STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

July 20, 2012

John Lawrence
New Cingular Wireless PCS, LLC
95 Ryan Drive, Suite #1
Raynham, MA 02767

RE: **EM-CING-155-120629** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 3114 Albany Avenue, West Hartford, Connecticut.

Dear Mr. Lawrence:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated June 26, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of

uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Scott Slifka, Mayor, Town of West Hartford
Barry M. Feldman, Town Manager, Town of West Hartford
Mila Limson, Town Planner, Town of West Hartford
Grain Communications LLC

New Cingular Wireless PCS, LLC
EM-CING-155-120629 Drive
nnecticut 06067

nce
Consultant
Suite #1
Raynham, MA 02767
Phone: (781) 715-5532
jlawrence@clinellc.com

June 26, 2012

Honorable Robert Stein, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Notice of Exempt Modification – Existing Telecommunications Facility at 3114 Albany Ave, West Hartford, CT 06117

Dear Chairman Stein and Members of the Council:

New Cingular Wireless PCS, LLC ("AT&T") intends to modify the existing telecommunications antennas and associated equipment at an existing multicarrier telecommunications tower at 3114 Albany Ave, West Hartford CT 06117. AT&T operates under licenses issued by the Federal Communications Commission ("FCC") to provide cellular and PCS mobile telephone service in Hartford County, which includes the area to be served by AT&T's proposed installation.

In order to accommodate technological changes, implement Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to Ron Van Winkle, Town Manager of West Hartford.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Existing Facility

The Wethersfield facility is located at 3114 Albany Ave, West Hartford CT 06117

The facility is owned by Grain Communications, LLC

The existing facility consists of a 346 foot monopole tower with an existing chain link fence around the tower compound fenced in compound. AT&T currently operates wireless communications equipment at the facility and has nine (9) antennas mounted at the tower centerline height of 115'.

Statutory Considerations

The changes to the West Hartford tower facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2) because they will not result in any substantial adverse environmental effect.

1. The height of the overall structure will be unaffected.

2. The proposed changes will not affect the property boundaries. All new construction will take place inside the existing fenced compound.

3. The proposed additions will not increase the noise level at the existing facility by six decibels or more.

4. LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons, New Cingular Wireless respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully yours,

John Lawrence
Real Estate Consultant

Enclosures:
Ron Van Winkle, Town Manager of West Hartford

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781) 715-5532
jlawrence@clinellc.com

June 26, 2012

Ron Van Winkle, Town Manager
Town of West Hartford
50 South Main Street
West Hartford, CT 06107

Re: Notice of Exempt Modification – Existing Telecommunications Facility at 3114 Albany Ave, West Hartford, CT 06117

Dear Mr. Van Winkle,

New Cingular Wireless PCS, LLC ("AT&T") intends to replace telecommunications antennas and associated equipment at an existing telecommunications tower, owned and operated by Grain Communications.

A Notice of Exempt Modification has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73. Please accept this letter as notification to the Town of West Hartford under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The attached letter fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact John Lawrence at (781) 715-5532 or Linda Roberts, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

John Lawrence
Real Estate Consultant

Enclosure
CC: Honorable Robert Stein, Chairmen of the Connecticut Siting Council

CT1154 – 3114 Albany Ave, West Hartford CT

Aerial Location Map

Street Location Map

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT1154

(West Hartford, Route 44)

3114 Albany Ave, West Hartford, CT 06117

March 27, 2012

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the guyed tower located at 3114 Albany Ave in West Hartford, CT. The coordinates of the tower are 41-47-48.5 N, 72-47-48.6 W.

AT&T is proposing the following modifications:

1) Replace six of nine existing dual-band (850/1900 MHz) panel antennas with six multi-band (700/850/1900/2100 MHz) antennas (two per sector);
2) Relocate three of nine existing dual-band (850/1900 MHz) panel antennas (one per sector) to an existing pipe mount;
3) Install three 700 MHz LTE Remote Radio Units (RRUs) (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular GSM	*115*	*880*	*2*	*296*	*0.0161*	*0.5867*	*2.74%*
Cingular GSM	*115*	*1930*	*1*	*427*	*0.0116*	*1.0000*	*1.16%*
Cingular UMTS	*115*	*880*	*1*	*500*	*0.0136*	*0.5867*	*2.32%*
VHF	200	450	1	250	0.0022	0.3000	0.75%
WCCC	420	106.9	1	23000	0.0469	0.2000	23.44%
WMNR	150	91.9	1	10	0.0002	0.2000	0.08%
Pocket	120	2130	3	631	0.0473	1.0000	4.73%
Verizon	130	875	9	200	0.0383	0.5833	6.57%
Verizon	130	1900	3	200	0.0128	1.0000	1.28%
Rinkers Paging	265	152.03	1	100	0.0005	0.2000	0.26%
LPTV, Ch. 38	285	614	1	50000	0.2213	0.4093	54.07%
WHfd Fire Dept	265	166.25	1	50	0.0003	0.2000	0.13%
T-Mobile	160	1935	8	131	0.0147	1.0000	1.47%
AT&T UMTS	112	880	2	565	0.0032	0.5867	0.55%
AT&T UMTS	112	1900	2	1077	0.0062	1.0000	0.62%
AT&T LTE	112	734	1	1375	0.0039	0.4893	0.81%
AT&T GSM	112	880	1	538	0.0015	0.5867	0.26%
AT&T GSM	112	1900	4	934	0.0107	1.0000	1.07%
						Total	**96.08%**

Table 1: Carrier Information[1][2]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 1/10/2012.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **96.08% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

March 27, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

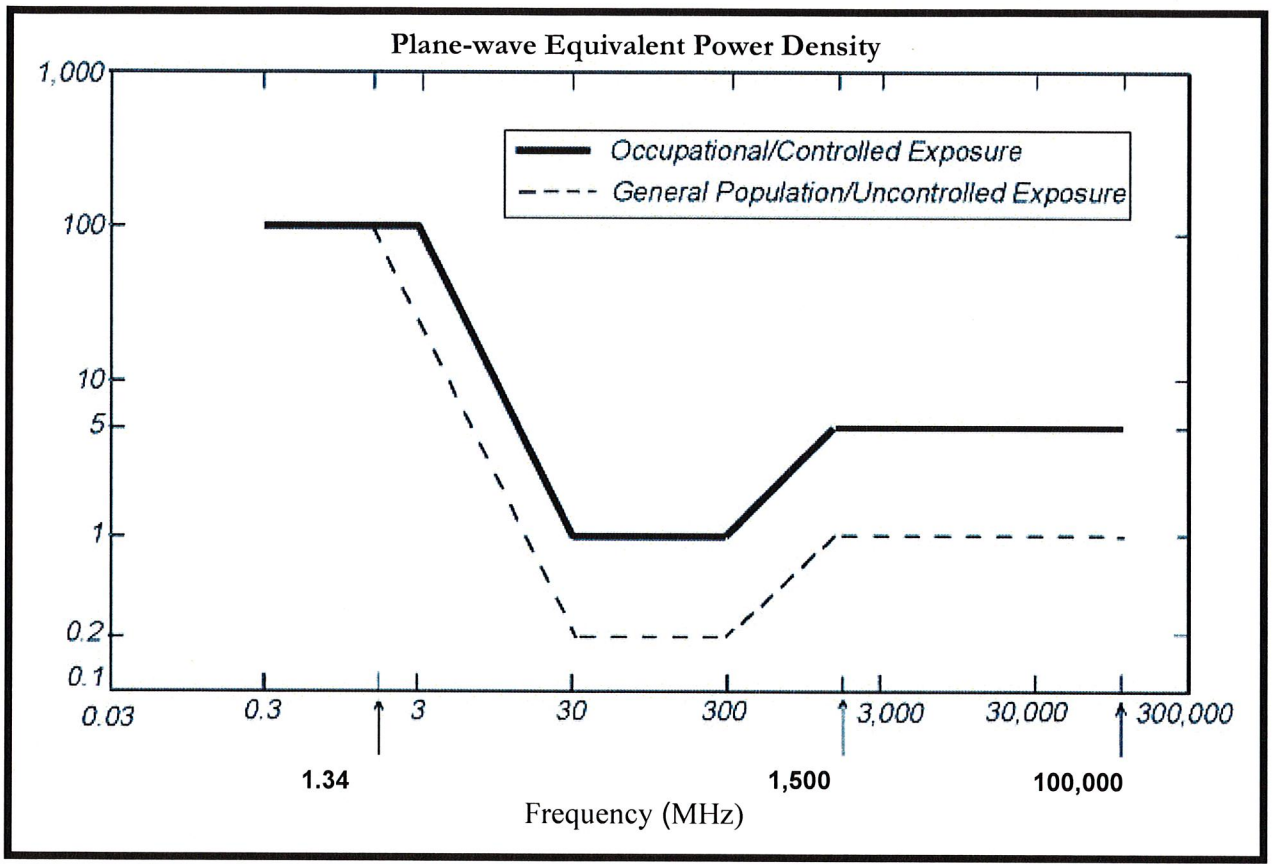
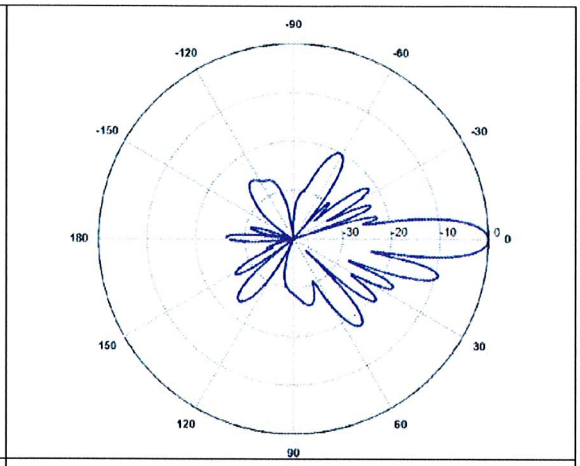


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

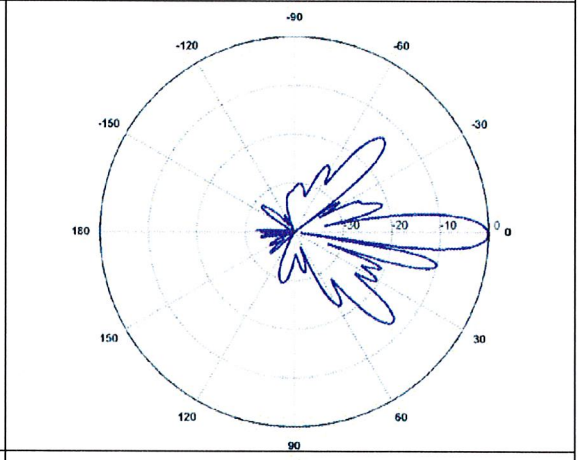
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



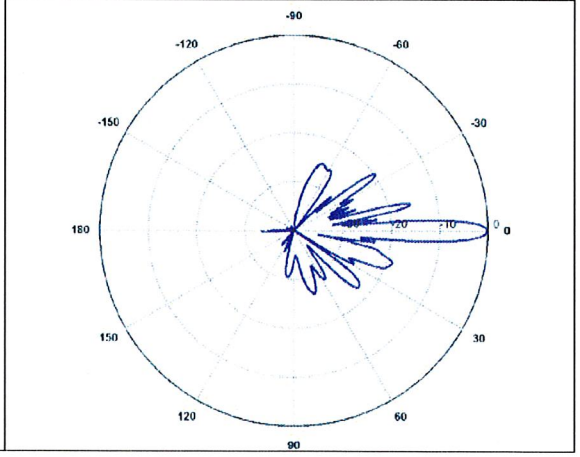
850 MHz GSM

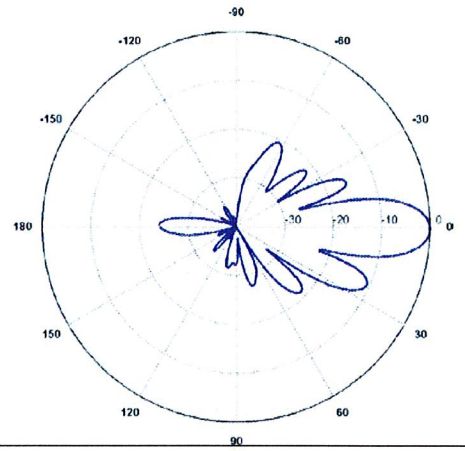
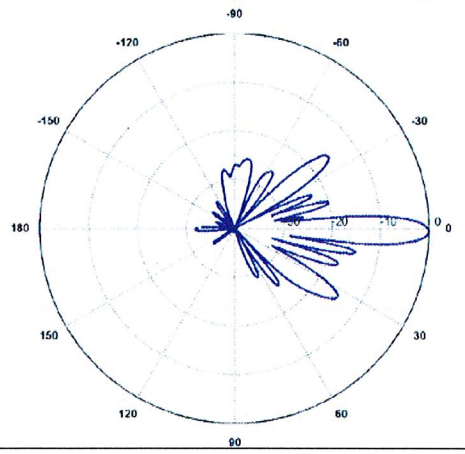
Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	806-896 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	7.8°
Horizontal Beamwidth:	67°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



1900 MHz GSM

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	1850-1990 MHz
Gain:	15.9 dBd
Vertical Beamwidth:	5.1°
Horizontal Beamwidth:	57°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.9" x 7.1"



850 MHz UMTS Manufacturer: Kathrein-Scala Model #: 80010121 Frequency Band: 824-896 MHz Gain: 11.5 dBd Vertical Beamwidth: 14.5° Horizontal Beamwidth: 86° Polarization: ±45° Size L x W x D: 54.5" x 10.3" x 5.9"	
1900 MHz UMTS Manufacturer: Kathrein-Scala Model #: 80010121 Frequency Band: 1850-1990 MHz Gain: 14.3 dBd Vertical Beamwidth: 6.6° Horizontal Beamwidth: 85° Polarization: ±45° Size L x W x D: 54.5" x 10.3" x 5.9"	

Date: **June 14, 2012**

J.R. Carroll
Grain Communications
100 N Washington Blvd, Suite 201
Sarasota, FL 34239

Tower Engineering Professionals
3703 Junction Blvd
Raleigh, NC 27603
(919) 661-6351
arucker@tepgroup.net

Subject: **Structural Analysis Report - Revision 1**

Carrier Designation:	**AT&T Reconfiguration**	
	Carrier Site Number:	CT1154
	Carrier Site Name:	West Hartford-Albany Ave
Grain Designation:	**Grain Site Number:**	0101-CT-000101
	Grain Site Name:	West Hartford
	FCC Designation #:	1226764
Engineering Firm Designation:	**TEP Project Number:**	112343
Site Data:	**3114 Albany Ave., West Hartford, Hartford County, CT 06117** **Latitude *41° 47' 48"*, Longitude *-72° 47' 50"*** **311.3 ft - Guyed Tower w/ 35 ft Pipe Mast**	

Dear Mr. Carroll,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine structural acceptability of the structure stress level. Based on our analysis we have determined the stress level for the structure and foundation, under the following load case, to be:

LC1: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 for the existing and proposed loading.

Structure Capacity	Controlling Component
65.9%	Guy Anchor Lateral

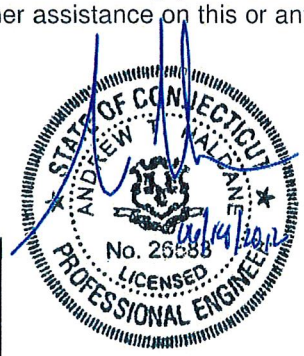
The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, ASCE 7-05 Minimum Design Loads for Buildings and Other Structures, and the 2003 International Building Code.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Table 1 for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *Grain Communications*. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Andrew T. Haldane, P.E.



Revision #	Date Issued	Description
0	July 18, 2011	Original structural analysis report
1	June 14, 2012	Revised structural report to include proposed AT&T loading

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 311.4 foot Model 60 guyed tower designed by Pirod in February of 2001. The tower was designed for a fastest mile wind speed of 80 mph with 0.5 in of radial ice per EIA/TIA-222-F for the appurtenances listed in Table 2. TEP visited the site in July of 2011 to collect existing steel and appurtenance information. All other information provided to TEP was assumed accurate and complete.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1.0 inch escalating ice thickness, and 50 mph under service loads.

Table 1 - Existing and Proposed Antenna and Cable Information

Existing/ Proposed	Elevation (Ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size (in)	Coax Location	Owner/ Tenant
Existing	332.0	1	ERI 3 Bay FM w/ radomes	Arm	1	3	CA Face	WCCC
Existing	297.0	1	ACS 16R4	Arm	1	3	CA Face	WHCT
Existing	261.0	1	Decibel DB420-B	Sidearm	1	7/8	BC Face	Master Combiner
Existing	251.8	1	Antenna Concepts ACB16A	Pipe	1 1	1 5/8 3/8"Ø	BC Face	WRDM
Existing	243.0	1	Antel WPA800120	Direct	2	7/8	Inside C Leg	Town of West Hartford
Existing	235.0	1	Scala 6'x3' Grid Dish	Direct	1	7/8	CA Face	WCCC
Existing	232.0	1	Radiowaves SP02-4.7NS	Direct	2 1	1/4"Ø 3/8"Ø	Inside C Leg	Town of West Hartford
Existing	220.0	2	Unknown Panel 34"x7"x24"	Pipe	2	3/8"Ø	CA Face	SNEW ISP
Existing	220.0	1	Antel WPA800120	Direct	1	1 5/8	Inside C Leg	Town of West Hartford
Existing	213.0	1	Decibel DB420-B	Arm	1	1/2	BC Face	Master Combiner
Existing	196.0	1	Cablewave PA6-112	Arm	1	EW	BC Face	WRDM
Existing	180.0	6	Kathrein 601417	Pipe	1	1 5/8	BC Face	WRNT
Existing	165.0	1	Antel BCD80010	Sidearm	1	1 5/8	Inside C Leg	Town of West Hartford
Existing	164.5	1	Shively 6810 (1) Bay FM	Pipe	1	1/2	BC Face	91.9 FM
Existing	160.0	2	RFS APX16PV-16-PVL	Sector	8[2] 1	1 5/8[2] 1/4"Ø	AB Face	T-Mobile
Existing	146.5	1	2'Ø MW Dish w/o Radome	Pipe	1	3/8"Ø	CA Face	SNEW ISP
Existing	145.0	1	1"Øx12' Omni	Sidearm	1	1 5/8	AB Face	Ham Radio
Existing	142.5	-	-	-	1[1]	1 5/8[1]	AB Face	-
Existing	140.5	-	-	-	1[1]	1 5/8[1]	AB Face	-
Existing	136.5	1	5'x10" Detuner	Direct	1	1/4"Ø	CA Face	Ham Radio
Existing	128.0	4	Andrew 848F65T5E-SX	Sector	4	1 5/8	BC Face	Verizon
		4	Andrew 950G65VT2E-M		4	1 5/8	BC Face	
Existing	120.5	3	RFS APXV18-206517S	Pipe	6	1 5/8	CA Face	Metro PCS

Table 1 - Existing and Proposed Antenna and Cable Information - Continued

Existing/ Proposed	Elevation (Ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size (in)	Coax Location	Owner/ Tenant
Proposed	*112.0*	*2*	*KMW AM-X-CD-16-65-00T-RET*	*Sector*	*12*[3]	*1 5/8*[3]	*AB Face*	*AT&T*
		4	*Andrew SBNH-1D6565C*					
		3	*Kathrein 800-10121*					
		6	*CCI DTMABP7819VG12A*					
		6	*Ericsson RRU*					
Existing	48.0	1	GPS	Direct	1	3/8"Ø	CA Face	Metro PCS
Existing	21.0	1	14-Element 4.5-ft Yagi	Sidearm	1	1/2	C Leg	Ham Radio

Notes:
1) All unused coax and antennas are to be removed.
2) Coax stacked 4-on-4.
3) Coax stacked 6-on-6.

Table 2 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Quantity	Antenna Manufacturer	Antenna Model	Quantity Coax	Coax Size (in)	Coax Location
696.5	696.5	1	Dielectric	TFU-30GTH-RD-TV	1	6"	Unknown
640	640	1	ERI	3-Bay FM w/ radomes	1	3 1/8	Unknown
600	600	1	Celwave	PD220	1	1 5/8	Unknown
575	575	1	Celwave	PD220	1	1 5/8	Unknown
550	550	1	Celwave	PD220	1	1 5/8	Unknown
525	525	1	Celwave	PD220	1	1 5/8	Unknown
500	500	1	Celwave	PD220	1	1 5/8	Unknown
475	475	1	Celwave	PD220	1	1 5/8	Unknown
450	450	1	Celwave	PD220	1	1 5/8	Unknown
425	425	1	Celwave	PD220	1	1 5/8	Unknown
335	335	3	Celwave	PD220	3	1 5/8	Unknown
328.5	328.5	1	ERI	3-Bay FM w/ radomes	1	3 1/8	Unknown
310	310	3	Celwave	PD220	3	1 5/8	Unknown
300	300	1	ERI	1-Bay FM w/ radomes	1	3 1/8	Unknown
275	275	4	Celwave	PD220	4	7/8	Unknown
250	250	12	Allgon	ALP9212-N	12	1 5/8	Unknown
230	230	12	Allgon	ALP9212-N	12	1 5/8	Unknown
210	210	12	Allgon	ALP9212-N	12	1 5/8	Unknown
190	190	12	Allgon	ALP9212-N	12	1 5/8	Unknown
170	170	12	Allgon	ALP9212-N	12	1 5/8	Unknown
150	150	12	Allgon	ALP9212-N	12	1 5/8	Unknown
115	115	2	Scala	PR-950	2	7/8	Unknown

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower and Foundation Drawings	Pirod dated February 23, 2001 File No. A-117361-1	-	Grain
Previous Structural Analysis	Malouf Engineering dated August 28, 2008 ID No. CT01294G-08V0	-	Grain
Steel and Appurtenance Mapping	Tower Engineering Professionals dated July 12, 2011	112343	TEP

3.1) Analysis Method

tnxTower (version 6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and foundations were built in accordance with the manufacturer's specifications.
2) The tower and foundations have been maintained in accordance with the manufacturer's specification.
3) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
4) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 1.
5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance. See Table 6.
6) TEP did not analyze the antenna supporting mounts as part of this structural analysis report. TEP assumes that all antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts.
7) This report is not a construction document.
8) TEP assumes the geotechnical soil parameters used in the previous structural analysis by Malouf Engineering dated August 28, 2008 (No. CT01294G-08V0) are accurate and complete.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	311.333 - 310.333	Leg	2 3/4	1	-10437.20	226136.78	14.8	Pass
		Top Girt	6x1	6	-130.19	30366.94	5.1	Pass
T2	310.333 - 299.167	Leg	2 3/4	8	-19570.30	195896.34	10.0 11.6 (b)	Pass
		Diagonal	7/8	23	-1421.57	9591.29	14.8	Pass
		Top Girt	1 1/4	10	-318.70	14854.02	2.1	Pass
		Bottom Girt	1 1/4	15	4262.83	36815.50	11.6	Pass
		Guy A@299.802	13/16	981	17436.20	40000.00	43.6	Pass
		Guy B@299.802	13/16	980	18726.60	40000.00	46.8	Pass
		Guy C@299.802	13/16	979	17545.90	40000.00	43.9	Pass
T3	299.167 - 279.167	Leg	2 3/4	41	-19307.30	203713.05	9.5 9.6 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
		Diagonal	7/8	95	-1754.52	10204.74	17.2	Pass
		Top Girt	1	45	-1755.69	6084.21	28.9	Pass
		Bottom Girt	1	47	-35.88	6084.21	0.6	Pass
		Mid Girt	1	50	106.97	23561.90	0.5	Pass
T4	279.167 - 259.167	Leg	2 3/4	101	-15891.30	152823.00	10.4 11.6 (b)	Pass
		Diagonal	7/8	115	-1185.52	10204.74	11.6	Pass
		Top Girt	1	103	-61.66	6084.21	1.0	Pass
		Bottom Girt	1	108	-188.71	6084.21	3.1	Pass
		Mid Girt	1	110	114.46	23561.90	0.5	Pass
T5	259.167 - 239.167	Leg	2 3/4	161	-32181.40	203713.05	15.8 19.1 (b)	Pass
		Diagonal	7/8	173	-2476.74	10204.74	24.3	Pass
		Top Girt	1	165	-162.71	6084.21	2.7	Pass
		Bottom Girt	1	168	-721.35	6084.21	11.9	Pass
		Mid Girt	1	169	122.01	23561.90	0.5	Pass
T6	239.167 - 219.167	Leg	2 3/4	221	-42519.90	203713.05	20.9	Pass
		Diagonal	7/8	237	-2884.42	10204.74	28.3	Pass
		Top Girt	1	225	-721.81	6084.21	11.9	Pass
		Bottom Girt	1	226	-413.46	6084.21	6.8	Pass
		Mid Girt	1	230	2269.51	23561.90	9.6	Pass
		Guy A@230.177	7/8	984	19771.70	46000.00	43.0	Pass
		Guy B@230.177	7/8	983	21177.20	46000.00	46.0	Pass
		Guy C@230.177	7/8	982	19793.30	46000.00	43.0	Pass
T7	219.167 - 199.167	Leg	2 3/4	281	-30481.30	152823.00	19.9 21.6 (b)	Pass
		Diagonal	7/8	339	-2639.22	10204.74	25.9	Pass
		Top Girt	1	285	-629.61	6084.21	10.3	Pass
		Bottom Girt	1	286	-254.27	6084.21	4.2	Pass
		Mid Girt	1	290	225.37	23561.90	1.0	Pass
T8	199.167 - 179.167	Leg	2 3/4	341	-32409.70	152823.00	21.2 23.3 (b)	Pass
		Diagonal	7/8	397	-1821.38	10204.74	17.8	Pass
		Top Girt	1	345	-395.55	6084.21	6.5	Pass
		Bottom Girt	1	348	153.82	23561.90	0.7	Pass
		Mid Girt	1	349	237.11	23561.90	1.0	Pass
T9	179.167 - 159.167	Leg	2 3/4	400	-35388.90	152823.00	23.2	Pass
		Diagonal	7/8	413	-2288.98	10204.74	22.4	Pass
		Top Girt	1	404	-69.66	6084.21	1.1	Pass
		Bottom Girt	1	406	-416.55	6084.21	6.8	Pass
		Mid Girt	1	409	249.13	23561.90	1.1	Pass
T10	159.167 - 139.167	Leg	3	461	-45453.90	185200.00	24.5 30.6 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
		Diagonal	1	477	-3793.30	16737.01	22.7	Pass
		Top Girt	1 1/4	463	-894.80	14984.65	6.0	Pass
		Bottom Girt	1 1/4	468	-747.92	14984.65	5.0	Pass
		Mid Girt	1 1/4	469	2674.62	36815.50	7.3	Pass
		Guy A@150.177	13/16	987	18496.70	40000.00	46.2	Pass
		Guy B@150.177	13/16	986	19453.60	40000.00	48.6	Pass
		Guy C@150.177	13/16	985	18405.20	40000.00	46.0	Pass
T11	139.167 - 119.167	Leg	3	521	-48881.90	178327.00	27.4 36.7 (b)	Pass
		Diagonal	7/8	579	-3466.28	10294.45	33.7	Pass
		Top Girt	1	525	-684.38	6137.69	11.2	Pass
		Bottom Girt	1	527	-81.64	6137.69	1.3	Pass
		Mid Girt	1	529	567.69	31408.01	1.8	Pass
T12	119.167 - 99.1667	Leg	3	581	-52615.50	178327.00	29.5 35.9 (b)	Pass
		Diagonal	7/8	593	-3818.19	10294.45	37.1	Pass
		Top Girt	1	583	191.54	23561.90	0.8	Pass
		Bottom Girt	1	586	-506.05	6137.69	8.2	Pass
		Mid Girt	1	589	382.85	23561.90	1.6	Pass
T13	99.1667 - 79.1667	Leg	3	641	-59908.50	178327.00	33.6 40.7 (b)	Pass
		Diagonal	7/8	695	-3949.67	10294.45	38.4	Pass
		Top Girt	1	645	-629.09	6137.69	10.2	Pass
		Bottom Girt	1	647	-344.10	6137.69	5.6	Pass
		Mid Girt	1	649	4488.99	23561.90	19.1	Pass
		Guy A@89.1667	3/4	990	14913.40	34000.00	43.9	Pass
		Guy B@89.1667	3/4	989	15733.30	34000.00	46.3	Pass
		Guy C@89.1667	3/4	988	14916.40	34000.00	43.9	Pass
T14	79.1667 - 59.1667	Leg	3	701	-62038.50	178327.00	34.8 45.0 (b)	Pass
		Diagonal	7/8	759	-2662.22	10294.45	25.9	Pass
		Top Girt	1	705	-185.55	6137.69	3.0	Pass
		Bottom Girt	1	707	-80.09	6137.69	1.3	Pass
		Mid Girt	1	709	445.99	23561.90	1.9	Pass
T15	59.1667 - 39.1667	Leg	3	761	-64046.90	178327.00	35.9 46.2 (b)	Pass
		Diagonal	7/8	819	-1806.71	10294.45	17.6	Pass
		Top Girt	1	763	232.73	23561.90	1.0	Pass
		Bottom Girt	1	768	261.82	23561.90	1.1	Pass
		Mid Girt	1	769	462.00	23561.90	2.0	Pass
T16	39.1667 - 19.1667	Leg	3	821	-65934.60	178327.00	37.0 44.5 (b)	Pass
		Diagonal	7/8	833	-2240.96	10294.45	21.8	Pass
		Top Girt	1	824	422.61	31408.01	1.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
		Bottom Girt	1	828	468.82	31408.01	1.5	Pass
		Mid Girt	1	829	478.44	23561.90	2.0	Pass
T17	19.1667 - 14.3958	Leg	3	881	-66116.20	178327.00	37.1	Pass
		Diagonal	1	896	-2643.79	16789.13	15.7	Pass
		Top Girt	1 1/4	883	734.02	49075.06	1.5	Pass
		Mid Girt	7/8	887	882.31	18039.60	4.9	Pass
T18	14.3958 - 11.8125	Leg	3	902	-65738.50	178327.00	36.9	Pass
		Diagonal	1	907	-2572.99	16295.52	15.8	Pass
		Top Girt	7/8	904	966.18	18039.60	5.4	Pass
T19	11.8125 - 9.47917	Leg	3	914	-66771.80	178327.00	37.4	Pass
		Diagonal	1 1/4	919	-2635.29	28639.64	9.2	Pass
		Horizontal	6x3/4	921	-1156.52	9695.17	11.9	Pass
		Redund Horz 1 Bracing	7/8	920	-1156.52	13483.20	8.6	Pass
T20	9.47917 - 7.14583	Leg	3	932	-65667.70	178327.00	36.8	Pass
		Diagonal	1 1/4	935	-3316.91	28639.64	11.6	Pass
		Horizontal	6x3/4	934	-1403.01	9695.17	14.5	Pass
		Redund Horz 1 Bracing	7/8	939	1798.04	18039.60	10.0	Pass
		Redund Diag 1 Bracing	7/8	940	-1252.42	11236.50	11.1	Pass
T21	7.14583 - 1.17708	Leg	3	956	-75024.00	176144.00	42.6	Pass
		Diagonal	1 1/4	964	-8859.15	22002.80	40.3	Pass
		Horizontal	6x3/4	958	7201.56	97200.00	7.4	Pass
		Bottom Girt	6x3/4	962	6440.85	97200.00	6.6	Pass
							Summary	
						Leg (T15)	46.2	Pass
						Diagonal (T21)	40.3	Pass
						Horizontal (T20)	14.5	Pass
						Top Girt (T3)	28.9	Pass
						Bottom Girt (T5)	11.9	Pass
						Mid Girt (T13)	19.1	Pass
						Redund Horz 1 Bracing (T20)	10.0	Pass
						Redund Diag 1 Bracing (T20)	11.1	Pass
						Guy A (T10)	46.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
						Guy B (T10)	48.6	Pass
						Guy C (T10)	46.0	Pass
						Bolt Checks	46.2	Pass
						RATING =	**48.6**	**Pass**

Table 5 - Component Stresses vs. Capacity - Foundation

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
-	Mast Axial	-	45.8	Pass
-	Mast Lateral	-	55.3	Pass
-	Guy Anchor Lateral	-	65.9	Pass
-	Guy Anchor Uplift	-	49.5	Pass

Structure Rating (max from all components) =	**65.9%**

Table 6 - Dish Twist/Sway Results for 50 mph Service Wind Speed

Elevation (ft)	Dish Model	Beam Deflection		
		Deflection (in)	Tilt (deg)	Twist (deg)
235	Scala 6'x3' Grid Dish	2.255	0.0358	0.6983
232	Radiowaves SP02-4.7NS	2.261	0.0360	0.6940
196	Cablewave PA6-112	2.340	0.0232	0.6415
146	2-ft Dish w/o Radome	2.165	0.0211	0.5483

4.1) Recommendations

1) If the load differs from that described in Table 1 of this report, or the provisions of this analysis are found to be invalid, another structural analysis should be performed.

APPENDIX A

TNXTOWER OUTPUT

345.2 ft

Section	Size	Length (ft)	Grade	Weight (lb)
1	P10STD	17'	A53-B-35	688.9
2	P10STD	18'		729.4

328.2 ft

310.2 ft

1418.2

DESIGNED APPURTENANCE LOADING

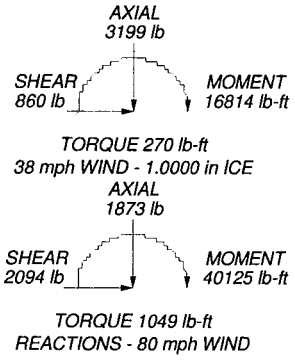
TYPE	ELEVATION	TYPE	ELEVATION
30" x 18" Dia (TOT Beacon)	345.156	(3) 2.4" Dia x 18" Pipe	330.656
3 Bay/20' length/ Dielectric DCR (Ant 41)	330.656		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
3. Deflections are based upon a 50 mph wind.



Tower Engineering Professionals, Inc.

Tower Engineering Professionals, Inc.
3703 Junction Blvd.
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job:	***West Hartford***
Project:	***TEP# 112343 - Revision 1***
Client: Grain Communications	Drawn by: Aaron T. Rucker, E.I. App'd:
Code: TIA/EIA-222-F	Date: 06/12/12 Scale: NTS
Path: P:\2343 West Hartford\Structural\Rev 1\TNX\West Hartford Mast.eri	Dwg No. E-1

Tower Input Data

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

Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	345'1-29/32"-328' 1-29/32"	17'	P10STD	A53-B-35 (35 ksi)	
L2	328'1-29/32"-310' 1-29/32"	18'	P10STD	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	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
L1 345'1-29/32"-328'1-29/32"				1	1	1		
L2 328'1-29/32"-310'1-29/32"				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
Step Pegs (5/8" SR) 7-in. w/30" step	B	No	CaAa (Out Of Face)	345'1-29/32" - 310'1-29/32"	1	No Ice	0.03	0.49
						1/2" Ice	0.13	0.97
						1" Ice	0.23	2.07
						2" Ice	0.43	6.09
						4" Ice	0.83	21.46
1/2" dia. coax	C	No	Inside Pole	345'1-29/32" - 310'1-29/32"	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
HJ8-50B (3 AIR)	A	No	CaAa (Out Of Face)	3307-29/32" - 310'1-29/32"	1	No Ice	0.30	1.78
						1/2" Ice	0.40	3.92
						1" Ice	0.50	6.68
						2" Ice	0.70	14.02
						4" Ice	1.10	36.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	345'1-29/32"-328' 1-29/32"	A	0.000	0.000	0.000	0.752	4.45
		B	0.000	0.000	0.000	0.496	8.28
		C	0.000	0.000	0.000	0.000	2.55
L2	328'1-29/32"-310' 1-29/32"	A	0.000	0.000	0.000	5.418	32.04
		B	0.000	0.000	0.000	0.526	8.77
		C	0.000	0.000	0.000	0.000	2.70

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	345'1-29/32"-328' 1-29/32"	A	1.321	0.000	0.000	0.000	1.413	22.60
		B		0.000	0.000	0.000	4.989	57.09
		C		0.000	0.000	0.000	0.000	2.55
L2	328'1-29/32"-310'	A	1.313	0.000	0.000	0.000	10.145	161.59

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
	1-29/32"	B		0.000	0.000	0.000	5.252	59.84
		C		0.000	0.000	0.000	0.000	2.70

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	345'1-29/32"-328'1-2 9/32"	0.0351	-0.0411	0.2288	0.0573
L2	328'1-29/32"-310'1-2 9/32"	0.0277	-0.3139	0.1724	-0.2849

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
30" x 18" Dia (TOT Beacon)	C	None		0.0000	345'1-29/32"	No Ice	3.00	3.00	55.00
						1/2" Ice	3.27	3.27	92.44
						1" Ice	3.56	3.56	133.39
						2" Ice	4.16	4.16	226.45
						4" Ice	5.49	5.49	461.43
*****									
3 Bay/20' length/ Dielectric DCR (Ant 41)	C	From Leg	1.50 0' 0'	0.0000	330'7-29/32"	No Ice	9.80	9.80	324.00
						1/2" Ice	10.40	10.40	421.20
						1" Ice	11.00	11.00	518.40
						2" Ice	12.20	12.20	712.80
						4" Ice	14.60	14.60	1101.60
(3) 2.4" Dia x 18" Pipe	C	From Leg	0.75 0' 0'	0.0000	330'7-29/32"	No Ice	0.24	0.24	5.50
						1/2" Ice	0.36	0.36	8.45
						1" Ice	0.49	0.49	12.72
						2" Ice	0.78	0.78	25.80
						4" Ice	1.50	1.50	74.44

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	1418.25					

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
Bracing Weight	0.00					
Total Member Self-Weight	1418.25			312.92	557.08	
Total Weight	1872.53			312.92	557.08	
Wind 0 deg - No Ice		0.00	-2094.41	-38866.79	557.08	-921.30
Wind 30 deg - No Ice		1047.20	-1813.81	-33617.71	-19032.78	-542.55
Wind 60 deg - No Ice		1813.81	-1047.20	-19276.94	-33373.55	-18.43
Wind 90 deg - No Ice		2094.41	0.00	312.92	-38622.64	510.64
Wind 120 deg - No Ice		1813.81	1047.20	19902.77	-33373.55	902.87
Wind 150 deg - No Ice		1047.20	1813.81	34243.54	-19032.78	1053.19
Wind 180 deg - No Ice		0.00	2094.41	39492.63	557.08	921.30
Wind 210 deg - No Ice		-1047.20	1813.81	34243.54	20146.93	542.55
Wind 240 deg - No Ice		-1813.81	1047.20	19902.77	34487.70	18.43
Wind 270 deg - No Ice		-2094.41	0.00	312.92	39736.79	-510.64
Wind 300 deg - No Ice		-1813.81	-1047.20	-19276.94	34487.70	-902.87
Wind 330 deg - No Ice		-1047.20	-1813.81	-33617.71	20146.93	-1053.19
Member Ice	679.61					
Total Weight Ice	3198.88			539.24	986.17	
Wind 0 deg - Ice		0.00	-859.75	-14922.03	986.17	-237.53
Wind 30 deg - Ice		429.87	-744.56	-12850.61	-6744.46	-137.98
Wind 60 deg - Ice		744.56	-429.87	-7191.39	-12403.68	-1.45
Wind 90 deg - Ice		859.75	0.00	539.24	-14475.09	135.47
Wind 120 deg - Ice		744.56	429.87	8269.87	-12403.68	236.08
Wind 150 deg - Ice		429.87	744.56	13929.09	-6744.46	273.44
Wind 180 deg - Ice		0.00	859.75	16000.51	986.17	237.53
Wind 210 deg - Ice		-429.87	744.56	13929.09	8716.81	137.98
Wind 240 deg - Ice		-744.56	429.87	8269.87	14376.03	1.45
Wind 270 deg - Ice		-859.75	0.00	539.24	16447.44	-135.47
Wind 300 deg - Ice		-744.56	-429.87	-7191.39	14376.03	-236.08
Wind 330 deg - Ice		-429.87	-744.56	-12850.61	8716.81	-273.44
Total Weight	1872.53			312.92	557.08	
Wind 0 deg - Service		0.00	-828.39	-15142.29	563.69	-359.86
Wind 30 deg - Service		414.20	-717.41	-13070.01	-7170.18	-212.00
Wind 60 deg - Service		717.41	-414.20	-7408.42	-12831.77	-7.34
Wind 90 deg - Service		828.39	0.00	325.45	-14904.05	199.29
Wind 120 deg - Service		717.41	414.20	8059.32	-12831.77	352.52
Wind 150 deg - Service		414.20	717.41	13720.90	-7170.18	411.29
Wind 180 deg - Service		0.00	828.39	15793.19	563.69	359.86
Wind 210 deg - Service		-414.20	717.41	13720.90	8297.56	212.00
Wind 240 deg - Service		-717.41	414.20	8059.32	13959.14	7.34
Wind 270 deg - Service		-828.39	0.00	325.45	16031.43	-199.29
Wind 300 deg - Service		-717.41	-414.20	-7408.42	13959.14	-352.52
Wind 330 deg - Service		-414.20	-717.41	-13070.01	8297.56	-411.29

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice

Comb. No.	Description
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	345.156 - 328.156	1.911	35	0.3493	0.0193
L2	328.156 - 310.156	0.705	35	0.3099	0.0170

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
345'1-29/32"	30" x 18" Dia	35	1.911	0.3493	0.0193	14963
330'7-29/32"	3 Bay/20' length/ Dielectric DCR	35	0.852	0.3300	0.0181	5233

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	345.156 - 328.156	4.656	10	0.8492	0.0495
L2	328.156 - 310.156	1.726	10	0.7537	0.0434

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
345'1-29/32"	30" x 18" Dia	10	4.656	0.8492	0.0495	6228
330'7-29/32"	3 Bay/20' length/ Dielectric DCR	10	2.084	0.8025	0.0463	2178

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	345.156 - 328.156 (1)	P10STD	17'	0'	0.0	21.000	11.9083	-1082.58	250074.00	0.004
L2	328.156 - 310.156 (2)	P10STD	18'	0'	0.0	21.000	11.9083	-1871.26	250074.00	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	345.156 - 328.156 (1)	P10STD	9603.17	3.854	23.100	0.167	0.00	0.000	23.100	0.000
L2	328.156 - 310.156 (2)	P10STD	40124.67	16.101	23.100	0.697	0.00	0.000	23.100	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	345.156 - 328.156 (1)	P10STD	1290.43	0.217	14.000	0.015	0.83	0.000	14.000	0.000
L2	328.156 - 310.156 (2)	P10STD	2095.55	0.352	14.000	0.025	18.42	0.004	14.000	0.000

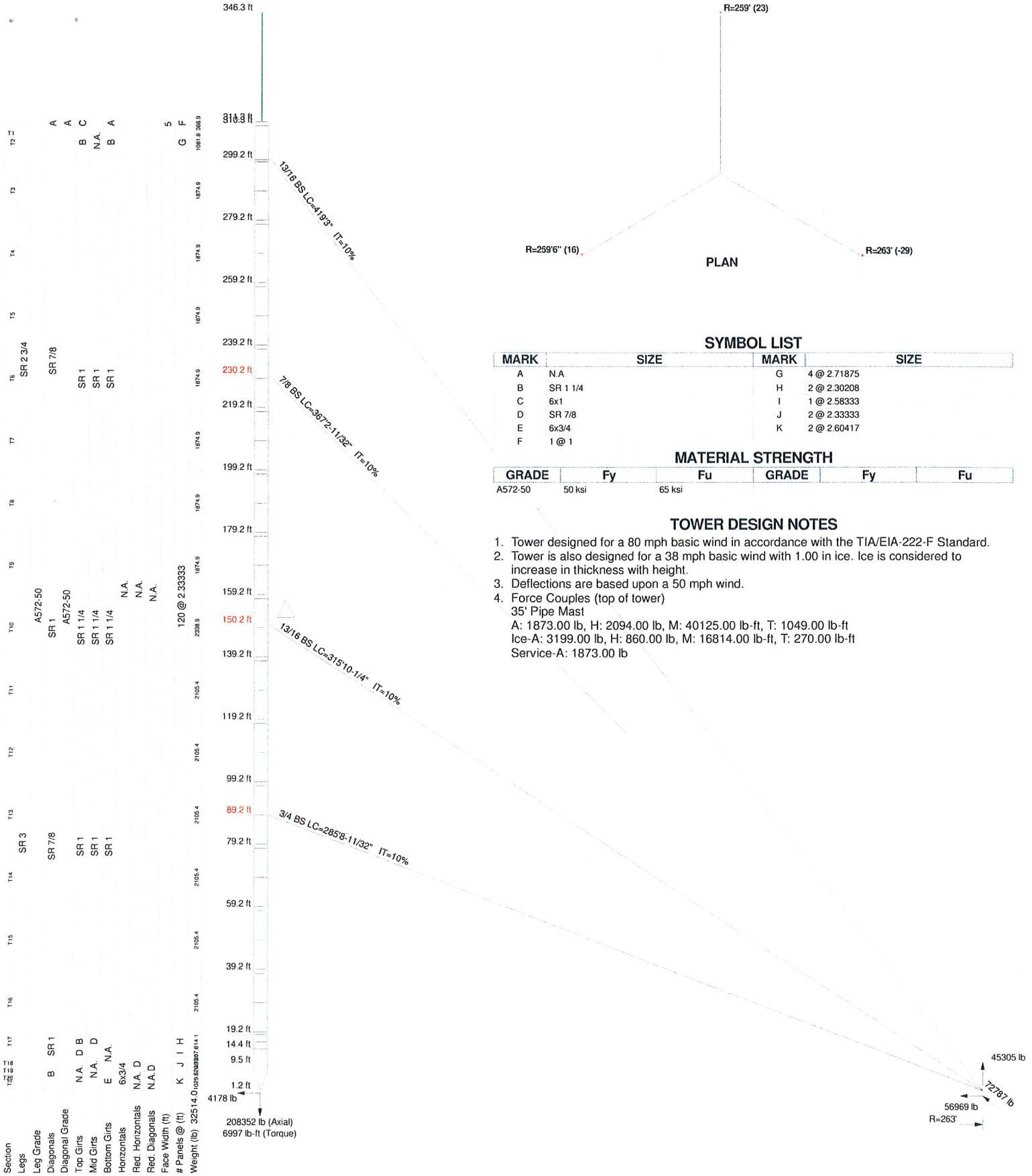
Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	345.156 - 328.156 (1)	0.004	0.167	0.000	0.015	0.000	0.171 ✓	1.333	H1-3+VT ✓
L2	328.156 - 310.156 (2)	0.007	0.697	0.000	0.025	0.000	0.705 ✓	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	345.156 - 328.156	Pole	P10STD	1	-1082.58	333348.63	12.9	Pass
L2	328.156 - 310.156	Pole	P10STD	2	-1871.26	333348.63	52.9	Pass
							Summary	
							Pole (L2) 52.9	Pass
							RATING = 52.9	**Pass**



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	N.A.	G	4 @ 2.71875
B	SR 1 1/4	H	2 @ 2.30208
C	6x1	I	1 @ 2.58333
D	SR 7/8	J	2 @ 2.33333
E	6x3/4	K	2 @ 2.60417
F	1 @ 1		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
3. Deflections are based upon a 50 mph wind.
4. Force Couples (top of tower)
   35' Pipe Mast
   A: 1873.00 lb, H: 2094.00 lb, M: 40125.00 lb-ft, T: 1049.00 lb-ft
   Ice-A: 3199.00 lb, H: 860.00 lb, M: 16814.00 lb-ft, T: 270.00 lb-ft
   Service-A: 1873.00 lb

Tower Engineering Professionals, Inc.
3703 Junction Blvd.
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: West Hartford			
Project: TEP# 112343 - Revision 1			
Client: Grain Communications	Drawn by: Aaron T. Rucker, E.I.	App'd:	
Code: TIA/EIA-222-F	Date: 06/14/12	Scale: NTS	
Path: P:\2343 West Hartford\Structural\Rev I\TNX\West Hartford Guyed Tower.eri		Dwg No. E-1	

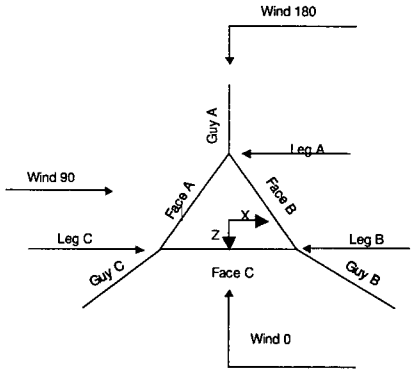
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 311'4" above the ground line.
The base of the tower is set at an elevation of 1'2-1/8" above the ground line.
The face width of the tower is 5' at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
√ Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	√ Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	311'3-31/32"-310' 3-31/32"			5'	1	1'
T2	310'3-31/32"-299' 2-1/32"			5'	1	11'2-1/32"
T3-T9	299'2-1/32"-159'2 -1/32"			5'	7	20'
T10	159'2-1/32"-139'2 -1/32"			5'	1	20'
T11-T16	139'2-1/32"-19'2-1/32"			5'	6	20'
T17	19'2-1/32"-14'4-1 3/16"			5'	1	4'9-1/4"
T18	14'4-13/16"-11'9-23/32"			5'	1	2'6-31/32"
T19	11'9-23/32"-9'5-3 /4"			5'	1	2'3-31/32"
T20	9'5-3/4"-7'1-13/1 6"			5'	1	2'3-31/32"
T21	7'1-13/16"-1'2-5/ 32"			5'	1	5'11-5/8"

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	311'3-31/32"-310' 3-31/32"	1'	X Brace	No	Yes	0.0000	0.0000
T2	310'3-31/32"-299' 2-1/32"	2'8-5/8"	X Brace	No	No	3.5000	0.0000
T3-T9	299'2-1/32"-159'2 -1/32"	2'3-31/32"	X Brace	No	No	8.0000	8.0000
T10	159'2-1/32"-139'2 -1/32"	2'3-31/32"	X Brace	No	No	8.0000	8.0000
T11-T16	139'2-1/32"-19'2-1/32"	2'3-31/32"	X Brace	No	No	8.0000	8.0000
T17	19'2-1/32"-14'4-1 3/16"	2'3-19/32"	X Brace	No	No	2.0000	0.0000
T18	14'4-13/16"-11'9-23/32"	2'6-31/32"	X Brace	No	No	0.0000	0.0000
T19	11'9-23/32"-9'5-3 /4"	2'3-31/32"	K1 Down	No	Yes	0.0000	0.0000
T20	9'5-3/4"-7'1-13/1 6"	2'3-31/32"	K1 Up	No	Yes	0.0000	0.0000
T21	7'1-13/16"-1'2-5/ 32"	2'7-3/16"	X Brace	No	Yes	3.0000	6.1250

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 311'3-31/32"-310' 3-31/32"	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 310'3-31/32"-299' 2-1/32"	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3-T9 299'2-1/32"-159'2 -1/32"	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 159'2-1/32"-139'2 -1/32"	Solid Round	3	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T11-T16 139'2-1/32"-19'2-1/32"	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 19'2-1/32"-14'4-1 3/16"	Solid Round	3	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T18 14'4-13/16"-11'9-23/32"	Solid Round	3	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T19 11'9-23/32"-9'5-3 /4"	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T20	Solid Round	3	A572-50	Solid Round	1 1/4	A572-50

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
9'5-3/4"-7'1-13/1 6"			(50 ksi)			(50 ksi)
T21 7'1-13/16"-1'2-5/ 32"	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T2 310'3-31/32"-299' 2-1/32"	Solid Round	1 1/4	A570-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T3-T9 299'2-1/32"-159'2 -1/32"	Solid Round	1	A570-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T10 159'2-1/32"-139'2 -1/32"	Solid Round	1 1/4	A570-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T11-T16 139'2-1/32"-19'2-1/32"	Solid Round	1	A570-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T17 19'2-1/32"-14'4-1 3/16"	Solid Round	1 1/4	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T18 14'4-13/16"-11'9-23/32"	Solid Round	7/8	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T21 7'1-13/16"-1'2-5/ 32"	Flat Bar		A36 (36 ksi)	Flat Bar	6x3/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 311'3-31/32"-310' 3-31/32"	None	Flat Bar		A572-50 (50 ksi)	Flat Bar	6x1	A36 (36 ksi)
T3-T9 299'2-1/32"-159'2 -1/32"	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T10 159'2-1/32"-139'2 -1/32"	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T11-T16 139'2-1/32"-19'2-1/32"	1	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T17 19'2-1/32"-14'4-13/16"	1	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T19 11'9-23/32"-9'5-3/4"	None	Flat Bar		A36 (36 ksi)	Flat Bar	6x3/4	A36 (36 ksi)
T20 9'5-3/4"-7'1-13/16"	None	Flat Bar		A36 (36 ksi)	Flat Bar	6x3/4	A36 (36 ksi)
T21 7'1-13/16"-1'2-5/32"	None	Flat Bar		A36 (36 ksi)	Flat Bar	6x3/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T19 11'9-23/32"-9'5-3/4"	A572-50 (50 ksi)	Horizontal (1)	Solid Round	7/8	1
T20 9'5-3/4"-7'1-13/16"	A572-50 (50 ksi)	Horizontal (1) Diagonal (1)	Solid Round Solid Round	7/8 7/8	1 1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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
T1 311'3-31/32"-310'3-31/32"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 310'3-31/32"-299'2-1/32"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3-T9 299'2-1/32"-159'2-1/32"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 159'2-1/32"-139'2-1/32"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11-T16 139'2-1/32"-19'2-1/32"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T17 19'2-1/32"-14'4-13/16"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T18	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
14'4-13/16"-11'9-23/32"			(36 ksi)					
T19 11'9-23/32"-9'5-3/4"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T20 9'5-3/4"-7'1-13/16"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T21 7'1-13/16"-1'2-5/32"	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X / Y	K Brace Diags X / Y	Single Diags X / Y	Girts X / Y	Horiz. X / Y	Sec. Horiz. X / Y	Inner Brace X / Y
T1 311'3-31/32"-310'3-31/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 310'3-31/32"-299'2-1/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3-T9 299'2-1/32"-159'2-1/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 159'2-1/32"-139'2-1/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11-T16 139'2-1/32"-9'2-1/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T17 19'2-1/32"-14'4-13/16"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T18 14'4-13/16"-11'9-23/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T19 11'9-23/32"-9'5-3/4"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T20 9'5-3/4"-7'1-3/16"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T21 7'1-13/16"-1'2-5/32"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 311'3-31/32"-310'3-31/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T2 310'3-31/32"-299'2-1/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T3-T9 299'2-1/32"-159'2-1/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T10 159'2-1/32"-139'2-1/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T11-T16 139'2-1/32"-19'2-1/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T17 19'2-1/32"-14'4-13/16"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T18 14'4-13/16"-11'9-23/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T19 11'9-23/32"-9'5-3/4"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T20 9'5-3/4"-7'1-13/16"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75
T21 7'1-13/16"-1'2-5/32"	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 311'3-31/32"-310'3-31/32"	Flange	1.7500 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 310'3-31/32"-299'2-1/32"	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3-T9 299'2-1/32"-159'2-1/32"	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T10 159'2-1/32"-139'2-1/32"	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11-T16 139'2-1/32"-19'2-1/32"	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T17 19'2-1/32"-14'4-13/16"	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T18 14'4-13/16"-11'9-23/32"	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T19 11'9-23/32"-9'5-3/4"	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T20 9'5-3/4"-7'1-13/16"	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T21 7'1-13/16"-1'2-5/32"	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
299.802	BS	A	13/16	8000.00	10%	24000	1.390	376'9-27/32"	259'	0.0000	23'	100%
		B	13/16	8000.00	10%	24000	1.390	418'11-1/32"	263'	0.0000	-29'	100%
		C	13/16	8000.00	10%	24000	1.390	382'3-27/32"	259'6"	0.0000	16'	100%
230.177	BS	A	7/8	9200.00	10%	24000	1.610	329'1-29/32"	259'	0.0000	23'	100%
		B	7/8	9200.00	10%	24000	1.610	366'10-29/32	263'	0.0000	-29'	100%
		C	7/8	9200.00	10%	24000	1.610	" 333'11-7/8"	259'6"	0.0000	16'	100%
150.177	BS	A	13/16	8000.00	10%	24000	1.390	285'8-3/4"	259'	0.0000	23'	100%
		B	13/16	8000.00	10%	24000	1.390	315'7-5/16"	263'	0.0000	-29'	100%
		C	13/16	8000.00	10%	24000	1.390	289'4-3/16"	259'6"	0.0000	16'	100%
89.1667	BS	A	3/4	6800.00	10%	24000	1.180	264'3-27/32"	259'	0.0000	23'	100%
		B	3/4	6800.00	10%	24000	1.180	285'5-3/4"	263'	0.0000	-29'	100%
		C	3/4	6800.00	10%	24000	1.180	266'7-11/16"	259'6"	0.0000	16'	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
299.802	Corner						
230.177	Corner						

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
150.177	Corner						
89.1667	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
299'9-19/32"	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
230'2-5/32'	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
150'2-5/32'	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
89'2-1/32"	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
299.802	523.78	582.30	531.42		12'23/32" 6.0 sec/pulse	14'10-3/32" 6.7 sec/pulse	12'4-29/32" 6.1 sec/pulse	
230.177	529.96	590.73	537.73		9'3-27/32" 5.3 sec/pulse	11'6-3/8" 5.9 sec/pulse	9'7-3/32" 5.3 sec/pulse	
150.177	397.17	438.70	402.20		7'1/4" 4.6 sec/pulse	8'6-3/8" 5.0 sec/pulse	7'2-13/32" 4.6 sec/pulse	
89.1667	311.90	336.86	314.63		6'3/8" 4.2 sec/pulse	7'1/8" 4.6 sec/pulse	6'1-11/16" 4.3 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
299.802	No	No			1	1	1	1
230.177	No	No			1	1	1	1
150.177	No	No			1	1	1	1
89.1667	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
299.802	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
230.177	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
150.177	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
89.1667	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
299.802	A	161'4-13/16"	26	6	1.2098
	B	135'4-13/16"	25	5	1.1846
	C	157'10-13/16"	26	6	1.2067
230.177	A	126'7-3/32"	24	5	1.1751
	B	100'7-3/32"	23	5	1.1431
	C	123'1-3/32"	24	5	1.1711
150.177	A	86'7-3/32"	22	5	1.1227
	B	60'7-3/32"	19	4	1.0756
	C	83'1-3/32"	21	5	1.1172
89.1667	A	56'31/32"	19	4	1.0657
	B	30'31/32"	16	4	1.0000
	C	52'6-31/32"	19	4	1.0575

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
299.802	A	256.11	276.80	9500	10.19	8990	10.76	8489	11.38	8000	12.06	7524	12.80	7064	13.62	6622	14.50
	B	260.11	328.80	9242	12.89	8820	13.49	8406	14.14	8000	14.84	7603	15.59	7217	16.40	6843	17.27
	C	256.61	283.80	9461	10.52	8964	11.10	8477	11.72	8000	12.41	7536	13.15	7087	13.97	6655	14.85
230.177	A	256.11	207.18	11485	7.49	10704	8.03	9941	8.64	9200	9.32	8487	10.09	7806	10.95	7146	11.95
	B	260.11	259.18	11083	9.60	10441	10.18	9813	10.82	9200	11.53	8607	12.31	8035	13.16	7490	14.10
	C	256.61	214.18	11426	7.75	10665	8.29	9922	8.90	9200	9.59	8504	10.36	7822	11.25	7195	12.21
150.177	A	256.11	127.18	10646	5.29	9737	5.78	8853	6.35	8000	7.02	7189	7.81	6431	8.72	5737	9.76
	B	260.11	179.18	10217	6.70	9457	7.23	8717	7.84	8000	8.53	7313	9.32	6663	10.21	6056	11.22
	C	256.61	134.18	10587	5.45	9699	5.95	8834	6.52	8000	7.20	7206	7.98	6462	8.89	5780	9.92
89.1667	A	256.11	66.17	9452	4.35	8539	4.81	7652	5.36	6800	6.03	5998	6.84	5261	7.79	4605	8.89
	B	260.11	118.17	9127	5.23	8327	5.73	7549	6.32	6800	7.01	6090	7.82	5429	8.76	4829	9.83
	C	256.61	73.17	9414	4.44	8514	4.90	7640	5.46	6800	6.14	6008	6.94	5280	7.89	4630	8.99

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1-5/8 FOAM) (1-12)	B	Yes	Ar (CfAe)	112'1/8" - 1'2-5/32"	0.0000	-0.45	12	6	0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (15)	B	Yes	Ar (CfAe)	145'1/8" - 1'2-5/32"	0.0000	0.4	1	1	0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (16-23)	B	Yes	Ar (CfAe)	160'1/8" - 1'2-5/32"	0.0000	0.45	8	4	0.5000	1.9800		0.82
1/4 Coax (24)	B	Yes	Ar (CfAe)	160'1/8" - 1'2-5/32"	4.7100	0.43	1	1	0.5000	0.2500		0.10
LDF7-50A (1-5/8 FOAM) (25-28)	C	Yes	Ar (CfAe)	128'1/8" - 1'2-5/32"	0.0000	-0.45	5	5	0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (29)	C	Yes	Ar (CfAe)	251'9-1/8" - 128'1/8"	0.0000	-0.43	1	1	0.5000	1.9800		0.82
3/8" coax (30)	C	Yes	Ar (CfAe)	251'9-1/8" - 1'2-5/32"	0.0000	-0.39	1	1	0.5000	0.3750		0.07
EW71 (31)	C	Yes	Af (CfAe)	196'1/8" - 1'2-5/32"	0.0000	-0.25	1	1	0.5000	1.1313	4.0779	0.45
LDF7-50A (1-5/8 FOAM) (32)	C	Yes	Ar (CfAe)	180'1/8" - 1'2-5/32"	0.0000	-0.2	1	1	0.5000	1.9800		0.82
1" Metal Conduit (33)	C	Yes	Ar (CfAe)	310'1/8" - 1'2-5/32"	0.0000	0	1	1	0.5000	1.0000		1.13
LDF7-50A (1-5/8 FOAM) (34-37)	C	Yes	Ar (CfAe)	128'1/8" - 1'2-5/32"	0.0000	0.25	4	4	0.5000	1.9800		0.82
LDF5-50A (7/8 FOAM) (38)	C	Yes	Ar (CfAe)	268'1/8" - 1'2-5/32"	0.0000	0.3	1	1	0.5000	1.0900		0.33
LDF4-50A (1/2 FOAM) (39)	C	Yes	Ar (CfAe)	164'5-5/32" - 1'2-5/32"	0.0000	0.45	2	2	0.5000	0.6300		0.15
LDF4-50A (1/2 FOAM) (40)	C	Yes	Ar (CfAe)	203'1/8" - 164'5-5/32"	0.0000	0.45	1	1	0.5000	0.6300		0.15
LDF4-50A (1/2 FOAM) (41)	C	Yes	Ar (CfAe)	21'1/8" - 1'2-5/32"	0.0000	0.5	1	1	0.5000	0.6300		0.15
1/4 Coax (42)	A	Yes	Ar (CfAe)	136'6-1/8" - 1'2-5/32"	0.0000	-0.48	1	1	0.5000	0.2500		0.10
1/8" coax (43)	A	Yes	Ar (CfAe)	141'6-1/8" - 1'2-5/32"	0.0000	-0.47	1	1	0.5000	0.1250		0.03
LDF5-50A (7/8 FOAM) (44)	A	Yes	Ar (CfAe)	135'1/8" - 1'2-5/32"	0.0000	-0.45	1	1	0.5000	1.0900		0.33
3/8" coax (45)	A	Yes	Ar (CfAe)	136'6-1/8" - 1'2-5/32"	1.2500	-0.45	3	3	0.5000	0.3750		0.07
3/8" coax (46-47)	A	Yes	Ar (CfAe)	225'6-1/8" - 136'6-1/8"	1.2500	-0.45	2	2	0.5000	0.3750		0.07
HJ8-50B (3 AIR) (48)	A	Yes	Ar (CfAe)	311'3-31/32" - 1'2-5/32"	0.0000	-0.4	1	1	0.5000	3.0100		1.78
LDF7-50A (1-5/8 FOAM) (49-54)	A	Yes	Ar (CfAe)	120'6-1/8" - 1'2-5/32"	0.0000	0.4	6	6	0.5000	1.9800		0.82
3/8" coax (55)	A	Yes	Ar (CfAe)	48'1/8" - 1'2-5/32"	1.2500	0.35	1	1	0.5000	0.3750		0.07

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
HJ8-50B (3 AIR) (56)	A	Yes	Ar (CfAe)	297'6-1/8" - 1'2-5/32"	0.0000	0.48	1	1	0.5000	3.0100		1.78
LDF5-50A (7/8 FOAM) (57)	A	Yes	Ar (CfAe)	243'1/8" - 1'2-5/32"	-1.0000	-0.45	1	1	0.5000	1.0900		0.33
1/4 Coax (58-59)	C	Yes	Ar (CfAe)	232'1/8" - 1'2-5/32"	-1.0000	0.45	2	2	0.5000	0.2500		0.10
3/8" coax (60)	A	Yes	Ar (CfAe)	232'1/8" - 1'2-5/32"	-1.0000	-0.45	1	1	0.5000	0.3750		0.07
LDF5-50A (7/8 FOAM) (61)	C	Yes	Ar (CfAe)	243'1/8" - 1'2-5/32"	-2.0000	0.5	1	1	0.5000	1.0900		0.33
LDF7-50A (1-5/8 FOAM) (63)	C	Yes	Ar (CfAe)	165'1/8" - 1'2-5/32"	-2.0000	0.5	2	2	0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (62)	C	Yes	Ar (CfAe)	220'1/8" - 165'1/8"	-2.0000	0.5	1	1	0.5000	1.9800		0.82
*****												
Safety Line 3/8	A	Yes	Ar (CfAe)	311'3-31/32" - 1'2-5/32"	0.0000	0	1	1	0.5000	0.3750		0.22
Ladder Steps	A	Yes	Ar (CfAe)	311'3-31/32" - 1'2-5/32"	0.0000	0	1	1	0.0000	1.6700		3.90
*****												
1/8" coax	A	Yes	Ar (CfAe)	311'3-31/32" - 1'2-5/32"	3.0000	0.5	1	1	0.2500	0.1250		0.03
1/8" coax	B	Yes	Ar (CfAe)	311'3-31/32" - 1'2-5/32"	3.0000	0.5	1	1	0.2500	0.1250		0.03
1/8" coax	C	Yes	Ar (CfAe)	311'3-31/32" - 1'2-5/32"	3.0000	0.5	1	1	0.2500	0.1250		0.03

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
T1	311'3-31/32"-310' 3-31/32"	A	0.432	0.000	0.000	0.000	5.94
		B	0.010	0.000	0.000	0.000	0.03
		C	0.010	0.000	0.000	0.000	0.03
T2	310'3-31/32"-299' 2-1/32"	A	4.820	0.000	0.000	0.000	66.29
		B	0.116	0.000	0.000	0.000	0.35
		C	1.020	0.000	0.000	0.000	12.60
T3	299'2-1/32"-279'2-1/32"	A	13.235	0.000	0.000	0.000	151.37
		B	0.208	0.000	0.000	0.000	0.62
		C	1.875	0.000	0.000	0.000	23.22
T4	279'2-1/32"-259'2-1/32"	A	13.650	0.000	0.000	0.000	154.32
		B	0.208	0.000	0.000	0.000	0.62
		C	2.678	0.000	0.000	0.000	26.14
T5	259'2-1/32"-239'2-1/32"	A	13.999	0.000	0.000	0.000	155.59
		B	0.208	0.000	0.000	0.000	0.62
		C	6.512	0.000	0.000	0.000	42.36
T6	239'2-1/32"-219'2-1/32"	A	16.265	0.000	0.000	0.000	162.83
		B	0.208	0.000	0.000	0.000	0.62
		C	10.108	0.000	0.000	0.000	57.58
T7	219'2-1/32"-199'2-1/32"	A	17.342	0.000	0.000	0.000	165.42
		B	0.208	0.000	0.000	0.000	0.62

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
		C	13.768	0.000	0.000	0.000	75.30
T8	199'2-1/32"-179'2-1/32"	A	17.342	0.000	0.000	0.000	165.42
		B	0.208	0.000	0.000	0.000	0.62
		C	14.756	1.588	0.000	0.000	85.99
T9	179'2-1/32"-159'2-1/32"	A	17.342	0.000	0.000	0.000	165.42
		B	0.783	0.000	0.000	0.000	6.24
		C	19.157	1.886	0.000	0.000	108.70
T10	159'2-1/32"-139'2-1/32"	A	17.366	0.000	0.000	0.000	165.49
		B	14.789	0.000	0.000	0.000	138.61
		C	22.267	1.886	0.000	0.000	122.52
T11	139'2-1/32"-119'2-1/32"	A	21.223	0.000	0.000	0.000	180.91
		B	17.125	0.000	0.000	0.000	150.22
		C	33.940	1.886	0.000	0.000	180.54
T12	119'2-1/32"-99'2-1/32"	A	40.208	0.000	0.000	0.000	274.54
		B	29.840	0.000	0.000	0.000	276.60
		C	48.667	1.886	0.000	0.000	253.72
T13	99'2-1/32"-79'2-1/32"	A	40.208	0.000	0.000	0.000	274.54
		B	36.925	0.000	0.000	0.000	347.02
		C	48.667	1.886	0.000	0.000	253.72
T14	79'2-1/32"-59'2-1/32"	A	40.208	0.000	0.000	0.000	274.54
		B	36.925	0.000	0.000	0.000	347.02
		C	48.667	1.886	0.000	0.000	253.72
T15	59'2-1/32"-39'2-1/32"	A	40.485	0.000	0.000	0.000	275.20
		B	36.925	0.000	0.000	0.000	347.02
		C	48.667	1.886	0.000	0.000	253.72
T16	39'2-1/32"-19'2-1/32"	A	40.833	0.000	0.000	0.000	276.04
		B	36.925	0.000	0.000	0.000	347.02
		C	48.763	1.886	0.000	0.000	254.00
T17	19'2-1/32"-14'4-13/16"	A	9.740	0.000	0.000	0.000	65.85
		B	8.808	0.000	0.000	0.000	82.78
		C	11.859	0.450	0.000	0.000	61.24
T18	14'4-13/16"-11'9-2 3/32"	A	5.274	0.000	0.000	0.000	35.66
		B	4.769	0.000	0.000	0.000	44.82
		C	6.422	0.244	0.000	0.000	33.16
T19	11'9-23/32"-9'5-3/4"	A	4.764	0.000	0.000	0.000	32.20
		B	4.308	0.000	0.000	0.000	40.49
		C	5.800	0.220	0.000	0.000	29.95
T20	9'5-3/4"-7'1-13/16"	A	4.764	0.000	0.000	0.000	32.20
		B	4.308	0.000	0.000	0.000	40.49
		C	5.800	0.220	0.000	0.000	29.95
T21	7'1-13/16"-1'2-5/32"	A	12.186	0.000	0.000	0.000	82.38
		B	11.020	0.000	0.000	0.000	103.56
		C	14.837	0.563	0.000	0.000	76.61

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
T1	311'3-31/32"-310'3-31/32"	A	1.309	1.304	0.000	0.000	0.000	22.59
		B		0.229	0.000	0.000	0.000	2.32
		C		0.229	0.000	0.000	0.000	2.32
T2	310'3-31/32"-299'2-1/32"	A	1.306	14.541	0.000	0.000	0.000	251.60
		B		2.546	0.000	0.000	0.000	25.83
		C		5.810	0.000	0.000	0.000	77.97
T3	299'2-1/32"-279'2-1/32"	A	1.298	34.502	0.000	0.000	0.000	605.41
		B		4.533	0.000	0.000	0.000	45.72
		C		10.525	0.000	0.000	0.000	141.16

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
T4	279'2-1/32"-259'2-1/32"	A	1.286	35.090	0.000	0.000	0.000	613.94
		B		4.496	0.000	0.000	0.000	44.99
		C		13.151	0.000	0.000	0.000	175.40
T5	259'2-1/32"-239'2-1/32"	A	1.275	36.058	0.000	0.000	0.000	623.27
		B		4.457	0.000	0.000	0.000	44.21
		C		25.425	0.000	0.000	0.000	340.75
T6	239'2-1/32"-219'2-1/32"	A	1.262	45.338	0.463	0.000	0.000	736.78
		B		4.414	0.000	0.000	0.000	43.38
		C		37.955	0.803	0.000	0.000	509.81
T7	219'2-1/32"-199'2-1/32"	A	1.248	49.998	1.458	0.000	0.000	794.46
		B		4.369	0.000	0.000	0.000	42.49
		C		47.433	1.250	0.000	0.000	647.04
T8	199'2-1/32"-179'2-1/32"	A	1.233	49.599	1.458	0.000	0.000	783.34
		B		4.319	0.000	0.000	0.000	41.54
		C		51.506	5.146	0.000	0.000	767.28
T9	179'2-1/32"-159'2-1/32"	A	1.217	49.161	1.458	0.000	0.000	771.22
		B		4.763	0.523	0.000	0.000	65.32
		C		58.056	7.542	0.000	0.000	904.33
T10	159'2-1/32"-139'2-1/32"	A	1.198	49.168	1.458	0.000	0.000	762.51
		B		18.041	12.400	0.000	0.000	653.63
		C		57.448	11.815	0.000	0.000	960.96
T11	139'2-1/32"-119'2-1/32"	A	1.178	61.064	4.112	0.000	0.000	924.93
		B		22.931	12.400	0.000	0.000	721.01
		C		59.959	24.564	0.000	0.000	1223.25
T12	119'2-1/32"-99'2-1/32"	A	1.154	68.634	23.583	0.000	0.000	1374.06
		B		27.207	25.672	0.000	0.000	1195.85
		C		63.127	40.651	0.000	0.000	1547.93
T13	99'2-1/32"-79'2-1/32"	A	1.127	67.526	23.583	0.000	0.000	1340.32
		B		29.303	33.067	0.000	0.000	1444.15
		C		62.112	40.589	0.000	0.000	1510.41
T14	79'2-1/32"-59'2-1/32"	A	1.093	66.173	23.583	0.000	0.000	1299.73
		B		28.739	33.067	0.000	0.000	1416.71
		C		60.872	40.514	0.000	0.000	1465.21
T15	59'2-1/32"-39'2-1/32"	A	1.049	66.241	23.583	0.000	0.000	1264.90
		B		28.008	33.067	0.000	0.000	1381.55
		C		59.264	40.417	0.000	0.000	1407.61
T16	39'2-1/32"-19'2-1/32"	A	1.000	66.417	23.583	0.000	0.000	1226.82
		B		27.192	33.067	0.000	0.000	1342.82
		C		57.871	40.308	0.000	0.000	1348.56
T17	19'2-1/32"-14'4-13/16"	A	1.000	15.843	5.626	0.000	0.000	292.65
		B		6.486	7.888	0.000	0.000	320.32
		C		14.754	9.615	0.000	0.000	330.96
T18	14'4-13/16"-11'9-2 3/32"	A	1.000	8.579	3.046	0.000	0.000	158.46
		B		3.512	4.271	0.000	0.000	173.45
		C		7.989	5.206	0.000	0.000	179.21
T19	11'9-23/32"-9'5-3/4"	A	1.000	7.749	2.751	0.000	0.000	143.13
		B		3.172	3.858	0.000	0.000	156.66
		C		7.216	4.703	0.000	0.000	161.87
T20	9'5-3/4"-7'1-13/16"	A	1.000	7.749	2.751	0.000	0.000	143.13
		B		3.172	3.858	0.000	0.000	156.66
		C		7.216	4.703	0.000	0.000	161.87
T21	7'1-13/16"-1'2-5/32"	A	1.000	19.821	7.038	0.000	0.000	366.13
		B		8.115	9.868	0.000	0.000	400.75
		C		18.458	12.029	0.000	0.000	414.06

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	311'3-31/32"-310'3-31/32"	A	0.000	0.284	0.216	0.652
		B	0.000	0.050	0.005	0.114
		C	0.000	0.050	0.005	0.114
T2	310'3-31/32"-299'2-1/32"	A	0.377	4.283	0.000	0.000
		B	0.009	0.750	0.000	0.000
		C	0.080	1.711	0.000	0.000
T3	299'2-1/32"-279'2-1/32"	A	1.017	10.358	0.000	0.000
		B	0.016	1.361	0.000	0.000
		C	0.144	3.160	0.000	0.000
T4	279'2-1/32"-259'2-1/32"	A	1.049	10.468	0.000	0.000
		B	0.016	1.341	0.000	0.000
		C	0.206	3.923	0.000	0.000
T5	259'2-1/32"-239'2-1/32"	A	1.076	10.683	0.000	0.000
		B	0.016	1.320	0.000	0.000
		C	0.501	7.533	0.000	0.000
T6	239'2-1/32"-219'2-1/32"	A	1.250	13.469	0.000	0.000
		B	0.016	1.298	0.000	0.000
		C	0.777	11.398	0.000	0.000
T7	219'2-1/32"-199'2-1/32"	A	1.333	15.011	0.000	0.000
		B	0.016	1.274	0.000	0.000
		C	1.058	14.201	0.000	0.000
T8	199'2-1/32"-179'2-1/32"	A	1.333	14.763	0.000	0.000
		B	0.016	1.249	0.000	0.000
		C	1.256	16.714	0.000	0.000
T9	179'2-1/32"-159'2-1/32"	A	1.333	14.493	0.000	0.000
		B	0.060	1.513	0.000	0.000
		C	1.618	19.168	0.000	0.000
T10	159'2-1/32"-139'2-1/32"	A	1.549	14.960	0.000	0.000
		B	1.319	8.995	0.000	0.000
		C	2.154	20.860	0.000	0.000
T11	139'2-1/32"-119'2-1/32"	A	1.631	18.225	0.000	0.000
		B	1.316	9.880	0.000	0.000
		C	2.754	24.002	0.000	0.000
T12	119'2-1/32"-99'2-1/32"	A	3.091	25.414	0.000	0.000
		B	2.294	14.573	0.000	0.000
		C	3.886	28.953	0.000	0.000
T13	99'2-1/32"-79'2-1/32"	A	3.091	24.674	0.000	0.000
		B	2.839	16.891	0.000	0.000
		C	3.886	28.152	0.000	0.000
T14	79'2-1/32"-59'2-1/32"	A	3.091	23.785	0.000	0.000
		B	2.839	16.378	0.000	0.000
		C	3.886	27.189	0.000	0.000
T15	59'2-1/32"-39'2-1/32"	A	3.112	23.125	0.000	0.000
		B	2.839	15.724	0.000	0.000
		C	3.886	25.962	0.000	0.000
T16	39'2-1/32"-19'2-1/32"	A	3.139	22.411	0.000	0.000
		B	2.839	15.005	0.000	0.000
		C	3.894	24.724	0.000	0.000
T17	19'2-1/32"-14'4-13/16"	A	1.111	7.251	0.000	0.000
		B	1.004	4.855	0.000	0.000
		C	1.404	8.320	0.000	0.000
T18	14'4-13/16"-11'9-23/32"	A	0.532	3.611	0.000	0.000
		B	0.481	2.417	0.000	0.000
		C	0.672	4.143	0.000	0.000
T19	11'9-23/32"-9'5-3/4"	A	0.440	3.495	1.021	2.250
		B	0.398	2.340	0.923	1.506
		C	0.556	4.011	1.290	2.582
T20	9'5-3/4"-7'1-13/16"	A	0.643	4.970	1.021	2.250
		B	0.582	3.328	0.923	1.506
		C	0.813	5.703	1.290	2.582
T21	7'1-13/16"-1'2-5/32"	A	1.315	9.420	2.229	5.299

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		B	1.189	6.307	2.015	3.548
		C	1.661	10.809	2.816	6.080

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	311'3-31/32"-310'3-31/32"	-0.5573	0.0751	-0.4748	-0.0020
T2	310'3-31/32"-299'2-1/32"	-3.0149	0.8517	-1.9145	0.4327
T3	299'2-1/32"-279'2-1/32"	-2.9587	-1.4803	-1.8795	-0.7606
T4	279'2-1/32"-259'2-1/32"	-3.1246	-1.4535	-2.0589	-0.6660
T5	259'2-1/32"-239'2-1/32"	-2.6176	-0.3816	-1.7027	0.2689
T6	239'2-1/32"-219'2-1/32"	-3.5283	0.8085	-2.4229	1.2069
T7	219'2-1/32"-199'2-1/32"	-4.9779	1.5764	-3.2166	1.6072
T8	199'2-1/32"-179'2-1/32"	-4.8019	2.0525	-3.3384	2.0350
T9	179'2-1/32"-159'2-1/32"	-4.2755	2.9018	-2.5804	2.2892
T10	159'2-1/32"-139'2-1/32"	-0.5464	4.3064	-0.2703	2.2128
T11	139'2-1/32"-119'2-1/32"	-0.0469	5.6957	-0.9056	3.0559
T12	119'2-1/32"-99'2-1/32"	0.2363	0.2562	-0.9003	1.0138
T13	99'2-1/32"-79'2-1/32"	0.3594	-1.0309	-0.8221	0.4906
T14	79'2-1/32"-59'2-1/32"	0.3594	-1.0309	-0.8118	0.4694
T15	59'2-1/32"-39'2-1/32"	0.3502	-1.0707	-0.8184	0.3179
T16	39'2-1/32"-19'2-1/32"	0.3228	-1.1109	-0.8548	0.1510
T17	19'2-1/32"-14'4-13/16"	0.1551	-0.9420	-0.9015	0.1951
T18	14'4-13/16"-11'9-23/32"	0.1593	-0.9672	-0.9727	0.2329
T19	11'9-23/32"-9'5-3/4"	0.1062	-0.6452	-0.3837	-0.0945
T20	9'5-3/4"-7'1-13/16"	0.0996	-0.6047	-0.0201	-0.3093
T21	7'1-13/16"-1'2-5/32"	0.0747	-0.2543	-0.4472	-0.1525

Force Couples At Top Of Tower *35' Pipe Mast*

Description	Shear	Vertical	Moment	Torque
	lb	lb	lb-ft	lb-ft
No Ice	2094.00	1873.00	40125.00	1049.00
With Ice	860.00	3199.00	16814.00	270.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
1-ft Side Arm	C	From Leg	5.00 0' 0'	-90.0000	21'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.25 0.41	0.35 0.53 0.70 1.05 1.75	8.00 12.00 20.00 35.00 50.00
4.5-ft Yagi (Ant 1)	C	From Leg	1.00 0' 0'	-90.0000	21'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.50 2.22 2.94 4.38 7.26	1.50 2.22 2.94 4.38 7.26	37.00 44.00 51.00 65.00 93.00
***** 1" dia. x 16" Pipe	C	From Leg	1.00 0' 0'	30.0000	48'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.11 0.20 0.30 0.56 1.20	0.11 0.20 0.30 0.56 1.20	1.51 2.83 5.22 13.83 50.58
GPS (Ant 2)	C	From Leg	1.00 0' 0'	0.0000	48'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.62 0.73 0.85 1.11 1.73	0.62 0.73 0.85 1.11 1.73	15.00 22.03 30.81 54.41 131.15
***** Sector Mount [SM 409-3]	C	None		0.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	22.47 31.99 41.51 60.55 98.63	22.47 31.99 41.51 60.55 98.63	1034.77 1500.50 1966.23 2897.69 4760.61
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (Ant 3-11)	B	From Leg	4.00 0' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	74.05 136.21 210.28 384.86 874.17
(2) SBNH-1D6565C w/ Mount Pipe (Ant 3-11)	C	From Leg	4.00 0' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.56 12.22 12.89 14.29 17.43	9.72 11.19 12.59 14.87 19.62	97.13 181.97 281.54 513.39 1147.53
(2) SBNH-1D6565C w/ Mount Pipe (Ant 3-11)	A	From Leg	4.00 0' 1'	75.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.56 12.22 12.89 14.29 17.43	9.72 11.19 12.59 14.87 19.62	97.13 181.97 281.54 513.39 1147.53
800 10121 w/ Mount Pipe (Ant 3-11)	A	From Leg	4.00 -3' 1'	75.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice	5.69 6.18 6.68 7.70	4.60 5.35 6.05 7.53	66.50 111.78 166.59 297.73

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
						4" Ice	9.86	10.83	675.20
800 10121 w/ Mount Pipe (Ant 3-11)	B	From Leg	4.00 -3' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.68 7.70 9.86	4.60 5.35 6.05 7.53 10.83	66.50 111.78 166.59 297.73 675.20
800 10121 w/ Mount Pipe (Ant 3-11)	C	From Leg	4.00 -3' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.68 7.70 9.86	4.60 5.35 6.05 7.53 10.83	66.50 111.78 166.59 297.73 675.20
(2) DTMA (TMA) (Ant 3-11)	A	From Leg	3.75 0' 1'	75.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.71 0.83 0.97 1.26 1.95	0.41 0.52 0.64 0.90 1.54	14.30 19.33 25.98 44.90 110.65
(2) DTMA (TMA) (Ant 3-11)	B	From Leg	3.75 0' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.71 0.83 0.97 1.26 1.95	0.41 0.52 0.64 0.90 1.54	14.30 19.33 25.98 44.90 110.65
(2) DTMA (TMA) (Ant 3-11)	C	From Leg	3.75 0' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.71 0.83 0.97 1.26 1.95	0.41 0.52 0.64 0.90 1.54	14.30 19.33 25.98 44.90 110.65
(2) RRUS-11 (Ant 3-11)	A	From Leg	3.75 -3' 1'	75.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	47.62 68.42 92.25 149.81 309.89
(2) RRUS-11 (Ant 3-11)	B	From Leg	3.75 -3' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	47.62 68.42 92.25 149.81 309.89
(2) RRUS-11 (Ant 3-11)	C	From Leg	3.75 -3' 1'	65.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	47.62 68.42 92.25 149.81 309.89
2.4" Dia. x 5-ft Pipe	A	From Leg	4.00 3' 1'	0.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.50 1.81 2.47 3.93	1.20 1.50 1.81 2.47 3.93	18.30 27.45 40.05 76.23 196.71
2.4" Dia. x 5-ft Pipe	B	From Leg	4.00 3' 1'	0.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.50 1.81 2.47 3.93	1.20 1.50 1.81 2.47 3.93	18.30 27.45 40.05 76.23 196.71
2.4" Dia. x 5-ft Pipe	C	From Leg	4.00 3' 1'	0.0000	111'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.50 1.81 2.47 3.93	1.20 1.50 1.81 2.47 3.93	18.30 27.45 40.05 76.23 196.71
*****									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APXV18-206517S w/ Mount Pipe (Ant 12-14)	A	From Leg	0.50 0' 0'	0.0000	120'6-1/8"	No Ice	5.17	4.46	54.40
						1/2" Ice	5.62	5.39	94.46
						1" Ice	6.08	6.20	145.15
						2" Ice	7.02	7.87	270.63
						4" Ice	9.12	11.40	648.84
APXV18-206517S w/ Mount Pipe (Ant 12-14)	B	From Leg	0.50 0' 0'	0.0000	120'6-1/8"	No Ice	5.17	4.46	54.40
						1/2" Ice	5.62	5.39	94.46
						1" Ice	6.08	6.20	145.15
						2" Ice	7.02	7.87	270.63
						4" Ice	9.12	11.40	648.84
APXV18-206517S w/ Mount Pipe (Ant 12-14)	C	From Leg	0.50 0' 0'	0.0000	120'6-1/8"	No Ice	5.17	4.46	54.40
						1/2" Ice	5.62	5.39	94.46
						1" Ice	6.08	6.20	145.15
						2" Ice	7.02	7.87	270.63
						4" Ice	9.12	11.40	648.84
*****									
Sector Mount [SM 411-3]	C	None		0.0000	128'1/8"	No Ice	21.88	21.88	1069.05
						1/2" Ice	30.68	30.68	1484.97
						1" Ice	39.48	39.48	1900.89
						2" Ice	57.08	57.08	2732.73
						4" Ice	92.28	92.28	4396.41
(2) 848F65T5E-SX w/Mount Pipe (Ant 15-22)	B	From Leg	2.25 0' 0'	40.0000	128'1/8"	No Ice	19.13	11.03	68.20
						1/2" Ice	19.89	12.46	187.93
						1" Ice	20.66	13.74	322.66
						2" Ice	22.22	15.98	626.36
						4" Ice	25.45	20.64	1408.62
(2) 848F65T5E-SX w/Mount Pipe (Ant 15-22)	C	From Leg	2.25 0' 0'	40.0000	128'1/8"	No Ice	19.13	11.03	68.20
						1/2" Ice	19.89	12.46	187.93
						1" Ice	20.66	13.74	322.66
						2" Ice	22.22	15.98	626.36
						4" Ice	25.45	20.64	1408.62
(2) 950G65VTZE-M w/Mount Pipe (Ant 15-22)	B	From Leg	2.25 0' 0'	40.0000	128'1/8"	No Ice	4.47	4.44	35.55
						1/2" Ice	5.06	5.54	74.79
						1" Ice	5.57	6.35	124.70
						2" Ice	6.64	8.00	247.22
						4" Ice	9.11	11.51	617.47
(2) 950G65VTZE-M w/Mount Pipe (Ant 15-22)	C	From Leg	2.25 0' 0'	40.0000	128'1/8"	No Ice	4.47	4.44	35.55
						1/2" Ice	5.06	5.54	74.79
						1" Ice	5.57	6.35	124.70
						2" Ice	6.64	8.00	247.22
						4" Ice	9.11	11.51	617.47
(2) 2.4" Dia. x 10-ft Mount Pipe	A	From Leg	2.25 0' 0'	0.0000	128'1/8"	No Ice	2.38	2.38	36.60
						1/2" Ice	3.40	3.40	54.45
						1" Ice	4.45	4.45	78.81
						2" Ice	5.91	5.91	147.64
						4" Ice	8.47	8.47	370.06
(2) 2.4" x 7-ft Pipe	A	From Leg	2.25 0' 0'	0.0000	128'1/8"	No Ice	1.66	1.66	43.92
						1/2" Ice	2.39	2.39	56.50
						1" Ice	2.83	2.83	73.76
						2" Ice	3.71	3.71	122.89
						4" Ice	5.58	5.58	283.92
*****									
30" Sidearm Mount	B	From Leg	1.25 0' 0'	0.0000	145'1/8"	No Ice	0.35	1.79	22.53
						1/2" Ice	0.48	2.65	32.24
						1" Ice	0.61	3.51	41.96
						2" Ice	0.87	5.23	61.40
						4" Ice	1.39	8.66	100.27

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
12-ft x 1" Omni (Ant 23)	B	From Leg	2.50 0' 6'	0.0000	145'1/8"	No Ice	1.20	1.20	15.00
						1/2" Ice	2.42	2.42	26.10
						1" Ice	3.65	3.65	44.78
						2" Ice	6.17	6.17	105.51
						4" Ice	9.69	9.69	324.71
*****									
2.4" Dia x 4-ft Mount Pipe (Ant 24)	A	From Leg	0.50 0' 0'	0.0000	146'6-1/8"	No Ice	0.87	0.87	14.64
						1/2" Ice	1.12	1.12	22.02
						1" Ice	1.37	1.37	32.24
						2" Ice	1.91	1.91	61.82
						4" Ice	3.24	3.24	161.77
12"x4.5"x6.25" TMA (Ant 24)	A	From Leg	0.25 0' 0'	0.0000	146'6-1/8"	No Ice	0.53	0.73	15.00
						1/2" Ice	0.64	0.85	20.86
						1" Ice	0.76	0.98	28.39
						2" Ice	1.02	1.27	49.24
						4" Ice	1.66	1.95	119.51
*****									
Sector Mount [SM 408-3]	C	None		0.0000	160'1/8"	No Ice	22.45	22.45	1019.41
						1/2" Ice	33.50	33.50	1474.67
						1" Ice	44.55	44.55	1929.93
						2" Ice	66.65	66.65	2840.45
						4" Ice	110.85	110.85	4661.49
APX16PV-16PVL w/ Mount Pipe	A	From Leg	2.50 -8' 0'	0.0000	160'1/8"	No Ice	7.02	3.41	61.50
						1/2" Ice	7.59	4.23	106.01
						1" Ice	8.12	4.93	160.30
						2" Ice	9.23	6.38	290.48
						4" Ice	11.58	9.48	668.01
APX16PV-16PVL w/ Mount Pipe	C	From Leg	2.50 -8' 0'	0.0000	160'1/8"	No Ice	7.02	3.41	61.50
						1/2" Ice	7.59	4.23	106.01
						1" Ice	8.12	4.93	160.30
						2" Ice	9.23	6.38	290.48
						4" Ice	11.58	9.48	668.01
TMA 11"x7"x4"	A	From Leg	2.25 -8' 0'	0.0000	160'1/8"	No Ice	0.75	0.43	15.00
						1/2" Ice	0.87	0.53	20.57
						1" Ice	1.00	0.64	27.77
						2" Ice	1.28	0.89	47.80
						4" Ice	1.96	1.48	115.85
TMA 11"x7"x4"	C	From Leg	2.25 -8' 0'	0.0000	160'1/8"	No Ice	0.75	0.43	15.00
						1/2" Ice	0.87	0.53	20.57
						1" Ice	1.00	0.64	27.77
						2" Ice	1.28	0.89	47.80
						4" Ice	1.96	1.48	115.85
(2) 2.4" x 7-ft Pipe	A	From Leg	2.25 4' 0'	0.0000	160'1/8"	No Ice	1.66	1.66	43.92
						1/2" Ice	2.39	2.39	56.50
						1" Ice	2.83	2.83	73.76
						2" Ice	3.71	3.71	122.89
						4" Ice	5.58	5.58	283.92
(3) 2.4" x 7-ft Pipe	B	From Leg	2.25 0' 0'	0.0000	160'1/8"	No Ice	1.66	1.66	43.92
						1/2" Ice	2.39	2.39	56.50
						1" Ice	2.83	2.83	73.76
						2" Ice	3.71	3.71	122.89
						4" Ice	5.58	5.58	283.92
(2) 2.4" x 7-ft Pipe	C	From Leg	2.25 4' 0'	0.0000	160'1/8"	No Ice	1.66	1.66	43.92
						1/2" Ice	2.39	2.39	56.50
						1" Ice	2.83	2.83	73.76
						2" Ice	3.71	3.71	122.89
						4" Ice	5.58	5.58	283.92

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
*****									
2.4" Dia. x 10-ft Mount Pipe	C	From Leg	0.50 0' 0'	0.0000	164'6-1/8"	No Ice	2.38	2.38	36.60
						1/2" Ice	3.40	3.40	54.45
						1" Ice	4.45	4.45	78.81
						2" Ice	5.91	5.91	147.64
						4" Ice	8.47	8.47	370.06
6812 (Ant 27)	C	From Leg	1.00 0' 0'	0.0000	164'6-1/8"	No Ice	0.20	0.20	3.00
						1/2" Ice	0.36	0.36	3.90
						1" Ice	0.52	0.52	4.80
						2" Ice	0.84	0.84	6.60
						4" Ice	1.48	1.48	10.20
*****									
36" Standoff	A	From Leg	1.50 0' 0'	15.0000	165'1/8"	No Ice	0.72	2.08	38.53
						1/2" Ice	0.94	2.88	57.77
						1" Ice	1.16	3.67	77.02
						2" Ice	1.59	5.26	115.51
						4" Ice	2.45	8.44	192.49
BCD-80010 (Ant 28)	A	From Leg	3.00 0' 6'	0.0000	165'1/8"	No Ice	2.95	2.95	26.50
						1/2" Ice	4.11	4.11	48.29
						1" Ice	5.29	5.29	77.42
						2" Ice	7.16	7.16	158.32
						4" Ice	10.03	10.03	414.92
*****									
2.4"x25' Mt. Pipe	B	From Leg	0.50 0' 0'	0.0000	180'1/8"	No Ice	5.95	5.95	91.50
						1/2" Ice	8.48	8.48	135.77
						1" Ice	11.02	11.02	195.71
						2" Ice	16.16	16.16	363.20
						4" Ice	26.64	26.64	892.90
(6) 601417	B	From Leg	1.00 0' 0'	35.0000	192'6-1/8" - 167'6-1/8"	No Ice	7.30	2.65	50.00
						1/2" Ice	7.68	2.96	89.69
						1" Ice	8.07	3.27	133.81
						2" Ice	8.88	3.92	236.08
						4" Ice	10.60	5.32	502.28
*****									
4.5" Dia x 6' Dish Mount (Ant 30)	B	From Leg	1.00 0' 0'	0.0000	196'1/8"	No Ice	2.25	2.25	64.80
						1/2" Ice	2.62	2.62	83.90
						1" Ice	3.00	3.00	107.27
						2" Ice	3.78	3.78	167.45
						4" Ice	5.56	5.56	345.85
T.S. 3"x3"x6.5' (Ant 30)	C	From Face	0.00 -1'6" 0'	0.0000	196'1/8"	No Ice	3.25	3.25	57.07
						1/2" Ice	3.77	3.77	75.28
						1" Ice	4.24	4.24	99.13
						2" Ice	5.21	5.21	164.53
						4" Ice	7.23	7.23	371.55
2.4" Dia. x 6.5' Mount Pipe (Ant 30)	B	From Face	0.00 0' 0'	0.0000	196'1/8"	No Ice	1.54	1.54	23.73
						1/2" Ice	2.16	2.16	38.31
						1" Ice	2.58	2.58	58.57
						2" Ice	3.47	3.47	107.37
						4" Ice	5.49	5.49	269.57
*****									
Side Arm Mount [SO 306-1]	C	From Leg	2.00 0' 0'	0.0000	203'1/8"	No Ice	0.98	2.18	42.00
						1/2" Ice	1.70	3.80	62.37
						1" Ice	2.42	5.42	82.75
						2" Ice	3.86	8.66	123.49
						4" Ice	6.74	15.14	204.99
DB420-B (Ant 31)	C	From Leg	4.00 0'	0.0000	203'1/8"	No Ice	3.33	3.33	34.00
						1/2" Ice	5.99	5.99	44.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			10'			1" Ice	8.66	8.66	54.40
						2" Ice	13.99	13.99	74.80
						4" Ice	24.64	24.64	115.60
*****									
WPA-800120-8CF (Ant 32)	B	From Leg	0.00 0' 0'	30.0000	220'1/8"	No Ice	6.45	6.45	16.80
						1/2" Ice	7.02	7.02	56.31
						1" Ice	7.61	7.61	102.89
						2" Ice	8.79	8.79	218.05
						4" Ice	11.26	11.26	541.77
*****									
TMA 6"x6"x2"	A	From Leg	0.75 0' 0'	15.0000	225'6-1/8"	No Ice	0.35	0.12	20.00
						1/2" Ice	0.43	0.17	22.43
						1" Ice	0.52	0.24	25.96
						2" Ice	0.73	0.39	37.11
						4" Ice	1.25	0.81	81.19
TMA 6"x6"x2"	B	From Leg	0.75 0' 0'	15.0000	225'6-1/8"	No Ice	0.35	0.12	20.00
						1/2" Ice	0.43	0.17	22.43
						1" Ice	0.52	0.24	25.96
						2" Ice	0.73	0.39	37.11
						4" Ice	1.25	0.81	81.19
2'10" x 7" x 2" Panel w/ 48" Mt. Pipe (Ant 33)	A	From Leg	1.00 0' 0'	15.0000	225'6-1/8"	No Ice	2.60	1.79	43.16
						1/2" Ice	2.94	2.25	66.26
						1" Ice	3.29	2.72	95.00
						2" Ice	4.03	3.71	168.82
						4" Ice	5.70	6.19	397.72
2'10" x 7" x 2" Panel w/ 48" Mt. Pipe (Ant 34)	B	From Leg	1.00 0' 0'	15.0000	225'6-1/8"	No Ice	2.60	1.79	43.16
						1/2" Ice	2.94	2.25	66.26
						1" Ice	3.29	2.72	95.00
						2" Ice	4.03	3.71	168.82
						4" Ice	5.70	6.19	397.72
(2) 1" x 8" Pipe	A	From Leg	0.33 0' 0'	15.0000	225'6-1/8"	No Ice	0.05	0.05	0.14
						1/2" Ice	0.10	0.10	0.85
						1" Ice	0.17	0.17	2.23
						2" Ice	0.33	0.33	7.57
						4" Ice	0.80	0.80	32.92
(2) 1" x 8" Pipe	B	From Leg	0.33 0' 0'	15.0000	225'6-1/8"	No Ice	0.05	0.05	0.14
						1/2" Ice	0.10	0.10	0.85
						1" Ice	0.17	0.17	2.23
						2" Ice	0.33	0.33	7.57
						4" Ice	0.80	0.80	32.92
*****									
TMA 12"x12"x2" (Ant 35)	B	From Leg	1.00 0' 0'	0.0000	232'1/8"	No Ice	1.40	0.23	14.00
						1/2" Ice	1.56	0.33	21.10
						1" Ice	1.73	0.43	30.07
						2" Ice	2.09	0.67	54.44
						4" Ice	2.92	1.24	134.30
*****									
TMA 18"x6"x6"	B	From Leg	1.00 0' 0'	0.0000	243'1/8"	No Ice	1.05	1.05	20.00
						1/2" Ice	1.21	1.21	29.17
						1" Ice	1.38	1.38	40.48
						2" Ice	1.74	1.74	70.30
						4" Ice	2.57	2.57	164.15
WPA-800120-8CF w/ Mount Pipe (Ant 37)	B	From Leg	1.00 0' 0'	0.0000	243'1/8"	No Ice	6.48	8.75	63.12
						1/2" Ice	7.07	10.16	124.94
						1" Ice	7.66	11.23	198.62
						2" Ice	8.86	13.41	379.17
						4" Ice	11.35	17.99	895.64

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
*****									
2.4"x25' Mt. Pipe	C	From Leg	0.50 0' 0'	0.0000	251'9-1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.95 8.48 11.02 16.16 26.64	5.95 8.48 11.02 16.16 26.64	91.50 135.77 195.71 363.20 892.90
Antenna Concepts ACB16A w/ Mount (Ant 38)	C	From Leg	2.50 0' 0'	0.0000	251'9-1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	19.29 24.18 29.07 38.84 58.40	14.11 18.33 22.56 31.00 47.88	200.00 300.00 400.00 600.00 1000.00
*****									
Side Arm Mount [SO 305-1]	C	From Leg	1.50 0' 0'	0.0000	251'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	30.00 43.27 56.54 83.07 136.14
DB420-B (Ant 39)	C	From Leg	3.00 0' 10'	0.0000	251'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 5.99 8.66 13.99 24.64	3.33 5.99 8.66 13.99 24.64	34.00 44.20 54.40 74.80 115.60
*****									
(4) L2.5x2.5x0.25, 10-ft Length	B	From Leg	0.00 0' 0'	-60.0000	309'6-1/8" - 284'6-1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.17 5.31 6.46 8.62 11.59	4.17 5.31 6.46 8.62 11.59	41.00 64.73 96.76 186.48 474.03
2.9"x22-ft Mt. Pipe	B	From Leg	5.00 0' 0'	0.0000	297'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.38 8.61 10.86 15.41 24.69	6.38 8.61 10.86 15.41 24.69	127.60 173.68 233.65 395.85 893.63
ACS 16R4	B	From Leg	5.00 0' 0'	0.0000	297'1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	33.33 36.19 39.06 44.84 54.56	10.42 13.22 16.04 21.72 33.22	100.00 212.83 345.97 674.00 1582.44
*****									
Control Box 12"x13.5"x6.5" (Appurt 1)	C	From Face	0.25 2' 0'	0.0000	5'8-5/32"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.58 1.74 1.92 2.31 3.17	0.76 0.88 1.02 1.31 1.99	50.00 61.69 75.65 111.15 217.94
Detuning Box 29"x24"x12" (Appurt 2)	C	From Face	0.50 2' 0'	0.0000	10'6-1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.77 7.11 7.47 8.21 9.79	3.38 3.65 3.93 4.52 5.79	50.00 95.31 145.02 258.44 546.74
Detuner (Appurt 3)	C	From Leg	0.00 0' 0'	30.0000	136'6-1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.25 2.10 2.94 4.64 8.03	3.08 5.26 7.44 11.80 20.52	25.00 50.00 75.00 125.00 225.00
Control Box 12"x13.5"x6.5" (Appurt 4)	B	From Leg	0.25 0' 0'	0.0000	141'6-1/8"	No Ice 1/2" Ice 1" Ice	1.58 1.74 1.92	0.76 0.88 1.02	50.00 61.69 75.65

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	2.31	1.31	111.15
						4" Ice	3.17	1.99	217.94
CC806-12 (Appurt 5)	C	From Face	0.00 -2' 0'	0.0000	236'6-1/8"	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.22 7.00 8.79 12.43 17.95	5.22 7.00 8.79 12.43 17.95	49.00 86.64 135.39 266.77 669.44

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
2-ft Dish w/o Radome (Ant 24)	A	Paraboloid w/o Radome	From Leg	1.50 0' 0'	70.0000		146'6-1/8"	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	39.00 58.00 77.00 115.00 191.00
*****											
6-FT MW w/ Radome (Ant 30)	C	Paraboloid w/Radome	From Leg	1.50 0' 0'	0.0000		196'1/8"	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.07 29.86 31.44 34.60	590.00 740.00 890.00 1190.00 1790.00
*****											
SP2-4.7NS (Ant 35)	B	Paraboloid w/o Radome	From Leg	1.50 0' 0'	60.0000		232'1/8"	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	22.00 39.00 56.00 90.00 158.00
*****											
6-ft x 3-ft Grid (Ant 36)	B	Grid	From Leg	1.00 0' 0'	30.0000		235'1/8"	4.79	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	19.63 20.29 20.95 22.27 24.91	125.00 229.18 358.36 566.72 983.44

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	20674.44			
Bracing Weight	11839.57			
Total Member Self-Weight	32514.00			

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Guy Weight	5497.36			
Total Weight	55877.03			
Wind 0 deg - No Ice		-674.07	-40731.23	3993.44
Wind 30 deg - No Ice		19502.60	-34879.26	10452.62
Wind 60 deg - No Ice		34533.15	-19681.19	14229.54
Wind 90 deg - No Ice		40433.45	807.54	14505.05
Wind 120 deg - No Ice		35472.83	20957.15	11679.23
Wind 150 deg - No Ice		20884.54	35270.65	5639.74
Wind 180 deg - No Ice		742.01	40300.73	-1107.94
Wind 210 deg - No Ice		-19508.55	34612.75	-7461.97
Wind 240 deg - No Ice		-34621.04	19646.62	-11664.71
Wind 270 deg - No Ice		-40237.87	-742.26	-12591.01
Wind 300 deg - No Ice		-35129.63	-20889.40	-9006.09
Wind 330 deg - No Ice		-20661.79	-35416.07	-3081.68
Member Ice	20380.48			
Guy Ice	10617.48			
Total Weight Ice	131259.58			
Wind 0 deg - Ice		-244.40	-19708.16	40.66
Wind 30 deg - Ice		9451.12	-17007.82	2939.50
Wind 60 deg - Ice		16699.65	-9628.67	4830.76
Wind 90 deg - Ice		19447.90	174.49	5671.79
Wind 120 deg - Ice		17004.57	9933.14	5224.56
Wind 150 deg - Ice		9874.24	16951.37	3194.60
Wind 180 deg - Ice		142.90	19451.45	589.80
Wind 210 deg - Ice		-9574.09	16803.03	-2091.92
Wind 240 deg - Ice		-16802.84	9650.08	-4152.81
Wind 270 deg - Ice		-19464.87	-328.83	-4551.41
Wind 300 deg - Ice		-16852.23	-10010.01	-3942.60
Wind 330 deg - Ice		-9861.75	-17058.21	-2371.17
Total Weight	55877.03			
Wind 0 deg - Service		-263.31	-15092.67	1150.17
Wind 30 deg - Service		7209.22	-12916.33	3673.29
Wind 60 deg - Service		12781.13	-7278.98	5148.65
Wind 90 deg - Service		14976.35	315.45	5256.27
Wind 120 deg - Service		13148.19	7777.40	4152.44
Wind 150 deg - Service		7749.04	13069.22	1793.26
Wind 180 deg - Service		289.85	14924.51	-842.56
Wind 210 deg - Service		-7211.54	12812.22	-3324.60
Wind 240 deg - Service		-12815.46	7265.48	-4966.29
Wind 270 deg - Service		-14899.95	-289.94	-5328.13
Wind 300 deg - Service		-13014.13	-7750.94	-3927.77
Wind 330 deg - Service		-7662.03	-13126.02	-1613.55

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy
5	Dead+Wind 90 deg - No Ice+Guy
6	Dead+Wind 120 deg - No Ice+Guy
7	Dead+Wind 150 deg - No Ice+Guy

Comb. No.	Description
8	Dead+Wind 180 deg - No Ice+Guy
9	Dead+Wind 210 deg - No Ice+Guy
10	Dead+Wind 240 deg - No Ice+Guy
11	Dead+Wind 270 deg - No Ice+Guy
12	Dead+Wind 300 deg - No Ice+Guy
13	Dead+Wind 330 deg - No Ice+Guy
14	Dead+Ice+Temp+Guy
15	Dead+Wind 0 deg+Ice+Temp+Guy
16	Dead+Wind 30 deg+Ice+Temp+Guy
17	Dead+Wind 60 deg+Ice+Temp+Guy
18	Dead+Wind 90 deg+Ice+Temp+Guy
19	Dead+Wind 120 deg+Ice+Temp+Guy
20	Dead+Wind 150 deg+Ice+Temp+Guy
21	Dead+Wind 180 deg+Ice+Temp+Guy
22	Dead+Wind 210 deg+Ice+Temp+Guy
23	Dead+Wind 240 deg+Ice+Temp+Guy
24	Dead+Wind 270 deg+Ice+Temp+Guy
25	Dead+Wind 300 deg+Ice+Temp+Guy
26	Dead+Wind 330 deg+Ice+Temp+Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	311.333 - 310.333	1.964	37	0.0573	0.7670
T2	310.333 - 299.167	1.970	37	0.0573	0.7671
T3	299.167 - 279.167	2.041	37	0.0574	0.7673
T4	279.167 - 259.167	2.162	37	0.0501	0.7502
T5	259.167 - 239.167	2.228	37	0.0408	0.7272
T6	239.167 - 219.167	2.249	37	0.0358	0.7040
T7	219.167 - 199.167	2.293	37	0.0357	0.6748
T8	199.167 - 179.167	2.338	37	0.0257	0.6461
T9	179.167 - 159.167	2.314	37	0.0124	0.6125
T10	159.167 - 139.167	2.220	37	0.0208	0.5684
T11	139.167 - 119.167	2.137	37	0.0228	0.5360
T12	119.167 - 99.1667	2.029	37	0.0405	0.4843
T13	99.1667 - 79.1667	1.798	37	0.0582	0.4172
T14	79.1667 - 59.1667	1.533	37	0.0646	0.3571
T15	59.1667 - 39.1667	1.250	37	0.0786	0.3016
T16	39.1667 - 19.1667	0.884	37	0.0961	0.2469
T17	19.1667 - 14.3958	0.438	37	0.1105	0.1954
T18	14.3958 - 11.8125	0.323	37	0.1128	0.1864
T19	11.8125 - 9.47917	0.260	37	0.1138	0.1824
T20	9.47917 - 7.14583	0.203	37	0.1147	0.1798
T21	7.14583 - 1.17708	0.146	37	0.1151	0.1767

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
309'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	37	1.976	0.0573	0.7672	366150
304'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	37	2.007	0.0575	0.7678	306871
299'9-19/32"	Guy	37	2.037	0.0575	0.7675	185763
299'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	37	2.039	0.0575	0.7674	185533
297'1/8"	2.9"x22-ft Mt. Pipe	37	2.055	0.0571	0.7665	220733
294'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	37	2.071	0.0566	0.7652	381838
289'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	37	2.103	0.0549	0.7613	174212
284'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	37	2.133	0.0527	0.7563	101444
251'9-1/8"	2.4"x25' Mt. Pipe	37	2.237	0.0381	0.7190	177056
251'1/8"	Side Arm Mount [SO 305-1]	37	2.238	0.0379	0.7182	207551
243'1/8"	TMA 18"x6"x6"	37	2.245	0.0361	0.7089	175330
236'6-1/8"	CC806-12	37	2.253	0.0357	0.7004	111562
235'1/8"	6-ft x 3-ft Grid	37	2.255	0.0358	0.6983	115948
232'1/8"	SP2-4.7NS	37	2.261	0.0360	0.6940	126207
230'2-5/32"	Guy	37	2.265	0.0361	0.6913	132501
225'6-1/8"	TMA 6"x6"x2"	37	2.276	0.0363	0.6843	151766
220'1/8"	WPA-800120-8CF	37	2.291	0.0359	0.6760	199559
203'1/8"	Side Arm Mount [SO 306-1]	37	2.333	0.0284	0.6516	61380
196'1/8"	6-FT MW w/ Radome	37	2.340	0.0232	0.6415	47918
192'6-1/8"	(6) 601417	37	2.340	0.0204	0.6363	46410
187'6-1/8"	(6) 601417	37	2.335	0.0162	0.6282	44515
182'6-1/8"	(6) 601417	37	2.324	0.0123	0.6192	42860
180'1/8"	2.4"x25' Mt. Pipe	37	2.317	0.0118	0.6142	43370
177'6-1/8"	(6) 601417	37	2.308	0.0135	0.6090	47206
172'6-1/8"	(6) 601417	37	2.287	0.0164	0.5977	69755
167'6-1/8"	(6) 601417	37	2.262	0.0187	0.5861	141236
165'1/8"	36" Standoff	37	2.249	0.0196	0.5804	289638
164'6-1/8"	2.4" Dia. x 10-ft Mount Pipe	37	2.247	0.0197	0.5793	366698
160'1/8"	Sector Mount [SM 408-3]	37	2.224	0.0207	0.5700	159033
150'2-5/32"	Guy	37	2.180	0.0210	0.5538	179920
146'6-1/8"	2-ft Dish w/o Radome	37	2.165	0.0211	0.5483	215072
145'1/8"	30" Sidearm Mount	37	2.159	0.0212	0.5460	233755
141'6-1/8"	Control Box 12"x13.5"x6.5"	37	2.146	0.0220	0.5403	312565
136'6-1/8"	Detuner	37	2.126	0.0242	0.5307	152042
128'1/8"	Sector Mount [SM 411-3]	37	2.089	0.0312	0.5103	44171
120'6-1/8"	APXV18-206517S w/ Mount Pipe	37	2.040	0.0391	0.4885	28002
111'1/8"	Sector Mount [SM 409-3]	37	1.947	0.0490	0.4573	40365
89'2-1/32"	Guy	37	1.665	0.0616	0.3860	388173
48'1/8"	1" dia. x 16" Pipe	37	1.057	0.0884	0.2712	50069
21'1/8"	1-ft Side Arm	37	0.482	0.1095	0.1994	91841
10'6-1/8"	Detuning Box 29"x24"x12"	37	0.228	0.1143	0.1809	283704
5'8-5/32"	Control Box 12"x13.5"x6.5"	37	0.110	0.1154	0.1747	Inf

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	311.333 - 310.333	8.977	12	0.1639	2.0016
T2	310.333 - 299.167	8.936	12	0.1628	1.9998
T3	299.167 - 279.167	8.557	12	0.1468	1.9914

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T4	279.167 - 259.167	7.998	12	0.1350	1.9371
T5	259.167 - 239.167	7.443	12	0.1248	1.8669
T6	239.167 - 219.167	6.917	12	0.0990	1.7961
T7	219.167 - 199.167	6.606	12	0.0815	1.7138
T8	199.167 - 179.167	6.600	13	0.0668	1.6364
T9	179.167 - 159.167	6.530	13	0.0666	1.5462
T10	159.167 - 139.167	6.414	2	0.0739	1.4291
T11	139.167 - 119.167	6.345	2	0.0717	1.3453
T12	119.167 - 99.1667	6.139	2	0.1119	1.2136
T13	99.1667 - 79.1667	5.544	2	0.1633	1.0427
T14	79.1667 - 59.1667	4.776	2	0.1951	0.8909
T15	59.1667 - 39.1667	3.890	2	0.2447	0.7521
T16	39.1667 - 19.1667	2.742	2	0.2995	0.6155
T17	19.1667 - 14.3958	1.353	2	0.3424	0.4871
T18	14.3958 - 11.8125	0.998	2	0.3491	0.4645
T19	11.8125 - 9.47917	0.804	2	0.3521	0.4545
T20	9.47917 - 7.14583	0.628	2	0.3545	0.4482
T21	7.14583 - 1.17708	0.451	2	0.3559	0.4405

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
309'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	12	8.904	0.1618	1.9986	10877
304'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	12	8.725	0.1546	1.9946	12865
299'9-19/32"	Guy	12	8.576	0.1477	1.9920	23598
299'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	12	8.567	0.1473	1.9918	24545
297'1/8"	2.9"x22-ft Mt. Pipe	12	8.493	0.1444	1.9887	32472
294'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	12	8.421	0.1420	1.9841	39185
289'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	12	8.280	0.1387	1.9716	58892
284'6-1/8"	(4) L2.5x2.5x0.25, 10-ft Length	12	8.143	0.1367	1.9558	104277
251'9-1/8"	2.4"x25' Mt. Pipe	12	7.234	0.1179	1.8416	38943
251'1/8"	Side Arm Mount [SO 305-1]	12	7.214	0.1170	1.8390	35445
243'1/8"	TMA 18"x6"x6"	12	7.005	0.1059	1.8106	18116
236'6-1/8"	CC806-12	12	6.862	0.0935	1.7857	15423
235'1/8"	6-ft x 3-ft Grid	12	6.832	0.0903	1.7796	15745
232'1/8"	SP2-4.7NS	12	6.779	0.0836	1.7673	16629
230'2-5/32"	Guy	12	6.748	0.0795	1.7596	17224
225'6-1/8"	TMA 6"x6"x2"	12	6.680	0.0755	1.7400	18947
220'1/8"	WPA-800120-8CF	12	6.614	0.0810	1.7172	22055
203'1/8"	Side Arm Mount [SO 306-1]	13	6.595	0.0729	1.6512	32332
196'1/8"	6-FT MW w/ Radome	13	6.601	0.0610	1.6240	21572
192'6-1/8"	(6) 601417	13	6.597	0.0573	1.6098	20306
187'6-1/8"	(6) 601417	13	6.582	0.0607	1.5881	18791
182'6-1/8"	(6) 601417	13	6.555	0.0642	1.5640	17521
180'1/8"	2.4"x25' Mt. Pipe	13	6.537	0.0660	1.5508	17438
177'6-1/8"	(6) 601417	13	6.516	0.0677	1.5367	18559
172'6-1/8"	(6) 601417	13	6.464	0.0708	1.5067	25190
167'6-1/8"	(6) 601417	2	6.435	0.0731	1.4759	40712
165'1/8"	36" Standoff	2	6.430	0.0738	1.4610	58842
164'6-1/8"	2.4" Dia. x 10-ft Mount Pipe	2	6.428	0.0739	1.4581	64594
160'1/8"	Sector Mount [SM 408-3]	2	6.416	0.0741	1.4334	43814
150'2-5/32"	Guy	2	6.387	0.0706	1.3909	51672
146'6-1/8"	2-ft Dish w/o Radome	2	6.374	0.0696	1.3767	61209
145'1/8"	30" Sidearm Mount	2	6.369	0.0695	1.3708	66208
141'6-1/8"	Control Box 12"x13.5"x6.5"	2	6.355	0.0702	1.3561	73873

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'6-1/8"	Detuner	2	6.332	0.0744	1.3318	35505
128'1/8"	Sector Mount [SM 411-3]	2	6.269	0.0898	1.2797	14428
120'6-1/8"	APXV18-206517S w/ Mount Pipe	2	6.164	0.1082	1.2243	9722
111'1/8"	Sector Mount [SM 409-3]	2	5.937	0.1358	1.1448	13231
89'2-1/32"	Guy	2	5.171	0.1788	0.9638	50203
48'1/8"	1" dia. x 16" Pipe	2	3.284	0.2759	0.6762	17203
21'1/8"	1-ft Side Arm	2	1.488	0.3393	0.4970	33313
10'6-1/8"	Detuning Box 29"x24"x12"	2	0.706	0.3535	0.4509	108307
5'8-5/32"	Control Box 12"x13.5"x6.5"	2	0.340	0.3567	0.4355	481276

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	311.333	Leg	A325N	1.7500	2	4485.51	105828.00	0.042 ✓	1.333	Bolt Tension
T2	310.333	Leg	A325N	0.8750	5	3914.06	25255.50	0.155 ✓	1.333	Bolt DS
T3	299.167	Leg	A325N	0.8750	5	3242.63	25255.50	0.128 ✓	1.333	Bolt DS
T4	279.167	Leg	A325N	0.8750	5	3919.19	25255.50	0.155 ✓	1.333	Bolt DS
T5	259.167	Leg	A325N	0.8750	5	6436.27	25255.50	0.255 ✓	1.333	Bolt DS
T6	239.167	Leg	A325N	0.8750	5	6446.54	25255.50	0.255 ✓	1.333	Bolt DS
T7	219.167	Leg	A325N	0.8750	5	7261.51	25255.50	0.288 ✓	1.333	Bolt DS
T8	199.167	Leg	A325N	0.8750	5	7843.16	25255.50	0.311 ✓	1.333	Bolt DS
T9	179.167	Leg	A325N	0.8750	5	7708.34	25255.50	0.305 ✓	1.333	Bolt DS
T10	159.167	Leg	A325N	0.8750	5	10300.80	25255.50	0.408 ✓	1.333	Bolt DS
T11	139.167	Leg	A325N	0.8750	5	12371.90	25255.50	0.490 ✓	1.333	Bolt DS
T12	119.167	Leg	A325N	0.8750	5	12100.10	25255.50	0.479 ✓	1.333	Bolt DS
T13	99.1667	Leg	A325N	0.8750	5	13699.70	25255.50	0.542 ✓	1.333	Bolt DS
T14	79.1667	Leg	A325N	0.8750	5	15146.10	25255.50	0.600 ✓	1.333	Bolt DS
T15	59.1667	Leg	A325N	0.8750	5	15540.90	25255.50	0.615 ✓	1.333	Bolt DS
T16	39.1667	Leg	A325N	0.8750	5	14992.70	25255.50	0.594 ✓	1.333	Bolt DS

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T2	299'9-19/32" (A) (981)	13/16 BS	8000.00	79999.92	17436.20	40000.00	2.000	4.588 ✓
	299'9-19/32" (B) (980)	13/16 BS	8000.00	79999.92	18726.60	40000.00	2.000	4.272 ✓
	299'9-19/32" (C) (979)	13/16 BS	8000.00	79999.92	17545.90	40000.00	2.000	4.559 ✓

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T6	230'2-5/32" (A) (984)	7/8 BS	9200.00	92000.13	19771.70	46000.00	2.000	4.653 ✓
	230'2-5/32" (B) (983)	7/8 BS	9200.00	92000.13	21177.20	46000.00	2.000	4.344 ✓
	230'2-5/32" (C) (982)	7/8 BS	9200.00	92000.13	19793.30	46000.00	2.000	4.648 ✓
T10	150'2-5/32" (A) (987)	13/16 BS	8000.00	79999.92	18496.70	40000.00	2.000	4.325 ✓
	150'2-5/32" (B) (986)	13/16 BS	8000.00	79999.92	19453.60	40000.00	2.000	4.112 ✓
	150'2-5/32" (C) (985)	13/16 BS	8000.00	79999.92	18405.20	40000.00	2.000	4.347 ✓
T13	89'2-1/32" (A) (990)	3/4 BS	6800.00	67999.85	14913.40	34000.00	2.000	4.560 ✓
	89'2-1/32" (B) (989)	3/4 BS	6800.00	67999.85	15733.30	34000.00	2.000	4.322 ✓
	89'2-1/32" (C) (988)	3/4 BS	6800.00	67999.85	14916.40	34000.00	2.000	4.559 ✓

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T1	311.333 - 310.333	2 3/4	1'	1'	17.5 K=1.00	1.00	28.562	5.9396	-10437.20	169645.00	0.062
T2	310.333 - 299.167	2 3/4	11'2-1/32"	2'8-5/8"	47.5 K=1.00	1.00	24.742	5.9396	-19570.30	146959.00	0.133
T3	299.167 - 279.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-19307.30	152823.00	0.126
T4	279.167 - 259.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-15891.30	152823.00	0.104*
T5	259.167 - 239.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-32181.40	152823.00	0.211
T6	239.167 - 219.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-42519.90	152823.00	0.278
T7	219.167 - 199.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-30481.30	152823.00	0.199*
T8	199.167 - 179.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-32409.70	152823.00	0.212*
T9	179.167 - 159.167	2 3/4	20'	2'3-31/32"	40.7 K=1.00	1.00	25.730	5.9396	-35388.90	152823.00	0.232*
T10	159.167 - 139.167	3	20'	2'3-31/32"	37.3 K=1.00	1.00	26.201	7.0686	-45453.90	185200.00	0.245*
T11	139.167 - 119.167	3	20'	2'3-31/32"	37.3 K=1.00	0.96	25.228	7.0686	-48881.90	178327.00	0.274*
T12	119.167 - 99.1667	3	20'	2'3-31/32"	37.3 K=1.00	0.96	25.228	7.0686	-52615.50	178327.00	0.295*
T13	99.1667 - 79.1667	3	20'	2'3-31/32"	37.3 K=1.00	0.96	25.228	7.0686	-59908.50	178327.00	0.336*

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T14	79.1667 - 59.1667	3	20'	2'3-31/32"	37.3 K=1.00	0.96	25.228	7.0686	-62038.50	178327.00	0.348
T15	59.1667 - 39.1667	3	20'	2'3-31/32"	37.3 K=1.00	0.96	25.228	7.0686	-64046.90	178327.00	0.359
T16	39.1667 - 19.1667	3	20'	2'3-31/32"	37.3 K=1.00	0.96	25.228	7.0686	-65934.60	178327.00	0.370
T17	19.1667 - 14.3958	3	4'9-1/4"	2'3-19/32"	36.8 K=1.00	0.96	25.228	7.0686	-66116.20	178327.00	0.371
T18	14.3958 - 11.8125	3	2'6-31/32"	2'6-31/32"	41.3 K=1.00	0.98	25.228	7.0686	-65738.50	178327.00	0.369
T19	11.8125 - 9.47917	3	2'3-31/32"	1'2-1/32"	18.7 K=1.00	0.89	25.228	7.0686	-66771.80	178327.00	0.374
T20	9.47917 - 7.14583	3	2'3-31/32"	1'2-1/32"	18.7 K=1.00	0.89	25.228	7.0686	-65667.70	178327.00	0.368
T21	7.14583 - 1.17708	3	6'7-9/16"	2'10-11/16"	46.3 K=1.00	1.00	24.919	7.0686	-75024.00	176144.00	0.426

* DL controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	311.333 - 310.333	2 3/4	862.38	-5.068	37.500	0.135	0.00	0.000	37.500	0.000
T2	310.333 - 299.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	299.167 - 279.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	279.167 - 259.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	259.167 - 239.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	239.167 - 219.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T7	219.167 - 199.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	199.167 - 179.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T9	179.167 - 159.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T10	159.167 - 139.167	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	139.167 - 119.167	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	119.167 - 99.1667	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T13	99.1667 - 79.1667	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T14	79.1667 - 59.1667	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T15	59.1667 -	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	39.1667									
T16	39.1667 - 19.1667	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T17	19.1667 - 14.3958	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T18	14.3958 - 11.8125	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T19	11.8125 - 9.47917	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T20	9.47917 - 7.14583	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T21	7.14583 - 1.17708	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	311.333 - 310.333	2 3/4	0.062	0.135	0.000	0.197 ✓	1.333	H1-3 ✓
T2	310.333 - 299.167	2 3/4	0.133	0.000	0.000	0.133 ✓	1.333	H1-3 ✓
T3	299.167 - 279.167	2 3/4	0.126	0.000	0.000	0.126 ✓	1.333	H1-3 ✓
T4	279.167 - 259.167	2 3/4	0.104	0.000	0.000	0.104 * ✓	1.000	H1-3 ✓
T5	259.167 - 239.167	2 3/4	0.211	0.000	0.000	0.211 ✓	1.333	H1-3 ✓
T6	239.167 - 219.167	2 3/4	0.278	0.000	0.000	0.278 ✓	1.333	H1-3 ✓
T7	219.167 - 199.167	2 3/4	0.199	0.000	0.000	0.199 * ✓	1.000	H1-3 ✓
T8	199.167 - 179.167	2 3/4	0.212	0.000	0.000	0.212 * ✓	1.000	H1-3 ✓
T9	179.167 - 159.167	2 3/4	0.232	0.000	0.000	0.232 * ✓	1.000	H1-3 ✓
T10	159.167 - 139.167	3	0.245	0.000	0.000	0.245 * ✓	1.000	H1-3 ✓
T11	139.167 - 119.167	3	0.274	0.000	0.000	0.274 * ✓	1.000	H1-3 ✓
T12	119.167 - 99.1667	3	0.295	0.000	0.000	0.295 * ✓	1.000	H1-3 ✓
T13	99.1667 - 79.1667	3	0.336	0.000	0.000	0.336 * ✓	1.000	H1-3 ✓
T14	79.1667 - 59.1667	3	0.348	0.000	0.000	0.348 * ✓	1.000	H1-3 ✓
T15	59.1667 - 39.1667	3	0.359	0.000	0.000	0.359 * ✓	1.000	H1-3 ✓
T16	39.1667 - 19.1667	3	0.370	0.000	0.000	0.370 * ✓	1.000	H1-3 ✓
T17	19.1667 - 14.3958	3	0.371	0.000	0.000	0.371 * ✓	1.000	H1-3 ✓
T18	14.3958 - 11.8125	3	0.369	0.000	0.000	0.369 * ✓	1.000	H1-3 ✓

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T19	11.8125 - 9.47917	3	0.374	0.000	0.000	0.374* ✓	1.000	H1-3 ✓
T20	9.47917 - 7.14583	3	0.368	0.000	0.000	0.368* ✓	1.000	H1-3 ✓
T21	7.14583 - 1.17708	3	0.426	0.000	0.000	0.426* ✓	1.000	H1-3 ✓

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	310.333 - 299.167	7/8	5'8-9/32"	2'8-5/8"	111.7 K=0.75	11.966	0.6013	-1421.57	7195.27	0.198 ✓
T3	299.167 - 279.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-1754.52	7655.47	0.229 ✓
T4	279.167 - 259.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-1185.52	7655.47	0.155 ✓
T5	259.167 - 239.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-2476.74	7655.47	0.324 ✓
T6	239.167 - 219.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-2884.42	7655.47	0.377 ✓
T7	219.167 - 199.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-2639.22	7655.47	0.345 ✓
T8	199.167 - 179.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-1821.38	7655.47	0.238 ✓
T9	179.167 - 159.167	7/8	5'6-1/4"	2'7-9/16"	108.3 K=0.75	12.731	0.6013	-2288.98	7655.47	0.299 ✓
T10	159.167 - 139.167	1	5'6-1/4"	2'7-7/16"	94.4 K=0.75	15.987	0.7854	-3793.30	12555.90	0.302 ✓
T11	139.167 - 119.167	7/8	5'6-1/4"	2'7-7/16"	107.8 K=0.75	12.843	0.6013	-3466.28	7722.77	0.449 ✓
T12	119.167 - 99.1667	7/8	5'6-1/4"	2'7-7/16"	107.8 K=0.75	12.843	0.6013	-3818.19	7722.77	0.494 ✓
T13	99.1667 - 79.1667	7/8	5'6-1/4"	2'7-7/16"	107.8 K=0.75	12.843	0.6013	-3949.67	7722.77	0.511 ✓
T14	79.1667 - 59.1667	7/8	5'6-1/4"	2'7-7/16"	107.8 K=0.75	12.843	0.6013	-2662.22	7722.77	0.345 ✓
T15	59.1667 - 39.1667	7/8	5'6-1/4"	2'7-7/16"	107.8 K=0.75	12.843	0.6013	-1806.71	7722.77	0.234 ✓
T16	39.1667 - 19.1667	7/8	5'6-1/4"	2'7-7/16"	107.8 K=0.75	12.843	0.6013	-2240.96	7722.77	0.290 ✓
T17	19.1667 - 14.3958	1	5'6"	2'7-5/16"	94.1 K=0.75	16.037	0.7854	-2643.79	12595.00	0.210 ✓
T18	14.3958 - 11.8125	1	5'7-9/16"	2'8-1/32"	96.2 K=0.75	15.565	0.7854	-2572.99	12224.70	0.210 ✓
T19	11.8125 - 9.47917	1 1/4	3'5-1/32"	3'3"	87.3 K=0.70	17.508	1.2272	-2635.29	21485.10	0.123 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T20	9.47917 - 7.14583	1 1/4	3'5-1/32"	3'3"	87.3 K=0.70	17.508	1.2272	-3316.91	21485.10	0.154 ✓
T21	7.14583 - 1.17708	1 1/4	3'31/32"	2'4-29/32'	85.3 K=0.92	17.930	1.2272	-8859.15	22002.80	0.403* ✓

* DL controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T19	11.8125 - 9.47917	6x3/4 KL/R > 200 (C) - 916	5'	4'9"	263.3 K=1.00	2.154	4.5000	-1156.52	9695.17	0.119* ✓
T20	9.47917 - 7.14583	6x3/4 KL/R > 200 (C) - 934	5'	4'9"	263.3 K=1.00	2.154	4.5000	-1403.01	9695.17	0.145* ✓

* DL controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	311.333 - 310.333	6x1	5'	4'9-1/4"	198.3 K=1.00	3.797	6.0000	-130.19	22780.90	0.006
T2	310.333 - 299.167	1 1/4	5'	4'9-1/4"	128.2 K=0.70	9.080	1.2272	-318.70	11143.30	0.029
T3	299.167 - 279.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-1755.69	4564.30	0.385
T4	279.167 - 259.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-61.66	4564.30	0.014
T5	259.167 - 239.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-162.71	4564.30	0.036
T6	239.167 - 219.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-721.81	4564.30	0.158
T7	219.167 - 199.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-629.61	4564.30	0.138
T8	199.167 - 179.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-395.55	4564.30	0.087
T9	179.167 - 159.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-69.66	4564.30	0.015
T10	159.167 - 139.167	1 1/4	5'	4'9"	127.7 K=0.70	9.160	1.2272	-894.80	11241.30	0.080
T11	139.167 - 119.167	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-684.38	4604.42	0.149
T13	99.1667 - 79.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-629.09	4604.42	0.137

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T14	79.1667 - 59.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-185.55	4604.42	0.040
T16	39.1667 - 19.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-47.63	4604.42	0.010
T17	19.1667 - 14.3958	1 1/4	5'	4'9"	127.7 K=0.70	9.160	1.2272	-24.95	11241.30	0.002

Top Girt Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_z lb-ft	Actual f_{bz} ksi	Allow. F_{bz} ksi	Ratio $\frac{f_{bz}}{F_{bz}}$
T1	311.333 - 310.333	6x1	709.64	-1.419	27.000	0.053	-20.52	-0.246	27.000	0.009
T2	310.333 - 299.167	1 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	299.167 - 279.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	279.167 - 259.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	259.167 - 239.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	239.167 - 219.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T7	219.167 - 199.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	199.167 - 179.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T9	179.167 - 159.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T10	159.167 - 139.167	1 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	139.167 - 119.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T13	99.1667 - 79.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T14	79.1667 - 59.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T16	39.1667 - 19.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T17	19.1667 - 14.3958	1 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{bz}}{F_{bz}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	311.333 - 310.333	6x1	0.006	0.053	0.009	0.067 ✓	1.333	H1-3 ✓
T2	310.333 - 299.167	1 1/4	0.029	0.000	0.000	0.029 ✓	1.333	H1-3 ✓

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{bz}}{F_{bz}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T3	299.167 - 279.167	1	0.385	0.000	0.000	0.385 ✓	1.333	H1-3 ✓
T4	279.167 - 259.167	1	0.014	0.000	0.000	0.014 ✓	1.333	H1-3 ✓
T5	259.167 - 239.167	1	0.036	0.000	0.000	0.036 ✓	1.333	H1-3 ✓
T6	239.167 - 219.167	1	0.158	0.000	0.000	0.158 ✓	1.333	H1-3 ✓
T7	219.167 - 199.167	1	0.138	0.000	0.000	0.138 ✓	1.333	H1-3 ✓
T8	199.167 - 179.167	1	0.087	0.000	0.000	0.087 ✓	1.333	H1-3 ✓
T9	179.167 - 159.167	1	0.015	0.000	0.000	0.015 ✓	1.333	H1-3 ✓
T10	159.167 - 139.167	1 1/4	0.080	0.000	0.000	0.080 ✓	1.333	H1-3 ✓
T11	139.167 - 119.167	1	0.149	0.000	0.000	0.149 ✓	1.333	H1-3 ✓
T13	99.1667 - 79.1667	1	0.137	0.000	0.000	0.137 ✓	1.333	H1-3 ✓
T14	79.1667 - 59.1667	1	0.040	0.000	0.000	0.040 ✓	1.333	H1-3 ✓
T16	39.1667 - 19.1667	1	0.010	0.000	0.000	0.010 ✓	1.333	H1-3 ✓
T17	19.1667 - 14.3958	1 1/4	0.002	0.000	0.000	0.002 ✓	1.333	H1-3 ✓

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T3	299.167 - 279.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-35.88	4564.30	0.008 ✓
T4	279.167 - 259.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-188.71	4564.30	0.041 ✓
T5	259.167 - 239.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-721.35	4564.30	0.158 ✓
T6	239.167 - 219.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-413.46	4564.30	0.091 ✓
T7	219.167 - 199.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-254.27	4564.30	0.056 ✓
T9	179.167 - 159.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-416.55	4564.30	0.091 ✓
T10	159.167 - 139.167	1 1/4	5'	4'9"	127.7 K=0.70	9.160	1.2272	-747.92	11241.30	0.067 ✓
T11	139.167 - 119.167	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-81.64	4604.42	0.018 ✓
T12	119.167 - 99.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-506.05	4604.42	0.110 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T13	99.1667 - 79.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-344.10	4604.42	0.075 ✓
T14	79.1667 - 59.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-80.09	4604.42	0.017 ✓
T16	39.1667 - 19.1667	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-47.76	4604.42	0.010 ✓

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T5	259.167 - 239.167	1	5'	4'9-1/4"	160.3 K=0.70	5.811	0.7854	-4.09	4564.30	0.001 ✓
T11	139.167 - 119.167	1	5'	4'9"	159.6 K=0.70	5.863	0.7854	-82.27	4604.42	0.018 ✓

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T19	11.8125 - 9.47917	7/8	1'3"	1'1-9/16"	61.7 K=1.00	22.423	0.6013	-1156.52	13483.20	0.086* ✓
T20	9.47917 - 7.14583	7/8	1'3"	1'1-9/16"	61.7 K=1.00	22.423	0.6013	-1137.40	13483.20	0.084* ✓

* DL controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T20	9.47917 - 7.14583	7/8	1'8-17/32'	1'6-15/32'	81.6 K=0.97	18.686	0.6013	-1252.42	11236.50	0.111* ✓

* DL controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T1	311.333 - 310.333	2 3/4	1'	1'	17.5	30.000	5.9396	8971.01	178187.00	0.050
T2	310.333 - 299.167	2 3/4	11'2-1/32'	2'8-5/8"	47.5	32.500	3.4123	13175.60	110900.00	0.119
T3	299.167 - 279.167	2 3/4	20'	2'3-31/32'	40.7	32.500	3.4123	1509.22	110900.00	0.014
T5	259.167 - 239.167	2 3/4	20'	2'3-31/32'	40.7	32.500	3.4123	6501.74	110900.00	0.059
T6	239.167 - 219.167	2 3/4	20'	2'3-31/32'	40.7	32.500	3.4123	11883.40	110900.00	0.107
T11	139.167 - 119.167	3	20'	2'3-31/32'	37.3	32.500	4.3026	7007.76	139833.00	0.050
T12	119.167 - 99.1667	3	20'	2'3-31/32'	37.3	32.500	4.3026	7033.32	139833.00	0.050

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	311.333 - 310.333	2 3/4	772.25	4.539	37.500	0.121	0.00	0.000	37.500	0.000
T2	310.333 - 299.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	299.167 - 279.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	259.167 - 239.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	239.167 - 219.167	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	139.167 - 119.167	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	119.167 - 99.1667	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_u}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	311.333 - 310.333	2 3/4	0.050	0.121	0.000	0.171 ✓	1.333	H2-1 ✓
T2	310.333 - 299.167	2 3/4	0.119	0.000	0.000	0.119 ✓	1.333	H2-1 ✓
T3	299.167 - 279.167	2 3/4	0.014	0.000	0.000	0.014 ✓	1.333	H2-1 ✓
T5	259.167 -	2 3/4	0.059	0.000	0.000	0.059	1.333	H2-1 ✓

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	239.167					✓		
T6	239.167 - 219.167	2 3/4	0.107	0.000	0.000	0.107 ✓	1.333	H2-1 ✓
T11	139.167 - 119.167	3	0.050	0.000	0.000	0.050 ✓	1.333	H2-1 ✓
T12	119.167 - 99.1667	3	0.050	0.000	0.000	0.050 ✓	1.333	H2-1 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T2	310.333 - 299.167	7/8	5'8-9/32"	2'8-5/8"	149.0	30.000	0.6013	1763.31	18039.60	0.098 ✓
T3	299.167 - 279.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	1329.71	18039.60	0.074 ✓
T4	279.167 - 259.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	1099.48	18039.60	0.061 ✓
T5	259.167 - 239.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	2401.83	18039.60	0.133 ✓
T6	239.167 - 219.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	3458.25	18039.60	0.192 ✓
T7	219.167 - 199.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	2524.91	18039.60	0.140 ✓
T8	199.167 - 179.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	1608.80	18039.60	0.089 ✓
T9	179.167 - 159.167	7/8	5'6-1/4"	2'7-9/16"	144.4	30.000	0.6013	2144.39	18039.60	0.119 ✓
T10	159.167 - 139.167	1	5'6-1/4"	2'7-7/16"	125.8	30.000	0.7854	3528.28	23561.90	0.150 ✓
T11	139.167 - 119.167	7/8	5'6-1/4"	2'7-7/16"	143.8	30.000	0.6013	3281.18	18039.60	0.182 ✓
T12	119.167 - 99.1667	7/8	5'6-1/4"	2'7-7/16"	143.8	30.000	0.6013	3608.40	18039.60	0.200 ✓
T13	99.1667 - 79.1667	7/8	5'6-1/4"	2'7-7/16"	143.8	30.000	0.6013	3713.30	18039.60	0.206 ✓
T14	79.1667 - 59.1667	7/8	5'6-1/4"	2'7-7/16"	143.8	30.000	0.6013	2403.60	18039.60	0.133 ✓
T15	59.1667 - 39.1667	7/8	5'6-1/4"	2'7-7/16"	143.8	30.000	0.6013	1521.73	18039.60	0.084 ✓
T16	39.1667 - 19.1667	7/8	5'6-1/4"	2'7-7/16"	143.8	30.000	0.6013	1992.26	18039.60	0.110 ✓
T17	19.1667 - 14.3958	1	5'6"	2'7-5/16"	125.5	30.000	0.7854	1882.04	23561.90	0.080 ✓
T18	14.3958 - 11.8125	1	5'7-9/16"	2'8-1/32"	128.3	30.000	0.7854	1468.38	23561.90	0.062 ✓
T19	11.8125 - 9.47917	1 1/4	3'5-1/32"	3'3"	124.8	30.000	1.2272	2490.30	36815.50	0.068 ✓
T20	9.47917 -	1 1/4	3'5-1/32"	3'3"	124.8	30.000	1.2272	3175.10	36815.50	0.086

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
	7.14583									✓
T21	7.14583 - 1.17708	1 1/4	3'31/32"	2'4-29/32'	92.6	30.000	1.2272	962.90	36815.50	0.026 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T19	11.8125 - 9.47917	6x3/4	5'	4'9"	263.3	21.600	4.5000	2563.98	97200.00	0.026 ✓
T20	9.47917 - 7.14583	6x3/4	5'	4'9"	263.3	21.600	4.5000	13865.90	97200.00	0.143* ✓
T21	7.14583 - 1.17708	6x3/4	4'9-15/32'	4'6-15/32'	251.7	21.600	4.5000	7201.56	97200.00	0.074* ✓

* DL controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T1	311.333 - 310.333	6x1	5'	4'9-1/4"	198.3	21.600	6.0000	83.17	129600.00	0.001
T2	310.333 - 299.167	1 1/4	5'	4'9-1/4"	183.2	30.000	1.2272	135.05	36815.50	0.004
T4	279.167 - 259.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	122.96	23561.90	0.005
T5	259.167 - 239.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	234.18	23561.90	0.010
T6	239.167 - 219.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	307.09	23561.90	0.013
T7	219.167 - 199.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	700.07	23561.90	0.030
T8	199.167 - 179.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	421.54	23561.90	0.018
T9	179.167 - 159.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	243.84	23561.90	0.010
T10	159.167 - 139.167	1 1/4	5'	4'9"	182.4	30.000	1.2272	562.61	36815.50	0.015
T11	139.167 - 119.167	1	5'	4'9"	228.0	30.000	0.7854	937.47	23561.90	0.040
T12	119.167 - 99.1667	1	5'	4'9"	228.0	30.000	0.7854	191.54	23561.90	0.008*
T13	99.1667 - 79.1667	1	5'	4'9"	228.0	30.000	0.7854	891.51	23561.90	0.038
T14	79.1667 - 59.1667	1	5'	4'9"	228.0	30.000	0.7854	553.61	23561.90	0.023
T15	59.1667 -	1	5'	4'9"	228.0	30.000	0.7854	232.73	23561.90	0.010*

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T16	39.1667 - 19.1667	1	5'	4'9"	228.0	30.000	0.7854	422.61	23561.90	0.018
T17	19.1667 - 14.3958	1 1/4	5'	4'9"	182.4	30.000	1.2272	734.02	36815.50	0.020
T18	14.3958 - 11.8125	7/8	5'	4'9"	260.6	30.000	0.6013	966.18	18039.60	0.054*

* DL controls

Top Girt Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	311.333 - 310.333	6x1	-728.54	1.457	27.000	0.054	-26.31	0.316	27.000	0.012
T2	310.333 - 299.167	1 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	279.167 - 259.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	259.167 - 239.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	239.167 - 219.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T7	219.167 - 199.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	199.167 - 179.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T9	179.167 - 159.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T10	159.167 - 139.167	1 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	139.167 - 119.167	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	119.167 - 99.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T13	99.1667 - 79.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T14	79.1667 - 59.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T15	59.1667 - 39.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T16	39.1667 - 19.1667	1	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T17	19.1667 - 14.3958	1 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T18	14.3958 - 11.8125	7/8	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	311.333 - 310.333	6x1	0.001	0.054	0.012	0.066 ✓	1.333	H2-1 ✓
T2	310.333 - 299.167	1 1/4	0.004	0.000	0.000	0.004 ✓	1.333	H2-1 ✓
T4	279.167 - 259.167	1	0.005	0.000	0.000	0.005 ✓	1.333	H2-1 ✓
T5	259.167 - 239.167	1	0.010	0.000	0.000	0.010 ✓	1.333	H2-1 ✓
T6	239.167 - 219.167	1	0.013	0.000	0.000	0.013 ✓	1.333	H2-1 ✓
T7	219.167 - 199.167	1	0.030	0.000	0.000	0.030 ✓	1.333	H2-1 ✓
T8	199.167 - 179.167	1	0.018	0.000	0.000	0.018 ✓	1.333	H2-1 ✓
T9	179.167 - 159.167	1	0.010	0.000	0.000	0.010 ✓	1.333	H2-1 ✓
T10	159.167 - 139.167	1 1/4	0.015	0.000	0.000	0.015 ✓	1.333	H2-1 ✓
T11	139.167 - 119.167	1	0.040	0.000	0.000	0.040 ✓	1.333	H2-1 ✓
T12	119.167 - 99.1667	1	0.008	0.000	0.000	0.008* ✓	1.000	H2-1 ✓
T13	99.1667 - 79.1667	1	0.038	0.000	0.000	0.038 ✓	1.333	H2-1 ✓
T14	79.1667 - 59.1667	1	0.023	0.000	0.000	0.023 ✓	1.333	H2-1 ✓
T15	59.1667 - 39.1667	1	0.010	0.000	0.000	0.010* ✓	1.000	H2-1 ✓
T16	39.1667 - 19.1667	1	0.018	0.000	0.000	0.018 ✓	1.333	H2-1 ✓
T17	19.1667 - 14.3958	1 1/4	0.020	0.000	0.000	0.020 ✓	1.333	H2-1 ✓
T18	14.3958 - 11.8125	7/8	0.054	0.000	0.000	0.054* ✓	1.000	H2-1 ✓

* DL controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	310.333 - 299.167	1 1/4	5'	4'9-1/4"	183.2	30.000	1.2272	4262.83	36815.50	0.116* ✓
T3	299.167 - 279.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	150.81	23561.90	0.006 ✓
T4	279.167 - 259.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	264.71	23561.90	0.011 ✓
T5	259.167 - 239.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	654.39	23561.90	0.028 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T6	239.167 - 219.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	887.50	23561.90	0.038 ✓
T7	219.167 - 199.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	542.71	23561.90	0.023 ✓
T8	199.167 - 179.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	153.82	23561.90	0.007* ✓
T9	179.167 - 159.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	531.44	23561.90	0.023 ✓
T10	159.167 - 139.167	1 1/4	5'	4'9"	182.4	30.000	1.2272	1270.80	36815.50	0.035 ✓
T11	139.167 - 119.167	1	5'	4'9"	228.0	30.000	0.7854	323.29	23561.90	0.014 ✓
T12	119.167 - 99.1667	1	5'	4'9"	228.0	30.000	0.7854	802.78	23561.90	0.034 ✓
T13	99.1667 - 79.1667	1	5'	4'9"	228.0	30.000	0.7854	566.10	23561.90	0.024 ✓
T14	79.1667 - 59.1667	1	5'	4'9"	228.0	30.000	0.7854	358.25	23561.90	0.015 ✓
T15	59.1667 - 39.1667	1	5'	4'9"	228.0	30.000	0.7854	261.82	23561.90	0.011* ✓
T16	39.1667 - 19.1667	1	5'	4'9"	228.0	30.000	0.7854	468.82	23561.90	0.020 ✓
T21	7.14583 - 1.17708	6x3/4	5-5/32"	2-5/32"	9.8	21.600	4.5000	6440.85	97200.00	0.066* ✓

* DL controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T3	299.167 - 279.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	106.97	23561.90	0.005* ✓
T4	279.167 - 259.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	114.46	23561.90	0.005* ✓
T5	259.167 - 239.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	122.01	23561.90	0.005* ✓
T6	239.167 - 219.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	2269.51	23561.90	0.096* ✓
T7	219.167 - 199.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	225.37	23561.90	0.010* ✓
T8	199.167 - 179.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	237.11	23561.90	0.010* ✓
T9	179.167 - 159.167	1	5'	4'9-1/4"	229.0	30.000	0.7854	249.13	23561.90	0.011* ✓
T10	159.167 - 139.167	1 1/4	5'	4'9"	182.4	30.000	1.2272	2674.62	36815.50	0.073* ✓
T11	139.167 - 119.167	1	5'	4'9"	228.0	30.000	0.7854	567.69	23561.90	0.024 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T12	119.167 - 99.1667	1	5'	4'9"	228.0	30.000	0.7854	382.85	23561.90	0.016* ✓
T13	99.1667 - 79.1667	1	5'	4'9"	228.0	30.000	0.7854	4488.99	23561.90	0.191* ✓
T14	79.1667 - 59.1667	1	5'	4'9"	228.0	30.000	0.7854	445.99	23561.90	0.019* ✓
T15	59.1667 - 39.1667	1	5'	4'9"	228.0	30.000	0.7854	462.00	23561.90	0.020* ✓
T16	39.1667 - 19.1667	1	5'	4'9"	228.0	30.000	0.7854	478.44	23561.90	0.020* ✓
T17	19.1667 - 14.3958	7/8	5'	4'9"	260.6	30.000	0.6013	882.31	18039.60	0.049* ✓

* DL controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T19	11.8125 - 9.47917	7/8	1'3"	1'1-9/16"	61.7	30.000	0.6013	1156.52	18039.60	0.064* ✓
T20	9.47917 - 7.14583	7/8	1'3"	1'1-9/16"	61.7	30.000	0.6013	1798.04	18039.60	0.100* ✓

* DL controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_u ksi	A in^2	Actual P lb	Allow. P_u lb	Ratio $\frac{P}{P_u}$
T20	9.47917 - 7.14583	7/8	1'8-17/32'	1'6-15/32'	84.4	30.000	0.6013	777.91	18039.60	0.043* ✓

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	311.333 - 310.333	Leg	2 3/4	1	-10437.20	226136.78	14.8	Pass
		Top Girt	6x1	6	-130.19	30366.94	5.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P$_{allow}$ lb	% Capacity	Pass Fail
T2	310.333 - 299.167	Leg	2 3/4	8	-19570.30	195896.34	10.0	Pass
							11.6 (b)	
		Diagonal	7/8	23	-1421.57	9591.29	14.8	Pass
		Top Girt	1 1/4	10	-318.70	14854.02	2.1	Pass
		Bottom Girt	1 1/4	15	4262.83	36815.50	11.6	Pass
		Guy A@299.802	13/16	981	17436.20	40000.00	43.6	Pass
		Guy B@299.802	13/16	980	18726.60	40000.00	46.8	Pass
		Guy C@299.802	13/16	979	17545.90	40000.00	43.9	Pass
T3	299.167 - 279.167	Leg	2 3/4	41	-19307.30	203713.05	9.5	Pass
							9.6 (b)	
		Diagonal	7/8	95	-1754.52	10204.74	17.2	Pass
		Top Girt	1	45	-1755.69	6084.21	28.9	Pass
		Bottom Girt	1	47	-35.88	6084.21	0.6	Pass
		Mid Girt	1	50	106.97	23561.90	0.5	Pass
T4	279.167 - 259.167	Leg	2 3/4	101	-15891.30	152823.00	10.4	Pass
							11.6 (b)	
		Diagonal	7/8	115	-1185.52	10204.74	11.6	Pass
		Top Girt	1	103	-61.66	6084.21	1.0	Pass
		Bottom Girt	1	108	-188.71	6084.21	3.1	Pass
		Mid Girt	1	110	114.46	23561.90	0.5	Pass
T5	259.167 - 239.167	Leg	2 3/4	161	-32181.40	203713.05	15.8	Pass
							19.1 (b)	
		Diagonal	7/8	173	-2476.74	10204.74	24.3	Pass
		Top Girt	1	165	-162.71	6084.21	2.7	Pass
		Bottom Girt	1	168	-721.35	6084.21	11.9	Pass
		Mid Girt	1	169	122.01	23561.90	0.5	Pass
T6	239.167 - 219.167	Leg	2 3/4	221	-42519.90	203713.05	20.9	Pass
		Diagonal	7/8	237	-2884.42	10204.74	28.3	Pass
		Top Girt	1	225	-721.81	6084.21	11.9	Pass
		Bottom Girt	1	226	-413.46	6084.21	6.8	Pass
		Mid Girt	1	230	2269.51	23561.90	9.6	Pass
		Guy A@230.177	7/8	984	19771.70	46000.00	43.0	Pass
		Guy B@230.177	7/8	983	21177.20	46000.00	46.0	Pass
		Guy C@230.177	7/8	982	19793.30	46000.00	43.0	Pass
T7	219.167 - 199.167	Leg	2 3/4	281	-30481.30	152823.00	19.9	Pass
							21.6 (b)	
		Diagonal	7/8	339	-2639.22	10204.74	25.9	Pass
		Top Girt	1	285	-629.61	6084.21	10.3	Pass
		Bottom Girt	1	286	-254.27	6084.21	4.2	Pass
		Mid Girt	1	290	225.37	23561.90	1.0	Pass
T8	199.167 - 179.167	Leg	2 3/4	341	-32409.70	152823.00	21.2	Pass
							23.3 (b)	
		Diagonal	7/8	397	-1821.38	10204.74	17.8	Pass
		Top Girt	1	345	-395.55	6084.21	6.5	Pass
		Bottom Girt	1	348	153.82	23561.90	0.7	Pass
		Mid Girt	1	349	237.11	23561.90	1.0	Pass
T9	179.167 - 159.167	Leg	2 3/4	400	-35388.90	152823.00	23.2	Pass
		Diagonal	7/8	413	-2288.98	10204.74	22.4	Pass
		Top Girt	1	404	-69.66	6084.21	1.1	Pass
		Bottom Girt	1	406	-416.55	6084.21	6.8	Pass
		Mid Girt	1	409	249.13	23561.90	1.1	Pass
T10	159.167 - 139.167	Leg	3	461	-45453.90	185200.00	24.5	Pass
							30.6 (b)	
		Diagonal	1	477	-3793.30	16737.01	22.7	Pass
		Top Girt	1 1/4	463	-894.80	14984.65	6.0	Pass
		Bottom Girt	1 1/4	468	-747.92	14984.65	5.0	Pass
		Mid Girt	1 1/4	469	2674.62	36815.50	7.3	Pass
		Guy A@150.177	13/16	987	18496.70	40000.00	46.2	Pass
		Guy B@150.177	13/16	986	19453.60	40000.00	48.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P$_{allow}$ lb	% Capacity	Pass Fail
		Guy C@150.177	13/16	985	18405.20	40000.00	46.0	Pass
T11	139.167 - 119.167	Leg	3	521	-48881.90	178327.00	27.4	Pass
							36.7 (b)	
		Diagonal	7/8	579	-3466.28	10294.45	33.7	Pass
		Top Girt	1	525	-684.38	6137.69	11.2	Pass
		Bottom Girt	1	527	-81.64	6137.69	1.3	Pass
		Mid Girt	1	529	567.69	31408.01	1.8	Pass
T12	119.167 - 99.1667	Leg	3	581	-52615.50	178327.00	29.5	Pass
							35.9 (b)	
		Diagonal	7/8	593	-3818.19	10294.45	37.1	Pass
		Top Girt	1	583	191.54	23561.90	0.8	Pass
		Bottom Girt	1	586	-506.05	6137.69	8.2	Pass
		Mid Girt	1	589	382.85	23561.90	1.6	Pass
T13	99.1667 - 79.1667	Leg	3	641	-59908.50	178327.00	33.6	Pass
							40.7 (b)	
		Diagonal	7/8	695	-3949.67	10294.45	38.4	Pass
		Top Girt	1	645	-629.09	6137.69	10.2	Pass
		Bottom Girt	1	647	-344.10	6137.69	5.6	Pass
		Mid Girt	1	649	4488.99	23561.90	19.1	Pass
		Guy A@89.1667	3/4	990	14913.40	34000.00	43.9	Pass
		Guy B@89.1667	3/4	989	15733.30	34000.00	46.3	Pass
		Guy C@89.1667	3/4	988	14916.40	34000.00	43.9	Pass
T14	79.1667 - 59.1667	Leg	3	701	-62038.50	178327.00	34.8	Pass
							45.0 (b)	
		Diagonal	7/8	759	-2662.22	10294.45	25.9	Pass
		Top Girt	1	705	-185.55	6137.69	3.0	Pass
		Bottom Girt	1	707	-80.09	6137.69	1.3	Pass
		Mid Girt	1	709	445.99	23561.90	1.9	Pass
T15	59.1667 - 39.1667	Leg	3	761	-64046.90	178327.00	35.9	Pass
							46.2 (b)	
		Diagonal	7/8	819	-1806.71	10294.45	17.6	Pass
		Top Girt	1	763	232.73	23561.90	1.0	Pass
		Bottom Girt	1	768	261.82	23561.90	1.1	Pass
		Mid Girt	1	769	462.00	23561.90	2.0	Pass
T16	39.1667 - 19.1667	Leg	3	821	-65934.60	178327.00	37.0	Pass
							44.5 (b)	
		Diagonal	7/8	833	-2240.96	10294.45	21.8	Pass
		Top Girt	1	824	422.61	31408.01	1.3	Pass
		Bottom Girt	1	828	468.82	31408.01	1.5	Pass
		Mid Girt	1	829	478.44	23561.90	2.0	Pass
T17	19.1667 - 14.3958	Leg	3	881	-66116.20	178327.00	37.1	Pass
		Diagonal	1	896	-2643.79	16789.13	15.7	Pass
		Top Girt	1 1/4	883	734.02	49075.06	1.5	Pass
		Mid Girt	7/8	887	882.31	18039.60	4.9	Pass
T18	14.3958 - 11.8125	Leg	3	902	-65738.50	178327.00	36.9	Pass
		Diagonal	1	907	-2572.99	16295.52	15.8	Pass
		Top Girt	7/8	904	966.18	18039.60	5.4	Pass
T19	11.8125 - 9.47917	Leg	3	914	-66771.80	178327.00	37.4	Pass
		Diagonal	1 1/4	919	-2635.29	28639.64	9.2	Pass
		Horizontal	6x3/4	921	-1156.52	9695.17	11.9	Pass
		Redund Horz 1 Bracing	7/8	920	-1156.52	13483.20	8.6	Pass
T20	9.47917 - 7.14583	Leg	3	932	-65667.70	178327.00	36.8	Pass
		Diagonal	1 1/4	935	-3316.91	28639.64	11.6	Pass
		Horizontal	6x3/4	934	-1403.01	9695.17	14.5	Pass
		Redund Horz 1 Bracing	7/8	939	1798.04	18039.60	10.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
		Redund Diag 1 Bracing	7/8	940	-1252.42	11236.50	11.1	Pass
T21	7.14583 - 1.17708	Leg	3	956	-75024.00	176144.00	42.6	Pass
		Diagonal	1 1/4	964	-8859.15	22002.80	40.3	Pass
		Horizontal	6x3/4	958	7201.56	97200.00	7.4	Pass
		Bottom Girt	6x3/4	962	6440.85	97200.00	6.6	Pass
							Summary	
							Leg (T15) 46.2	Pass
							Diagonal (T21) 40.3	Pass
							Horizontal (T20) 14.5	Pass
							Top Girt (T3) 28.9	Pass
							Bottom Girt (T5) 11.9	Pass
							Mid Girt (T13) 19.1	Pass
							Redund Horz 1 Bracing (T20) 10.0	Pass
							Redund Diag 1 Bracing (T20) 11.1	Pass
							Guy A (T10) 46.2	Pass
							Guy B (T10) 48.6	Pass
							Guy C (T10) 46.0	Pass
							Bolt Checks 46.2	Pass
							RATING = 48.6	**Pass**

APPENDIX B

ADDITIONAL CALCULATIONS

Project Name:	West Hartford	Engineer:	ATR
Project Number:	TEP# 112343	Check:	MLG
Client Site Number:	0101-CT-000101	Date:	06/14/12

Input:

Foundation:

Pier Shape:	Round	
d:	3.50	ft - pier diameter
L:	2.50	ft - pier length
l:	0.50	ft - pier extension above grade
B:	8.00	ft - width of pad
t:	2.00	ft - thickness of pad
γ_c:	150.00	pcf - unit weight of concrete
γ_w:	62.40	pcf - unit weight of water

Code: TIA-F

Loads:

P:	208.35	kip - maximum axial reaction
V:	4.18	kip - maximum shear reaction

Soil:

t_1:	1.50	ft - thickness of soil layer (t/ pad)
γ_1:	105.00	pcf - effective unit weight of soil
ϕ_1:	30.00	deg - friction angle of soil layer
t_2:	0.50	ft - thickness of soil layer
γ_2:	105.00	pcf - effective unit weight of soil
ϕ_2:	30.00	deg - friction angle of soil layer
t_3:		ft - thickness of soil layer
γ_3:		pcf - effective unit weight of soil
ϕ_3:		deg - friction angle of soil layer
t_4:		ft - thickness of soil layer
γ_4:		pcf - effective unit weight of soil
ϕ_4:		deg - friction angle of soil layer
t_5:		ft - thickness of soil layer
γ_5:		pcf - effective unit weight of soil
ϕ_5:		deg - friction angle of soil layer
q_{ult}:	16.00	ksf - ultimate end bearing capacity
FS:	2.00	- factor of safety for bearing
Net?	No	
f_s:	0.00	ksf - ultimate skin friction on sides of pad
μ:	0.00	- friction factor along base of foundation
F_{lat}:	315.00	psf - ultimate lateral resistance per foot
D_w:	99.00	ft - depth to water table

Bearing Capacity: Foundation is Adequate in Bearing 45.8%

q_{max}:	3.66	ksf
q_{all}:	8.00	ksf

Lateral Capacity: Foundation is Adequate in Lateral 55.3%

V:	4.18	kip
V_{all}:	7.56	kip

Project Name:	West Hartford	**Engineer:**	ATR
Project Number:	TEP# 112343	**Check:**	MLG
Client Site Number:	0101-CT-0001	**Date:**	6/14/2012

Input:

Concrete pad:

f'_c:	3000.00	psi	- concrete compressive strength
f_y:	60.00	ksi	- yield strength of reinforcing steel
cover:	3.00	in	- clear cover to reinforcement
R/F:	5		- bar size for flexural reinforcement
Qty. of R/F:	12		- quantity of reinforcing bars
A_s:	3.72	in^2	- quantity of reinforcing bars
α:	40.00		- 40 for interior columns
β:	1.00		- ratio of long side to short side (pier)
β:	0.85		- concrete strength ratio
ε_c:	0.003		- maximum concrete strain (typically 0.003)
ϕ_v:	0.75		- strength reduction factor for shear per ACI318
ϕ_f:	0.9		- strength reduction factor for flexure per ACI318
LF:	1.30		- load factor for TIA-F

Shear Capacity: Foundation is Adequate in Shear 19.1%

V_u:	125.07	kip	- ultimate punching shear
ϕV_c:	656.05	kip	- punching shear resistance
V_u:	20.74	kip	- ultimate one-way shear
ϕV_c:	160.70	kip	- one-way shear resistance

Flexural Capacity: Foundation is Adequate in Flexure 29.0%

M_{max}:	93.65	kip-ft
$\phi_f M_n$:	322.98	kip-ft

Deadman Anchor Analysis: A, B, C - Inner

Project Name: West Hartford
Job #: TEP# 112343
Client: Grain Communications
Analysis by: ATR
Checked by: MLG
Code: TIA - F

Anchor Block is Adequate for Uplift	49.5%
Anchor Block is Adequate for Lateral	65.9%

Loads

U_{max}: 45.31 kips - maximum uplift reaction
H_{max}: 56.97 kips - maximum horizontal reaction

Capacity

U_{all}: 91.58 kips - allowable uplift
H_{all}: 86.48 kips - allowable horizontal

Foundation Input

Guy Path: A, B, C
Anchor Ring: Inner

W_b: 4.00 ft - width of anchor block
L_b: 20.50 ft - length of anchor block
T_b: 3.75 ft - thickness of anchor block
d: 6.25 ft - depth from t/ grade to t/ anchor block
b: 10.00 ft - depth from t/ grade to b/ anchor block

Ultimate Soil Properties

D_w: 99.00 ft - depth from t/ grade to water table

Geotechnical Firm:
Report:
Date:
Notes:

Layer	Begin (ft)	End (ft)	ϕ Friction Angle (deg)	c Ult. Cohesion (psf)	γ Eff. Unit Weight (pcf)	f_s Ult. Skin Friction (ksf)	μ Friction Factor
1	0.00	10.00	28.00	0.00	100.00	0.00	0.00
2							
3							
4							
5							
6							

Analysis Criteria

Uplift:

F_{s_sides}=	0.00	Yes
F_{s_front}=	0.00	Yes
F_{s_back}=	0.00	No

Horizontal:

F_{s_sides} =	0.00	Yes
F_{s_top} =	0.00	No
F_{s_bottom} =	0.00	No
$F_{\perp} \cdot \mu$ =	0.00	Yes

Project Name:	Mars Hill	**Engineer:**	ATR
Project Number:	TEP# 112343	**Check:**	MLG
Client Site Number:	0101-CT-000101	**Date:**	06/14/12

PiRod Leg Splice Connections

Input - Properties

Elevation:	160	ft - elevation of leg splice connection
F_y:	50.00	ksi - yield stress of leg
F_u:	65.00	ksi - tensile stress of leg
D_t:	2.75	in - diameter of leg above splice
D_b:	3.00	in - diameter of leg below splice
d_{bolt}:	0.875	in - bolt diameter
Type:	A325-N	- bolt type (X - threads excluded, N - threads included)
n:	5	- number of bolts

Input - Loads

Code:	TIA-F	- select version of the TIA
T_u:		kips - maximum leg tension load
P_u:	35.39	kips - maximum leg compression load
ASIF:	1.33	- stress increase factor
U:	1.00	- shear lag coefficient
ϕ_t:	0.90	< = = DISREGARD
ϕ_t:	0.75	< = = DISREGARD
ϕ_b:	0.75	< = = DISREGARD

Leg Capacity:

2.75 inch diameter leg above splice

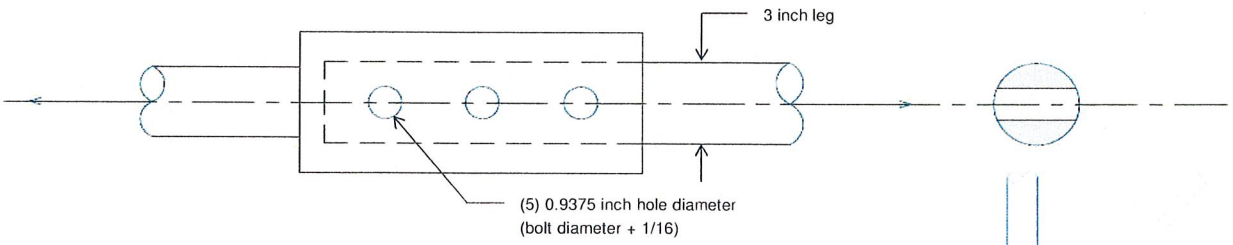
Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = 1.333(0.6)(50 ksi)(5.9396 in2) = **237.58** kips

3 inch diameter leg below splice

An = Net Area = (Db/2)^2(θ - sin(θ)) = 4.30 in^2

Gross Allowable Tension = ASIF(0.6)(Fy)(Ag) = 1.333(0.6)(50 ksi)(7.0686 in2) = 282.74 kips

Net Allowable Tension = ASIF(0.5)(U)(Fu)(An) = 1.333(0.5)(1)(65 ksi)(4.3026 in2) = **186.44** kips

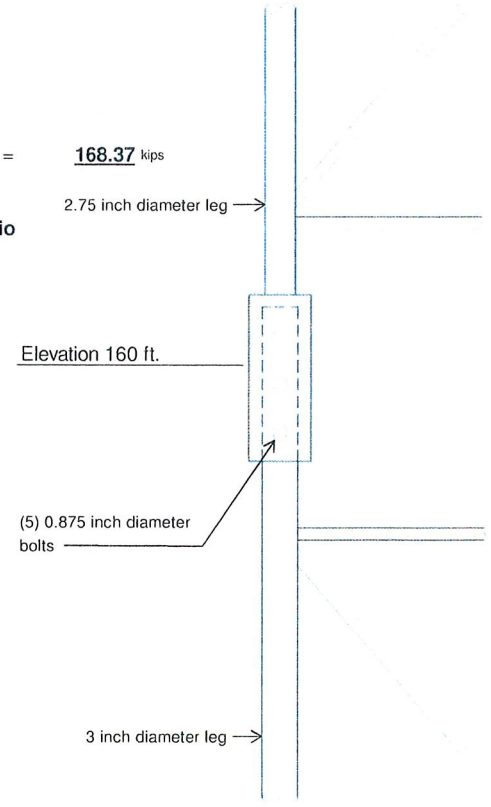


Bolt Capacity:

Allowable Load = (1.333)(21 ksi)(0.601 in2)(5)(2 shear planes) = **168.37** kips

Summary:

		Stress Ratio
Leg Above Tension:	**0.00 < 237.58 (Pass)**	0.0%
Leg Below Tension:	**0.00 < 186.44 (Pass)**	0.0%
Leg Compression:	**35.39 < 168.37 (Pass)**	**21.0%**
Leg Splice Bolts:	**35.39 < 168.37 (Pass)**	**21.0%**



PROJECT INFORMATION

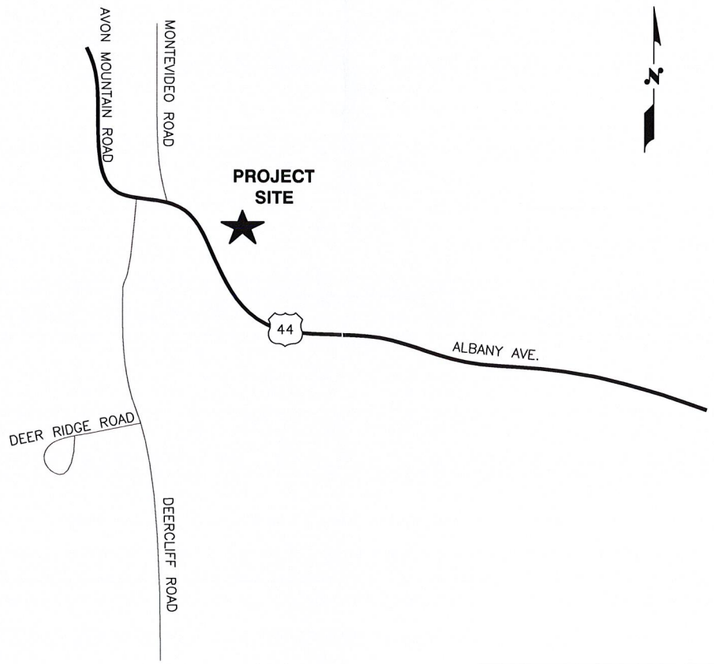
SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY MODIFICATIONS
SITE ADDRESS:	3114 ALBANY AVE WEST HARTFORD, CT 06117
LATITUDE:	41.796811 N 41° 47' 48.5" N
LONGITUDE:	72.796833 W 72° 47' 48.6" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:
FROM ROCKY HILL: MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD 9.2 MILES. MERGE ONTO I-84 W / US-6 W VIA THE EXIT ON THE LEFT TOWARD WATERBURY 1.0 MILE. TAKE EXIT 48 TOWARD ASYLUM STREET <0.1 MILE. STAY STRAIGHT TO GO ONTO SPRING ST <0.1 MILE. TURN RIGHT ONTO ASYLUM AVE 1.7 MILES. TURN RIGHT ONTO PROSPECT AVE 0.6 MILE. TURN LEFT ONTO US-44 / ALBANY AVE 4.2 MILES. END AT 3114 ALBANY AVE WEST HARTFORD, CT 06117.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/18/12	CONSTRUCTION REVISED	MJS	DC	DPH
0	03/12/12	ISSUED FOR REVIEW			

SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 21178 — LICENSED PROFESSIONAL ENGINEER

AT&T
TITLE SHEET (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1154.01	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – NEXLINK
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

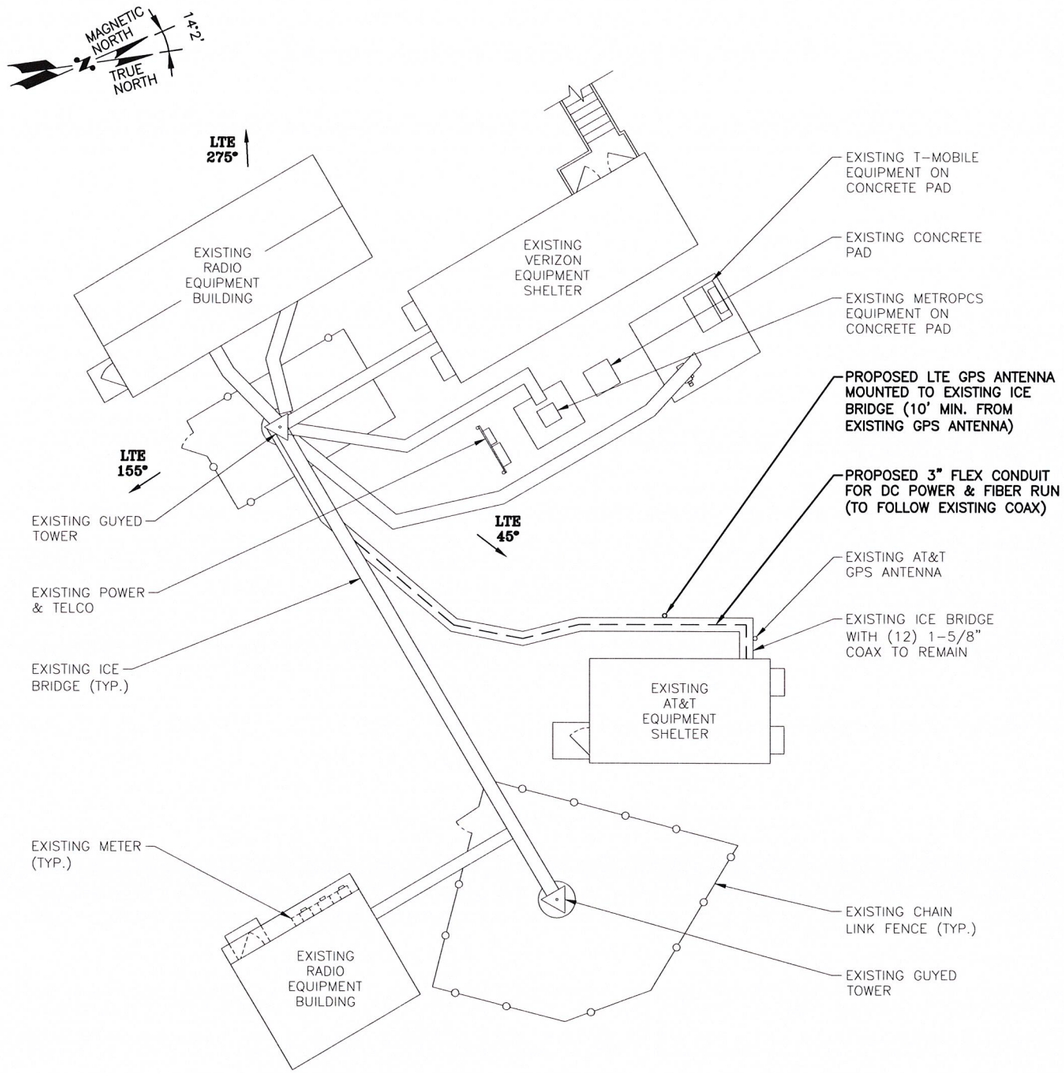
NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/18/12	CONSTRUCTION REVISED	MJS	DC	DPH
0	03/12/12	ISSUED FOR REVIEW	MJS	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

AT&T

GENERAL NOTES
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
1154.01	GN-1	1



COMPOUND PLAN

SCALE: 1/8"=1'-0"

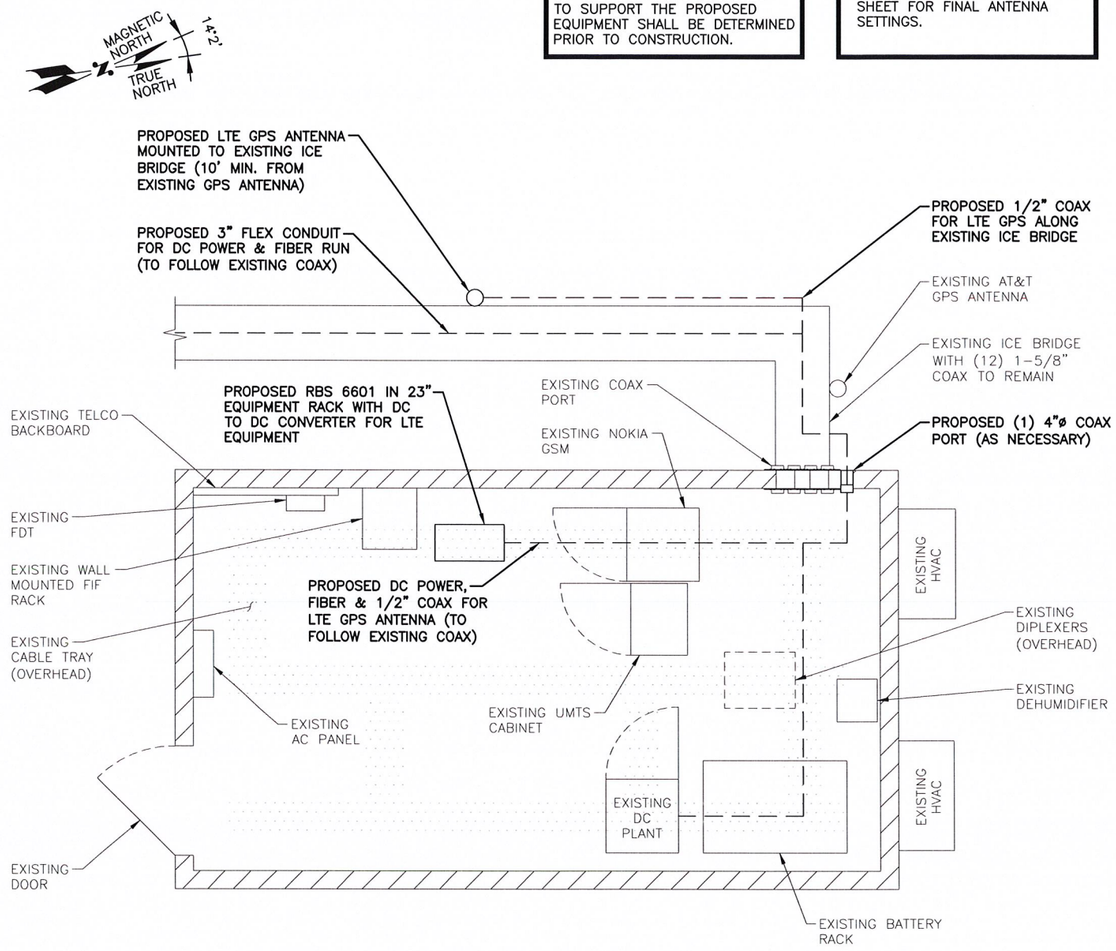
0 4'-0" 8'-0" 16'-0" 24'-0"

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



EQUIPMENT PLAN

SCALE: 1/2"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/18/12	CONSTRUCTION REVISED	MJS	DC	DPH
0	03/12/12	ISSUED FOR REVIEW	MJS	DC	DPH

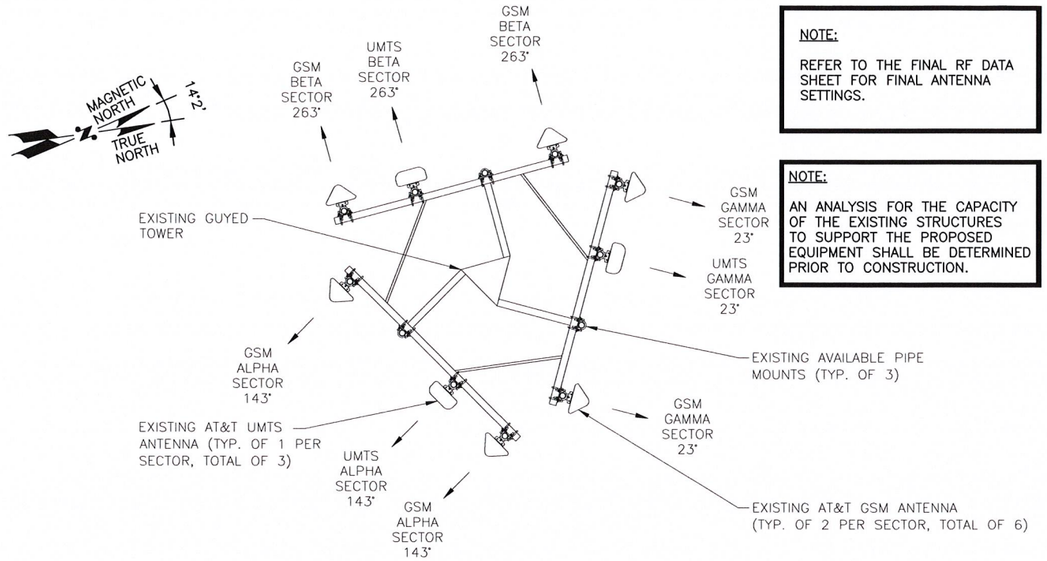
SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

STATE OF CONNECTICUT · DEPARTMENT OF CONSUMER PROTECTION · No. 24175 · LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1154.01	A-1	1



NOTE:

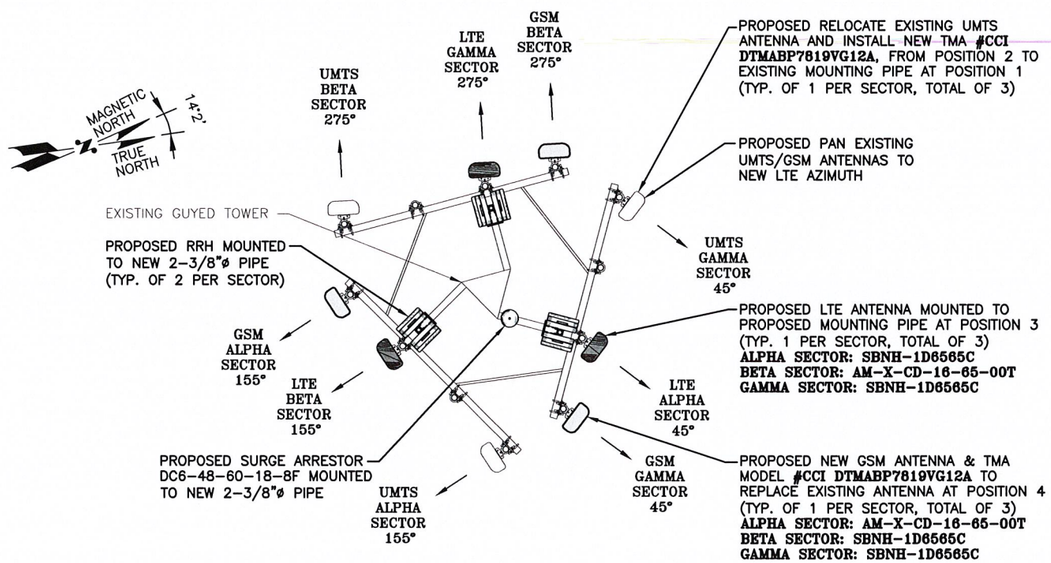
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

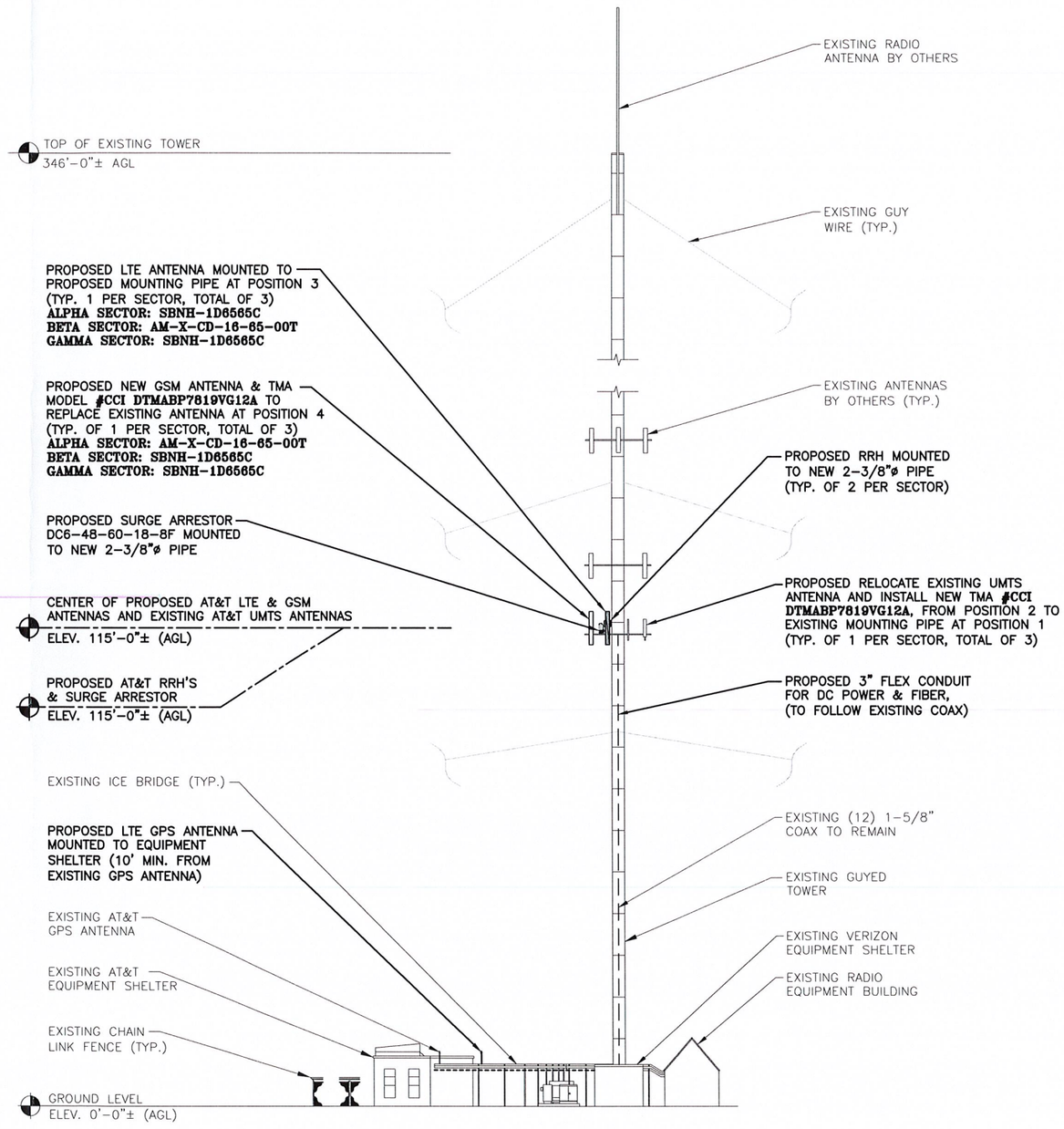
EXISTING UMTS/GSM ANTENNA PLAN

SCALE: N.T.S.



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



NORTH ELEVATION

SCALE: 1/16"=1'-0"

0 8'-0" 16'-0" 32'-0" 48'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

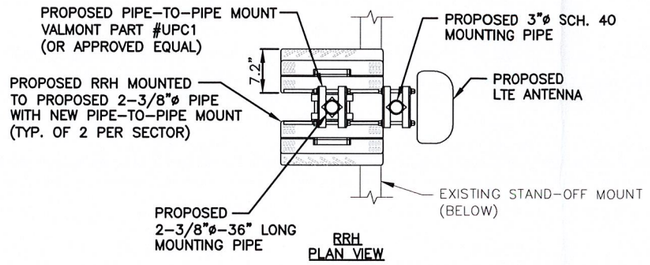
NO.	DATE	REVISIONS	BY	CHK'D	APP'D
1	04/18/12	CONSTRUCTION REVISED	MJS	DC	DPH
0	03/12/12	ISSUED FOR REVIEW	MJS	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

AT&T

ANTENNA LAYOUT & ELEVATION (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1754.01	A-2	1



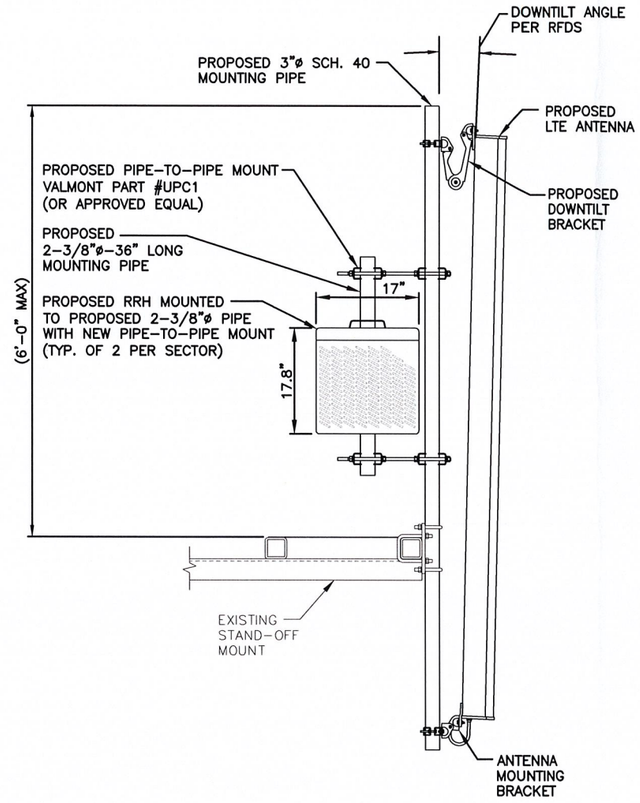
RRH
PLAN VIEW

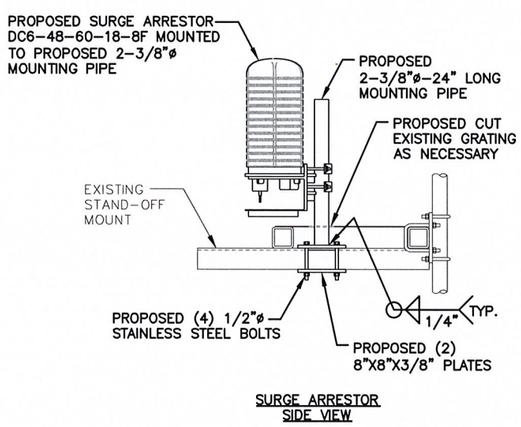
NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

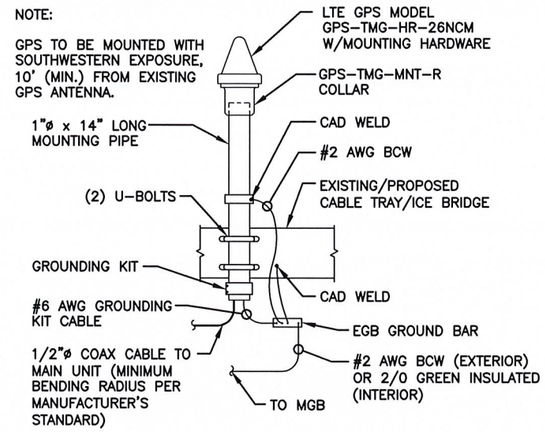




SURGE ARRESTOR
SIDE VIEW

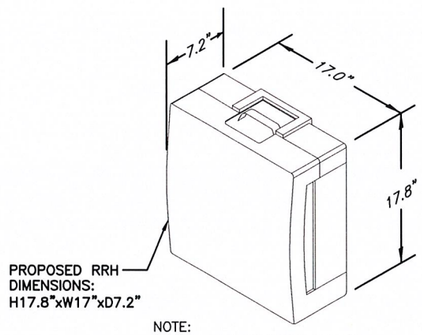
PROPOSED LTE/GSM ANTENNA, RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.



GPS MOUNTING DETAIL

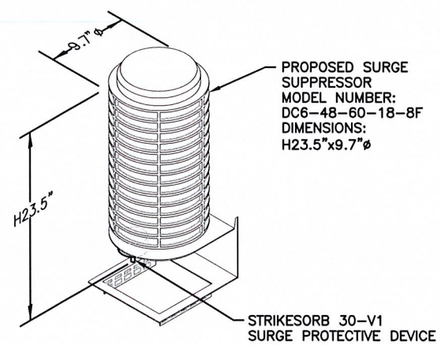
SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

RRH DETAIL

SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/18/12	CONSTRUCTION REVISED	MJS	DC	DPH
0	03/12/12	ISSUED FOR REVIEW	MJS	DC	DPH

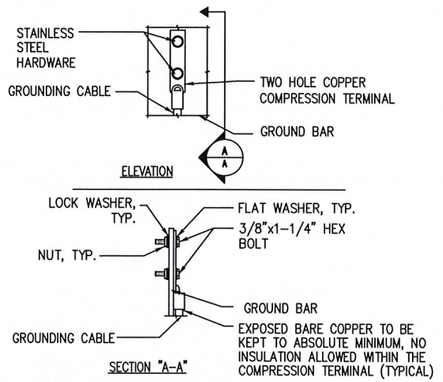
SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

STATE OF CONNECTICUT DANIEL P. HAMM No. 20178 LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
(LTE)

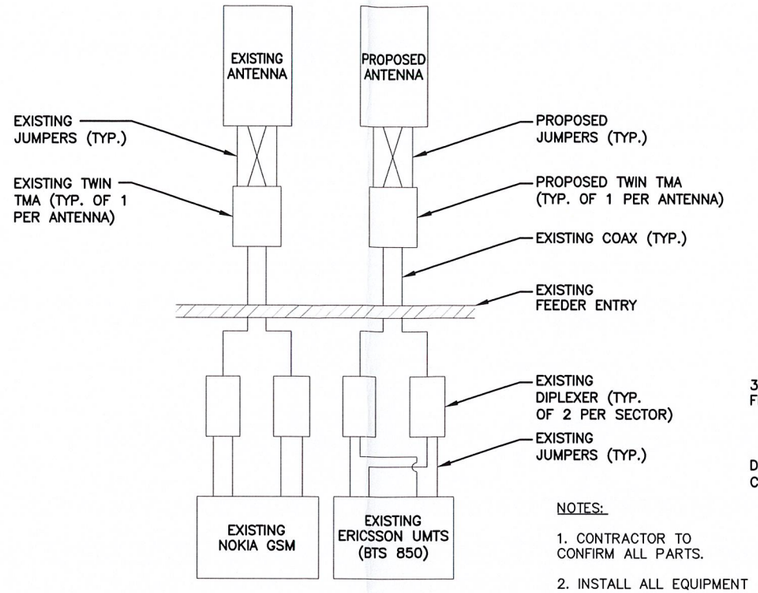
JOB NUMBER	DRAWING NUMBER	REV
1154.01	A-3	1



NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

1 TYPICAL GROUND BAR CONNECTION DETAIL

N.T.S.

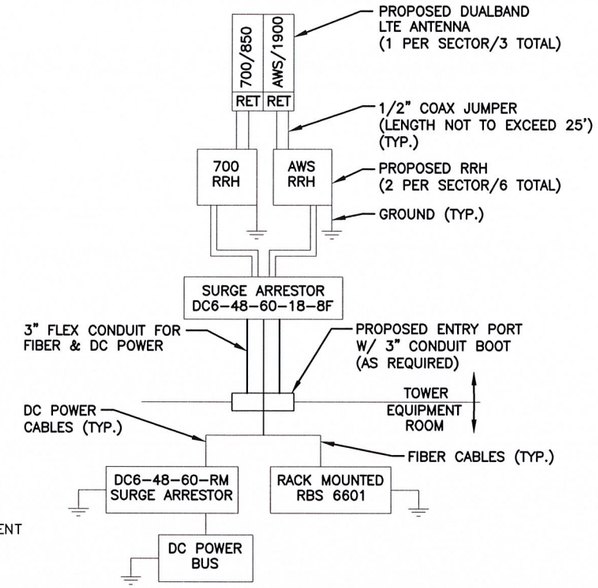


NOTES:

1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

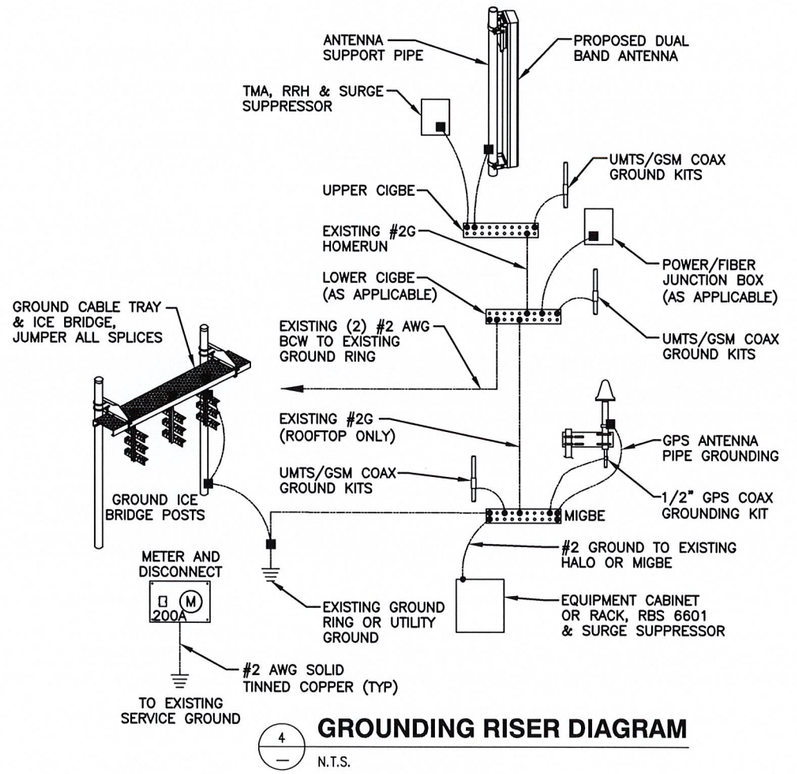
2 UMTS /GSM PLUMBING DIAGRAM

N.T.S.



3 LTE PLUMBING DIAGRAM

N.T.S.



4 GROUNDING RISER DIAGRAM

N.T.S.

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

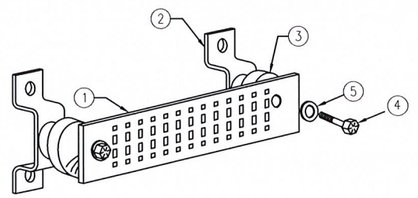
SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
–48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



5 GROUND BAR - DETAIL

N.T.S.

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1154
SITE NAME: WEST HARTFORD ROUTE 44
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/18/12	CONSTRUCTION REVISED	MJS	DC	DPH
0	03/12/12	ISSUED FOR REVIEW	MJS	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: MJS | DRAWN BY: MJS

STATE OF CONNECTICUT · DENNIS P. HAMM · No. 21175 · LICENSED PROFESSIONAL ENGINEER

AT&T

WIRING DIAGRAM & GROUNDING DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1154.01	G-1	1