0.388	0.00	4333383.33	0.000
L4	85.09 - 42.03 (4)	TP51.4688x40.1429x0.547	3287683.33	6429708.00	0.511	0.00	6429708.00	0.000
L5	42.03 - 0 (5)	TP60x48.7667x0.5725	5407533.33	9695083.33	0.558	0.00	9695083.33	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 128.66 (1)	TP33.375x23x0.25	22116.90	878552.00	0.025	88.91	2321000.00	0.000
L2	128.66 - 100 (2)	TP39.145x31.8272x0.3125	32718.60	1343980.00	0.024	13717.75	4297233.33	0.003
L3	100 - 85.09 (3)	TP42.5625x39.145x0.5428	34858.90	2603860.00	0.013	13711.17	8677333.33	0.002
L4	85.09 - 42.03 (4)	TP51.4688x40.1429x0.547	40899.10	3180470.00	0.013	13692.25	12875166.67	0.001
L5	42.03 - 0 (5)	TP60x48.7667x0.5725	45437.50	3973800.00	0.011	13680.08	19413916.00	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 128.66 (1)	0.007	0.405	0.000	0.025	0.000	0.414 ✔	1.000	4.8.2 ✔
L2	128.66 - 100 (2)	0.010	0.641	0.000	0.024	0.003	0.652 ✔	1.000	4.8.2 ✔
L3	100 - 85.09 (3)	0.006	0.388	0.000	0.013	0.002	0.394 ✔	1.000	4.8.2 ✔
L4	85.09 - 42.03 (4)	0.008	0.511	0.000	0.013	0.001	0.519	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L5	42.03 - 0 (5)	0.009	0.558	0.000	0.011	0.001	0.567	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$øP_{allow}$ lb	% Capacity	Pass Fail
L1	175 - 128.66	Pole	TP33.375x23x0.25	1	-13075.50	1757100.00	41.4	Pass
L2	128.66 - 100	Pole	TP39.145x31.8272x0.3125	2	-27750.40	2687950.00	65.2	Pass
L3	100 - 85.09	Pole	TP42.5625x39.145x0.5428	3	-30882.30	5207730.00	39.4	Pass
L4	85.09 - 42.03	Pole	TP51.4688x40.1429x0.547	4	-48984.60	6360950.00	51.9	Pass
L5	42.03 - 0	Pole	TP60x48.7667x0.5725	5	-74956.70	7947590.00	56.7	Pass
							Summary	
						Pole (L2)	65.2	Pass
						RATING =	**65.2**	**Pass**