10 Industrial Ave, Suite 3
Mahwah, NJ 07430
Phone: (845)499-4712
Jennifer Notaro
Real Estate Consultant

August 22, 2014

Hand Delivered

Ms. Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

CC to Property Owner
Connecticut State Police
1111 Country Club Road
Middletown, CT 06457

RE: Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 46 Fernwood Lane Wilton, CT 06897. Known to Sprint Spectrum L.P. as site CT03XC360.

Dear Ms. Bachman:

In order to accommodate technological changes, implement Code Division Multiple Access ("CDMA") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, Sprint Spectrum L.P. plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, 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 and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

CDMA employs Spread-Spectrum technology and special coding scheme to allow multiple users to be multiplexed over the same physical channel.

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.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("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 the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more CDMA transmissions. Moreover, 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 Sprint Spectrum L.P. respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (845)-499-4712 or email JNotaro@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Jennifer Notaro
Real Estate Consultant

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY FCC REGULATORY COMPLIANCE MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT03XC360

CTS

46 Fernwood Lane
Wilton, CT 06897

July 11, 2014

EBI Project Number: 62143782

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

July 11, 2014

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC360 - CTS

Site Total: 11.87% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 46 Fernwood Lane, Wilton, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of µW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 46 Fernwood Lane, Wilton, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 3 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
7) The antenna mounting height centerline for the proposed antennas is **106 feet** above ground level (AGL).
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT03XC360 - CTS
Site Addresss	46 Fernwood Lane, Wilton, CT, 06897
Site Type	Self Support Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	106	100	1/2 "	0.5	0	208.04	0.75%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	106	100	1/2 "	0.5	0	39.00	0.25%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	106	100	1/2 "	0.5	0	138.69	0.88%
														Sector total Power Density Value:		1.87%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	106	100	1/2 "	0.5	0	208.04	0.75%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	106	100	1/2 "	0.5	0	39.00	0.25%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	106	100	1/2 "	0.5	0	138.69	0.88%
														Sector total Power Density Value:		1.87%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	106	100	1/2 "	0.5	0	208.04	0.75%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	106	100	1/2 "	0.5	0	39.00	0.25%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	106	100	1/2 "	0.5	0	138.69	0.88%
														Sector total Power Density Value:		1.87%

Site Composite MPE %

Carrier	MPE %
Sprint	5.62%
Field Measurements for all additional systems on site	6.25%
Total Site MPE %	**11.87%**

EBI Consulting
environmental | engineering | due diligence

Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **5.62% (1.87% from sector 1, 1.87% from sector 2 and 1.87% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **11.87%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 180' SELF-SUPPORTING LATTICE TOWER FOR NEW ANTENNA ARRANGEMENT

Sprint Site #: CT03XC360
Site Name: Connecticut State Police Tower #31
Address: 46 Fenwood Lane
Wilton, Connecticut

prepared for

Sprint

1 International Blvd.
Suite 800
Mahwah, NJ. 07495

prepared by

URS

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

36928700.00000
TWS-015

May 16, 2014

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1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and evaluation of the 180' self-supporting lattice tower located at 46 Fenwood Lane in Wilton, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code, the TIA/EIA-222-F standard and additional requirements of the Connecticut State Police for wind velocity of 90 mph concurrent with ½" ice design wind load. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report. The proposed Sprint installation is as follows:

Antenna and Mount	Carrier	Antenna Center Elevation
Install: **(3) RFS APXVTM14-C-20 Panel Antennas** **(3) TD-RRH-8x20-25 RRH Units** **(1) Junction Box** **(27) 8' Jumper cables** **(3) 8' Comscope AISG Cables** **(1) ALU Fiber Optic Cable**	**Sprint (Proposed)**	**@ 106'**

The result of the analysis indicates that the existing tower, foundation and anchor bolts have sufficient capacity to support the proposed loading conditions without modification. The tower structure, foundation and anchor bolts are considered structurally adequate for the proposed antenna loading with the wind load classification specified above.

The tower deflection (sway) is 0.7097 degrees, and the tower rotation (twist) is 0.0349 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. **The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).**

The above analysis is based upon completion of tower foundation modifications required for T-mobile antenna loadings, per URS Corporation structural analysis and reinforcement design, project number HPC-070 (Rev. 1), signed and sealed April 11, 2014. If this foundation modification has not been constructed, notify the engineer in writing immediately.

1. EXECUTIVE SUMMARY - *continued*

This analysis is based on:

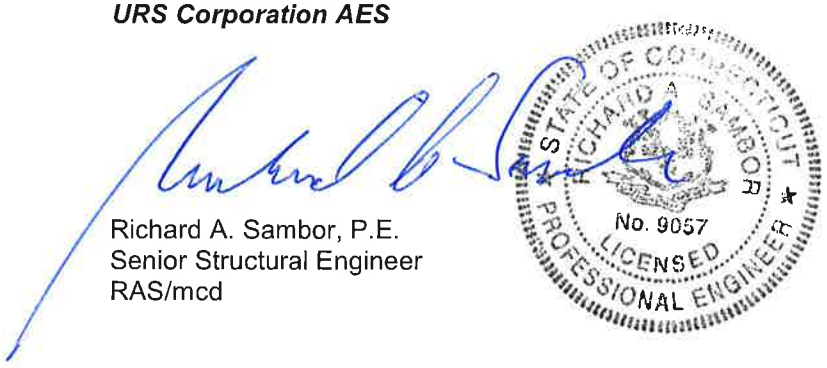
1) The tower structure's theoretical capacity not including any assessment of the condition of the tower.
2) Tower geometry and structural member sizes utilized in the preparation of this report obtained from the manufacturers original design documents prepared by Bayar and Associates dated July 1990.
3) Sprint antennas taken from CT Police Sites Flat File, dated April 22, 2014.
4) Antenna inventory provided by the Connecticut State Police via email on February 8, 2014.
5) Previous structural analysis and reinforcement design performed by URS Corporation, project number HPC-070 (Rev 1), signed and sealed April 11, 2014.
6) Antenna and mount configuration as specified on the following page of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation AES



Richard A. Sambor, P.E.
Senior Structural Engineer
RAS/mcd

2. INTRODUCTION

The subject tower is located at 46 Fenwood Lane in Wilton, Connecticut. The structure is a 180' four sided self-supporting lattice tower designed by Bayar and Associates.

The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Mount Elevation*	*Cable*
(3) 6' Dishes (Wind Load)	CSP 69 to 71 (reserved)	Leg Mounted	180'	N/A
(2) Scala OGT9-806 (2) TX/RX 101-83B-09 (1) 7' Omni	CSP 1 to 4,6 (existing)	(3) 4' Stand-Off	180'	(4) 1-5/8" (1) 7/8"
(1) 10' Dipole (1) TX/RX TMA	CSP 7 & 67 (existing)	Pipe Mounted	180'	(1) 7/8" (1) 1/2"
(1) 6' Dishes	CSP – 59 (existing)	(1) Pipe Mounts	180'	(1) WEP65
(2) 6' Dishes	CSP 5 & 36 (existing)	(2) Pipe Mounts	176'	(2) WEP65
(1) 8-Bay Dipole	FCP – 12 (existing)	6' Standoff	170'	(1) 7/8"
(1) 5' Omni	CSP – 10 (existing)	6' Standoff	170'	(1) 7/8"
(1) 3' Omni	CAP – 25 (existing)	Leg Mounted	169'	(1) 7/8"
(6) Powerwave 7770 (6) LGP21401 TMAs	AT&T (existing)	(3) T-Frames	163'	(12) 1-5/8"
(3) Powerwave P-65-16-XLH-RR (6) Ericsson RRU (12) LGP21901 Diplexers (3) Powerwave TT19-08BP111-001 TMAs (1) RAYCAP Surge Protector	AT&T (existing)	Shared with Above	163'	(1) 3" Flex Conduit with Fiber & DC Cables
(3) TX/RX 101-83B-08-T5 (1) TX/RX TMA	CSP 63 to 66 (existing)	Leg Mounted	160'	(3) 1-5/8" (1) 1/2"
(1) DB636	NEU – 57 (existing)	4' Standoff	150'	(1) 7/8"
(1) 3' Yagi	WTR – 28 (existing)	6' Standoff	145'	(1) 7/8"
(1) 6' Dish	CSP – 35 (existing)	Pipe Mounted	130'	(1) WEP65
(3) Ericsson AIR21 B2A|B4P Panel Antennas (3) Ericsson AIR21 B4A/B2P Panel Antennas (3) (UMTS) TMA Units (3) (LTE) TMA Units	T-Mobile (Existing)	(3) Antenna Mounts	122'	(6) 1 1/4" (6) 1-1/4" (2) Fiber Optic Cables
(2) DB586-Y (one inverted and one upright)	NEU 30 & 31 (existing)	6' Standoff	120'	(2) 7/8"

Antenna Type	*Carrier*	*Mount*	*Mount Elevation*	*Cable*
(1) Celwave PD-128 (1) 17' Omni	WPD 33 & 55 (existing)	6' Standoff	120'	(2) 7/8"
(1) Celwave PD-128	CSP – 8 (existing)	Leg Mounted	120'	(1) 7/8"
(1) ASP-711	WTR – 29 (existing)	Leg Mounted	116'	(1) 7/8"
(1) Decibel DB-222	DHS – 9 (existing)	Leg Mounted	112'	(1) 7/8"
(3) RFS APXVTM14-C-20 Panel Antennas (3) TD-RRH-8x20-25 RRH Units (1) Junction Box	**Sprint (Proposed)**	*See Below Mount*	**106'**	**(27) 8' Jumper cables (3) 8' Comscope AISG Cables (1) ALU Fiber Optic Cable**
(3) APXVSPP18-C (6) ALU RRH	Sprint (existing)	(3) 10' Frame (existing)	106'	(3) RFS Hybriflex Cables
(1) BCD806-09NE	CSP – 62 (existing)	Leg Mounted	101'	(1) 1-5/8"
(1) 4' Grid Dish	CSP – 11 (existing)	Pipe Mounted	100'	(1) 7/8"
(1) 15' Omni	DEA – 32 (existing)	4' Standoff	100'	(1) 7/8"
(1) 20' 4-Bay Dipole	USS – 26 (existing)	3' Standoff	85'	(1) 7/8"
(1) Ice Shield for 6' Grid Dish Below	CSP (existing)	4' Standoff	80'	N/A
(1) 6' Grid Dish	CSP – 13 (existing)	Pipe Mounted	75'	(1) 1/2"
(1) GPS	Sprint (existing)	3' Standoff	56'	(1) 1/2"
(1) DB-803 Omni	CSP – 68 (existing)	3' Stand-Off	47'	(1) 1/2"

This structural analysis of the communications tower was performed by URS Corporation, AES (URS) for Sprint. The purpose of this analysis was to analyze the existing tower for its existing and proposed antenna loads. This analysis was conducted to evaluate rotation (twist), deflection (sway) and stress on the tower, and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F - Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction - Allowable Stress Design (ASD).

The analysis was conducted using TNX Tower 6.0.0.8. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 90 mph (fastest mile) Wind Load + Tower Dead Load
Load Condition 2 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the allowable stress in accordance with AISC. The results of the analysis indicate that the calculated stresses under the proposed loading are within the allowable stresses for the tower structure, foundation and anchor bolts.

The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for deflection (sway) and rotation (twist).

Tower Base Reactions:

Description	Current
Pier Compression (kips)	453
Pier Uplift (kips)	404
Overall Overturning (kip-ft)	10769
Overall Shear (kips)	99
Shear per Leg (kips)	43

Controlling Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Critical Component Size	Controlling Elevation	Stress (% capacity)	Pass/Fail
Leg (T19)	L8x8x1 1/8"	0' – 10'	99.3	Pass
Diagonal (T12)	L3 1/2X3X1/4	80'-90'	84.8	Pass
Horizontal (T19)	2L2 1/2x2 1/2x1/4	0'-10'	53.5	Pass
Secondary Horizontal (T18)	L3 1/2x3 1/2x1/4	10'-20'	86.9	Pass
Top Girt (T3)	L2x2x3/16	159.049'-163.573'	12.9	Pass
Redund Horz 1 Bracing (T19)	L2 1/2x2 1/2x3/16	0'-10'	44.4	Pass
Redund Diag 1 Bracing (T19)	L2 1/2x2 1/2x3/16	0'-10'	73.3	Pass
Redund Hip 1 Bracing (T19)	L2 1/2x2 1/2x3/16	0'-10'	0.3	Pass
Redund Sub Horz Bracing (T19)	L3x3x5/16	0'-10'	68.4	Pass
Inner Bracing (T19)	2L2x2 1/2x3/16	0'-10'	3.5	Pass
Anchor Bolts	(4) 2-1/2" dia. A36 bolts	N/A	88	Pass

Foundation Summary:

Component	Required / Allowable	Computed	% Capacity	Pass/Fail
Overturning Moment Factor of Safety	2.0 min	2.30	87.0	Pass
Foundation Bearing Pressure	3.4 ksf max	2.4679 ksf	72.6	Pass

Tower Twist & Sway at Top:

Description	Current	Total Allowable
Tower Twist (degrees)	0.0349	---
Tower Sway (degrees)	0.7097	
Total Deflection (degrees)	0.7446	0.75

5. CONCLUSIONS

The result of the analysis indicates that the existing tower, foundation and anchor bolts have sufficient capacity to support the proposed loading conditions without modification. The tower structure, foundation and anchor bolts are considered structurally adequate for the proposed antenna loading with the wind load classification specified above. The tower deflection (sway) is 0.7097 degrees, and the tower rotation (twist) is 0.0349 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. **The tower deflection and rotation are within the Connecticut State Police specification of 0.75 degrees for combined deflection (sway) and rotation (twist).**

The above analysis is based upon completion of tower foundation modifications required for T-mobile antenna loadings, per URS Corporation structural analysis and reinforcement design, project number HPC-070 (Rev. 1), signed and sealed April 11, 2014. If this foundation modification has not been constructed, notify the engineer in writing immediately.

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place and all previous modifications have been performed.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

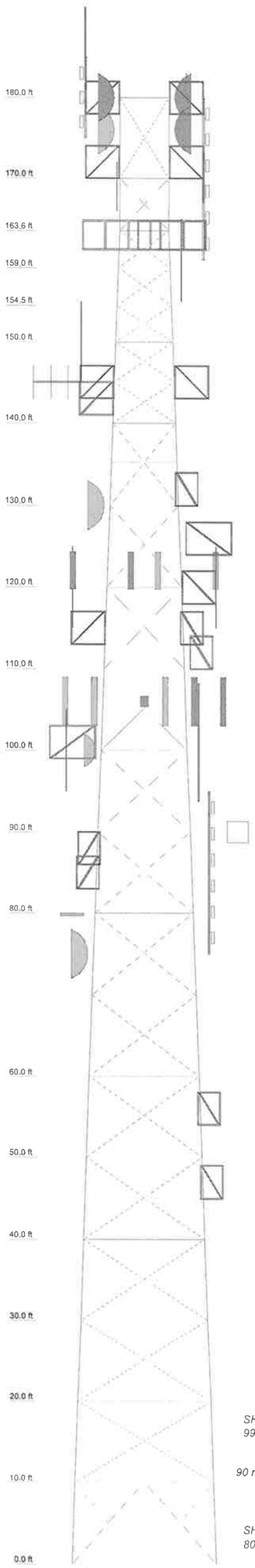
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading condition.

6.) DRAWINGS AND DATA

TNX TOWER INPUT / OUTPUT SUMMARY

Section	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		L8x8x1 1/8				L8x8x1-1/8 wl 1/2x7 Plates		L8x8x1/2 wl 1/2x7 Plates		L8x8x3/4		L6x6x3/4		L6x6x1/2	L5x5x3/8			L5x5x5/16		L3 1/2x3 1/2x3/8
Leg Grade								A36												
Diagonals	2L2 1/2x2 1/2x1/4			2L2 1/2x2x3/8				2L2 1/2x2x3/16		L3 1/2x3x1/4		L3x3x1/4		L3x2 1/2x1/4	L2 1/2x2x3/16		A		L2 1/2x2 1/2x3/16	
Diagonal Grade								A36												
Top Girts		N.A.		2L2x2x3/16		N.A.		L2 1/2x2 1/2x1/4		N.A.		L2 1/2x2 1/2x1/4		L2 1/2x2 1/2x3/16	N.A.			L2x2x3/16		
Horizontals	2L2 1/2x2 1/2x1/4	2L2x2x3/16		N.A.		2L2x2x3/16		L2 1/2x2 1/2x1/4	N.A.	L2 1/2x2 1/2x1/4	N.A.	L2x2x3/16		N.A.					1 @ 6.427	1 @ 10
Sec. Horizontals	N.A.			L3 1/2x3 1/2x1/4				N.A.	L2 1/2x2 1/2x1/4	N.A.	L2x2x1/4	L2x2x3/16		L2x2x1/4	N.A.				3 @ 4.52433	
Red. Horizontals	L2 1/2x2 1/2x3/16							N.A.												
Red. Diagonals	L2 1/2x2 1/2x3/16							N.A.												
Red. Sub-Horizs	L3x3x5/16							N.A.												
Red. Hips	L2 1/2x2 1/2x3/16							N.A.												
Inner Bracing	2L2x2 1/2x3/16		N.A.	15.5779	14.8608	2L2x2x3/16	14.1436	2L2x2x3/16	11.9926	13.4267	11.2756	10.5585	9.84145	9.1244	8.40735	7.6903	6.9733	6.84887	6.32443	6
Face Width (ft)	17.73	16.2949						14 @ 10								2 @ 5				
# Panels @ (ft)	17.01 25																			
Weight (K)	51.6	5.0		4.3	4.8	8.1	4.6	8.0	2.4	9.5	1.9	2.1	1.4	1.5	1.0	0.4	0.4	0.4	0.5	0.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' Standoff (CSP)	180	DB636-A (NEU - 57)	150
OGT9-806 (CSP - 1)	180	6' Standoff (CSP)	145
3" Dia x 15' Omni (CSP - 2)	180	3' Yagi (WTR - 28)	145
6' Standoff (CSP)	180	6' Standoff (CSP)	145
OGT9-806 (CSP - 6)	180	6' Standoff (CSP)	145
3" Dia x 15' Omni (CSP - 3)	180	6' Standoff (CSP)	143
6' Standoff (CSP)	180	10'6"x4" Pipe Mount (CSP)	133
7' Whip (CSP - 4)	180	3' Stand-off (CSP)	132
10'6"x4" Pipe Mount (CSP)	180	PA6-65AC (CSP - 35)	130
10' Dipole (CSP - 7)	180	LeBlanc 10' Standoff (1) (CSP)	126
TMA (CSP - 67)	180	EUSF10-U (T-Mobile)	122
PA6-65AC (CSP - 69)	180	EUSF10-U (T-Mobile)	122
PA6-65AC (CSP - 70)	180	EUSF10-U (T-Mobile)	122
PA6-65AC (CSP - 71)	180	(2) AIR B2A/B4P (T-Mobile)	122
PA6-65AC (CSP - 59)	180	(2) AIR B2A/B4P (T-Mobile)	122
10'6"x4" Pipe Mount (CSP)	176	(2) AIR B2A/B4P (T-Mobile)	122
10'6"x4" Pipe Mount (CSP)	176	(2) TMA (T-Mobile)	122
10'6"x4" Pipe Mount (CSP)	176	(2) TMA (T-Mobile)	122
PA6-65AC (CSP - 5)	176	(2) TMA (T-Mobile)	122
PA6-65AC (CSP - 36)	176	Rohn 6' Side-Arm(1) (NU - 3031)	120
10'6"x4" Pipe Mount (CSP)	176	3" Dia x 15' Omni (WPD - 55)	120
6' Standoff (CSP)	172	PD128-1 (CSP - 8)	120
6' Standoff (CSP)	172	PD128-1 (WPD - 33)	120
20' 8 Bay Di-Pole (FCP - 12)	170	(2) DB586-Y (NU - 3031)	120
4' Omni (CSP - 10)	170	ASP711 (WTR - 29)	116
4' Omni (CAP - 25)	169	3' Stand-off (CSP)	115
7770 (ATT)	163	6' Standoff (CSP)	115
(2) LGP 219nn (ATT)	163	6' Stand-off (CSP)	112
TT19-08BP111-001 TMA (ATT)	163	10'6"x4" Pipe Mount (CSP)	112
P65-16-XLH-RR (ATT)	163	DB222 (DHS - 9)	112
(2) RRU (ATT)	163	12' Wireless Frame (Sprint)	106
Raycap DC6-48-60-18-8F DC Power Surge Protection (ATT)	163	12' Wireless Frame (Sprint)	106
		12' Wireless Frame (Sprint)	106
7770 (ATT)	163	APXVSPP18-C (Sprint)	106
(2) LGP 219nn (ATT)	163	APXVSPP18-C (Sprint)	106
(2) LPG21401 TMA (ATT)	163	APXVTM14-C-1 20 (Sprint)	106
7770 (ATT)	163	APXVTM14-C-1 20 (Sprint)	106
(2) LGP 219nn (ATT)	163	APXVTM14-C-1 20 (Sprint)	106
TT19-08BP111-001 TMA (ATT)	163	TD-RRH8x20-25 (Sprint)	106
P65-16-XLH-RR (ATT)	163	TD-RRH8x20-25 (Sprint)	106
(2) RRU (ATT)	163	TD-RRH8x20-25 (Sprint)	106
7770 (ATT)	163	junction box (Sprint)	106
(2) LGP 219nn (ATT)	163	APXVSPP18-C (Sprint)	106
(2) LPG21401 TMA (ATT)	163	(2) ALU RRH (Sprint)	106
7770 (ATT)	163	(2) ALU RRH (Sprint)	106
(2) LGP 219nn (ATT)	163	(2) ALU RRH (Sprint)	106
TT19-08BP111-001 TMA (ATT)	163	LeBlanc 10' Standoff (1) (CSP)	101
P65-16-XLH-RR (ATT)	163	SC479-HF1LDF (CSP - 62)	101
(2) RRU (ATT)	163	4' Grid Dish (CSP - 11)	100
T-Frame (ATT)	163	3" Dia x 15' Omni (DEA - 32)	100
T-Frame (ATT)	163	3' Stand-off (CSP)	88
7770 (ATT)	163	3' Stand-off (CSP)	85
(2) LGP 219nn (ATT)	163	20' 4-Bay Dipole (USS - 26)	85
(2) LPG21401 TMA (ATT)	163	6' Ice Shield (CSP)	80
T-Frame (ATT)	163	10'6"x4" Pipe Mount (CSP)	76
3" Dia x 15' Omni (CSP - 63)	160	6' Grid Dish (CSP - 13)	75
3" Dia x 15' Omni (CSP - 64)	160	3' Stand-off (Sprint)	56
3" Dia x 15' Omni (CSP - 65)	160	GPS (Sprint)	56
TMA (CSP - 66)	160	3' Stand-off (CSP)	47
2" Dia 10' Omni (CSP)	150	DB803M-Y (CSP - 68)	47

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2x2x3/16		

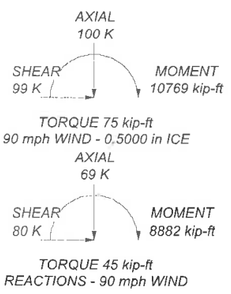
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

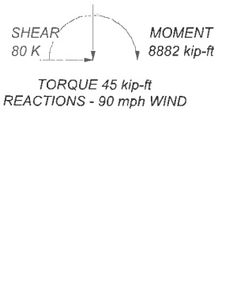
TOWER DESIGN NOTES

1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. TOWER RATING: 99.3%

MAX. CORNER REACTIONS AT BASE:
DOWN: 453 K
UPLIFT: -404 K
SHEAR: 43 K



TORQUE 75 kip-ft
90 mph WIND - 0.5000 in ICE



TORQUE 45 kip-ft
REACTIONS - 90 mph WIND

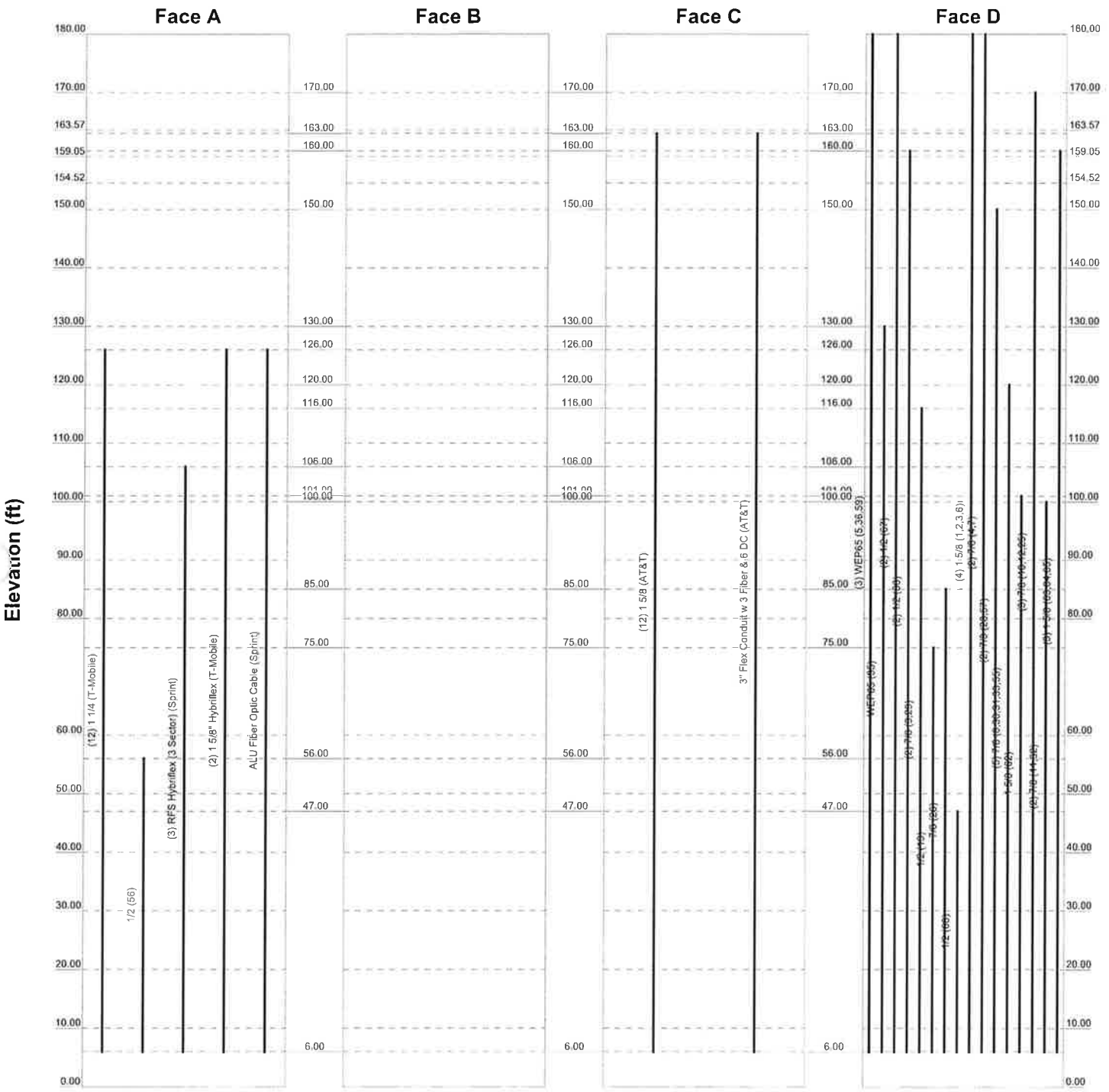
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***180' Lattice Tower - CSP***
Project: ***Wilton, Connecticut (TWS-015)***
Client: Sprint | Drawn by: MCD | App'd:
Code: TIA/EIA-222-F | Date: 05/14/14 | Scale: NTS
Path: W:\Transmittal_Wireless_TWS\26826705-TWS015_Wilton\CAD\Rnl Files\180' Lattice Wilton_CSP.eri | Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION

Feedline Distribution Chart
0' - 180'

_____ Round _____ Flat _____ App In Face _____ App Out Face _____ Truss Leg

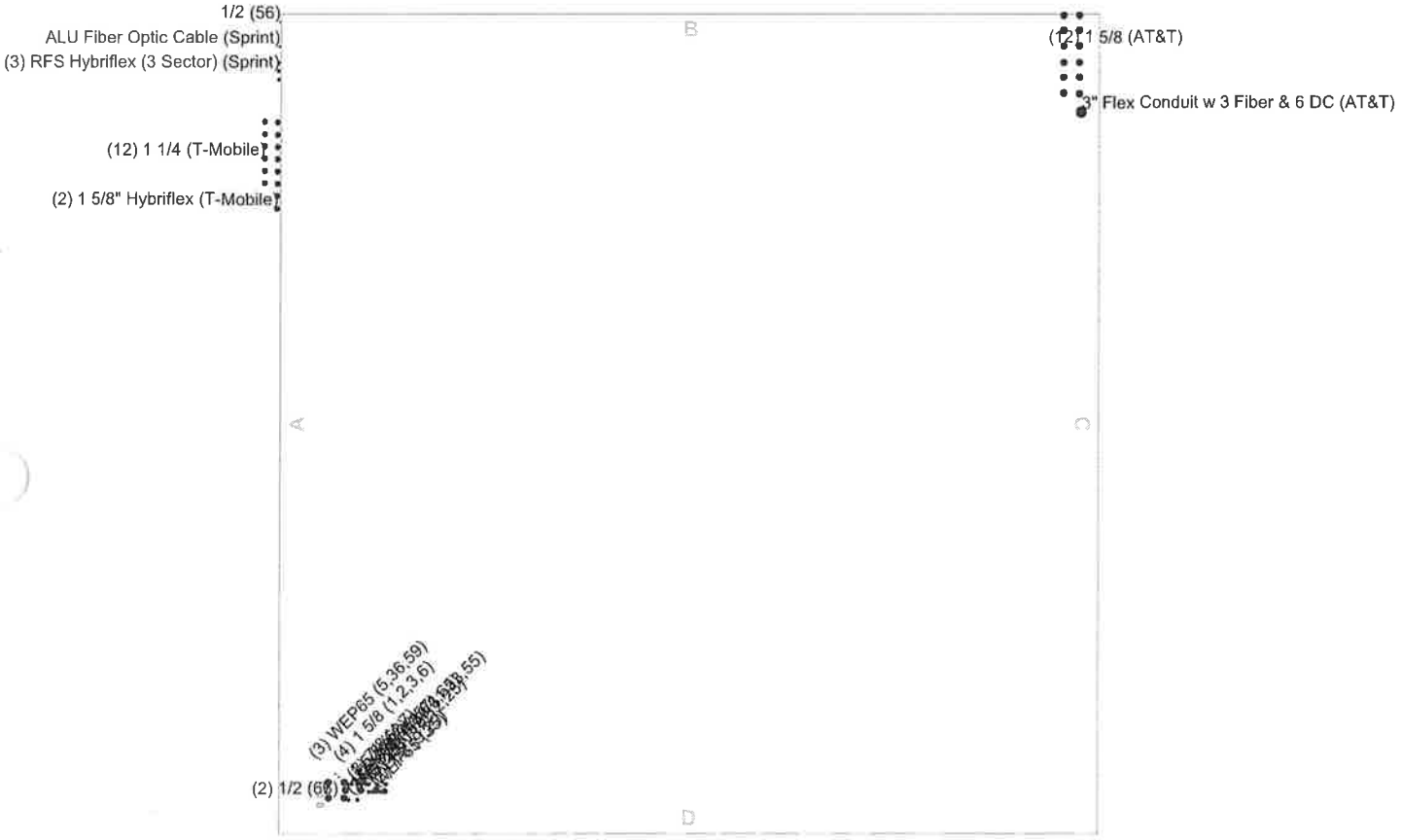


URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: 860-529-8882 FAX: 860-529-3991	Job: ***180' Lattice Tower - CSP***		
	Project: ***Wilton, Connecticut (TWS-015)***		
	Client: Sprint	Drawn by: MCD	App'd:
	Code: TIA/EIA-222-F	Date: 05/14/14	Scale: NTS
	Path:		Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feedline Plan

Round _____ Flat _____ App In Face App Out Face

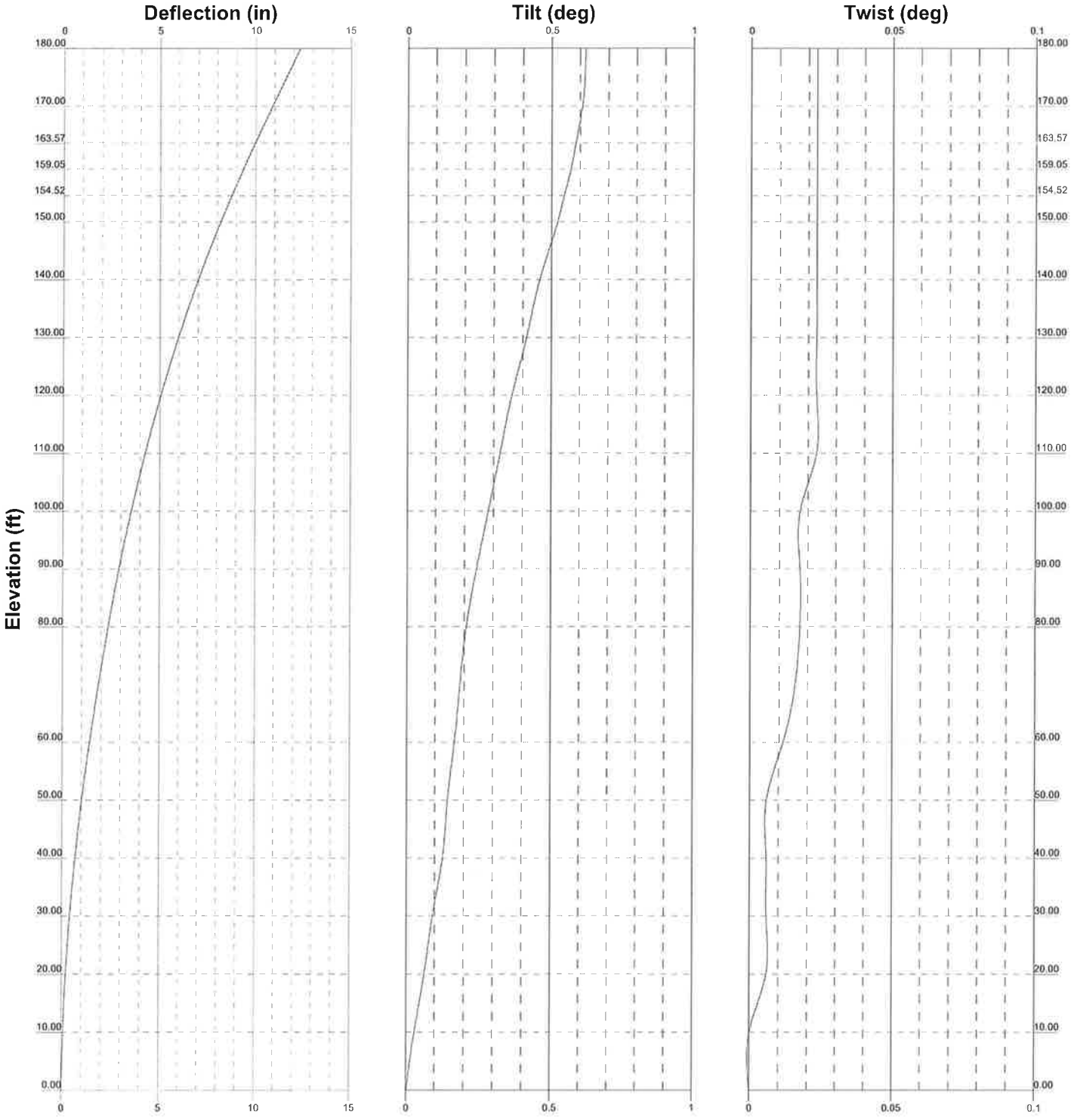


URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: 860-529-8882 FAX: 860-529-3991	Job: ***180' Lattice Tower - CSP***		
	Project: ***Wilton, Connecticut (TWS-015)***		
	Client: Sprint	Drawn by: MCD	App'd:
	Code: TIA/EIA-222-F	Date: 05/14/14	Scale: NTS
	Path: W:\Transcend Wireless, TWS\36998706-TWS015_Wilton\06 ERI Files\180' Lattice Wilton CSP.pri		Dwg No. E-7

TNX TOWER DEFLECTION, TILT AND TWIST

TIA/EIA-222-F - Service - 90 mph

Maximum Values



URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***180' Lattice Tower - CSP***		
Project: ***Wilton, Connecticut (TWS-015)***		
Client: Sprint	Drawn by: MCD	App'd:
Code: TIA/EIA-222-F	Date: 05/14/14	Scale: NTS
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DETAILED OUTPUT

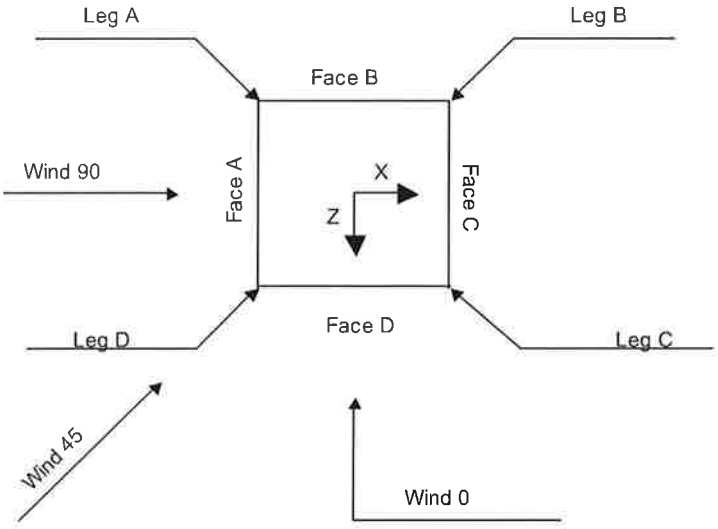
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.00 ft at the top and 17.73 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 90 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
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		



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-170.00			6.00	1	10.00
T2	170.00-163.57			6.00	1	6.43
T3	163.57-159.05			6.00	1	4.52
T4	159.05-154.52			6.32	1	4.52
T5	154.52-150.00			6.65	1	4.52
T6	150.00-140.00			6.97	1	10.00
T7	140.00-130.00			7.69	1	10.00
T8	130.00-120.00			8.41	1	10.00
T9	120.00-110.00			9.12	1	10.00
T10	110.00-100.00			9.84	1	10.00
T11	100.00-90.00			10.56	1	10.00
T12	90.00-80.00			11.28	1	10.00
T13	80.00-60.00			11.99	1	20.00
T14	60.00-50.00			13.43	1	10.00
T15	50.00-40.00			14.14	1	10.00
T16	40.00-30.00			14.86	1	10.00
T17	30.00-20.00			15.58	1	10.00
T18	20.00-10.00			16.29	1	10.00
T19	10.00-0.00			17.01	1	10.00

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

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	180.00-170.00	10.00	X Brace	No	Yes	0.0000	0.0000
T2	170.00-163.57	6.43	X Brace	No	No	0.0000	0.0000
T3	163.57-159.05	4.52	X Brace	No	No	0.0000	0.0000
T4	159.05-154.52	4.52	X Brace	No	No	0.0000	0.0000
T5	154.52-150.00	4.52	X Brace	No	No	0.0000	0.0000
T6	150.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T7	140.00-130.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	130.00-120.00	10.00	X Brace	No	Yes	0.0000	0.0000
T9	120.00-110.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	110.00-100.00	10.00	X Brace	No	Yes	0.0000	0.0000
T11	100.00-90.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	90.00-80.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	80.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	60.00-50.00	10.00	X Brace	No	Yes	0.0000	0.0000
T15	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T16	40.00-30.00	10.00	X Brace	No	Yes	0.0000	0.0000
T17	30.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T18	20.00-10.00	10.00	X Brace	No	Yes	0.0000	0.0000
T19	10.00-0.00	10.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-170.00	Single Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 170.00-163.57	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 163.57-159.05	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 159.05-154.52	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 154.52-150.00	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 150.00-140.00	Single Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 140.00-130.00	Single Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)
T8 130.00-120.00	Single Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T9 120.00-110.00	Single Angle	L6x6x3/4	A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T10 110.00-100.00	Single Angle	L6x6x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T11 100.00-90.00	Single Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T12 90.00-80.00	Single Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T13 80.00-60.00	Arbitrary Shape	L8x8x1 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T14 60.00-50.00	Arbitrary Shape	L8x8x1-1/8 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16	A36 (36 ksi)
T15 50.00-40.00	Arbitrary Shape	L8x8x1-1/8 w/ 1/2x7 Plates	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T16 40.00-30.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T17 30.00-20.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T18 20.00-10.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2x3/8	A36 (36 ksi)
T19 10.00-0.00	Single Angle	L8x8x1 1/8	A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4	A36 (36 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
T1 180.00-170.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 170.00-163.57	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 163.57-159.05	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T6 150.00-140.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 140.00-130.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 80.00-60.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 40.00-30.00	Double Angle	2L2x2x3/16	A36 (36 ksi)	Single Angle		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 180.00-170.00	1	Single Angle	L2x2x3/16	A36 (36 ksi)	Double Angle		A36 (36 ksi)
T9 120.00-110.00	1	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T11 100.00-90.00	None	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T14 60.00-50.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T18 20.00-10.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T19 10.00-0.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 180.00-170.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 140.00-130.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T8 130.00-120.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 120.00-110.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T10 110.00-100.00	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 100.00-90.00	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T12 90.00-80.00	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 80.00-60.00	Equal Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T14 60.00-50.00	Single Angle		A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T15 50.00-40.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 40.00-30.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Double Angle	2L2x2x3/16	A36 (36 ksi)
T17 30.00-20.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T18 20.00-10.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Double Angle	2L2x2 1/2x3/16	A36 (36 ksi)
T19 10.00-0.00	Single Angle		A36 (36 ksi)	Double Angle	2L2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T19 10.00-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Sub-Horizontal	Single Angle	L3x3x5/16	1
		Hip (1)	Single Angle	L2 1/2x2 1/2x3/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 180.00-170.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T2 170.00-163.57	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T3 163.57-159.05	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T4 159.05-154.52	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T5 154.52-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T6 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T7 140.00-130.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T8 130.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T9 120.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T10 110.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T11 100.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T12 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T13 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T14 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T15 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T16 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T17 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T18 20.00-10.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000
T19 10.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	24.0000	24.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 180.00-170.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 170.00-163.57	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 163.57-159.05	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 159.05-154.52	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 154.52-150.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 150.00-140.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T7	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
140.00-130.00				1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
130.00-120.00				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
120.00-110.00				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
110.00-100.00				1	1	1	1	1	1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
100.00-90.00				1	1	1	1	1	1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
90.00-80.00				1	1	1	1	1	1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-50.00				1	1	1	1	1	1	1	1	1	1	1	1
T15	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
50.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T16	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-30.00				1	1	1	1	1	1	1	1	1	1	1	1
T17	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
30.00-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T18	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
20.00-10.00				1	1	1	1	1	1	1	1	1	1	1	1
T19	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
10.00-0.00				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	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
180.00-170.00														
T2	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
170.00-163.57														
T3	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
163.57-159.05														
T4	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
159.05-154.52														
T5	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
154.52-150.00														
T6	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
150.00-140.00														
T7	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
140.00-130.00														
T8	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
130.00-120.00														

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T9 120.00-110.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T10 110.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T11 100.00-90.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T12 90.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T13 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T14 60.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T15 50.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T16 40.00-30.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T17 30.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T18 20.00-10.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75
T19 10.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.6250	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 180.00-170.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 170.00-163.57	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 163.57-159.05	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 159.05-154.52	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 154.52-150.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 150.00-140.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 140.00-130.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T8 130.00-120.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T9 120.00-110.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T10 110.00-100.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T11 100.00-90.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T12 90.00-80.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T13 80.00-60.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T14 60.00-50.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T15 50.00-40.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T16 40.00-30.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T17 30.00-20.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T18 20.00-10.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T19 10.00-0.00	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-170.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325X	2
T2 170.00-163.57	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T3 163.57-159.05	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T4 159.05-154.52	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T5 154.52-150.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T6 150.00-140.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T7 140.00-130.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T8 130.00-120.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T9 120.00-110.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	2
T10 110.00-100.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T11 100.00-90.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0
T12 90.00-80.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T13 80.00-60.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	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.
T14 60.00-50.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0
T15 50.00-40.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T16 40.00-30.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	2	0.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T17 30.00-20.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	2
T18 20.00-10.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	2
T19 10.00-0.00	Flange	0.7500 A325X	0	0.6250 A325X	2	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	2	0.6250 A325X	2	0.6250 A325X	0

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
1 1/4 (T-Mobile)	A	Yes	Ar (CfAe)	126.00 - 6.00	0.0000	0.33	12	6	1.5500	1.5500		0.66
WEP65 (5,36,59)	D	Yes	Af (CfAe)	180.00 - 6.00	-12.0000	0.45	3	1	1.5836	1.5836	5.1284	0.53
WEP65 (35)	D	Yes	Ar (CfAe)	130.00 - 6.00	-10.0000	0.37	1	1	1.5836	1.5836		0.53
1/2 (67)	D	No	Ar (Leg)	180.00 - 6.00	0.0000	0.1	2	1	0.5800	0.5800		0.25
1/2 (66)	D	No	Ar (Leg)	160.00 - 6.00	0.0000	0.1	2	1	0.5800	0.5800		0.25
7/8 (9,29)	D	Yes	Ar (CfAe)	116.00 - 6.00	-10.0000	0.38	2	2	1.1100	1.1100		0.54
1/2 (13)	D	Yes	Ar (CfAe)	75.00 - 6.00	-10.0000	0.39	1	1	0.5800	0.5800		0.25
7/8 (26)	D	Yes	Ar (CfAe)	85.00 - 6.00	-10.0000	0.39	1	1	1.1100	1.1100		0.54
1/2 (68)	D	Yes	Ar (CfAe)	47.00 - 6.00	-10.0000	0.4	1	1	0.5800	0.5800		0.25
1/2 (56)	A	Yes	Ar (CfAe)	56.00 - 6.00	0.0000	0.49	1	1	0.5800	0.5800		0.25
1 5/8 (1,2,3,6)	D	Yes	Ar (CfAe)	180.00 - 6.00	-12.0000	0.43	4	2	1.9800	1.9800		1.04
7/8 (4,7)	D	Yes	Ar (CfAe)	180.00 - 6.00	-12.0000	0.41	2	2	1.1100	1.1100		0.54
7/8 (28,57)	D	Yes	Ar (CfAe)	150.00 - 6.00	-12.0000	0.4	2	2	1.1100	1.1100		0.54
7/8 (8,30,31,33,55)	D	Yes	Ar (CfAe)	120.00 - 6.00	-12.0000	0.39	5	5	1.1100	1.1100		0.54
1 5/8 (62)	D	Yes	Ar (CfAe)	101.00 - 6.00	-12.0000	0.4	1	1	1.9800	1.9800		1.04
7/8 (10,12,25)	D	Yes	Ar (CfAe)	170.00 - 6.00	-12.0000	0.38	3	3	1.1100	1.1100		0.54
7/8 (11,32)	D	Yes	Ar (CfAe)	100.00 - 6.00	-8.0000	0.41	2	2	1.1100	1.1100		0.54
1 5/8	D	Yes	Ar (CfAe)	160.00 - 6.00	-10.0000	0.4	3	3	1.9800	1.9800		1.04

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
(63,64,65) 1 5/8 (AT&T)	C	Yes	Ar (CfAe)	163.00 - 6.00	-8.0000	-0.45	12	6	1.9800	1.9800		1.04
3" Flex Conduit w 3 Fiber & 6 DC (AT&T)	C	Yes	Ar (CfAe)	163.00 - 6.00	-3.0000	-0.38	1	1	3.0000	3.0000		3.00
RFS Hybriflex (3 Sector) (Sprint)	A	Yes	Ar (CfAe)	106.00 - 6.00	0.0000	0.43	3	3	1.0900	1.0900		0.37
1 5/8" Hybriflex (T-Mobile)	A	Yes	Ar (CfAe)	126.00 - 6.00	0.0000	0.27	2	2	1.6250	1.6250		0.21
ALU Fiber Optic Cable (Sprint)	A	Yes	Ar (CfAe)	126.00 - 6.00	0.0000	0.46	1	1	0.7000	0.7000		0.12

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 K
T1	180.00-170.00	A	0.483	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	5.633	1.320	0.000	0.000	0.07
T2	170.00-163.57	A	0.311	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	5.404	0.848	0.000	0.000	0.06
T3	163.57-159.05	A	0.265	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	4.900	0.000	0.000	0.000	0.06
		D	4.321	0.597	0.000	0.000	0.04
T4	159.05-154.52	A	0.437	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	5.610	0.000	0.000	0.000	0.07
		D	6.262	0.597	0.000	0.000	0.06
T5	154.52-150.00	A	0.437	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	5.610	0.000	0.000	0.000	0.07
		D	6.262	0.597	0.000	0.000	0.06
T6	150.00-140.00	A	0.967	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	15.692	1.320	0.000	0.000	0.14
T7	140.00-130.00	A	0.967	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	15.692	1.320	0.000	0.000	0.14
T8	130.00-120.00	A	7.592	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	17.011	1.320	0.000	0.000	0.14
T9	120.00-110.00	A	12.008	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15

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 K
		D	22.746	1.320	0.000	0.000	0.18
T10	110.00-100.00	A	13.643	0.000	0.000	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	23.651	1.320	0.000	0.000	0.18
T11	100.00-90.00	A	14.733	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	26.986	1.320	0.000	0.000	0.20
T12	90.00-80.00	A	14.733	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	27.449	1.320	0.000	0.000	0.20
T13	80.00-60.00	A	29.467	0.000	0.000	0.000	0.19
		B	0.000	0.000	0.000	0.000	0.00
		C	24.800	0.000	0.000	0.000	0.31
		D	56.548	2.639	0.000	0.000	0.42
T14	60.00-50.00	A	15.023	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	28.395	1.320	0.000	0.000	0.21
T15	50.00-40.00	A	15.217	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	28.733	1.320	0.000	0.000	0.21
T16	40.00-30.00	A	15.217	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	28.878	1.320	0.000	0.000	0.21
T17	30.00-20.00	A	15.217	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	28.878	1.320	0.000	0.000	0.21
T18	20.00-10.00	A	15.217	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	12.400	0.000	0.000	0.000	0.15
		D	28.878	1.320	0.000	0.000	0.21
T19	10.00-0.00	A	6.087	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	4.960	0.000	0.000	0.000	0.06
		D	11.551	0.528	0.000	0.000	0.08

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 K
T1	180.00-170.00	A	0.500	1.317	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		9.800	1.875	0.000	0.000	0.21
T2	170.00-163.57	A	0.500	0.846	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		9.689	1.205	0.000	0.000	0.16
T3	163.57-159.05	A	0.500	0.721	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		7.205	0.000	0.000	0.000	0.14

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 K
		D		7.654	0.848	0.000	0.000	0.12
T4	159.05-154.52	A	0.500	1.191	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		8.249	0.000	0.000	0.000	0.16
		D		10.787	0.848	0.000	0.000	0.16
T5	154.52-150.00	A	0.500	1.191	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		8.249	0.000	0.000	0.000	0.16
		D		10.787	0.848	0.000	0.000	0.16
T6	150.00-140.00	A	0.500	2.633	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		27.358	1.875	0.000	0.000	0.38
T7	140.00-130.00	A	0.500	2.633	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		27.358	1.875	0.000	0.000	0.38
T8	130.00-120.00	A	0.500	13.758	0.000	0.000	0.000	0.16
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		29.511	1.875	0.000	0.000	0.40
T9	120.00-110.00	A	0.500	21.175	0.000	0.000	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		40.413	1.875	0.000	0.000	0.49
T10	110.00-100.00	A	0.500	24.310	0.000	0.000	0.000	0.29
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		42.068	1.875	0.000	0.000	0.51
T11	100.00-90.00	A	0.500	26.400	0.000	0.000	0.000	0.31
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		47.820	1.875	0.000	0.000	0.56
T12	90.00-80.00	A	0.500	26.400	0.000	0.000	0.000	0.31
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		48.699	1.875	0.000	0.000	0.57
T13	80.00-60.00	A	0.500	52.800	0.000	0.000	0.000	0.62
		B		0.000	0.000	0.000	0.000	0.00
		C		36.467	0.000	0.000	0.000	0.72
		D		101.131	3.750	0.000	0.000	1.16
T14	60.00-50.00	A	0.500	27.190	0.000	0.000	0.000	0.31
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		50.895	1.875	0.000	0.000	0.58
T15	50.00-40.00	A	0.500	27.717	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		51.816	1.875	0.000	0.000	0.59
T16	40.00-30.00	A	0.500	27.717	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		52.211	1.875	0.000	0.000	0.59
T17	30.00-20.00	A	0.500	27.717	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		52.211	1.875	0.000	0.000	0.59
T18	20.00-10.00	A	0.500	27.717	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		18.233	0.000	0.000	0.000	0.36
		D		52.211	1.875	0.000	0.000	0.59

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 K
T19	10.00-0.00	A	0.500	11.087	0.000	0.000	0.000	0.13
		B		0.000	0.000	0.000	0.000	0.00
		C		7.293	0.000	0.000	0.000	0.14
		D		20.885	0.750	0.000	0.000	0.24

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180.00-170.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
		D	0.000	0.522	0.740	1.216
T2	170.00-163.57	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
		D	0.000	0.521	0.719	1.237
T3	163.57-159.05	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.462	0.628	0.924
		D	0.000	0.507	0.597	1.014
T4	159.05-154.52	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.370	0.630	0.926
		D	0.000	0.475	0.721	1.187
T5	154.52-150.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.365	0.620	0.912
		D	0.000	0.467	0.710	1.168
T6	150.00-140.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.888	1.509	2.219
		D	0.000	1.309	1.953	3.271
T7	140.00-130.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.788	1.453	2.137
		D	0.000	1.162	1.880	3.150
T8	130.00-120.00	A	0.000	0.374	0.613	1.029
		B	0.000	0.000	0.000	0.000
		C	0.000	0.613	1.147	1.686
		D	0.000	0.976	1.606	2.685
T9	120.00-110.00	A	0.000	0.758	1.216	2.042
		B	0.000	0.000	0.000	0.000
		C	0.000	0.745	1.366	2.008
		D	0.000	1.632	2.544	4.398
T10	110.00-100.00	A	0.000	0.686	1.247	2.132
		B	0.000	0.000	0.000	0.000
		C	0.000	0.577	1.219	1.793
		D	0.000	1.317	2.360	4.089
T11	100.00-90.00	A	0.000	0.735	1.376	2.375
		B	0.000	0.000	0.000	0.000
		C	0.000	0.564	1.239	1.822
		D	0.000	1.464	2.732	4.730
T12	90.00-80.00	A	0.000	0.720	1.346	2.323
		B	0.000	0.000	0.000	0.000
		C	0.000	0.553	1.212	1.782

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		D	0.000	1.461	2.717	4.713
T13	80.00-60.00	A	0.000	1.206	1.747	3.016
		B	0.000	0.000	0.000	0.000
		C	0.000	0.925	1.573	2.314
		D	0.000	2.542	3.633	6.356
T14	60.00-50.00	A	0.000	0.710	0.958	1.673
		B	0.000	0.000	0.000	0.000
		C	0.000	0.527	0.845	1.242
		D	0.000	1.458	1.959	3.435
T15	50.00-40.00	A	0.000	0.717	1.137	2.001
		B	0.000	0.000	0.000	0.000
		C	0.000	0.521	0.989	1.455
		D	0.000	1.467	2.320	4.095
T16	40.00-30.00	A	0.000	0.918	1.364	2.400
		B	0.000	0.000	0.000	0.000
		C	0.000	0.667	1.186	1.745
		D	0.000	1.894	2.797	4.950
T17	30.00-20.00	A	0.000	0.703	1.117	1.965
		B	0.000	0.000	0.000	0.000
		C	0.000	0.511	0.972	1.429
		D	0.000	1.449	2.290	4.053
T18	20.00-10.00	A	0.000	0.906	1.346	2.369
		B	0.000	0.000	0.000	0.000
		C	0.000	0.658	1.171	1.722
		D	0.000	1.868	2.760	4.885
T19	10.00-0.00	A	0.000	0.425	0.604	1.064
		B	0.000	0.000	0.000	0.000
		C	0.000	0.309	0.526	0.773
		D	0.000	0.878	1.240	2.194

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.00-170.00	-3.3826	2.7685	-3.8531	3.1934
T2	170.00-163.57	-3.6578	3.0306	-4.4392	3.7152
T3	163.57-159.05	-0.0465	-0.7044	-0.6833	-0.1357
T4	159.05-154.52	-0.8855	0.0638	-1.7348	0.8176
T5	154.52-150.00	-0.8792	0.1478	-1.7609	0.9417
T6	150.00-140.00	-1.4265	0.8104	-2.4720	1.7730
T7	140.00-130.00	-1.3634	0.9668	-2.4818	2.0106
T8	130.00-120.00	-4.9685	-0.2959	-6.7865	0.5263
T9	120.00-110.00	-8.1539	0.5717	-10.4982	1.7164
T10	110.00-100.00	-9.7412	0.4492	-12.7005	1.5964
T11	100.00-90.00	-10.4376	1.2946	-13.8446	2.5397
T12	90.00-80.00	-11.0751	1.6543	-14.6978	3.0477
T13	80.00-60.00	-13.4332	2.5084	-17.6794	4.3543
T14	60.00-50.00	-14.1222	2.6899	-18.5584	4.5244
T15	50.00-40.00	-14.0874	2.8092	-18.8530	4.7382
T16	40.00-30.00	-13.9195	2.9324	-18.3797	4.8481
T17	30.00-20.00	-15.4507	3.3467	-20.6102	5.5396
T18	20.00-10.00	-14.7660	3.2923	-19.5210	5.3704
T19	10.00-0.00	-7.1714	1.6290	-9.8467	2.7506

Discrete Tower Loads

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 K
6' Standoff (CSP)	B	From Leg	3.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	4.97 6.12	4.97 6.12	0.07 0.13
OGT9-806 (CSP - 1)	B	From Leg	6.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	2.15 3.25	2.15 3.25	0.02 0.03
3" Dia x 15' Omni (CSP - 2)	D	From Leg	6.00 0.00 6.00	0.0000	180.00	No Ice 1/2" Ice	4.50 6.00	4.50 6.00	0.04 0.07
6' Standoff (CSP)	D	From Leg	3.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	4.97 6.12	4.97 6.12	0.07 0.13
OGT9-806 (CSP - 6)	B	From Leg	6.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	2.15 3.25	2.15 3.25	0.02 0.03
3" Dia x 15' Omni (CSP - 3)	D	From Leg	6.00 0.00 6.00	0.0000	180.00	No Ice 1/2" Ice	4.50 6.00	4.50 6.00	0.04 0.07
6' Standoff (CSP)	C	From Leg	3.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	4.97 6.12	4.97 6.12	0.07 0.13
7' Whip (CSP - 4)	C	From Leg	3.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	1.74 2.60	1.74 2.60	0.04 0.05
10'6"x4" Pipe Mount (CSP)	A	From Leg	0.50 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	4.72 5.62	4.72 5.62	0.11 0.15
10' Dipole (CSP - 7)	A	From Leg	6.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	0.05 0.07
TMA (CSP - 67)	C	From Leg	2.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	0.02 0.03
10'6"x4" Pipe Mount (CSP)	A	From Leg	0.50 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice	4.72 5.62	4.72 5.62	0.11 0.15
10'6"x4" Pipe Mount (CSP)	B	From Leg	0.50 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice	4.72 5.62	4.72 5.62	0.11 0.15
10'6"x4" Pipe Mount (CSP)	C	From Leg	0.50 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice	4.72 5.62	4.72 5.62	0.11 0.15
10'6"x4" Pipe Mount (CSP)	D	From Leg	0.50 0.00 0.00	0.0000	176.00	No Ice 1/2" Ice	4.72 5.62	4.72 5.62	0.11 0.15
6' Standoff (CSP)	D	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	4.97 6.12	4.97 6.12	0.07 0.13
6' Standoff (CSP)	C	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	4.97 6.12	4.97 6.12	0.07 0.13
20' 8 Bay Di-Pole	B	From Leg	6.00	0.0000	170.00	No Ice	4.00	4.00	0.06

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 K
(FCP - 12)			0.00 0.00			1/2" Ice	6.00	6.00	0.10
4' Omni	C	From Leg	6.00	0.0000	170.00	No Ice	0.53	0.53	0.03
(CSP - 10)			0.00 0.00			1/2" Ice	0.80	0.80	0.10
4' Omni	D	From Leg	0.50	0.0000	169.00	No Ice	0.53	0.53	0.03
(CAP - 25)			0.00 0.00			1/2" Ice	0.80	0.80	0.10
T-Frame	A	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00 0.00			1/2" Ice	16.20	16.20	0.60
T-Frame	B	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00 0.00			1/2" Ice	16.20	16.20	0.60
T-Frame	C	From Leg	0.50	0.0000	163.00	No Ice	10.20	10.20	0.40
(AT&T)			0.00 0.00			1/2" Ice	16.20	16.20	0.60
7770	A	From Face	2.00	0.0000	163.00	No Ice	10.03	5.60	0.02
(AT&T)			4.00 0.00			1/2" Ice	10.61	6.15	0.07
(2) LGP 219nn	A	From Face	2.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00 0.00			1/2" Ice	0.30	0.17	0.01
(2) LPG21401 TMA	A	From Face	2.00	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00 0.00			1/2" Ice	1.09	0.48	0.02
7770	A	From Face	0.50	0.0000	163.00	No Ice	10.03	5.60	0.02
(AT&T)			-4.00 0.00			1/2" Ice	10.61	6.15	0.07
(2) LGP 219nn	A	From Face	0.50	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			-4.00 0.00			1/2" Ice	0.30	0.17	0.01
TT19-08BP111-001 TMA	A	From Face	0.50	0.0000	163.00	No Ice	0.64	0.52	0.02
(AT&T)			-4.00 0.00			1/2" Ice	0.76	0.62	0.02
P65-16-XLH-RR	A	From Face	1.50	0.0000	163.00	No Ice	8.40	4.70	0.06
(AT&T)			0.00 0.00			1/2" Ice	8.95	5.15	0.11
(2) RRU	A	From Leg	1.50	0.0000	163.00	No Ice	3.79	1.02	0.06
(AT&T)			0.00 0.00			1/2" Ice	4.16	1.23	0.08
Raycap DC6-48-60-18-8F	A	From Leg	0.50	0.0000	163.00	No Ice	1.27	1.27	0.05
DC Power Surge Protection			0.00			1/2" Ice	1.46	1.46	0.07
(AT&T)			0.00						
7770	B	From Face	0.50	0.0000	163.00	No Ice	10.03	5.60	0.02
(AT&T)			4.00 0.00			1/2" Ice	10.61	6.15	0.07
(2) LGP 219nn	B	From Face	0.50	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00 0.00			1/2" Ice	0.30	0.17	0.01
(2) LPG21401 TMA	B	From Face	0.50	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00 0.00			1/2" Ice	1.09	0.48	0.02
7770	B	From Face	0.50	0.0000	163.00	No Ice	10.03	5.60	0.02
(AT&T)			-4.00 0.00			1/2" Ice	10.61	6.15	0.07
(2) LGP 219nn	B	From Face	0.50	0.0000	163.00	No Ice	0.23	0.12	0.01

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 K
(AT&T)			-4.00 0.00			1/2" Ice	0.30	0.17	0.01
TT19-08BP111-001 TMA	B	From Face	0.50	0.0000	163.00	No Ice	0.64	0.52	0.02
(AT&T)			-4.00 0.00			1/2" Ice	0.76	0.62	0.02
P65-16-XLH-RR	B	From Face	0.50	0.0000	163.00	No Ice	8.40	4.70	0.06
(AT&T)			0.00 0.00			1/2" Ice	8.95	5.15	0.11
(2) RRU	B	From Leg	0.50	0.0000	163.00	No Ice	3.79	1.02	0.06
(AT&T)			0.00 0.00			1/2" Ice	4.16	1.23	0.08
7770	C	From Face	0.50	0.0000	163.00	No Ice	10.03	5.60	0.02
(AT&T)			4.00 0.00			1/2" Ice	10.61	6.15	0.07
(2) LGP 219nn	C	From Face	0.50	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			4.00 0.00			1/2" Ice	0.30	0.17	0.01
(2) LPG21401 TMA	C	From Face	0.50	0.0000	163.00	No Ice	0.95	0.37	0.02
(AT&T)			4.00 0.00			1/2" Ice	1.09	0.48	0.02
7770	C	From Face	4.00	0.0000	163.00	No Ice	10.03	5.60	0.02
(AT&T)			-4.00 0.00			1/2" Ice	10.61	6.15	0.07
(2) LGP 219nn	C	From Face	4.00	0.0000	163.00	No Ice	0.23	0.12	0.01
(AT&T)			-4.00 0.00			1/2" Ice	0.30	0.17	0.01
TT19-08BP111-001 TMA	C	From Face	4.00	0.0000	163.00	No Ice	0.64	0.52	0.02
(AT&T)			-4.00 0.00			1/2" Ice	0.76	0.62	0.02
P65-16-XLH-RR	C	From Face	2.00	0.0000	163.00	No Ice	8.40	4.70	0.06
(AT&T)			0.00 0.00			1/2" Ice	8.95	5.15	0.11
(2) RRU	C	From Leg	2.00	0.0000	163.00	No Ice	3.79	1.02	0.06
(AT&T)			0.00 0.00			1/2" Ice	4.16	1.23	0.08
3" Dia x 15' Omni	C	From Leg	2.00	0.0000	160.00	No Ice	4.50	4.50	0.04
(CSP - 63)			0.00 0.00			1/2" Ice	6.00	6.00	0.07
3" Dia x 15' Omni	C	From Leg	2.00	0.0000	160.00	No Ice	4.50	4.50	0.04
(CSP - 64)			0.00 0.00			1/2" Ice	6.00	6.00	0.07
3" Dia x 15' Omni	C	From Leg	2.00	0.0000	160.00	No Ice	4.50	4.50	0.04
(CSP - 65)			0.00 0.00			1/2" Ice	6.00	6.00	0.07
TMA	C	From Leg	2.00	0.0000	160.00	No Ice	1.06	0.45	0.02
(CSP - 66)			0.00 0.00			1/2" Ice	1.21	0.57	0.03
2" Dia 10' Omni	D	From Leg	6.00	0.0000	150.00	No Ice	2.00	2.00	0.03
(CSP)			0.00 0.00			1/2" Ice	3.02	3.02	0.04
DB636-A	D	From Leg	6.00	0.0000	150.00	No Ice	2.78	2.78	0.03
(NEU - 57)			0.00 0.00			1/2" Ice	3.96	3.96	0.05
6' Standoff	A	From Leg	3.00	0.0000	145.00	No Ice	4.97	4.97	0.07
(CSP)			0.00 0.00			1/2" Ice	6.12	6.12	0.13
3' Yagi	A	From Leg	6.00	0.0000	145.00	No Ice	2.08	2.08	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(WTR - 28)			0.00 0.00			1/2" Ice	3.79	3.79	0.05
6' Standoff	C	From Leg	3.00	0.0000	145.00	No Ice	4.97	4.97	0.07
(CSP)			0.00 0.00			1/2" Ice	6.12	6.12	0.13
6' Standoff	D	From Leg	3.00	0.0000	145.00	No Ice	4.97	4.97	0.07
(CSP)			0.00 0.00			1/2" Ice	6.12	6.12	0.13
6' Standoff	A	From Leg	3.00	0.0000	143.00	No Ice	4.97	4.97	0.07
(CSP)			0.00 0.00			1/2" Ice	6.12	6.12	0.13
10'6"x4" Pipe Mount	A	From Leg	0.50	0.0000	133.00	No Ice	4.72	4.72	0.11
(CSP)			0.00 0.00			1/2" Ice	5.62	5.62	0.15
3' Stand-off	C	From Leg	1.50	0.0000	132.00	No Ice	1.00	2.00	0.05
(CSP)			0.00 0.00			1/2" Ice	1.20	2.70	0.07
LeBlanc 10' Standoff (1)	C	From Leg	5.00	0.0000	126.00	No Ice	17.00	17.00	0.55
(CSP)			0.00 0.00			1/2" Ice	22.00	22.00	0.75
3" Dia x 15' Omni	D	From Leg	6.00	0.0000	120.00	No Ice	4.50	4.50	0.04
(WPD - 55)			0.00 0.00			1/2" Ice	6.00	6.00	0.07
PD128-1	C	From Leg	2.00	0.0000	120.00	No Ice	1.00	1.00	0.01
(CSP - 8)			0.00 0.00			1/2" Ice	1.80	1.80	0.02
PD128-1	D	From Leg	2.00	0.0000	120.00	No Ice	1.00	1.00	0.01
(WPD - 33)			0.00 0.00			1/2" Ice	1.80	1.80	0.02
(2) DB586-Y	C	From Leg	6.00	0.0000	120.00	No Ice	1.01	1.01	0.01
(NU - 30&31)			0.00 0.00			1/2" Ice	1.28	1.28	0.02
Rohn 6' Side-Arm(1)	C	From Leg	3.00	0.0000	120.00	No Ice	10.60	10.60	0.14
(NU - 30&31)			0.00 0.00			1/2" Ice	15.40	15.40	0.21
ASP711	A	From Leg	2.00	0.0000	116.00	No Ice	2.34	2.34	0.01
(WTR - 29)			0.00 0.00			1/2" Ice	3.64	3.64	0.02
6' Standoff	D	From Leg	3.00	0.0000	115.00	No Ice	4.97	4.97	0.07
(CSP)			0.00 0.00			1/2" Ice	6.12	6.12	0.13
3' Stand-off	C	From Leg	1.50	0.0000	115.00	No Ice	1.00	2.00	0.05
(CSP)			0.00 0.00			1/2" Ice	1.20	2.70	0.07
6' Stand-off	B	From Leg	3.00	0.0000	112.00	No Ice	1.20	4.50	0.07
(CSP)			0.00 0.00			1/2" Ice	1.40	5.50	0.13
10'6"x4" Pipe Mount	C	From Leg	0.50	0.0000	112.00	No Ice	4.72	4.72	0.11
(CSP)			0.00 0.00			1/2" Ice	5.62	5.62	0.15
DB222	B	From Leg	2.00	0.0000	112.00	No Ice	1.60	1.60	0.02
(DHS - 9)			0.00 0.00			1/2" Ice	2.88	2.88	0.02
12' Wireless Frame	A	From Leg	1.00	0.0000	106.00	No Ice	11.07	11.07	0.24
(Sprint)			0.00 0.00			1/2" Ice	15.53	15.53	0.35
12' Wireless Frame	B	From Leg	1.00	0.0000	106.00	No Ice	11.07	11.07	0.24

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 K
(Sprint)			0.00 0.00			1/2" Ice	15.53	15.53	0.35
12' Wireless Frame	C	From Leg	1.00	0.0000	106.00	No Ice	11.07	11.07	0.24
(Sprint)			0.00 0.00			1/2" Ice	15.53	15.53	0.35
APXVSPP18-C	A	From Leg	1.50	0.0000	106.00	No Ice	8.26	5.28	0.06
(Sprint)			-5.00 0.00			1/2" Ice	8.81	5.74	0.11
APXVSPP18-C	B	From Leg	1.50	0.0000	106.00	No Ice	8.26	5.28	0.06
(Sprint)			-5.00 0.00			1/2" Ice	8.81	5.74	0.11
APXVSPP18-C	C	From Leg	1.50	0.0000	106.00	No Ice	8.26	5.28	0.06
(Sprint)			-5.00 0.00			1/2" Ice	8.81	5.74	0.11
(2) ALU RRH	A	From Leg	1.50	0.0000	106.00	No Ice	2.25	1.23	0.05
(Sprint)			0.00 0.00			1/2" Ice	2.45	1.39	0.07
(2) ALU RRH	B	From Leg	1.50	0.0000	106.00	No Ice	2.25	1.23	0.05
(Sprint)			0.00 0.00			1/2" Ice	2.45	1.39	0.07
(2) ALU RRH	C	From Leg	1.50	0.0000	106.00	No Ice	2.25	1.23	0.05
(Sprint)			0.00 0.00			1/2" Ice	2.45	1.39	0.07
LeBlanc 10' Standoff (1)	A	From Leg	5.00	0.0000	101.00	No Ice	17.00	17.00	0.55
(CSP)			0.00 0.00			1/2" Ice	22.00	22.00	0.75
SC479-HF1LDF	C	From Leg	2.00	0.0000	101.00	No Ice	5.06	5.06	0.03
(CSP - 62)			0.00 0.00			1/2" Ice	6.54	6.54	0.07
3" Dia x 15' Omni	D	From Leg	6.00	0.0000	100.00	No Ice	4.50	4.50	0.04
(DEA - 32)			0.00 0.00			1/2" Ice	6.00	6.00	0.07
3' Stand-off	D	From Leg	1.50	0.0000	88.00	No Ice	1.00	2.00	0.05
(CSP)			0.00 0.00			1/2" Ice	1.20	2.70	0.07
3' Stand-off	D	From Leg	1.50	0.0000	85.00	No Ice	1.00	2.00	0.05
(CSP)			0.00 0.00			1/2" Ice	1.20	2.70	0.07
20' 4-Bay Dipole	C	From Leg	3.00	0.0000	85.00	No Ice	4.00	4.00	0.06
(USS - 26)			0.00 0.00			1/2" Ice	6.00	6.00	0.10
6' Ice Shield	A	From Leg	4.00	0.0000	80.00	No Ice	2.60	2.60	0.13
(CSP)			0.00 0.00			1/2" Ice	3.00	3.00	0.15
10'6"x4" Pipe Mount	A	From Leg	0.50	0.0000	76.00	No Ice	4.72	4.72	0.11
(CSP)			0.00 0.00			1/2" Ice	5.62	5.62	0.15
3' Stand-off	B	From Leg	1.50	0.0000	56.00	No Ice	1.00	2.00	0.05
(Sprint)			0.00 0.00			1/2" Ice	1.20	2.70	0.07
GPS	B	From Leg	3.00	0.0000	56.00	No Ice	1.00	1.00	0.01
(Sprint)			0.00 0.00			1/2" Ice	1.50	1.50	0.01
3' Stand-off	B	From Leg	1.50	0.0000	47.00	No Ice	1.00	2.00	0.05
(CSP)			0.00 0.00			1/2" Ice	1.20	2.70	0.07
DB803M-Y	B	From Leg	3.00	0.0000	47.00	No Ice	0.50	0.50	0.00

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 K
(CSP - 68)			0.00 0.00			1/2" Ice	0.68	0.68	0.01
EUSF10-U (T-Mobile)	A	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
EUSF10-U (T-Mobile)	D	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
EUSF10-U (T-Mobile)	B	From Leg	0.50 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
(2) AIR B2A/B4P (T-Mobile)	A	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.22 4.64	0.08 0.12
(2) AIR B2A/B4P (T-Mobile)	B	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.22 4.64	0.08 0.12
(2) AIR B2A/B4P (T-Mobile)	D	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	6.42 6.86	4.22 4.64	0.08 0.12
(2) TMA (T-Mobile)	A	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.02
(2) TMA (T-Mobile)	B	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.02
(2) TMA (T-Mobile)	D	From Leg	1.00 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.02
APXVTM14-C-1 20 (Sprint)	A	From Leg	1.50 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice	6.90 7.35	4.34 4.74	0.07 0.11
APXVTM14-C-1 20 (Sprint)	B	From Leg	1.50 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice	6.90 7.35	4.34 4.74	0.07 0.11
APXVTM14-C-1 20 (Sprint)	C	From Leg	1.50 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice	6.90 7.35	4.34 4.74	0.07 0.11
TD-RRH8x20-25 (Sprint)	A	From Leg	1.50 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	0.07 0.09
TD-RRH8x20-25 (Sprint)	B	From Leg	1.50 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	0.07 0.09
TD-RRH8x20-25 (Sprint)	C	From Leg	1.50 0.00 0.00	0.0000	106.00	No Ice 1/2" Ice	4.32 4.60	1.41 1.61	0.07 0.09
junction box (Sprint)	A	None		0.0000	106.00	No Ice 1/2" Ice	1.87 2.05	1.40 1.57	0.05 0.06

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
PA6-65AC	A	Paraboloid w/o	From	1.00	Worst		180.00	6.00	No Ice	28.27	0.09
(CSP - 69)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
PA6-65AC	B	Paraboloid w/o	From	1.00	Worst		180.00	6.00	No Ice	28.27	0.09
(CSP - 70)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
PA6-65AC	C	Paraboloid w/o	From	1.00	Worst		180.00	6.00	No Ice	28.27	0.09
(CSP - 71)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
4' Grid Dish	A	Grid	From	1.00	Worst		100.00	4.00	No Ice	12.57	0.08
(CSP - 11)			Leg	0.00					1/2" Ice	13.10	0.15
				0.00							
6' Grid Dish	A	Grid	From	1.00	Worst		75.00	6.00	No Ice	28.27	0.13
(CSP - 13)			Leg	0.00					1/2" Ice	29.07	0.28
				0.00							
PA6-65AC	A	Paraboloid w/o	From	1.00	Worst		176.00	6.00	No Ice	28.27	0.09
(CSP - 5)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
PA6-65AC	C	Paraboloid w/o	From	1.00	Worst		176.00	6.00	No Ice	28.27	0.09
(CSP - 36)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
PA6-65AC	D	Paraboloid w/o	From	1.00	Worst		180.00	6.00	No Ice	28.27	0.09
(CSP - 59)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							
PA6-65AC	A	Paraboloid w/o	From	1.00	Worst		130.00	6.00	No Ice	28.27	0.09
(CSP - 35)		Radome	Leg	0.00					1/2" Ice	29.05	0.24
				0.00							

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	175.00	1.611	33	61.674	A	12.491	0.483	5.833	44.96	0.000	0.000
180.00-170.00					B	12.491	0.000		46.70	0.000	0.000
					C	12.491	0.000		46.70	0.000	0.000
					D	13.071	5.633		31.19	0.000	0.000
T2	166.79	1.589	33	40.022	A	9.832	0.311	5.356	52.81	0.000	0.000
170.00-163.57					B	9.832	0.000		54.47	0.000	0.000
					C	9.832	0.000		54.47	0.000	0.000
					D	9.961	5.404		34.86	0.000	0.000
T3	161.31	1.574	33	28.908	A	7.122	0.265	3.775	51.11	0.000	0.000
163.57-159.05					B	7.122	0.000		53.00	0.000	0.000
					C	6.494	4.900		33.13	0.000	0.000
					D	7.123	4.321		32.99	0.000	0.000
T4	156.79	1.561	32	30.376	A	6.903	0.437	3.775	51.43	0.000	0.000
159.05-154.52					B	6.903	0.000		54.69	0.000	0.000
					C	6.273	5.610		31.77	0.000	0.000
					D	6.779	6.262		28.95	0.000	0.000
T5	152.26	1.548	32	31.844	A	7.011	0.437	3.775	50.68	0.000	0.000
154.52-150.00					B	7.011	0.000		53.84	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	6.391	5.610		31.46	0.000	0.000
					D	6.898	6.262		28.68	0.000	0.000
T6	145.00	1.526	32	75.634	A	16.767	0.967	8.344	47.05	0.000	0.000
150.00-140.00					B	16.767	0.000		49.76	0.000	0.000
					C	15.258	12.400		30.17	0.000	0.000
					D	16.134	15.692		26.22	0.000	0.000
T7	135.00	1.496	31	83.296	A	19.051	0.967	10.013	50.02	0.000	0.000
140.00-130.00					B	19.051	0.000		52.56	0.000	0.000
					C	17.598	12.400		33.38	0.000	0.000
					D	18.490	15.692		29.29	0.000	0.000
T8	125.00	1.463	30	90.466	A	17.265	7.592	10.013	40.28	0.000	0.000
130.00-120.00					B	17.878	0.000		56.01	0.000	0.000
					C	16.731	12.400		34.37	0.000	0.000
					D	17.591	17.011		28.94	0.000	0.000
T9	115.00	1.429	30	97.774	A	18.812	12.008	10.013	32.49	0.000	0.000
120.00-110.00					B	20.028	0.000		49.99	0.000	0.000
					C	18.662	12.400		32.23	0.000	0.000
					D	18.804	22.746		24.10	0.000	0.000
T10	105.00	1.392	29	104.945	A	18.510	13.643	10.013	31.14	0.000	0.000
110.00-100.00					B	19.757	0.000		50.68	0.000	0.000
					C	18.538	12.400		32.36	0.000	0.000
					D	18.716	23.651		23.63	0.000	0.000
T11	95.00	1.353	28	112.984	A	22.496	14.733	13.350	35.86	0.000	0.000
100.00-90.00					B	23.872	0.000		55.93	0.000	0.000
					C	22.633	12.400		38.11	0.000	0.000
					D	22.460	26.986		27.00	0.000	0.000
T12	85.00	1.31	27	120.155	A	23.020	14.733	13.350	35.36	0.000	0.000
90.00-80.00					B	24.365	0.000		54.79	0.000	0.000
					C	23.153	12.400		37.55	0.000	0.000
					D	22.968	27.449		26.48	0.000	0.000
T13	70.00	1.24	26	263.233	A	13.769	57.836	28.370	39.62	0.000	0.000
80.00-60.00					B	15.516	28.370		64.64	0.000	0.000
					C	13.943	53.170		42.27	0.000	0.000
					D	14.523	84.917		28.53	0.000	0.000
T14	55.00	1.157	24	142.444	A	8.092	29.208	14.185	38.03	0.000	0.000
60.00-50.00					B	9.050	14.185		61.05	0.000	0.000
					C	8.205	26.585		40.77	0.000	0.000
					D	8.411	42.580		27.82	0.000	0.000
T15	45.00	1.093	23	149.614	A	10.055	29.402	14.185	35.95	0.000	0.000
50.00-40.00					B	11.192	14.185		55.90	0.000	0.000
					C	10.202	26.585		38.56	0.000	0.000
					D	10.191	42.918		26.71	0.000	0.000
T16	35.00	1.017	21	156.196	A	26.004	15.217	13.350	32.39	0.000	0.000
40.00-30.00					B	27.367	0.000		48.78	0.000	0.000
					C	26.181	12.400		34.60	0.000	0.000
					D	25.890	28.878		24.38	0.000	0.000
T17	25.00	1	21	163.366	A	24.350	15.217	13.350	33.74	0.000	0.000
30.00-20.00					B	25.467	0.000		52.42	0.000	0.000
					C	24.495	12.400		36.18	0.000	0.000
					D	24.496	28.878		25.01	0.000	0.000
T18	15.00	1	21	170.539	A	27.188	15.217	13.350	31.48	0.000	0.000
20.00-10.00					B	28.533	0.000		46.79	0.000	0.000
					C	27.362	12.400		33.58	0.000	0.000
					D	27.093	28.878		23.85	0.000	0.000
T19 10.00-0.00	5.00	1	21	177.715	A	29.084	6.087	13.350	37.96	0.000	0.000
					B	29.688	0.000		44.97	0.000	0.000
					C	29.162	4.960		39.13	0.000	0.000
					D	28.976	11.551		32.94	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.611	33	0.5000	62.507	A	12.491	5.837	7.500	40.92	0.000	0.000
180.00-170.00						B	12.491	4.520		44.09	0.000	0.000
						C	12.491	4.520		44.09	0.000	0.000
						D	13.151	13.798		27.83	0.000	0.000
T2	166.79	1.589	33	0.5000	40.557	A	9.832	3.803	6.427	47.14	0.000	0.000
170.00-163.57						B	9.832	2.957		50.26	0.000	0.000
						C	9.832	2.957		50.26	0.000	0.000
						D	9.800	12.124		29.31	0.000	0.000
T3	161.31	1.574	33	0.5000	29.285	A	7.122	3.150	4.530	44.10	0.000	0.000
163.57-159.05						B	7.122	2.429		47.43	0.000	0.000
						C	6.198	9.171		29.47	0.000	0.000
						D	6.957	9.576		27.40	0.000	0.000
T4	156.79	1.561	32	0.5000	30.753	A	6.903	3.197	4.530	44.85	0.000	0.000
159.05-154.52						B	6.903	2.006		50.85	0.000	0.000
						C	5.976	9.885		28.56	0.000	0.000
						D	6.564	12.318		23.99	0.000	0.000
T5	152.26	1.548	32	0.5000	32.221	A	7.011	3.241	4.530	44.19	0.000	0.000
154.52-150.00						B	7.011	2.050		50.00	0.000	0.000
						C	6.099	9.934		28.25	0.000	0.000
						D	6.691	12.369		23.77	0.000	0.000
T6	145.00	1.526	32	0.5000	76.467	A	16.767	7.671	10.013	40.97	0.000	0.000
150.00-140.00						B	16.767	5.038		45.92	0.000	0.000
						C	14.548	22.384		27.11	0.000	0.000
						D	15.371	31.088		21.55	0.000	0.000
T7	135.00	1.496	31	0.5000	84.129	A	19.051	7.625	11.682	43.79	0.000	0.000
140.00-130.00						B	19.051	4.992		48.59	0.000	0.000
						C	16.914	22.437		29.69	0.000	0.000
						D	17.776	31.188		23.86	0.000	0.000
T8	125.00	1.463	30	0.5000	91.300	A	16.849	17.904	11.682	33.61	0.000	0.000
130.00-120.00						B	17.878	4.520		52.16	0.000	0.000
						C	16.191	22.140		30.48	0.000	0.000
						D	17.068	33.055		23.31	0.000	0.000
T9	115.00	1.429	30	0.5000	98.608	A	17.986	25.793	11.682	26.68	0.000	0.000
120.00-110.00						B	20.028	5.376		45.98	0.000	0.000
						C	18.020	22.864		28.57	0.000	0.000
						D	17.505	44.157		18.94	0.000	0.000
T10	105.00	1.392	29	0.5000	105.778	A	17.625	28.422	11.682	25.37	0.000	0.000
110.00-100.00						B	19.757	4.799		47.57	0.000	0.000
						C	17.964	22.455		28.90	0.000	0.000
						D	17.543	45.550		18.52	0.000	0.000
T11	95.00	1.353	28	0.5000	113.818	A	21.497	30.579	15.019	28.84	0.000	0.000
100.00-90.00						B	23.872	4.914		52.17	0.000	0.000
						C	22.050	22.584		33.65	0.000	0.000
						D	21.017	51.270		20.78	0.000	0.000
T12 90.00-80.00	85.00	1.31	27	0.5000	120.989	A	22.043	30.757	15.019	28.45	0.000	0.000
						B	24.365	5.077		51.01	0.000	0.000
						C	22.583	22.758		33.13	0.000	0.000
						D	21.528	52.314		20.34	0.000	0.000
T13 80.00-60.00	70.00	1.24	26	0.5000	264.901	A	12.500	89.507	31.707	31.08	0.000	0.000
						B	15.516	37.914		59.34	0.000	0.000
						C	13.202	73.455		36.59	0.000	0.000
						D	12.911	136.503		21.22	0.000	0.000
T14 60.00-50.00	55.00	1.157	24	0.5000	143.277	A	7.377	46.165	15.854	29.61	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	9.050	19.686		55.17	0.000	0.000
						C	7.807	37.392		35.08	0.000	0.000
						D	7.490	69.122		20.69	0.000	0.000
T15 50.00-40.00	45.00	1.093	23	0.5000	150.448	A	9.191	46.871	15.854	28.28	0.000	0.000
						B	11.192	19.871		51.04	0.000	0.000
						C	9.737	37.583		33.50	0.000	0.000
						D	8.972	70.220		20.02	0.000	0.000
T16 40.00-30.00	35.00	1.017	21	0.5000	157.030	A	24.967	33.825	15.019	25.55	0.000	0.000
						B	27.367	7.027		43.67	0.000	0.000
						C	25.623	24.592		29.91	0.000	0.000
						D	24.293	57.344		18.40	0.000	0.000
T17 30.00-20.00	25.00	1	21	0.5000	164.200	A	23.501	33.021	15.019	26.57	0.000	0.000
						B	25.467	6.007		47.72	0.000	0.000
						C	24.038	23.729		31.44	0.000	0.000
						D	23.289	56.769		18.76	0.000	0.000
T18 20.00-10.00	15.00	1	21	0.5000	171.373	A	26.165	34.281	15.019	24.85	0.000	0.000
						B	28.533	7.470		41.72	0.000	0.000
						C	26.811	25.045		28.96	0.000	0.000
						D	25.523	57.813		18.02	0.000	0.000
T19 10.00-0.00	5.00	1	21	0.5000	178.549	A	28.624	18.717	15.019	31.73	0.000	0.000
						B	29.688	8.056		39.79	0.000	0.000
						C	28.915	15.040		34.17	0.000	0.000
						D	28.244	28.063		26.67	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	175.00	1.611	33	61.674	A	12.491	0.483	5.833	44.96	0.000	0.000
180.00-170.00					B	12.491	0.000		46.70	0.000	0.000
					C	12.491	0.000		46.70	0.000	0.000
					D	13.071	5.633		31.19	0.000	0.000
T2	166.79	1.589	33	40.022	A	9.832	0.311	5.356	52.81	0.000	0.000
170.00-163.57					B	9.832	0.000		54.47	0.000	0.000
					C	9.832	0.000		54.47	0.000	0.000
					D	9.961	5.404		34.86	0.000	0.000
T3	161.31	1.574	33	28.908	A	7.122	0.265	3.775	51.11	0.000	0.000
163.57-159.05					B	7.122	0.000		53.00	0.000	0.000
					C	6.494	4.900		33.13	0.000	0.000
					D	7.123	4.321		32.99	0.000	0.000
T4	156.79	1.561	32	30.376	A	6.903	0.437	3.775	51.43	0.000	0.000
159.05-154.52					B	6.903	0.000		54.69	0.000	0.000
					C	6.273	5.610		31.77	0.000	0.000
					D	6.779	6.262		28.95	0.000	0.000
T5	152.26	1.548	32	31.844	A	7.011	0.437	3.775	50.68	0.000	0.000
154.52-150.00					B	7.011	0.000		53.84	0.000	0.000
					C	6.391	5.610		31.46	0.000	0.000
					D	6.898	6.262		28.68	0.000	0.000
T6	145.00	1.526	32	75.634	A	16.767	0.967	8.344	47.05	0.000	0.000
150.00-140.00					B	16.767	0.000		49.76	0.000	0.000
					C	15.258	12.400		30.17	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					D	16.134	15.692		26.22	0.000	0.000
T7	135.00	1.496	31	83.296	A	19.051	0.967	10.013	50.02	0.000	0.000
140.00-130.00					B	19.051	0.000		52.56	0.000	0.000
					C	17.598	12.400		33.38	0.000	0.000
					D	18.490	15.692		29.29	0.000	0.000
T8	125.00	1.463	30	90.466	A	17.265	7.592	10.013	40.28	0.000	0.000
130.00-120.00					B	17.878	0.000		56.01	0.000	0.000
					C	16.731	12.400		34.37	0.000	0.000
					D	17.591	17.011		28.94	0.000	0.000
T9	115.00	1.429	30	97.774	A	18.812	12.008	10.013	32.49	0.000	0.000
120.00-110.00					B	20.028	0.000		49.99	0.000	0.000
					C	18.662	12.400		32.23	0.000	0.000
					D	18.804	22.746		24.10	0.000	0.000
T10	105.00	1.392	29	104.945	A	18.510	13.643	10.013	31.14	0.000	0.000
110.00-100.00					B	19.757	0.000		50.68	0.000	0.000
					C	18.538	12.400		32.36	0.000	0.000
					D	18.716	23.651		23.63	0.000	0.000
T11	95.00	1.353	28	112.984	A	22.496	14.733	13.350	35.86	0.000	0.000
100.00-90.00					B	23.872	0.000		55.93	0.000	0.000
					C	22.633	12.400		38.11	0.000	0.000
					D	22.460	26.986		27.00	0.000	0.000
T12	85.00	1.31	27	120.155	A	23.020	14.733	13.350	35.36	0.000	0.000
90.00-80.00					B	24.365	0.000		54.79	0.000	0.000
					C	23.153	12.400		37.55	0.000	0.000
					D	22.968	27.449		26.48	0.000	0.000
T13	70.00	1.24	26	263.233	A	13.769	57.836	28.370	39.62	0.000	0.000
80.00-60.00					B	15.516	28.370		64.64	0.000	0.000
					C	13.943	53.170		42.27	0.000	0.000
					D	14.523	84.917		28.53	0.000	0.000
T14	55.00	1.157	24	142.444	A	8.092	29.208	14.185	38.03	0.000	0.000
60.00-50.00					B	9.050	14.185		61.05	0.000	0.000
					C	8.205	26.585		40.77	0.000	0.000
					D	8.411	42.580		27.82	0.000	0.000
T15	45.00	1.093	23	149.614	A	10.055	29.402	14.185	35.95	0.000	0.000
50.00-40.00					B	11.192	14.185		55.90	0.000	0.000
					C	10.202	26.585		38.56	0.000	0.000
					D	10.191	42.918		26.71	0.000	0.000
T16	35.00	1.017	21	156.196	A	26.004	15.217	13.350	32.39	0.000	0.000
40.00-30.00					B	27.367	0.000		48.78	0.000	0.000
					C	26.181	12.400		34.60	0.000	0.000
					D	25.890	28.878		24.38	0.000	0.000
T17	25.00	1	21	163.366	A	24.350	15.217	13.350	33.74	0.000	0.000
30.00-20.00					B	25.467	0.000		52.42	0.000	0.000
					C	24.495	12.400		36.18	0.000	0.000
					D	24.496	28.878		25.01	0.000	0.000
T18	15.00	1	21	170.539	A	27.188	15.217	13.350	31.48	0.000	0.000
20.00-10.00					B	28.533	0.000		46.79	0.000	0.000
					C	27.362	12.400		33.58	0.000	0.000
					D	27.093	28.878		23.85	0.000	0.000
T19 10.00-0.00	5.00	1	21	177.715	A	29.084	6.087	13.350	37.96	0.000	0.000
					B	29.688	0.000		44.97	0.000	0.000
					C	29.162	4.960		39.13	0.000	0.000
					D	28.976	11.551		32.94	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.07	0.75	A	0.21	2.936	0.593	1	1	12.778	1.60	159.73	D
180.00-170.00			B	0.203	2.969	0.591	1	1	12.491			
			C	0.203	2.969	0.591	1	1	12.491			
			D	0.303	2.579	0.617	1	1	16.547			
T2	0.06	0.54	A	0.253	2.762	0.603	1	1	10.019	1.15	179.59	D
170.00-163.57			B	0.246	2.792	0.601	1	1	9.832			
			C	0.246	2.792	0.601	1	1	9.832			
			D	0.384	2.324	0.645	1	1	13.448			
T3	0.11	0.39	A	0.256	2.754	0.603	1	1	7.282	0.83	183.94	D
163.57-159.05			B	0.246	2.789	0.601	1	1	7.122			
			C	0.394	2.296	0.649	1	1	9.675			
			D	0.396	2.291	0.65	1	1	9.931			
T4	0.13	0.36	A	0.242	2.808	0.6	1	1	7.165	0.87	193.31	D
159.05-154.52			B	0.227	2.866	0.596	1	1	6.903			
			C	0.391	2.304	0.648	1	1	9.908			
			D	0.429	2.204	0.664	1	1	10.937			
T5	0.13	0.37	A	0.234	2.839	0.598	1	1	7.273	0.89	196.59	D
154.52-150.00			B	0.22	2.895	0.595	1	1	7.011			
			C	0.377	2.345	0.642	1	1	9.995			
			D	0.413	2.245	0.657	1	1	11.014			
T6	0.29	0.97	A	0.234	2.837	0.598	1	1	17.345	2.09	209.20	D
150.00-140.00			B	0.222	2.889	0.595	1	1	16.767			
			C	0.366	2.377	0.638	1	1	23.172			
			D	0.421	2.226	0.66	1	1	26.495			
T7	0.29	1.53	A	0.24	2.813	0.599	1	1	19.630	2.25	225.35	D
140.00-130.00			B	0.229	2.86	0.597	1	1	19.051			
			C	0.36	2.394	0.636	1	1	25.486			
			D	0.41	2.252	0.656	1	1	28.782			
T8	0.35	1.43	A	0.275	2.681	0.609	1	1	21.884	2.26	226.11	D
130.00-120.00			B	0.198	2.99	0.59	1	1	17.878			
			C	0.322	2.515	0.623	1	1	24.454			
			D	0.382	2.328	0.645	1	1	28.557			
T9	0.41	2.05	A	0.315	2.538	0.621	1	1	26.265	2.49	249.07	D
120.00-110.00			B	0.205	2.959	0.591	1	1	20.028			
			C	0.318	2.529	0.621	1	1	26.369			
			D	0.425	2.215	0.662	1	1	33.864			
T10	0.43	1.91	A	0.306	2.568	0.618	1	1	26.940	2.51	250.90	D
110.00-100.00			B	0.188	3.031	0.588	1	1	19.757			
			C	0.295	2.608	0.614	1	1	26.155			
			D	0.404	2.27	0.653	1	1	34.163			
T11	0.45	2.50	A	0.33	2.49	0.625	1	1	31.710	2.78	277.95	D
100.00-90.00			B	0.211	2.932	0.593	1	1	23.872			
			C	0.31	2.555	0.619	1	1	30.309			
			D	0.438	2.184	0.668	1	1	40.478			
T12	0.45	2.43	A	0.314	2.541	0.62	1	1	32.160	2.79	278.82	D
90.00-80.00			B	0.203	2.968	0.591	1	1	24.365			
			C	0.296	2.604	0.615	1	1	30.775			
			D	0.42	2.229	0.66	1	1	41.078			
T13	0.92	7.96	A	0.272	2.691	0.608	1	1	48.919	4.66	233.17	D
80.00-60.00			B	0.167	3.128	0.584	1	1	32.089			
			C	0.255	2.756	0.603	1	1	46.012			
			D	0.378	2.342	0.643	1	1	69.106			
T14	0.46	4.57	A	0.262	2.729	0.605	1	1	25.762	2.29	228.96	D
60.00-50.00			B	0.163	3.144	0.584	1	1	17.328			
			C	0.244	2.798	0.6	1	1	24.167			
			D	0.358	2.401	0.635	1	1	35.464			
T15	0.46	5.12	A	0.264	2.722	0.605	1	1	27.857	2.29	228.95	D
50.00-40.00			B	0.17	3.114	0.585	1	1	19.485			
			C	0.246	2.791	0.601	1	1	26.175			
			D	0.355	2.41	0.634	1	1	37.412			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T16	0.46	4.78	A	0.264	2.722	0.606	1	1	35.218	2.53	252.92	D
40.00-30.00			B	0.175	3.089	0.586	1	1	27.367			
			C	0.247	2.787	0.601	1	1	33.635			
			D	0.351	2.423	0.633	1	1	44.161			
T17	0.46	4.27	A	0.242	2.806	0.6	1	1	33.479	2.47	247.05	D
30.00-20.00			B	0.156	3.177	0.582	1	1	25.467			
			C	0.226	2.872	0.596	1	1	31.886			
			D	0.327	2.499	0.624	1	1	42.529			
T18	0.46	5.02	A	0.249	2.78	0.602	1	1	36.341	2.62	261.71	D
20.00-10.00			B	0.167	3.125	0.584	1	1	28.533			
			C	0.233	2.842	0.598	1	1	34.774			
			D	0.328	2.494	0.625	1	1	45.139			
T19	0.19	4.70	A	0.198	2.989	0.59	1	1	32.675	2.39	238.63	D
10.00-0.00			B	0.167	3.126	0.584	1	1	29.688			
			C	0.192	3.015	0.589	1	1	32.083			
			D	0.228	2.863	0.597	1	1	35.867			
Sum Weight:	6.59	51.64						OTM	3576.82 kip-ft	41.77		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.75	A	0.21	2.936	0.593	1.158	1.158	14.794	1.92	191.67	D
180.00-170.00			B	0.203	2.969	0.591	1.152	1.152	14.389			
			C	0.203	2.969	0.591	1.152	1.152	14.389			
			D	0.303	2.579	0.617	1.2	1.2	19.856			
T2	0.06	0.54	A	0.253	2.762	0.603	1.19	1.19	11.923	1.39	215.51	D
170.00-163.57			B	0.246	2.792	0.601	1.184	1.184	11.643			
			C	0.246	2.792	0.601	1.184	1.184	11.643			
			D	0.384	2.324	0.645	1.2	1.2	16.138			
T3	0.11	0.39	A	0.256	2.754	0.603	1.192	1.192	8.677	1.00	220.73	D
163.57-159.05			B	0.246	2.789	0.601	1.185	1.185	8.438			
			C	0.394	2.296	0.649	1.2	1.2	11.610			
			D	0.396	2.291	0.65	1.2	1.2	11.917			
T4	0.13	0.36	A	0.242	2.808	0.6	1.181	1.181	8.463	1.05	231.97	D
159.05-154.52			B	0.227	2.866	0.596	1.17	1.17	8.079			
			C	0.391	2.304	0.648	1.2	1.2	11.890			
			D	0.429	2.204	0.664	1.2	1.2	13.124			
T5	0.13	0.37	A	0.234	2.839	0.598	1.175	1.175	8.549	1.07	235.91	D
154.52-150.00			B	0.22	2.895	0.595	1.165	1.165	8.169			
			C	0.377	2.345	0.642	1.2	1.2	11.994			
			D	0.413	2.245	0.657	1.2	1.2	13.216			
T6	0.29	0.97	A	0.234	2.837	0.598	1.176	1.176	20.395	2.51	251.04	D
150.00-140.00			B	0.222	2.889	0.595	1.166	1.166	19.555			
			C	0.366	2.377	0.638	1.2	1.2	27.806			
			D	0.421	2.226	0.66	1.2	1.2	31.794			
T7	0.29	1.53	A	0.24	2.813	0.599	1.18	1.18	23.169	2.70	270.42	D
140.00-130.00			B	0.229	2.86	0.597	1.172	1.172	22.319			
			C	0.36	2.394	0.636	1.2	1.2	30.583			
			D	0.41	2.252	0.656	1.2	1.2	34.539			
T8	0.35	1.43	A	0.275	2.681	0.609	1.2	1.2	26.261	2.71	271.33	D
130.00-120.00			B	0.198	2.99	0.59	1.148	1.148	20.527			
			C	0.322	2.515	0.623	1.2	1.2	29.345			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			D	0.382	2.328	0.645	1.2	1.2	34.268			
T9	0.41	2.05	A	0.315	2.538	0.621	1.2	1.2	31.518	2.99	298.88	D
120.00-110.00			B	0.205	2.959	0.591	1.154	1.154	23.105			
			C	0.318	2.529	0.621	1.2	1.2	31.642			
			D	0.425	2.215	0.662	1.2	1.2	40.637			
T10	0.43	1.91	A	0.306	2.568	0.618	1.2	1.2	32.328	3.01	301.07	D
110.00-100.00			B	0.188	3.031	0.588	1.141	1.141	22.546			
			C	0.295	2.608	0.614	1.2	1.2	31.386			
			D	0.404	2.27	0.653	1.2	1.2	40.996			
T11	0.45	2.50	A	0.33	2.49	0.625	1.2	1.2	38.052	3.34	333.54	D
100.00-90.00			B	0.211	2.932	0.593	1.158	1.158	27.655			
			C	0.31	2.555	0.619	1.2	1.2	36.371			
			D	0.438	2.184	0.668	1.2	1.2	48.574			
T12	0.45	2.43	A	0.314	2.541	0.62	1.2	1.2	38.592	3.35	334.59	D
90.00-80.00			B	0.203	2.968	0.591	1.152	1.152	28.071			
			C	0.296	2.604	0.615	1.2	1.2	36.930			
			D	0.42	2.229	0.66	1.2	1.2	49.294			
T13	0.92	7.96	A	0.272	2.691	0.608	1.2	1.2	58.702	5.60	279.80	D
80.00-60.00			B	0.167	3.128	0.584	1.125	1.125	36.101			
			C	0.255	2.756	0.603	1.191	1.191	54.810			
			D	0.378	2.342	0.643	1.2	1.2	82.927			
T14	0.46	4.57	A	0.262	2.729	0.605	1.196	1.196	30.822	2.75	274.75	D
60.00-50.00			B	0.163	3.144	0.584	1.122	1.122	19.447			
			C	0.244	2.798	0.6	1.183	1.183	28.594			
			D	0.358	2.401	0.635	1.2	1.2	42.556			
T15	0.46	5.12	A	0.264	2.722	0.605	1.198	1.198	33.366	2.75	274.74	D
50.00-40.00			B	0.17	3.114	0.585	1.127	1.127	21.964			
			C	0.246	2.791	0.601	1.184	1.184	31.002			
			D	0.355	2.41	0.634	1.2	1.2	44.895			
T16	0.46	4.78	A	0.264	2.722	0.606	1.198	1.198	42.188	3.04	303.50	D
40.00-30.00			B	0.175	3.089	0.586	1.131	1.131	30.964			
			C	0.247	2.787	0.601	1.185	1.185	39.866			
			D	0.351	2.423	0.633	1.2	1.2	52.993			
T17	0.46	4.27	A	0.242	2.806	0.6	1.182	1.182	39.560	2.96	296.46	D
30.00-20.00			B	0.156	3.177	0.582	1.117	1.117	28.444			
			C	0.226	2.872	0.596	1.169	1.169	37.287			
			D	0.327	2.499	0.624	1.2	1.2	51.034			
T18	0.46	5.02	A	0.249	2.78	0.602	1.186	1.186	43.118	3.14	314.05	D
20.00-10.00			B	0.167	3.125	0.584	1.125	1.125	32.114			
			C	0.233	2.842	0.598	1.175	1.175	40.855			
			D	0.328	2.494	0.625	1.2	1.2	54.167			
T19	0.19	4.70	A	0.198	2.989	0.59	1.148	1.148	37.524	2.79	279.44	D
10.00-0.00			B	0.167	3.126	0.584	1.125	1.125	33.408			
			C	0.192	3.015	0.589	1.144	1.144	36.702			
			D	0.228	2.863	0.597	1.171	1.171	42.001			
Sum Weight:	6.59	51.64						OTM	4291.84 kip-ft	50.05		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.21	1.18	A	0.293	2.614	0.614	1	1	16.074	1.84	183.84	D
180.00-170.00			B	0.272	2.691	0.608	1	1	15.239			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.272	2.691	0.608	1	1	15.239			
			D	0.431	2.2	0.665	1	1	22.324			
T2	0.16	0.86	A	0.336	2.469	0.628	1	1	12.219	1.35	210.60	D
170.00-163.57			B	0.315	2.537	0.621	1	1	11.667			
			C	0.315	2.537	0.621	1	1	11.667			
			D	0.541	1.979	0.719	1	1	18.518			
T3	0.27	0.63	A	0.351	2.423	0.633	1	1	9.115	0.99	219.57	D
163.57-159.05			B	0.326	2.501	0.624	1	1	8.638			
			C	0.525	2.005	0.71	1	1	12.714			
			D	0.565	1.944	0.733	1	1	13.971			
T4	0.32	0.56	A	0.328	2.494	0.625	1	1	8.901	1.09	241.19	D
159.05-154.52			B	0.29	2.627	0.613	1	1	8.132			
			C	0.516	2.021	0.706	1	1	12.952			
			D	0.614	1.885	0.762	1	1	15.954			
T5	0.32	0.57	A	0.318	2.528	0.622	1	1	9.026	1.10	242.18	D
154.52-150.00			B	0.281	2.657	0.61	1	1	8.262			
			C	0.498	2.055	0.696	1	1	13.016			
			D	0.592	1.91	0.748	1	1	15.949			
T6	0.74	1.49	A	0.32	2.523	0.622	1	1	21.539	2.61	261.39	D
150.00-140.00			B	0.285	2.643	0.611	1	1	19.848			
			C	0.483	2.084	0.689	1	1	29.969			
			D	0.608	1.892	0.758	1	1	38.943			
T7	0.74	2.18	A	0.317	2.531	0.621	1	1	23.788	2.73	273.40	D
140.00-130.00			B	0.286	2.641	0.612	1	1	22.104			
			C	0.468	2.115	0.682	1	1	32.207			
			D	0.582	1.921	0.743	1	1	40.941			
T8	0.92	1.98	A	0.381	2.334	0.644	1	1	28.377	2.74	274.10	D
130.00-120.00			B	0.245	2.793	0.601	1	1	20.592			
			C	0.42	2.228	0.66	1	1	30.801			
			D	0.549	1.967	0.724	1	1	40.990			
T9	1.12	2.78	A	0.444	2.169	0.671	1	1	35.281	3.20	320.45	D
120.00-110.00			B	0.258	2.745	0.604	1	1	23.274			
			C	0.415	2.241	0.658	1	1	33.057			
			D	0.625	1.875	0.769	1	1	51.480			
T10	1.16	2.52	A	0.435	2.19	0.667	1	1	36.573	3.19	318.89	D
110.00-100.00			B	0.232	2.846	0.597	1	1	22.624			
			C	0.382	2.33	0.644	1	1	32.435			
			D	0.596	1.904	0.751	1	1	51.771			
T11	1.23	3.28	A	0.458	2.138	0.677	1	1	42.192	3.57	356.68	D
100.00-90.00			B	0.253	2.764	0.603	1	1	26.833			
			C	0.392	2.301	0.648	1	1	36.694			
			D	0.635	1.866	0.776	1	1	60.788			
T12	1.23	3.15	A	0.436	2.187	0.667	1	1	42.561	3.53	352.60	D
90.00-80.00			B	0.243	2.801	0.6	1	1	27.413			
			C	0.375	2.351	0.642	1	1	37.185			
			D	0.61	1.889	0.76	1	1	61.285			
T13	2.50	9.49	A	0.385	2.321	0.646	1	1	70.289	6.32	316.21	D
80.00-60.00			B	0.202	2.973	0.591	1	1	37.914			
			C	0.327	2.498	0.625	1	1	59.081			
			D	0.564	1.945	0.732	1	1	112.865			
T14	1.26	5.52	A	0.374	2.354	0.641	1	1	36.979	3.05	304.72	D
60.00-50.00			B	0.201	2.978	0.591	1	1	20.674			
			C	0.315	2.537	0.621	1	1	31.018			
			D	0.535	1.989	0.716	1	1	56.969			
T15	1.27	5.97	A	0.373	2.357	0.641	1	1	39.226	3.00	299.66	D
50.00-40.00			B	0.206	2.952	0.592	1	1	22.950			
			C	0.315	2.54	0.62	1	1	33.056			
			D	0.526	2.003	0.711	1	1	58.919			
T16	1.27	5.99	A	0.374	2.352	0.641	1	1	46.666	3.09	308.84	D
40.00-30.00			B	0.219	2.9	0.594	1	1	31.544			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.32	2.522	0.622	1	1	40.923			
			D	0.52	2.014	0.708	1	1	64.883			
T17	1.27	5.18	A	0.344	2.443	0.63	1	1	44.319	3.01	301.46	D
30.00-20.00			B	0.192	3.016	0.589	1	1	29.003			
			C	0.291	2.622	0.613	1	1	38.588			
			D	0.488	2.074	0.691	1	1	62.529			
T18	1.27	6.32	A	0.353	2.417	0.633	1	1	47.880	3.16	315.92	D
20.00-10.00			B	0.21	2.937	0.593	1	1	32.959			
			C	0.303	2.581	0.617	1	1	42.256			
			D	0.486	2.077	0.691	1	1	65.449			
T19	0.51	6.11	A	0.265	2.717	0.606	1	1	39.964	2.69	269.28	D
10.00-0.00			B	0.211	2.932	0.593	1	1	34.463			
			C	0.246	2.79	0.601	1	1	37.952			
			D	0.315	2.537	0.621	1	1	45.663			
Sum Weight:	17.73	65.76						OTM	4467.74 kip-ft	52.27		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.21	1.18	A	0.293	2.614	0.614	1.2	1.2	19.289	2.21	220.61	D
180.00-170.00			B	0.272	2.691	0.608	1.2	1.2	18.286			
			C	0.272	2.691	0.608	1.2	1.2	18.286			
			D	0.431	2.2	0.665	1.2	1.2	26.789			
T2	0.16	0.86	A	0.336	2.469	0.628	1.2	1.2	14.662	1.62	252.72	D
170.00-163.57			B	0.315	2.537	0.621	1.2	1.2	14.001			
			C	0.315	2.537	0.621	1.2	1.2	14.001			
			D	0.541	1.979	0.719	1.2	1.2	22.222			
T3	0.27	0.63	A	0.351	2.423	0.633	1.2	1.2	10.938	1.19	263.48	D
163.57-159.05			B	0.326	2.501	0.624	1.2	1.2	10.366			
			C	0.525	2.005	0.71	1.2	1.2	15.257			
			D	0.565	1.944	0.733	1.2	1.2	16.766			
T4	0.32	0.56	A	0.328	2.494	0.625	1.2	1.2	10.681	1.31	289.43	D
159.05-154.52			B	0.29	2.627	0.613	1.2	1.2	9.758			
			C	0.516	2.021	0.706	1.2	1.2	15.542			
			D	0.614	1.885	0.762	1.2	1.2	19.145			
T5	0.32	0.57	A	0.318	2.528	0.622	1.2	1.2	10.831	1.31	290.61	D
154.52-150.00			B	0.281	2.657	0.61	1.2	1.2	9.915			
			C	0.498	2.055	0.696	1.2	1.2	15.620			
			D	0.592	1.91	0.748	1.2	1.2	19.139			
T6	0.74	1.49	A	0.32	2.523	0.622	1.2	1.2	25.847	3.14	313.67	D
150.00-140.00			B	0.285	2.643	0.611	1.2	1.2	23.817			
			C	0.483	2.084	0.689	1.2	1.2	35.963			
			D	0.608	1.892	0.758	1.2	1.2	46.732			
T7	0.74	2.18	A	0.317	2.531	0.621	1.2	1.2	28.546	3.28	328.08	D
140.00-130.00			B	0.286	2.641	0.612	1.2	1.2	26.525			
			C	0.468	2.115	0.682	1.2	1.2	38.648			
			D	0.582	1.921	0.743	1.2	1.2	49.130			
T8	0.92	1.98	A	0.381	2.334	0.644	1.2	1.2	34.052	3.29	328.92	D
130.00-120.00			B	0.245	2.793	0.601	1.184	1.184	24.381			
			C	0.42	2.228	0.66	1.2	1.2	36.962			
			D	0.549	1.967	0.724	1.2	1.2	49.188			
T9	1.12	2.78	A	0.444	2.169	0.671	1.2	1.2	42.337	3.85	384.54	D

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
120.00-110.00			B	0.258	2.745	0.604	1.193	1.193	27.771			
			C	0.415	2.241	0.658	1.2	1.2	39.668			
			D	0.625	1.875	0.769	1.2	1.2	61.776			
T10	1.16	2.52	A	0.435	2.19	0.667	1.2	1.2	43.888	3.83	382.67	D
110.00-100.00			B	0.232	2.846	0.597	1.174	1.174	26.563			
			C	0.382	2.33	0.644	1.2	1.2	38.922			
			D	0.596	1.904	0.751	1.2	1.2	62.125			
T11	1.23	3.28	A	0.458	2.138	0.677	1.2	1.2	50.631	4.28	428.02	D
100.00-90.00			B	0.253	2.764	0.603	1.19	1.19	31.923			
			C	0.392	2.301	0.648	1.2	1.2	44.033			
			D	0.635	1.866	0.776	1.2	1.2	72.945			
T12	1.23	3.15	A	0.436	2.187	0.667	1.2	1.2	51.073	4.23	423.12	D
90.00-80.00			B	0.243	2.801	0.6	1.183	1.183	32.416			
			C	0.375	2.351	0.642	1.2	1.2	44.622			
			D	0.61	1.889	0.76	1.2	1.2	73.542			
T13	2.50	9.49	A	0.385	2.321	0.646	1.2	1.2	84.346	7.59	379.45	D
80.00-60.00			B	0.202	2.973	0.591	1.151	1.151	43.649			
			C	0.327	2.498	0.625	1.2	1.2	70.897			
			D	0.564	1.945	0.732	1.2	1.2	135.438			
T14	1.26	5.52	A	0.374	2.354	0.641	1.2	1.2	44.374	3.66	365.67	D
60.00-50.00			B	0.201	2.978	0.591	1.15	1.15	23.784			
			C	0.315	2.537	0.621	1.2	1.2	37.222			
			D	0.535	1.989	0.716	1.2	1.2	68.363			
T15	1.27	5.97	A	0.373	2.357	0.641	1.2	1.2	47.071	3.60	359.60	D
50.00-40.00			B	0.206	2.952	0.592	1.155	1.155	26.504			
			C	0.315	2.54	0.62	1.2	1.2	39.667			
			D	0.526	2.003	0.711	1.2	1.2	70.703			
T16	1.27	5.99	A	0.374	2.352	0.641	1.2	1.2	55.999	3.71	370.61	D
40.00-30.00			B	0.219	2.9	0.594	1.164	1.164	36.726			
			C	0.32	2.522	0.622	1.2	1.2	49.108			
			D	0.52	2.014	0.708	1.2	1.2	77.860			
T17	1.27	5.18	A	0.344	2.443	0.63	1.2	1.2	53.182	3.62	361.75	D
30.00-20.00			B	0.192	3.016	0.589	1.144	1.144	33.172			
			C	0.291	2.622	0.613	1.2	1.2	46.306			
			D	0.488	2.074	0.691	1.2	1.2	75.035			
T18	1.27	6.32	A	0.353	2.417	0.633	1.2	1.2	57.456	3.79	379.11	D
20.00-10.00			B	0.21	2.937	0.593	1.158	1.158	38.152			
			C	0.303	2.581	0.617	1.2	1.2	50.708			
			D	0.486	2.077	0.691	1.2	1.2	78.539			
T19	0.51	6.11	A	0.265	2.717	0.606	1.199	1.199	47.911	3.23	323.13	D
10.00-0.00			B	0.211	2.932	0.593	1.159	1.159	39.927			
			C	0.246	2.79	0.601	1.185	1.185	44.960			
			D	0.315	2.537	0.621	1.2	1.2	54.796			
Sum Weight:	17.73	65.76						OTM	5361.29 kip-ft	62.72		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.75	A	0.21	2.936	0.593	1	1	12.778	1.60	159.73	D
180.00-170.00			B	0.203	2.969	0.591	1	1	12.491			
			C	0.203	2.969	0.591	1	1	12.491			
			D	0.303	2.579	0.617	1	1	16.547			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T2	0.06	0.54	A	0.253	2.762	0.603	1	1	10.019	1.15	179.59	D
170.00-163.57			B	0.246	2.792	0.601	1	1	9.832			
			C	0.246	2.792	0.601	1	1	9.832			
			D	0.384	2.324	0.645	1	1	13.448			
T3	0.11	0.39	A	0.256	2.754	0.603	1	1	7.282	0.83	183.94	D
163.57-159.05			B	0.246	2.789	0.601	1	1	7.122			
			C	0.394	2.296	0.649	1	1	9.675			
			D	0.396	2.291	0.65	1	1	9.931			
T4	0.13	0.36	A	0.242	2.808	0.6	1	1	7.165	0.87	193.31	D
159.05-154.52			B	0.227	2.866	0.596	1	1	6.903			
			C	0.391	2.304	0.648	1	1	9.908			
			D	0.429	2.204	0.664	1	1	10.937			
T5	0.13	0.37	A	0.234	2.839	0.598	1	1	7.273	0.89	196.59	D
154.52-150.00			B	0.22	2.895	0.595	1	1	7.011			
			C	0.377	2.345	0.642	1	1	9.995			
			D	0.413	2.245	0.657	1	1	11.014			
T6	0.29	0.97	A	0.234	2.837	0.598	1	1	17.345	2.09	209.20	D
150.00-140.00			B	0.222	2.889	0.595	1	1	16.767			
			C	0.366	2.377	0.638	1	1	23.172			
			D	0.421	2.226	0.66	1	1	26.495			
T7	0.29	1.53	A	0.24	2.813	0.599	1	1	19.630	2.25	225.35	D
140.00-130.00			B	0.229	2.86	0.597	1	1	19.051			
			C	0.36	2.394	0.636	1	1	25.486			
			D	0.41	2.252	0.656	1	1	28.782			
T8	0.35	1.43	A	0.275	2.681	0.609	1	1	21.884	2.26	226.11	D
130.00-120.00			B	0.198	2.99	0.59	1	1	17.878			
			C	0.322	2.515	0.623	1	1	24.454			
			D	0.382	2.328	0.645	1	1	28.557			
T9	0.41	2.05	A	0.315	2.538	0.621	1	1	26.265	2.49	249.07	D
120.00-110.00			B	0.205	2.959	0.591	1	1	20.028			
			C	0.318	2.529	0.621	1	1	26.369			
			D	0.425	2.215	0.662	1	1	33.864			
T10	0.43	1.91	A	0.306	2.568	0.618	1	1	26.940	2.51	250.90	D
110.00-100.00			B	0.188	3.031	0.588	1	1	19.757			
			C	0.295	2.608	0.614	1	1	26.155			
			D	0.404	2.27	0.653	1	1	34.163			
T11	0.45	2.50	A	0.33	2.49	0.625	1	1	31.710	2.78	277.95	D
100.00-90.00			B	0.211	2.932	0.593	1	1	23.872			
			C	0.31	2.555	0.619	1	1	30.309			
			D	0.438	2.184	0.668	1	1	40.478			
T12	0.45	2.43	A	0.314	2.541	0.62	1	1	32.160	2.79	278.82	D
90.00-80.00			B	0.203	2.968	0.591	1	1	24.365			
			C	0.296	2.604	0.615	1	1	30.775			
			D	0.42	2.229	0.66	1	1	41.078			
T13	0.92	7.96	A	0.272	2.691	0.608	1	1	48.919	4.66	233.17	D
80.00-60.00			B	0.167	3.128	0.584	1	1	32.089			
			C	0.255	2.756	0.603	1	1	46.012			
			D	0.378	2.342	0.643	1	1	69.106			
T14	0.46	4.57	A	0.262	2.729	0.605	1	1	25.762	2.29	228.96	D
60.00-50.00			B	0.163	3.144	0.584	1	1	17.328			
			C	0.244	2.798	0.6	1	1	24.167			
			D	0.358	2.401	0.635	1	1	35.464			
T15	0.46	5.12	A	0.264	2.722	0.605	1	1	27.857	2.29	228.95	D
50.00-40.00			B	0.17	3.114	0.585	1	1	19.485			
			C	0.246	2.791	0.601	1	1	26.175			
			D	0.355	2.41	0.634	1	1	37.412			
T16	0.46	4.78	A	0.264	2.722	0.606	1	1	35.218	2.53	252.92	D
40.00-30.00			B	0.175	3.089	0.586	1	1	27.367			
			C	0.247	2.787	0.601	1	1	33.635			
			D	0.351	2.423	0.633	1	1	44.161			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T17	0.46	4.27	A	0.242	2.806	0.6	1	1	33.479	2.47	247.05	D
30.00-20.00			B	0.156	3.177	0.582	1	1	25.467			
			C	0.226	2.872	0.596	1	1	31.886			
			D	0.327	2.499	0.624	1	1	42.529			
T18	0.46	5.02	A	0.249	2.78	0.602	1	1	36.341	2.62	261.71	D
20.00-10.00			B	0.167	3.125	0.584	1	1	28.533			
			C	0.233	2.842	0.598	1	1	34.774			
			D	0.328	2.494	0.625	1	1	45.139			
T19	0.19	4.70	A	0.198	2.989	0.59	1	1	32.675	2.39	238.63	D
10.00-0.00			B	0.167	3.126	0.584	1	1	29.688			
			C	0.192	3.015	0.589	1	1	32.083			
			D	0.228	2.863	0.597	1	1	35.867			
Sum Weight:	6.59	51.64						OTM	3576.82 kip-ft	41.77		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.07	0.75	A	0.21	2.936	0.593	1.158	1.158	14.794	1.92	191.67	D
180.00-170.00			B	0.203	2.969	0.591	1.152	1.152	14.389			
			C	0.203	2.969	0.591	1.152	1.152	14.389			
			D	0.303	2.579	0.617	1.2	1.2	19.856			
T2	0.06	0.54	A	0.253	2.762	0.603	1.19	1.19	11.923	1.39	215.51	D
170.00-163.57			B	0.246	2.792	0.601	1.184	1.184	11.643			
			C	0.246	2.792	0.601	1.184	1.184	11.643			
			D	0.384	2.324	0.645	1.2	1.2	16.138			
T3	0.11	0.39	A	0.256	2.754	0.603	1.192	1.192	8.677	1.00	220.73	D
163.57-159.05			B	0.246	2.789	0.601	1.185	1.185	8.438			
			C	0.394	2.296	0.649	1.2	1.2	11.610			
			D	0.396	2.291	0.65	1.2	1.2	11.917			
T4	0.13	0.36	A	0.242	2.808	0.6	1.181	1.181	8.463	1.05	231.97	D
159.05-154.52			B	0.227	2.866	0.596	1.17	1.17	8.079			
			C	0.391	2.304	0.648	1.2	1.2	11.890			
			D	0.429	2.204	0.664	1.2	1.2	13.124			
T5	0.13	0.37	A	0.234	2.839	0.598	1.175	1.175	8.549	1.07	235.91	D
154.52-150.00			B	0.22	2.895	0.595	1.165	1.165	8.169			
			C	0.377	2.345	0.642	1.2	1.2	11.994			
			D	0.413	2.245	0.657	1.2	1.2	13.216			
T6	0.29	0.97	A	0.234	2.837	0.598	1.176	1.176	20.395	2.51	251.04	D
150.00-140.00			B	0.222	2.889	0.595	1.166	1.166	19.555			
			C	0.366	2.377	0.638	1.2	1.2	27.806			
			D	0.421	2.226	0.66	1.2	1.2	31.794			
T7	0.29	1.53	A	0.24	2.813	0.599	1.18	1.18	23.169	2.70	270.42	D
140.00-130.00			B	0.229	2.86	0.597	1.172	1.172	22.319			
			C	0.36	2.394	0.636	1.2	1.2	30.583			
			D	0.41	2.252	0.656	1.2	1.2	34.539			
T8	0.35	1.43	A	0.275	2.681	0.609	1.2	1.2	26.261	2.71	271.33	D
130.00-120.00			B	0.198	2.99	0.59	1.148	1.148	20.527			
			C	0.322	2.515	0.623	1.2	1.2	29.345			
			D	0.382	2.328	0.645	1.2	1.2	34.268			
T9	0.41	2.05	A	0.315	2.538	0.621	1.2	1.2	31.518	2.99	298.88	D
120.00-110.00			B	0.205	2.959	0.591	1.154	1.154	23.105			
			C	0.318	2.529	0.621	1.2	1.2	31.642			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			D	0.425	2.215	0.662	1.2	1.2	40.637			
T10	0.43	1.91	A	0.306	2.568	0.618	1.2	1.2	32.328	3.01	301.07	D
110.00-100.00			B	0.188	3.031	0.588	1.141	1.141	22.546			
			C	0.295	2.608	0.614	1.2	1.2	31.386			
			D	0.404	2.27	0.653	1.2	1.2	40.996			
T11	0.45	2.50	A	0.33	2.49	0.625	1.2	1.2	38.052	3.34	333.54	D
100.00-90.00			B	0.211	2.932	0.593	1.158	1.158	27.655			
			C	0.31	2.555	0.619	1.2	1.2	36.371			
			D	0.438	2.184	0.668	1.2	1.2	48.574			
T12	0.45	2.43	A	0.314	2.541	0.62	1.2	1.2	38.592	3.35	334.59	D
90.00-80.00			B	0.203	2.968	0.591	1.152	1.152	28.071			
			C	0.296	2.604	0.615	1.2	1.2	36.930			
			D	0.42	2.229	0.66	1.2	1.2	49.294			
T13	0.92	7.96	A	0.272	2.691	0.608	1.2	1.2	58.702	5.60	279.80	D
80.00-60.00			B	0.167	3.128	0.584	1.125	1.125	36.101			
			C	0.255	2.756	0.603	1.191	1.191	54.810			
			D	0.378	2.342	0.643	1.2	1.2	82.927			
T14	0.46	4.57	A	0.262	2.729	0.605	1.196	1.196	30.822	2.75	274.75	D
60.00-50.00			B	0.163	3.144	0.584	1.122	1.122	19.447			
			C	0.244	2.798	0.6	1.183	1.183	28.594			
			D	0.358	2.401	0.635	1.2	1.2	42.556			
T15	0.46	5.12	A	0.264	2.722	0.605	1.198	1.198	33.366	2.75	274.74	D
50.00-40.00			B	0.17	3.114	0.585	1.127	1.127	21.964			
			C	0.246	2.791	0.601	1.184	1.184	31.002			
			D	0.355	2.41	0.634	1.2	1.2	44.895			
T16	0.46	4.78	A	0.264	2.722	0.606	1.198	1.198	42.188	3.04	303.50	D
40.00-30.00			B	0.175	3.089	0.586	1.131	1.131	30.964			
			C	0.247	2.787	0.601	1.185	1.185	39.866			
			D	0.351	2.423	0.633	1.2	1.2	52.993			
T17	0.46	4.27	A	0.242	2.806	0.6	1.182	1.182	39.560	2.96	296.46	D
30.00-20.00			B	0.156	3.177	0.582	1.117	1.117	28.444			
			C	0.226	2.872	0.596	1.169	1.169	37.287			
			D	0.327	2.499	0.624	1.2	1.2	51.034			
T18	0.46	5.02	A	0.249	2.78	0.602	1.186	1.186	43.118	3.14	314.05	D
20.00-10.00			B	0.167	3.125	0.584	1.125	1.125	32.114			
			C	0.233	2.842	0.598	1.175	1.175	40.855			
			D	0.328	2.494	0.625	1.2	1.2	54.167			
T19	0.19	4.70	A	0.198	2.989	0.59	1.148	1.148	37.524	2.79	279.44	D
10.00-0.00			B	0.167	3.126	0.584	1.125	1.125	33.408			
			C	0.192	3.015	0.589	1.144	1.144	36.702			
			D	0.228	2.863	0.597	1.171	1.171	42.001			
Sum Weight:	6.59	51.64						OTM	4291.84 kip-ft	50.05		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	30.80					
Bracing Weight	20.84					
Total Member Self-Weight	51.64			-11.13	10.48	
Total Weight	68.76			-11.13	10.48	
Wind 0 deg - No Ice		-0.21	-71.45	-8070.12	35.04	-42.38
Wind 30 deg - No Ice		39.95	-68.94	-7597.36	-4398.04	-45.44

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 45 deg - No Ice		56.60	-56.23	-6197.92	-6236.82	-38.98
Wind 60 deg - No Ice		69.40	-39.68	-4376.86	-7649.86	-29.88
Wind 90 deg - No Ice		71.97	0.21	13.43	-8134.08	-7.53
Wind 120 deg - No Ice		69.61	40.05	4397.15	-7674.42	18.95
Wind 135 deg - No Ice		56.90	56.53	6210.40	-6271.55	30.07
Wind 150 deg - No Ice		40.31	69.15	7599.67	-4440.58	39.13
Wind 180 deg - No Ice		0.21	71.45	8047.86	-14.09	42.38
Wind 210 deg - No Ice		-39.95	68.94	7575.10	4418.99	45.44
Wind 225 deg - No Ice		-56.60	56.23	6175.66	6257.77	38.98
Wind 240 deg - No Ice		-69.40	39.68	4354.60	7670.81	29.88
Wind 270 deg - No Ice		-71.97	-0.21	-35.69	8155.03	7.53
Wind 300 deg - No Ice		-69.61	-40.05	-4419.41	7695.37	-18.95
Wind 315 deg - No Ice		-56.90	-56.53	-6232.66	6292.51	-30.07
Wind 330 deg - No Ice		-40.31	-69.15	-7621.93	4461.54	-39.13
Member Ice	14.12					
Total Weight Ice	100.21			-14.38	37.97	
Wind 0 deg - Ice		-0.21	-88.06	-9747.26	60.97	-72.15
Wind 30 deg - Ice		49.35	-85.21	-9205.64	-5299.03	-74.88
Wind 45 deg - Ice		69.89	-69.51	-7512.14	-7521.59	-62.89
Wind 60 deg - Ice		85.68	-49.08	-5307.68	-9228.98	-46.60
Wind 90 deg - Ice		88.60	0.21	8.61	-9782.31	-8.61
Wind 120 deg - Ice		85.89	49.44	5318.74	-9251.98	36.49
Wind 135 deg - Ice		70.19	69.81	7515.89	-7554.11	54.63
Wind 150 deg - Ice		49.71	85.42	9199.87	-5338.86	69.04
Wind 180 deg - Ice		0.21	88.06	9718.49	14.98	72.15
Wind 210 deg - Ice		-49.35	85.21	9176.87	5374.97	74.88
Wind 225 deg - Ice		-69.89	69.51	7483.37	7597.53	62.89
Wind 240 deg - Ice		-85.68	49.08	5278.91	9304.92	46.60
Wind 270 deg - Ice		-88.60	-0.21	-37.38	9858.26	8.61
Wind 300 deg - Ice		-85.89	-49.44	-5347.51	9327.92	-36.49
Wind 315 deg - Ice		-70.19	-69.81	-7544.66	7630.06	-54.63
Wind 330 deg - Ice		-49.71	-85.42	-9228.64	5414.80	-69.04
Total Weight	68.76			-11.13	10.48	
Wind 0 deg - Service		-0.21	-71.45	-8067.82	25.54	-42.38
Wind 30 deg - Service		39.95	-68.94	-7595.06	-4407.54	-45.44
Wind 45 deg - Service		56.60	-56.23	-6195.62	-6246.32	-38.98
Wind 60 deg - Service		69.40	-39.68	-4374.56	-7659.36	-29.88
Wind 90 deg - Service		71.97	0.21	15.74	-8143.58	-7.53
Wind 120 deg - Service		69.61	40.05	4399.45	-7683.92	18.95
Wind 135 deg - Service		56.90	56.53	6212.70	-6281.06	30.07
Wind 150 deg - Service		40.31	69.15	7601.97	-4450.09	39.13
Wind 180 deg - Service		0.21	71.45	8050.16	-23.59	42.38
Wind 210 deg - Service		-39.95	68.94	7577.41	4409.49	45.44
Wind 225 deg - Service		-56.60	56.23	6177.97	6248.27	38.98
Wind 240 deg - Service		-69.40	39.68	4356.91	7661.31	29.88
Wind 270 deg - Service		-71.97	-0.21	-33.39	8145.53	7.53
Wind 300 deg - Service		-69.61	-40.05	-4417.10	7685.87	-18.95
Wind 315 deg - Service		-56.90	-56.53	-6230.36	6283.01	-30.07
Wind 330 deg - Service		-40.31	-69.15	-7619.62	4452.03	-39.13

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice

Comb. No.	Description
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 170	Leg	Max Tension	21	6.70	-0.86	-0.83
			Max. Compression	29	-6.92	-0.99	-1.14
			Max. Mx	34	1.14	3.29	-2.58
			Max. My	24	1.15	-2.62	3.33
			Max. Vy	27	-2.81	1.25	-0.33

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	19	-2.81	-0.32	1.25
		Diagonal	Max Tension	27	5.71	0.00	0.00
			Max. Compression	19	-6.55	0.00	0.00
			Max. Mx	29	4.56	0.02	-0.00
			Max. My	17	4.23	0.01	0.00
			Max. Vy	29	0.01	0.02	-0.00
			Max. Vx	17	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.78	0.00	0.00
			Max. Compression	23	-0.80	0.00	0.00
			Max. Mx	18	0.01	-0.02	0.00
			Max. My	26	0.39	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	27	0.51	0.00	0.00
			Max. Compression	14	-0.12	0.00	0.00
			Max. Mx	18	0.12	-0.02	0.00
			Max. My	34	0.03	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
T2	170 - 163.573	Leg	Max Tension	29	19.66	-0.68	-0.82
			Max. Compression	29	-21.37	-1.00	-1.05
			Max. Mx	31	-15.04	1.44	-0.40
			Max. My	23	-14.89	-0.40	1.44
			Max. Vy	27	0.35	1.34	-0.30
			Max. Vx	19	0.35	-0.30	1.34
		Diagonal	Max Tension	32	6.52	0.00	0.00
			Max. Compression	24	-7.13	0.00	0.00
			Max. Mx	25	5.84	0.03	-0.00
			Max. My	15	4.23	0.00	0.00
			Max. Vy	25	0.01	0.03	-0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Girt	Max Tension	27	1.25	0.00	0.00
			Max. Compression	10	-0.73	0.00	0.00
			Max. Mx	18	0.34	-0.02	0.00
			Max. My	28	-0.09	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T3	163.573 - 159.049	Leg	Max Tension	25	32.78	-0.65	-0.65
			Max. Compression	25	-36.54	-1.05	-1.10
			Max. Mx	31	-25.51	1.74	-0.06
			Max. My	23	-26.00	-0.04	1.74
			Max. Vy	23	1.06	-0.69	-0.23
			Max. Vx	31	1.08	-0.23	-0.69
		Diagonal	Max Tension	31	5.69	0.00	0.00
			Max. Compression	31	-5.90	0.00	0.00
			Max. Mx	24	3.20	0.02	0.00
			Max. My	19	-5.74	-0.00	-0.01
			Max. Vy	24	0.01	0.02	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	27	1.52	0.00	0.00
			Max. Compression	14	-0.90	0.00	0.00
			Max. Mx	18	0.25	-0.02	0.00
			Max. My	28	-0.44	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T4	159.049 - 154.524	Leg	Max Tension	25	43.19	-0.39	-0.42
			Max. Compression	25	-48.73	-0.53	-0.51
			Max. Mx	30	8.90	1.33	-0.96

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	24	9.36	-0.96	1.33
			Max. Vy	34	-0.41	1.30	-0.95
			Max. Vx	24	-0.41	-0.96	1.33
		Diagonal	Max Tension	27	6.46	0.00	0.00
			Max. Compression	19	-6.15	0.00	0.00
			Max. Mx	24	2.68	0.04	0.00
			Max. My	27	-6.10	-0.01	0.01
			Max. Vy	24	0.02	0.04	0.00
			Max. Vx	27	-0.00	0.00	0.00
T5	154.524 - 150	Leg	Max Tension	25	52.82	-0.66	-0.61
			Max. Compression	25	-58.08	-0.91	-0.92
			Max. Mx	20	-55.82	-1.01	-0.74
			Max. My	30	-55.44	-0.74	-1.02
			Max. Vy	20	0.41	-1.01	-0.74
			Max. Vx	30	0.42	-0.74	-1.02
		Diagonal	Max Tension	31	6.02	0.00	0.00
			Max. Compression	31	-6.40	0.00	0.00
			Max. Mx	24	2.36	0.05	-0.00
			Max. My	27	-5.98	-0.01	0.01
			Max. Vy	24	-0.02	0.05	-0.00
			Max. Vx	27	-0.00	-0.01	0.01
T6	150 - 140	Leg	Max Tension	25	74.80	-0.68	-0.71
			Max. Compression	25	-81.08	-0.89	-0.79
			Max. Mx	30	14.11	1.66	-1.23
			Max. My	24	14.35	-1.24	1.67
			Max. Vy	30	-0.56	1.66	-1.23
			Max. Vx	24	-0.57	-1.24	1.67
		Diagonal	Max Tension	31	6.75	0.00	0.00
			Max. Compression	31	-6.84	0.00	0.00
			Max. Mx	24	3.07	0.07	-0.00
			Max. My	23	-6.30	-0.02	-0.01
			Max. Vy	24	-0.02	0.07	-0.00
			Max. Vx	23	0.00	0.00	0.00
		Top Girt	Max Tension	23	1.05	0.00	0.00
			Max. Compression	6	-0.91	0.00	0.00
			Max. Mx	27	1.04	-0.03	0.00
			Max. My	28	-0.38	0.00	0.00
			Max. Vy	27	0.02	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T7	140 - 130	Leg	Max Tension	25	89.59	-1.01	-1.02
			Max. Compression	25	-97.27	-0.22	-0.07
			Max. Mx	29	-3.77	4.88	-4.73
			Max. My	21	-5.06	-4.73	4.88
			Max. Vy	33	-1.03	4.79	-4.66
			Max. Vx	25	-1.03	-4.65	4.79
		Diagonal	Max Tension	31	8.96	0.00	0.00
			Max. Compression	24	-9.13	0.00	0.00
			Max. Mx	24	5.77	0.13	-0.00
			Max. My	23	-9.03	-0.03	-0.05
			Max. Vy	24	0.03	0.13	-0.00
			Max. Vx	23	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	25	1.46	0.00	0.00
			Max. Compression	25	-1.46	0.00	0.00
			Max. Mx	27	-0.82	-0.04	0.00
			Max. My	28	0.42	0.00	0.00
			Max. Vy	27	0.02	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Top Girt	Max Tension	32	0.90	0.00	0.00
			Max. Compression	31	-0.92	-0.09	0.00
			Max. Mx	19	-0.90	-0.12	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	19	-0.90	-0.12	0.01
			Max. Vy	19	-0.04	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Inner Bracing	Max Tension	33	0.17	0.00	0.00
			Max. Compression	33	-0.17	0.00	0.00
			Max. Mx	18	0.00	-0.03	0.00
			Max. My	31	-0.00	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T8	130 - 120	Leg	Max Tension	25	110.86	0.90	0.89
			Max. Compression	25	-120.84	-1.03	-0.73
			Max. Mx	30	-115.14	3.17	1.83
			Max. My	20	-114.83	1.83	3.16
			Max. Vy	20	1.33	2.20	-0.88
			Max. Vx	30	1.34	-0.86	2.25
		Diagonal	Max Tension	30	10.53	0.00	0.00
			Max. Compression	22	-10.76	0.00	0.00
			Max. Mx	24	3.84	0.17	-0.02
			Max. My	23	-10.10	-0.03	0.06
			Max. Vy	24	-0.04	0.17	-0.02
			Max. Vx	23	-0.01	-0.03	0.06
		Secondary Horizontal	Max Tension	25	1.81	0.00	0.00
			Max. Compression	25	-1.81	0.00	0.00
			Max. Mx	27	-1.38	-0.05	0.00
			Max. My	28	0.52	0.00	0.00
			Max. Vy	27	-0.02	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T9	120 - 110	Leg	Max Tension	25	133.20	-1.87	-1.85
			Max. Compression	25	-146.56	-0.42	-0.40
			Max. Mx	21	-5.82	5.80	-5.61
			Max. My	29	-7.73	-5.61	5.80
			Max. Vy	33	-1.27	5.75	-5.56
			Max. Vx	25	-1.27	-5.58	5.76
		Diagonal	Max Tension	32	11.02	0.00	0.00
			Max. Compression	24	-11.24	0.00	0.00
			Max. Mx	24	7.19	0.12	-0.00
			Max. My	23	-10.99	-0.02	-0.06
			Max. Vy	24	0.04	0.12	-0.00
			Max. Vx	23	0.01	0.00	0.00
		Horizontal	Max Tension	23	0.97	0.00	0.00
			Max. Compression	23	-1.16	-0.15	0.01
			Max. Mx	27	-1.14	-0.20	0.01
			Max. My	19	-1.12	-0.20	0.01
			Max. Vy	27	-0.06	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	25	2.20	0.00	0.00
			Max. Compression	25	-2.20	0.00	0.00
			Max. Mx	27	-1.17	-0.05	0.00
			Max. My	28	0.63	0.00	0.00
			Max. Vy	27	-0.02	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Inner Bracing	Max Tension	25	0.11	0.00	0.00
			Max. Compression	25	-0.11	0.00	0.00
			Max. Mx	18	0.00	-0.05	0.00
			Max. My	31	-0.00	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T10	110 - 100	Leg	Max Tension	25	157.46	-2.01	-2.30
			Max. Compression	33	-173.77	-2.02	-1.75

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	23	-117.68	3.77	-0.06
			Max. My	31	-117.99	-0.01	3.66
			Max. Vy	34	1.43	-1.18	-0.55
			Max. Vx	24	1.45	-0.60	-1.14
		Diagonal	Max Tension	26	12.31	0.00	0.00
			Max. Compression	34	-12.55	0.00	0.00
			Max. Mx	24	4.90	0.21	-0.01
			Max. My	31	-12.17	-0.03	0.04
			Max. Vy	24	-0.05	0.21	-0.01
			Max. Vx	27	0.01	-0.03	-0.04
		Secondary Horizontal	Max Tension	33	2.61	0.00	0.00
			Max. Compression	33	-2.61	0.00	0.00
			Max. Mx	27	-1.49	-0.07	0.00
			Max. My	28	0.75	0.00	0.00
			Max. Vy	27	0.03	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T11	100 - 90	Leg	Max Tension	33	183.09	-1.79	-1.39
			Max. Compression	33	-202.52	-0.52	-0.90
			Max. Mx	34	38.58	6.53	-5.68
			Max. My	24	40.91	-5.69	6.55
			Max. Vy	34	-1.01	6.53	-5.68
			Max. Vx	24	-1.00	-5.69	6.55
		Diagonal	Max Tension	27	12.96	0.00	0.00
			Max. Compression	27	-13.16	0.00	0.00
			Max. Mx	32	7.36	0.15	0.00
			Max. My	19	-13.07	-0.02	0.05
			Max. Vy	32	0.04	0.15	0.00
			Max. Vx	19	-0.01	0.00	0.00
		Horizontal	Max Tension	23	1.55	0.00	0.00
			Max. Compression	23	-1.65	-0.21	0.01
			Max. Mx	19	-1.61	-0.29	0.01
			Max. My	19	-1.60	-0.29	0.01
			Max. Vy	19	-0.07	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Inner Bracing	Max Tension	25	0.12	0.00	0.00
			Max. Compression	25	-0.12	0.00	0.00
			Max. Mx	18	0.00	-0.07	0.00
			Max. My	31	-0.00	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T12	90 - 80	Leg	Max Tension	33	209.04	-1.95	-2.17
			Max. Compression	33	-230.26	-1.08	-1.20
			Max. Mx	31	-155.62	3.86	-0.31
			Max. My	23	-155.62	-0.28	3.84
			Max. Vy	30	1.27	-2.53	-1.75
			Max. Vx	20	1.26	-1.83	-2.44
		Diagonal	Max Tension	27	13.70	0.00	0.00
			Max. Compression	27	-13.97	0.00	0.00
			Max. Mx	34	5.61	0.18	0.01
			Max. My	19	-12.49	-0.01	0.03
			Max. Vy	34	-0.05	0.18	0.01
			Max. Vx	19	-0.01	-0.01	0.03
		Secondary Horizontal	Max Tension	33	3.46	0.00	0.00
			Max. Compression	33	-3.46	0.00	0.00
			Max. Mx	27	-1.54	-0.11	0.00
			Max. My	28	0.98	0.00	0.00
			Max. Vy	27	0.04	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T13	80 - 60	Leg	Max Tension	33	260.62	0.77	0.22

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	33	-287.22	7.03	-0.04
			Max. Mx	33	-287.22	7.03	-0.04
			Max. My	21	-12.56	-1.27	6.85
			Max. Vy	25	-1.09	7.02	-0.41
			Max. Vx	21	-1.46	-1.27	6.85
		Diagonal	Max Tension	27	14.25	0.00	0.00
			Max. Compression	27	-14.93	0.00	0.00
			Max. Mx	34	6.15	-0.09	-0.01
			Max. My	19	-13.72	-0.03	-0.03
			Max. Vy	34	0.04	-0.09	-0.01
			Max. Vx	19	0.01	0.00	0.00
		Top Girt	Max Tension	26	1.08	0.00	0.00
			Max. Compression	30	-0.87	-0.34	0.01
			Max. Mx	27	-0.72	-0.48	0.02
			Max. My	19	-0.72	-0.48	0.02
			Max. Vy	27	-0.10	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Inner Bracing	Max Tension	25	0.16	0.00	0.00
			Max. Compression	25	-0.16	0.00	0.00
			Max. Mx	18	0.00	0.14	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	0.05	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
T14	60 - 50	Leg	Max Tension	33	283.24	0.67	-0.43
			Max. Compression	33	-314.06	-0.34	0.51
			Max. Mx	25	279.90	-4.34	0.15
			Max. My	21	-15.56	-2.25	9.12
			Max. Vy	25	0.64	-4.34	0.15
			Max. Vx	21	-1.48	-2.25	9.12
		Diagonal	Max Tension	20	14.12	0.00	0.00
			Max. Compression	28	-14.48	0.00	0.00
			Max. Mx	32	7.66	-0.08	-0.01
			Max. My	28	-14.43	-0.03	0.03
			Max. Vy	33	-0.04	-0.08	-0.01
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	19	2.52	0.00	0.00
			Max. Compression	14	-1.35	0.34	-0.02
			Max. Mx	19	-0.64	0.66	-0.04
			Max. My	27	-0.63	0.66	-0.04
			Max. Vy	19	0.12	0.00	0.00
			Max. Vx	27	0.01	0.00	0.00
		Inner Bracing	Max Tension	33	0.15	0.00	0.00
			Max. Compression	33	-0.15	0.00	0.00
			Max. Mx	18	0.00	0.17	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	-0.05	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
T15	50 - 40	Leg	Max Tension	33	307.24	0.13	0.43
			Max. Compression	33	-339.75	2.16	-0.20
			Max. Mx	33	-339.22	5.92	0.07
			Max. My	33	-18.52	1.22	5.77
			Max. Vy	33	-2.20	5.92	0.07
			Max. Vx	33	-1.58	1.22	5.77
		Diagonal	Max Tension	20	14.31	0.00	0.00
			Max. Compression	28	-15.89	0.00	0.00
			Max. Mx	34	4.74	-0.16	-0.02
			Max. My	20	6.51	-0.15	-0.02
			Max. Vy	32	-0.07	-0.16	0.02
			Max. Vx	20	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	33	5.10	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	33	-5.10	0.00	0.00
			Max. Mx	27	-2.06	-0.24	0.00
			Max. My	28	1.46	0.00	0.01
			Max. Vy	27	0.06	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T16	40 - 30	Leg	Max Tension	33	327.83	-2.83	-1.91
			Max. Compression	33	-365.07	2.28	1.56
			Max. Mx	20	-107.92	7.70	-5.86
			Max. My	26	-106.61	-5.88	7.69
			Max. Vy	20	-1.82	7.70	-5.86
			Max. Vx	26	-1.82	-5.88	7.69
		Diagonal	Max Tension	20	15.27	0.00	0.00
			Max. Compression	28	-16.23	0.00	0.00
			Max. Mx	33	11.46	-0.17	-0.02
			Max. My	22	-15.94	-0.04	-0.05
			Max. Vy	33	-0.07	-0.17	-0.02
			Max. Vx	22	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	33	5.48	0.00	0.00
			Max. Compression	33	-5.48	0.00	0.00
			Max. Mx	27	-2.01	-0.26	0.00
			Max. My	28	1.58	0.00	0.01
			Max. Vy	27	-0.07	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Top Girt	Max Tension	34	3.04	0.00	0.00
			Max. Compression	14	-1.25	0.43	-0.03
			Max. Mx	19	-0.01	0.73	-0.04
			Max. My	19	-0.01	0.73	-0.04
			Max. Vy	19	0.13	0.00	0.00
			Max. Vx	19	0.01	0.00	0.00
		Inner Bracing	Max Tension	33	0.20	0.00	0.00
			Max. Compression	33	-0.20	0.00	0.00
			Max. Mx	18	0.00	0.21	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	-0.06	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T17	30 - 20	Leg	Max Tension	33	351.40	-2.57	-3.23
			Max. Compression	33	-392.79	0.22	0.39
			Max. Mx	27	-259.11	6.54	0.56
			Max. My	19	-258.88	0.52	6.56
			Max. Vy	26	2.09	-3.70	-3.34
			Max. Vx	20	2.10	-3.31	-3.71
		Diagonal	Max Tension	20	14.87	0.00	0.00
			Max. Compression	28	-14.94	0.00	0.00
			Max. Mx	34	6.02	-0.20	-0.02
			Max. My	20	6.88	-0.19	-0.02
			Max. Vy	33	-0.07	-0.19	0.02
			Max. Vx	20	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	33	5.90	0.00	0.00
			Max. Compression	33	-5.90	0.00	0.00
			Max. Mx	27	-2.59	-0.28	0.00
			Max. My	28	1.71	0.00	0.01
			Max. Vy	27	0.07	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T18	20 - 10	Leg	Max Tension	33	372.69	-3.58	-2.72
			Max. Compression	33	-411.29	0.72	0.50
			Max. Mx	25	-18.91	-4.50	4.10
			Max. My	21	-19.77	4.08	-4.48
			Max. Vy	34	-1.40	2.47	1.79
			Max. Vx	28	-1.40	1.77	2.47

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	20	14.90	0.00	0.00
			Max. Compression	22	-20.29	0.00	0.00
			Max. Mx	33	11.25	-0.18	-0.02
			Max. My	19	-9.71	-0.10	-0.06
			Max. Vy	34	-0.08	-0.18	-0.02
			Max. Vx	19	0.01	0.00	0.00
		Horizontal	Max Tension	19	6.08	0.00	0.00
			Max. Compression	14	-1.12	0.57	-0.03
			Max. Mx	19	0.97	0.79	-0.05
			Max. My	19	0.98	0.79	-0.05
			Max. Vy	19	-0.13	0.00	0.00
			Max. Vx	19	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	33	6.17	0.00	0.00
			Max. Compression	33	-6.17	0.00	0.00
			Max. Mx	18	0.31	-0.31	0.00
			Max. My	28	1.77	0.00	0.01
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Inner Bracing	Max Tension	32	0.08	0.00	0.00
			Max. Compression	32	-0.06	0.00	0.00
			Max. Mx	18	0.00	0.29	0.00
			Max. My	33	0.06	0.00	0.00
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T19	10 - 0	Leg	Max Tension	33	369.65	-2.08	-2.32
			Max. Compression	33	-426.59	0.00	-0.00
			Max. Mx	27	-282.98	4.25	-0.33
			Max. My	19	-282.60	-0.35	4.26
			Max. Vy	34	1.52	-3.81	-3.41
			Max. Vx	28	1.52	-3.36	-3.83
		Diagonal	Max Tension	20	26.83	-0.04	-0.00
			Max. Compression	28	-21.38	0.00	0.00
			Max. Mx	3	13.15	-0.06	0.03
			Max. My	34	-21.22	0.01	-0.09
			Max. Vy	20	0.03	-0.06	-0.00
			Max. Vx	34	-0.02	0.00	0.00
		Horizontal	Max Tension	28	16.90	0.00	0.00
			Max. Compression	20	-16.66	-0.06	0.02
			Max. Mx	31	7.51	-0.14	-0.03
			Max. My	27	-5.17	-0.04	0.03
			Max. Vy	31	-0.07	-0.14	-0.03
			Max. Vx	27	-0.01	-0.04	0.03
		Redund Horz 1 Bracing	Max Tension	33	6.40	0.00	0.00
			Max. Compression	33	-6.40	0.00	0.00
			Max. Mx	28	6.16	-0.01	0.00
			Max. My	28	-1.17	0.00	0.00
			Max. Vy	28	0.01	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	19	10.47	0.00	0.00
			Max. Compression	14	-6.38	0.00	0.00
			Max. Mx	34	4.70	-0.02	0.00
			Max. My	20	10.42	0.00	-0.00
			Max. Vy	34	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	19	0.01	0.00	0.00
			Max. Compression	16	-0.03	0.00	0.00
			Max. Mx	18	0.01	-0.02	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	18	0.02	0.00	0.00
		Redund Sub Horz Bracing	Max Tension	19	12.84	0.00	0.00
			Max. Compression	14	-7.43	0.00	0.00
			Max. Mx	18	4.30	-0.09	0.00
			Max. My	18	4.30	0.00	0.00
			Max. Vy	18	0.04	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Inner Bracing	Max Tension	33	0.17	0.00	0.00
			Max. Compression	33	-0.20	0.00	0.00
			Max. Mx	18	-0.00	0.32	0.00
			Max. My	31	0.00	0.00	-0.00
			Max. Vy	18	-0.07	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg D	Max. Vert	29	450.73	26.55	-28.40
	Max. H_x	30	436.73	27.41	-25.67
	Max. H_z	20	-384.87	-26.24	31.55
	Min. Vert	21	-399.86	-29.07	30.76
	Min. H_x	22	-385.77	-29.96	27.91
	Min. H_z	28	435.82	23.84	-29.14
Leg C	Max. Vert	25	450.42	-28.31	-26.76
	Max. H_x	32	-389.70	31.27	26.97
	Max. H_z	34	-388.80	28.42	29.72
	Min. Vert	33	-403.85	30.88	29.33
	Min. H_x	24	436.36	-28.67	-24.51
	Min. H_z	26	435.45	-25.98	-27.14
Leg B	Max. Vert	21	449.39	-28.35	26.53
	Max. H_x	30	-387.10	31.26	-26.70
	Max. H_z	20	434.49	-25.98	26.95
	Min. Vert	29	-401.19	30.83	-29.08
	Min. H_x	22	435.40	-28.75	24.25
	Min. H_z	28	-386.21	28.33	-29.52
Leg A	Max. Vert	33	453.37	26.83	28.40
	Max. H_x	32	439.32	27.71	25.65
	Max. H_z	34	438.41	24.09	29.17
	Min. Vert	25	-400.88	-29.27	-30.77
	Min. H_x	24	-386.74	-30.18	-27.89
	Min. H_z	26	-385.84	-26.41	-31.58

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	68.76	0.00	0.00	-11.13	10.48	0.00
Dead+Wind 0 deg - No Ice	68.76	-0.21	-71.45	-8077.54	35.16	-42.39
Dead+Wind 30 deg - No Ice	68.76	39.95	-68.94	-7603.64	-4401.62	-45.47

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 45 deg - No Ice	68.76	56.60	-56.23	-6203.05	-6241.96	-39.03
Dead+Wind 60 deg - No Ice	68.76	69.40	-39.68	-4380.49	-7656.20	-29.93
Dead+Wind 90 deg - No Ice	68.76	71.97	0.21	13.45	-8141.64	-7.58
Dead+Wind 120 deg - No Ice	68.76	69.61	40.05	4400.80	-7680.81	18.91
Dead+Wind 135 deg - No Ice	68.76	56.90	56.53	6215.54	-6276.77	30.05
Dead+Wind 150 deg - No Ice	68.76	40.31	69.15	7605.95	-4444.26	39.13
Dead+Wind 180 deg - No Ice	68.76	0.21	71.45	8055.23	-14.06	42.39
Dead+Wind 210 deg - No Ice	68.76	-39.95	68.94	7581.26	4422.74	45.48
Dead+Wind 225 deg - No Ice	68.76	-56.60	56.23	6180.66	6263.02	39.03
Dead+Wind 240 deg - No Ice	68.76	-69.40	39.68	4358.11	7677.23	29.93
Dead+Wind 270 deg - No Ice	68.76	-71.97	-0.21	-35.77	8162.62	7.58
Dead+Wind 300 deg - No Ice	68.76	-69.61	-40.05	-4423.05	7701.83	-18.92
Dead+Wind 315 deg - No Ice	68.76	-56.90	-56.53	-6237.77	6297.81	-30.04
Dead+Wind 330 deg - No Ice	68.76	-40.31	-69.15	-7628.17	4465.35	-39.12
Dead+Ice+Temp	100.21	0.00	0.00	-14.41	38.01	0.00
Dead+Wind 0 deg+Ice+Temp	100.21	-0.21	-88.06	-9763.79	61.21	-72.23
Dead+Wind 30 deg+Ice+Temp	100.21	49.35	-85.21	-9220.06	-5307.22	-75.00
Dead+Wind 45 deg+Ice+Temp	100.21	69.89	-69.51	-7523.92	-7533.31	-63.00
Dead+Wind 60 deg+Ice+Temp	100.21	85.68	-49.08	-5316.02	-9243.43	-46.71
Dead+Wind 90 deg+Ice+Temp	100.21	88.60	0.21	8.64	-9799.00	-8.67
Dead+Wind 120 deg+Ice+Temp	100.21	85.89	49.44	5327.13	-9266.47	36.49
Dead+Wind 135 deg+Ice+Temp	100.21	70.19	69.81	7527.70	-7565.90	54.65
Dead+Wind 150 deg+Ice+Temp	100.21	49.71	85.42	9214.27	-5347.14	69.10
Dead+Wind 180 deg+Ice+Temp	100.21	0.21	88.06	9734.95	15.11	72.24
Dead+Wind 210 deg+Ice+Temp	100.21	-49.35	85.21	9191.08	5383.54	74.99
Dead+Wind 225 deg+Ice+Temp	100.21	-69.89	69.51	7494.92	7609.54	63.00
Dead+Wind 240 deg+Ice+Temp	100.21	-85.68	49.08	5287.04	9319.58	46.70
Dead+Wind 270 deg+Ice+Temp	100.21	-88.60	-0.21	-37.48	9875.08	8.67
Dead+Wind 300 deg+Ice+Temp	100.21	-85.89	-49.44	-5355.81	9342.63	-36.47
Dead+Wind 315 deg+Ice+Temp	100.21	-70.19	-69.81	-7556.36	7642.15	-54.64
Dead+Wind 330 deg+Ice+Temp	100.21	-49.71	-85.42	-9242.97	5423.48	-69.08
Dead+Wind 0 deg - Service	68.76	-0.21	-71.45	-8077.54	35.16	-42.39
Dead+Wind 30 deg - Service	68.76	39.95	-68.94	-7603.64	-4401.62	-45.47
Dead+Wind 45 deg - Service	68.76	56.60	-56.23	-6203.05	-6241.96	-39.03
Dead+Wind 60 deg - Service	68.76	69.40	-39.68	-4380.49	-7656.20	-29.93
Dead+Wind 90 deg - Service	68.76	71.97	0.21	13.45	-8141.64	-7.58
Dead+Wind 120 deg - Service	68.76	69.61	40.05	4400.80	-7680.81	18.91
Dead+Wind 135 deg - Service	68.76	56.90	56.53	6215.54	-6276.77	30.05
Dead+Wind 150 deg - Service	68.76	40.31	69.15	7605.95	-4444.26	39.13
Dead+Wind 180 deg - Service	68.76	0.21	71.45	8055.23	-14.06	42.39
Dead+Wind 210 deg - Service	68.76	-39.95	68.94	7581.26	4422.74	45.48
Dead+Wind 225 deg - Service	68.76	-56.60	56.23	6180.66	6263.02	39.03
Dead+Wind 240 deg - Service	68.76	-69.40	39.68	4358.11	7677.23	29.93
Dead+Wind 270 deg - Service	68.76	-71.97	-0.21	-35.77	8162.62	7.58
Dead+Wind 300 deg - Service	68.76	-69.61	-40.05	-4423.05	7701.83	-18.92
Dead+Wind 315 deg - Service	68.76	-56.90	-56.53	-6237.77	6297.81	-30.04
Dead+Wind 330 deg - Service	68.76	-40.31	-69.15	-7628.17	4465.35	-39.12

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-68.76	0.00	-0.00	68.76	0.00	0.000%
2	-0.21	-68.76	-71.45	0.21	68.76	71.45	0.000%
3	39.95	-68.76	-68.94	-39.95	68.76	68.94	0.000%
4	56.60	-68.76	-56.23	-56.60	68.76	56.23	0.000%
5	69.40	-68.76	-39.68	-69.40	68.76	39.68	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
6	71.97	-68.76	0.21	-71.97	68.76	-0.21	0.000%
7	69.61	-68.76	40.05	-69.61	68.76	-40.05	0.000%
8	56.90	-68.76	56.53	-56.90	68.76	-56.53	0.000%
9	40.31	-68.76	69.15	-40.31	68.76	-69.15	0.000%
10	0.21	-68.76	71.45	-0.21	68.76	-71.45	0.000%
11	-39.95	-68.76	68.94	39.95	68.76	-68.94	0.000%
12	-56.60	-68.76	56.23	56.60	68.76	-56.23	0.000%
13	-69.40	-68.76	39.68	69.40	68.76	-39.68	0.000%
14	-71.97	-68.76	-0.21	71.97	68.76	0.21	0.000%
15	-69.61	-68.76	-40.05	69.61	68.76	40.05	0.000%
16	-56.90	-68.76	-56.53	56.90	68.76	56.53	0.000%
17	-40.31	-68.76	-69.15	40.31	68.76	69.15	0.000%
18	0.00	-100.21	0.00	-0.00	100.21	-0.00	0.000%
19	-0.21	-100.21	-88.06	0.21	100.21	88.06	0.000%
20	49.35	-100.21	-85.21	-49.35	100.21	85.21	0.000%
21	69.89	-100.21	-69.51	-69.89	100.21	69.51	0.001%
22	85.68	-100.21	-49.08	-85.68	100.21	49.08	0.000%
23	88.60	-100.21	0.21	-88.60	100.21	-0.21	0.000%
24	85.89	-100.21	49.44	-85.89	100.21	-49.44	0.000%
25	70.19	-100.21	69.81	-70.19	100.21	-69.81	0.001%
26	49.71	-100.21	85.42	-49.71	100.21	-85.42	0.000%
27	0.21	-100.21	88.06	-0.21	100.21	-88.06	0.000%
28	-49.35	-100.21	85.21	49.35	100.21	-85.21	0.001%
29	-69.89	-100.21	69.51	69.89	100.21	-69.51	0.001%
30	-85.68	-100.21	49.08	85.68	100.21	-49.08	0.000%
31	-88.60	-100.21	-0.21	88.60	100.21	0.21	0.000%
32	-85.89	-100.21	-49.44	85.89	100.21	49.44	0.000%
33	-70.19	-100.21	-69.81	70.19	100.21	69.81	0.001%
34	-49.71	-100.21	-85.42	49.71	100.21	85.42	0.001%
35	-0.21	-68.76	-71.45	0.21	68.76	71.45	0.000%
36	39.95	-68.76	-68.94	-39.95	68.76	68.94	0.000%
37	56.60	-68.76	-56.23	-56.60	68.76	56.23	0.000%
38	69.40	-68.76	-39.68	-69.40	68.76	39.68	0.000%
39	71.97	-68.76	0.21	-71.97	68.76	-0.21	0.000%
40	69.61	-68.76	40.05	-69.61	68.76	-40.05	0.000%
41	56.90	-68.76	56.53	-56.90	68.76	-56.53	0.000%
42	40.31	-68.76	69.15	-40.31	68.76	-69.15	0.000%
43	0.21	-68.76	71.45	-0.21	68.76	-71.45	0.000%
44	-39.95	-68.76	68.94	39.95	68.76	-68.94	0.000%
45	-56.60	-68.76	56.23	56.60	68.76	-56.23	0.000%
46	-69.40	-68.76	39.68	69.40	68.76	-39.68	0.000%
47	-71.97	-68.76	-0.21	71.97	68.76	0.21	0.000%
48	-69.61	-68.76	-40.05	69.61	68.76	40.05	0.000%
49	-56.90	-68.76	-56.53	56.90	68.76	56.53	0.000%
50	-40.31	-68.76	-69.15	40.31	68.76	69.15	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00080087
2	Yes	6	0.00070591	0.00026647
3	Yes	5	0.00082153	0.00034561
4	Yes	5	0.00052442	0.00026055
5	Yes	5	0.00086647	0.00029255
6	Yes	6	0.00078687	0.00021839

7	Yes	5	0.00087492	0.00029386
8	Yes	5	0.00052947	0.00026231
9	Yes	5	0.00081949	0.00034597
10	Yes	6	0.00069777	0.00026444
11	Yes	5	0.00081313	0.00034477
12	Yes	5	0.00052482	0.00026137
13	Yes	5	0.00087674	0.00029421
14	Yes	6	0.00079667	0.00022016
15	Yes	5	0.00088301	0.00029585
16	Yes	5	0.00053515	0.00026346
17	Yes	5	0.00082756	0.00034717
18	Yes	5	0.00000001	0.00054990
19	Yes	7	0.00099477	0.00038415
20	Yes	6	0.00092845	0.00040174
21	Yes	6	0.00083428	0.00035581
22	Yes	9	0.00079693	0.00024253
23	Yes	11	0.00087677	0.00024619
24	Yes	9	0.00080773	0.00024525
25	Yes	6	0.00084303	0.00035816
26	Yes	6	0.00092392	0.00040076
27	Yes	7	0.00098060	0.00038024
28	Yes	6	0.00091711	0.00039848
29	Yes	6	0.00085704	0.00036109
30	Yes	9	0.00083981	0.00025285
31	Yes	11	0.00093018	0.00025842
32	Yes	9	0.00084808	0.00025471
33	Yes	6	0.00086805	0.00036460
34	Yes	6	0.00093467	0.00040365
35	Yes	6	0.00070591	0.00026647
36	Yes	5	0.00082153	0.00034561
37	Yes	5	0.00052442	0.00026055
38	Yes	5	0.00086647	0.00029255
39	Yes	6	0.00078687	0.00021839
40	Yes	5	0.00087492	0.00029386
41	Yes	5	0.00052947	0.00026231
42	Yes	5	0.00081949	0.00034597
43	Yes	6	0.00069777	0.00026444
44	Yes	5	0.00081313	0.00034477
45	Yes	5	0.00052482	0.00026137
46	Yes	5	0.00087674	0.00029421
47	Yes	6	0.00079667	0.00022016
48	Yes	5	0.00088301	0.00029585
49	Yes	5	0.00053515	0.00026346
50	Yes	5	0.00082756	0.00034717

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	12.325	48	0.6165	0.0227
T2	170 - 163.573	10.870	48	0.6053	0.0212
T3	163.573 - 159.049	9.959	48	0.5870	0.0215
T4	159.049 - 154.524	9.334	48	0.5699	0.0217
T5	154.524 - 150	8.734	48	0.5469	0.0229
T6	150 - 140	8.161	48	0.5203	0.0239
T7	140 - 130	6.996	48	0.4586	0.0250
T8	130 - 120	5.971	48	0.4114	0.0248
T9	120 - 110	5.059	48	0.3610	0.0224
T10	110 - 100	4.250	48	0.3204	0.0211

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T11	100 - 90	3.533	48	0.2781	0.0199
T12	90 - 80	2.902	48	0.2424	0.0175
T13	80 - 60	2.349	48	0.2061	0.0153
T14	60 - 50	1.416	48	0.1659	0.0101
T15	50 - 40	1.017	48	0.1460	0.0076
T16	40 - 30	0.689	48	0.1252	0.0063
T17	30 - 20	0.417	48	0.0940	0.0050
T18	20 - 10	0.213	48	0.0626	0.0037
T19	10 - 0	0.076	40	0.0307	0.0024

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	PA6-65AC	48	12.325	0.6165	0.0227	40708
176.00	PA6-65AC	48	11.740	0.6137	0.0218	40708
172.00	6' Standoff	48	11.158	0.6090	0.0213	26063
170.00	20' 8 Bay Di-Pole	48	10.870	0.6053	0.0212	22252
169.00	4' Omni	48	10.726	0.6031	0.0212	21256
163.00	T-Frame	48	9.879	0.5850	0.0215	15392
160.00	3" Dia x 15' Omni	48	9.464	0.5739	0.0216	11105
150.00	2" Dia 10' Omni	48	8.161	0.5203	0.0239	8594
145.00	6' Standoff	48	7.561	0.4885	0.0245	8353
143.00	6' Standoff	48	7.331	0.4760	0.0247	8270
133.00	10'6"x4" Pipe Mount	48	6.266	0.4253	0.0251	10120
132.00	3' Stand-off	48	6.167	0.4207	0.0250	10444
130.00	PA6-65AC	48	5.971	0.4114	0.0248	10983
126.00	LeBlanc 10' Standoff (1)	48	5.594	0.3912	0.0239	11315
122.00	EUSF10-U	48	5.233	0.3706	0.0229	11312
120.00	3" Dia x 15' Omni	48	5.059	0.3610	0.0224	11416
116.00	ASP711	48	4.723	0.3440	0.0218	12015
115.00	6' Standoff	48	4.642	0.3401	0.0216	12218
112.00	6' Stand-off	48	4.404	0.3284	0.0213	12809
106.00	12' Wireless Frame	48	3.952	0.3034	0.0207	13356
101.00	LeBlanc 10' Standoff (1)	48	3.600	0.2821	0.0201	13569
100.00	4' Grid Dish	48	3.533	0.2781	0.0199	13656
88.00	3' Stand-off	48	2.786	0.2350	0.0171	16256
85.00	3' Stand-off	48	2.617	0.2236	0.0164	16998
80.00	6' Ice Shield	48	2.349	0.2061	0.0153	18550
76.00	10'6"x4" Pipe Mount	48	2.146	0.1952	0.0144	20641
75.00	6' Grid Dish	48	2.097	0.1928	0.0142	21294
56.00	3' Stand-off	48	1.250	0.1581	0.0090	22444
47.00	3' Stand-off	48	0.911	0.1403	0.0071	15906

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	14.496	32	0.7097	0.0349
T2	170 - 163.573	12.824	32	0.6975	0.0316

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	163.573 - 159.049	11.776	32	0.6777	0.0319
T4	159.049 - 154.524	11.055	32	0.6594	0.0323
T5	154.524 - 150	10.360	32	0.6342	0.0339
T6	150 - 140	9.695	32	0.6048	0.0352
T7	140 - 130	8.338	32	0.5360	0.0366
T8	130 - 120	7.138	32	0.4827	0.0362
T9	120 - 110	6.066	32	0.4255	0.0339
T10	110 - 100	5.111	32	0.3791	0.0328
T11	100 - 90	4.260	32	0.3304	0.0316
T12	90 - 80	3.509	32	0.2890	0.0283
T13	80 - 60	2.846	32	0.2466	0.0253
T14	60 - 50	1.722	32	0.1994	0.0169
T15	50 - 40	1.237	32	0.1758	0.0126
T16	40 - 30	0.840	32	0.1510	0.0104
T17	30 - 20	0.511	32	0.1135	0.0082
T18	20 - 10	0.262	32	0.0756	0.0061
T19	10 - 0	0.094	24	0.0372	0.0040

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	PA6-65AC	32	14.496	0.7097	0.0349	37045
176.00	PA6-65AC	32	13.824	0.7067	0.0334	37045
172.00	6' Standoff	32	13.155	0.7015	0.0318	23764
170.00	20' 8 Bay Di-Pole	32	12.824	0.6975	0.0316	20473
169.00	4' Omni	32	12.659	0.6950	0.0316	19745
163.00	T-Frame	32	11.683	0.6756	0.0319	14941
160.00	3" Dia x 15' Omni	32	11.204	0.6637	0.0321	10305
150.00	2" Dia 10' Omni	32	9.695	0.6048	0.0352	7773
145.00	6' Standoff	32	8.997	0.5694	0.0361	7496
143.00	6' Standoff	32	8.729	0.5555	0.0363	7392
133.00	10'6"x4" Pipe Mount	32	7.484	0.4985	0.0366	8909
132.00	3' Stand-off	32	7.367	0.4933	0.0365	9182
130.00	PA6-65AC	32	7.138	0.4827	0.0362	9644
126.00	LeBlanc 10' Standoff (1)	32	6.695	0.4598	0.0353	9983
122.00	EUSF10-U	32	6.271	0.4364	0.0343	10053
120.00	3" Dia x 15' Omni	32	6.066	0.4255	0.0339	10158
116.00	ASP711	32	5.671	0.4061	0.0333	10628
115.00	6' Standoff	32	5.575	0.4016	0.0332	10781
112.00	6' Stand-off	32	5.293	0.3882	0.0329	11220
106.00	12' Wireless Frame	32	4.758	0.3595	0.0325	11708
101.00	LeBlanc 10' Standoff (1)	32	4.341	0.3350	0.0318	11957
100.00	4' Grid Dish	32	4.260	0.3304	0.0316	12031
88.00	3' Stand-off	32	3.370	0.2803	0.0277	13962
85.00	3' Stand-off	32	3.167	0.2671	0.0268	14666
80.00	6' Ice Shield	32	2.846	0.2466	0.0253	16143
76.00	10'6"x4" Pipe Mount	32	2.602	0.2338	0.0239	17989
75.00	6' Grid Dish	32	2.543	0.2311	0.0235	18556
56.00	3' Stand-off	32	1.520	0.1902	0.0150	18683
47.00	3' Stand-off	32	1.109	0.1690	0.0118	13069

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325X	0.6250	2	3.27	8.16	0.401 ✓	1.333	Member Bearing
		Secondary Horizontal	A325X	0.6250	2	0.40	8.16	0.049 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	0.25	8.16	0.031 ✓	1.333	Member Bearing
T2	170	Diagonal	A325X	0.6250	2	3.56	8.16	0.437 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	0.63	8.16	0.077 ✓	1.333	Member Bearing
T3	163.573	Diagonal	A325X	0.6250	2	2.95	8.16	0.361 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	0.76	8.16	0.093 ✓	1.333	Member Bearing
T4	159.049	Diagonal	A325X	0.6250	2	3.23	8.16	0.396 ✓	1.333	Member Bearing
T5	154.524	Diagonal	A325X	0.6250	2	3.20	8.16	0.392 ✓	1.333	Member Bearing
T6	150	Diagonal	A325X	0.6250	2	3.42	8.16	0.420 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	0.53	8.16	0.065 ✓	1.333	Member Bearing
T7	140	Diagonal	A325X	0.6250	2	4.57	9.20	0.496 ✓	1.333	Bolt Shear
		Top Girt	A325X	0.6250	2	0.46	8.16	0.056 ✓	1.333	Member Bearing
T8	130	Diagonal	A325X	0.6250	2	5.38	9.20	0.585 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	0.91	9.20	0.099 ✓	1.333	Bolt Shear
T9	120	Diagonal	A325X	0.6250	2	5.62	9.20	0.610 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.6250	2	0.58	9.20	0.063 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	1.10	8.16	0.135 ✓	1.333	Member Bearing
T10	110	Diagonal	A325X	0.6250	2	6.27	9.20	0.682 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	1.30	9.20	0.142 ✓	1.333	Bolt Shear
T11	100	Diagonal	A325X	0.6250	2	6.58	9.20	0.715 ✓	1.333	Bolt Shear
		Horizontal	A325X	0.6250	2	0.82	9.20	0.089 ✓	1.333	Bolt Shear
T12	90	Diagonal	A325X	0.6250	2	6.99	9.20	0.759 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	1.73	9.20	0.188 ✓	1.333	Bolt Shear
T13	80	Diagonal	A325X	0.6250	2	7.46	16.31	0.458 ✓	1.333	Member Bearing
		Top Girt	A325X	0.6250	2	0.54	9.20	0.059 ✓	1.333	Bolt Shear
T14	60	Diagonal	A325X	0.6250	2	7.24	16.31	0.444 ✓	1.333	Member Bearing
		Horizontal	A325X	0.6250	2	1.26	16.31	0.077 ✓	1.333	Member Bearing
T15	50	Diagonal	A325X	0.6250	2	7.95	18.41	0.432 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	2.55	9.20	0.277 ✓	1.333	Bolt Shear
T16	40	Diagonal	A325X	0.6250	2	8.11	18.41	0.441 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	2.74	9.20	0.298 ✓	1.333	Bolt Shear
		Top Girt	A325X	0.6250	2	1.52	16.31	0.093 ✓	1.333	Member Bearing
T17	30	Diagonal	A325X	0.6250	2	7.47	18.41	0.406 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.6250	2	2.95	9.20	0.320 ✓	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T18	20	Diagonal	A325X	0.6250	2	10.14	18.41	0.551 ✔	1.333	Bolt Shear
		Horizontal	A325X	0.6250	2	3.04	16.31	0.186 ✔	1.333	Member Bearing
		Secondary Horizontal	A325X	0.6250	2	3.09	9.20	0.335 ✔	1.333	Bolt Shear
T19	10	Diagonal	A325X	0.6250	2	13.41	18.41	0.729 ✔	1.333	Bolt Shear
		Horizontal	A325X	0.6250	2	8.45	18.41	0.459 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 170	L3 1/2x3 1/2x3/8	10.00	5.00	87.3 K=1.00	14.519	2.4800	-6.92	36.01	0.192 ✔
T2	170 - 163.573	L5x5x5/16	6.43	6.43	77.6 K=1.00	15.232	3.0300	-21.37	46.15	0.463 ✔
T3	163.573 - 159.049	L5x5x5/16	4.53	4.53	54.7 K=1.00	17.404	3.0300	-36.54	52.74	0.693 ✔
T4	159.049 - 154.524	L5x5x5/16	4.53	4.53	54.7 K=1.00	17.404	3.0300	-48.73	52.74	0.924 ✔
T5	154.524 - 150	L5x5x5/16	4.53	4.53	54.7 K=1.00	17.404	3.0300	-58.08	52.74	1.101 ✔
T6	150 - 140	L5x5x3/8	10.01	5.01	60.7 K=1.00	17.364	3.6100	-81.08	62.68	1.293 ✔
T7	140 - 130	L6x6x1/2	10.01	5.23	53.2 K=1.00	18.066	5.7500	-97.27	103.88	0.936 ✔
T8	130 - 120	L6x6x1/2	10.01	5.21	53.0 K=1.00	18.083	5.7500	-120.85	103.98	1.162 ✔
T9	120 - 110	L6x6x3/4	10.01	5.20	53.3 K=1.00	18.057	8.4400	-146.56	152.40	0.962 ✔
T10	110 - 100	L6x6x3/4	10.01	5.18	53.2 K=1.00	18.069	8.4400	-173.77	152.50	1.139 ✔
T11	100 - 90	L8x8x3/4	10.01	10.01	76.0 K=1.00	15.789	11.4000	-202.51	180.00	1.125 ✔
T12	90 - 80	L8x8x3/4	10.01	5.16	39.2 K=1.00	19.253	11.4000	-230.26	219.49	1.049 ✔
T13	80 - 60	L8x8x1 w/ 1/2x7 Plates	20.03	10.01	48.3 K=1.00	18.499	22.0000	-287.22	406.97	0.706 ✔
T14	60 - 50	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	10.01	48.6 K=1.00	18.477	23.7340	-314.06	438.54	0.716 ✔
T15	50 - 40	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	5.13	24.9 K=1.00	20.291	23.7340	-339.75	481.58	0.705 ✔
T16	40 - 30	L8x8x1 1/8	10.01	5.12	39.4	19.236	16.7000	-365.07	321.24	1.136

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.00					✓
T17	30 - 20	L8x8x1 1/8	10.01	5.12	39.4 K=1.00	19.239	16.7000	-392.79	321.29	1.223 ✓
T18	20 - 10	L8x8x1 1/8	10.01	5.11	39.3 K=1.00	19.242	16.7000	-411.29	321.34	1.280 ✓
T19	10 - 0	L8x8x1 1/8	10.01	5.01	38.5 K=1.00	19.307	16.7000	-426.58	322.43	1.323 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L2 1/2x2 1/2x3/16	11.41	5.49	130.1 K=0.98	8.827	0.9020	-6.55	7.96	0.823 ✓
T2	170 - 163.573	L2 1/2x2 1/2x3/16	8.46	4.02	103.0 K=1.06	12.592	0.9020	-7.13	11.36	0.628 ✓
T3	163.573 - 159.049	L2x2x3/16	7.25	3.51	110.1 K=1.03	11.658	0.7150	-5.90	8.34	0.707 ✓
T4	159.049 - 154.524	L2 1/2x2x3/16	7.51	3.63	106.6 K=1.04	12.128	0.8090	-6.15	9.81	0.627 ✓
T5	154.524 - 150	L2 1/2x2x3/16	7.77	3.76	109.3 K=1.03	11.766	0.8090	-6.40	9.52	0.672 ✓
T6	150 - 140	L2 1/2x2x3/16	8.61	4.20	118.4 K=1.00	10.505	0.8090	-6.84	8.50	0.805 ✓
T7	140 - 130	L3x2 1/2x1/4	12.53	6.33	138.3 K=0.96	7.810	1.3100	-9.13	10.23	0.893 ✓
T8	130 - 120	L3x3x1/4	12.98	6.54	129.6 K=0.98	8.886	1.4400	-10.76	12.80	0.841 ✓
T9	120 - 110	L3x3x1/4	13.45	6.76	133.1 K=0.97	8.432	1.4400	-11.24	12.14	0.925 ✓
T10	110 - 100	L3 1/2x3x1/4	13.94	7.00	130.0 K=0.98	8.832	1.5600	-12.55	13.78	0.911 ✓
T11	100 - 90	L3 1/2x3x1/4	14.44	7.25	133.6 K=0.97	8.366	1.5600	-13.16	13.05	1.008 ✓
T12	90 - 80	L3 1/2x3x1/4	14.97	7.50	137.3 K=0.96	7.920	1.5600	-13.97	12.36	1.131 ✓
T13	80 - 60	2L2 1/2x2x3/16	16.07	8.04	122.1 K=1.00	9.977	1.6200	-14.93	16.16	0.924 ✓
T14	60 - 50	2L2 1/2x2x3/16	16.63	8.32	126.4 K=1.00	9.352	1.6200	-14.48	15.15	0.956 ✓
T15	50 - 40	2L2 1/2x2x3/8	17.21	8.60	131.0 K=0.97	8.696	3.0900	-15.89	26.87	0.592 ✓
T16	40 - 30	2L2 1/2x2x3/8	17.80	8.90	134.5 K=0.97	8.254	3.0900	-16.23	25.50	0.636 ✓
T17	30 - 20	2L2 1/2x2x3/8	18.40	9.19	138.0 K=0.96	7.837	3.0900	-14.94	24.22	0.617 ✓
T18	20 - 10	2L2 1/2x2x3/8	19.00	9.49	141.6 K=0.95	7.446	3.0900	-20.29	23.01	0.882 ✓
T19	10 - 0	2L2 1/2x2 1/2x1/4	13.37	6.47	110.5	11.606	2.3800	-21.38	27.62	0.774

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.09					✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	120 - 110	L2 1/2x2 1/2x1/4	9.12	4.10	110.1 K=1.10	11.660	1.1900	-1.16	13.88	0.084 ✓
T11	100 - 90	L2 1/2x2 1/2x1/4	10.56	4.82	118.8 K=1.01	10.447	1.1900	-1.65	12.43	0.132 ✓
T14	60 - 50	2L2x2x3/16	13.43	6.15	119.8 K=1.00	10.316	1.4300	-1.35	14.75	0.091 ✓
T18	20 - 10	2L2x2x3/16	16.29	7.60	141.2 K=0.96	7.486	1.4300	-1.12	10.70	0.104 ✓
T19	10 - 0	2L2 1/2x2 1/2x1/4	17.01	7.96	123.2 K=0.99	9.813	2.3800	-16.66	23.35	0.713 ✓

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L2x2x3/16	6.00	5.28	141.5 K=0.88	7.454	0.7150	-0.80	5.33	0.151 ✓
T7	140 - 130	L2x2x1/4	8.03	7.53	192.1 K=0.83	4.048	0.9380	-1.46	3.80	0.384 ✓
T8	130 - 120	L2x2x1/4	8.75	7.82	198.2 K=0.83	3.802	0.9380	-1.81	3.57	0.509 ✓
T9	120 - 110	L2x2x3/16	9.47	8.54	211.7 K=0.81	3.331	0.7150	-2.20	2.38	0.924 ✓
T10	110 - 100	L2x2x1/4	10.19	9.26	228.0 K=0.80	2.873	0.9380	-2.61	2.69	0.968 ✓
T12	90 - 80	L2 1/2x2 1/2x1/4	11.62	10.53	209.8 K=0.82	3.392	1.1900	-3.46	4.04	0.856 ✓
T15	50 - 40	L3 1/2x3 1/2x1/4	14.49	13.36	191.8 K=0.83	4.061	1.6900	-5.10	6.86	0.743 ✓
T16	40 - 30	L3 1/2x3 1/2x1/4	15.21	14.12	200.8 K=0.82	3.705	1.6900	-5.48	6.26	0.875 ✓
T17	30 - 20	L3 1/2x3 1/2x1/4	15.93	14.83	209.2 K=0.82	3.412	1.6900	-5.90	5.77	1.022 ✓
T18	20 - 10	L3 1/2x3 1/2x1/4	16.65	15.55	217.6 K=0.81	3.154	1.6900	-6.17	5.33	1.158 ✓

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L2x2x3/16	6.00	5.28	145.1 K=0.90	7.091	0.7150	-0.12	5.07	0.024 ✔
T2	170 - 163.573	L2x2x3/16	6.00	5.28	145.1 K=0.90	7.091	0.7150	-0.73	5.07	0.144 ✔
T3	163.573 - 159.049	L2x2x3/16	6.00	5.16	142.8 K=0.91	7.325	0.7150	-0.90	5.24	0.172 ✔
T6	150 - 140	L2 1/2x2 1/2x3/16	6.97	6.13	137.6 K=0.93	7.889	0.9020	-0.91	7.12	0.127 ✔
T7	140 - 130	L2 1/2x2 1/2x3/16	7.69	3.42	101.5 K=1.22	12.788	0.9020	-0.92	11.53	0.080 ✔
T13	80 - 60	L2 1/2x2 1/2x1/4	11.99	5.45	130.1 K=0.98	8.825	1.1900	-0.87	10.50	0.083 ✔
T16	40 - 30	2L2x2x3/16	14.86	6.86	130.3 K=0.98	8.795	1.4300	-1.25	12.58	0.099 ✔

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L2 1/2x2 1/2x3/16	4.25	3.92	107.5 K=1.13	12.004	0.9020	-6.40	10.83	0.591 ✔

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.45	5.92	143.6 K=1.00	7.239	0.9020	-6.38	6.53	0.977 ✔

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.01	6.01	145.8 K=1.00	7.024	0.9020	-0.03	6.34	0.005 ✔

Redundant Sub-Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L3x3x5/16	8.86	8.86	180.6 K=1.00	4.578	1.7800	-7.43	8.15	0.911 ✔

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	140 - 130	L2x2x3/16	5.44	5.44	165.6 K=1.00	5.444	0.7150	-0.17	3.89	0.044 ✔
T9	120 - 110	L2 1/2x2x3/16	6.45	6.45	181.3 K=1.00	4.542	0.8090	-0.11	3.67	0.031 ✔
T11	100 - 90	L2 1/2x2x3/16	7.47	7.47	209.8 K=1.00	3.392	0.8090	-0.12	2.74	0.044 ✔
T13	80 - 60	2L2x2x3/16	8.48	8.48	164.9 K=1.00	5.490	1.4300	-0.16	7.85	0.020 ✔
T14	60 - 50	2L2x2x3/16	9.49	9.49	184.6 K=1.00	4.380	1.4300	-0.15	6.26	0.024 ✔
T16	40 - 30	2L2x2x3/16	10.51	10.51	204.4 K=1.00	3.575	1.4300	-0.20	5.11	0.038 ✔
T18	20 - 10	2L2x2 1/2x3/16	11.52	11.52	230.4 K=1.00	2.812	1.6200	-0.06	4.56	0.013 ✔
T19	10 - 0	2L2x2 1/2x3/16	12.03	12.03	240.6 K=1.00	2.580	1.6200	-0.20	4.18	0.047 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L3 1/2x3 1/2x3/8	10.00	5.00	56.1	21.600	2.4800	6.70	53.57	0.125 ✔
T2	170 - 163.573	L5x5x5/16	6.43	6.43	49.1	21.600	3.0300	19.66	65.45	0.300 ✔
T3	163.573 - 159.049	L5x5x5/16	4.53	4.53	34.6	21.600	3.0300	32.78	65.45	0.501 ✔
T4	159.049 - 154.524	L5x5x5/16	4.53	4.53	34.6	21.600	3.0300	43.19	65.45	0.660 ✔
T5	154.524 - 150	L5x5x5/16	4.53	4.53	34.6	21.600	3.0300	52.82	65.45	0.807 ✔
T6	150 - 140	L5x5x3/8	10.01	5.01	38.5	21.600	3.6100	74.65	77.98	0.957

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	140 - 130	L6x6x1/2	10.01	5.23	33.7	21.600	5.7500	89.59	124.20	0.721
T8	130 - 120	L6x6x1/2	10.01	5.21	33.6	21.600	5.7500	110.86	124.20	0.893
T9	120 - 110	L6x6x3/4	10.01	5.20	34.1	21.600	8.4400	133.20	182.30	0.731
T10	110 - 100	L6x6x3/4	10.01	5.18	34.0	21.600	8.4400	157.46	182.30	0.864
T11	100 - 90	L8x8x3/4	10.01	10.01	48.6	21.600	11.4000	183.09	246.24	0.744
T12	90 - 80	L8x8x3/4	10.01	5.16	25.1	21.600	11.4000	209.04	246.24	0.849
T13	80 - 60	L8x8x1 w/ 1/2x7 Plates	20.03	10.01	48.3	21.600	22.0000	260.62	475.20	0.548
T14	60 - 50	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	10.01	48.6	21.600	23.7340	283.25	512.65	0.553
T15	50 - 40	L8x8x1-1/8 w/ 1/2x7 Plates	10.01	5.13	24.9	21.600	23.7340	307.24	512.65	0.599
T16	40 - 30	L8x8x1 1/8	10.01	5.12	25.4	21.600	16.7000	327.83	360.72	0.909
T17	30 - 20	L8x8x1 1/8	10.01	5.12	25.4	21.600	16.7000	351.40	360.72	0.974
T18	20 - 10	L8x8x1 1/8	10.01	5.11	25.4	21.600	16.7000	372.69	360.72	1.033
T19	10 - 0	L8x8x1 1/8	10.01	5.01	24.8	21.600	16.7000	369.65	360.72	1.025

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L2 1/2x2 1/2x3/16	11.41	5.49	88.0	29.000	0.5710	5.71	16.56	0.345
T2	170 - 163.573	L2 1/2x2 1/2x3/16	8.46	4.02	65.2	29.000	0.5710	6.52	16.56	0.393
T3	163.573 - 159.049	L2x2x3/16	7.25	3.51	72.4	29.000	0.4308	5.69	12.49	0.455
T4	159.049 - 154.524	L2 1/2x2x3/16	7.51	3.63	77.0	29.000	0.5013	6.46	14.54	0.445
T5	154.524 - 150	L2 1/2x2x3/16	7.77	3.76	79.6	29.000	0.5013	6.02	14.54	0.414
T6	150 - 140	L2 1/2x2x3/16	8.61	4.20	88.2	29.000	0.5013	6.75	14.54	0.464
T7	140 - 130	L3x2 1/2x1/4	12.53	6.33	104.5	29.000	0.8419	8.96	24.41	0.367
T8	130 - 120	L3x3x1/4	12.98	6.54	87.2	29.000	0.9394	10.53	27.24	0.386
T9	120 - 110	L3x3x1/4	13.45	6.76	90.0	29.000	0.9394	11.02	27.24	0.404

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	110 - 100	L3 1/2x3x1/4	13.94	7.00	94.8	29.000	1.0294	12.31	29.85	0.412
T11	100 - 90	L3 1/2x3x1/4	14.44	7.25	98.1	29.000	1.0294	12.96	29.85	0.434
T12	90 - 80	L3 1/2x3x1/4	14.97	7.50	101.4	29.000	1.0294	13.70	29.85	0.459
T13	80 - 60	2L2 1/2x2x3/16	16.07	8.04	125.4	29.000	1.0041	14.25	29.12	0.489
T14	60 - 50	2L2 1/2x2x3/16	16.63	8.32	129.6	29.000	1.0041	14.12	29.12	0.485
T15	50 - 40	2L2 1/2x2x3/8	17.21	8.60	137.8	29.000	1.8956	14.31	54.97	0.260
T16	40 - 30	2L2 1/2x2x3/8	17.80	8.90	142.3	29.000	1.8956	15.27	54.97	0.278
T17	30 - 20	2L2 1/2x2x3/8	18.40	9.19	147.0	29.000	1.8956	14.87	54.97	0.271
T18	20 - 10	2L2 1/2x2x3/8	19.00	9.49	151.6	29.000	1.8956	14.90	54.97	0.271
T19	10 - 0	2L2 1/2x2 1/2x1/4	13.37	6.47	104.3	29.000	1.5037	26.83	43.61	0.615

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	120 - 110	L2 1/2x2 1/2x1/4	9.12	4.10	67.3	29.000	0.7519	0.97	21.80	0.045
T11	100 - 90	L2 1/2x2 1/2x1/4	10.56	4.82	78.5	29.000	0.7519	1.55	21.80	0.071
T14	60 - 50	2L2x2x3/16	13.43	6.15	123.7	29.000	0.8616	2.52	24.99	0.101
T18	20 - 10	2L2x2x3/16	16.29	7.60	152.0	29.000	0.8616	6.08	24.99	0.243
T19	10 - 0	2L2 1/2x2 1/2x1/4	17.01	7.96	127.5	29.000	1.5037	16.90	43.61	0.388

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L2x2x3/16	6.00	5.28	111.0	29.000	0.4308	0.78	12.49	0.063
T7	140 - 130	L2x2x1/4	8.03	7.53	148.4	21.600	0.9380	1.46	20.26	0.072

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T8	130 - 120	L2x2x1/4	8.75	7.82	162.6	29.000	0.5629	1.81	16.32	0.111 ✔
T9	120 - 110	L2x2x3/16	9.47	8.54	174.4	29.000	0.4308	2.20	12.49	0.176 ✔
T10	110 - 100	L2x2x1/4	10.19	9.26	190.9	29.000	0.5629	2.61	16.32	0.160 ✔
T12	90 - 80	L2 1/2x2 1/2x1/4	11.62	10.53	171.0	29.000	0.7519	3.46	21.80	0.159 ✔
T15	50 - 40	L3 1/2x3 1/2x1/4	14.49	13.36	151.8	29.000	1.1269	5.10	32.68	0.156 ✔
T16	40 - 30	L3 1/2x3 1/2x1/4	15.21	14.12	160.1	29.000	1.1269	5.48	32.68	0.168 ✔
T17	30 - 20	L3 1/2x3 1/2x1/4	15.93	14.83	168.0	29.000	1.1269	5.90	32.68	0.180 ✔
T18	20 - 10	L3 1/2x3 1/2x1/4	16.65	15.55	175.9	29.000	1.1269	6.17	32.68	0.189 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	L2x2x3/16	6.00	5.28	111.0	29.000	0.4308	0.51	12.49	0.040 ✔
T2	170 - 163.573	L2x2x3/16	6.00	5.28	111.0	29.000	0.4308	1.25	12.49	0.100 ✔
T3	163.573 - 159.049	L2x2x3/16	6.00	5.16	108.6	29.000	0.4308	1.52	12.49	0.122 ✔
T6	150 - 140	L2 1/2x2 1/2x3/16	6.97	6.13	101.1	29.000	0.5710	1.05	16.56	0.064 ✔
T7	140 - 130	L2 1/2x2 1/2x3/16	7.69	3.42	56.1	29.000	0.5710	0.90	16.56	0.054 ✔
T13	80 - 60	L2 1/2x2 1/2x1/4	11.99	5.45	88.4	29.000	0.7519	1.08	21.80	0.050 ✔
T16	40 - 30	2L2x2x3/16	14.86	6.86	137.6	29.000	0.8616	3.04	24.99	0.122 ✔

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L2 1/2x2 1/2x3/16	4.25	3.92	60.5	21.600	0.9020	6.40	19.48	0.329 ✔

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.45	5.92	91.4	21.600	0.9020	10.47	19.48	0.537 ✔

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L2 1/2x2 1/2x3/16	6.01	6.01	92.8	21.600	0.9020	0.01	19.48	0.000* ✔

* DL controls

Redundant Sub-Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T19	10 - 0	L3x3x5/16	8.86	8.86	115.4	21.600	1.7800	12.84	38.45	0.334 ✔

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	140 - 130	L2x2x3/16	5.44	5.44	105.8	21.600	0.7150	0.17	15.44	0.011 ✔
T9	120 - 110	L2 1/2x2x3/16	6.45	6.45	129.1	21.600	0.8090	0.11	17.47	0.006 ✔
T11	100 - 90	L2 1/2x2x3/16	7.47	7.47	149.4	21.600	0.8090	0.12	17.47	0.007 ✔
T13	80 - 60	2L2x2x3/16	8.48	8.48	164.9	21.600	1.4300	0.16	30.89	0.005 ✔
T14	60 - 50	2L2x2x3/16	9.49	9.49	184.6	21.600	1.4300	0.15	30.89	0.005 ✔
T16	40 - 30	2L2x2x3/16	10.51	10.51	204.4	21.600	1.4300	0.20	30.89	0.007 ✔
T18	20 - 10	2L2x2 1/2x3/16	11.52	11.52	230.4	21.600	1.6200	0.08	34.99	0.002 ✔
T19	10 - 0	2L2x2 1/2x3/16	12.03	12.03	240.6	21.600	1.6200	0.17	34.99	0.005

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T1	180 - 170	Leg	L3 1/2x3 1/2x3/8	1	-6.92	48.00	14.4	Pass
T2	170 - 163.573	Leg	L5x5x5/16	21	-21.37	61.52	34.7	Pass
T3	163.573 - 159.049	Leg	L5x5x5/16	38	-36.54	70.30	52.0	Pass
T4	159.049 - 154.524	Leg	L5x5x5/16	54	-48.73	70.30	69.3	Pass
T5	154.524 - 150	Leg	L5x5x5/16	66	-58.08	70.30	82.6	Pass
T6	150 - 140	Leg	L5x5x3/8	78	-81.08	83.56	97.0	Pass
T7	140 - 130	Leg	L6x6x1/2	102	-97.27	138.47	70.2	Pass
T8	130 - 120	Leg	L6x6x1/2	127	-120.85	138.60	87.2	Pass
T9	120 - 110	Leg	L6x6x3/4	143	-146.56	203.15	72.1	Pass
T10	110 - 100	Leg	L6x6x3/4	170	-173.77	203.29	85.5	Pass
T11	100 - 90	Leg	L8x8x3/4	186	-202.51	239.94	84.4	Pass
T12	90 - 80	Leg	L8x8x3/4	207	-230.26	292.58	78.7	Pass
T13	80 - 60	Leg	L8x8x1 w/ 1/2x7 Plates	223	-287.22	542.49	52.9	Pass
T14	60 - 50	Leg	L8x8x1-1/8 w/ 1/2x7 Plates	252	-314.06	584.58	53.7	Pass
T15	50 - 40	Leg	L8x8x1-1/8 w/ 1/2x7 Plates	273	-339.75	641.95	52.9	Pass
T16	40 - 30	Leg	L8x8x1 1/8	289	-365.07	428.21	85.3	Pass
T17	30 - 20	Leg	L8x8x1 1/8	314	-392.79	428.28	91.7	Pass
T18	20 - 10	Leg	L8x8x1 1/8	330	-411.29	428.35	96.0	Pass
T19	10 - 0	Leg	L8x8x1 1/8	355	-426.58	429.80	99.3	Pass
T1	180 - 170	Diagonal	L2 1/2x2 1/2x3/16	15	-6.55	10.61	61.7	Pass
T2	170 - 163.573	Diagonal	L2 1/2x2 1/2x3/16	30	-7.13	15.14	47.1	Pass
T3	163.573 - 159.049	Diagonal	L2x2x3/16	50	-5.90	11.11	53.1	Pass
T4	159.049 - 154.524	Diagonal	L2 1/2x2x3/16	60	-6.15	13.08	47.0	Pass
T5	154.524 - 150	Diagonal	L2 1/2x2x3/16	69	-6.40	12.69	50.4	Pass
T6	150 - 140	Diagonal	L2 1/2x2x3/16	85	-6.84	11.33	60.4	Pass
T7	140 - 130	Diagonal	L3x2 1/2x1/4	115	-9.13	13.64	67.0	Pass
T8	130 - 120	Diagonal	L3x3x1/4	134	-10.76	17.06	63.1	Pass
T9	120 - 110	Diagonal	L3x3x1/4	156	-11.24	16.19	69.4	Pass
T10	110 - 100	Diagonal	L3 1/2x3x1/4	177	-12.55	18.37	68.3	Pass
T11	100 - 90	Diagonal	L3 1/2x3x1/4	203	-13.16	17.40	75.6	Pass
T12	90 - 80	Diagonal	L3 1/2x3x1/4	215	-13.97	16.47	84.8	Pass
T13	80 - 60	Diagonal	2L2 1/2x2x3/16	240	-14.93	21.54	69.3	Pass
T14	60 - 50	Diagonal	2L2 1/2x2x3/16	269	-14.48	20.20	71.7	Pass
T15	50 - 40	Diagonal	2L2 1/2x2x3/8	281	-15.89	35.82	44.4	Pass
T16	40 - 30	Diagonal	2L2 1/2x2x3/8	306	-16.23	34.00	47.7	Pass
T17	30 - 20	Diagonal	2L2 1/2x2x3/8	322	-14.94	32.28	46.3	Pass
T18	20 - 10	Diagonal	2L2 1/2x2x3/8	344	-20.29	30.67	66.1	Pass
T19	10 - 0	Diagonal	2L2 1/2x2 1/2x1/4	386	-21.38	36.82	58.1	Pass
T9	120 - 110	Horizontal	L2 1/2x2 1/2x1/4	149	-1.16	18.50	6.3	Pass
T11	100 - 90	Horizontal	L2 1/2x2 1/2x1/4	190	-1.65	16.57	9.9	Pass
T14	60 - 50	Horizontal	2L2x2x3/16	255	2.52	33.31	7.6	Pass
T18	20 - 10	Horizontal	2L2x2x3/16	333	6.08	33.31	18.2	Pass
T19	10 - 0	Horizontal	2L2 1/2x2 1/2x1/4	382	-16.66	31.13	53.5	Pass
T1	180 - 170	Secondary Horizontal	L2x2x3/16	20	-0.80	7.10	11.3	Pass
T7	140 - 130	Secondary Horizontal	L2x2x1/4	122	-1.46	5.06	28.8	Pass
T8	130 - 120	Secondary Horizontal	L2x2x1/4	138	-1.81	4.75	38.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T9	120 - 110	Secondary Horizontal	L2x2x3/16	163	-2.20	3.17	69.3	Pass
T10	110 - 100	Secondary Horizontal	L2x2x1/4	181	-2.61	3.59	72.6	Pass
T12	90 - 80	Secondary Horizontal	L2 1/2x2 1/2x1/4	219	-3.46	5.38	64.2	Pass
T15	50 - 40	Secondary Horizontal	L3 1/2x3 1/2x1/4	284	-5.10	9.15	55.7	Pass
T16	40 - 30	Secondary Horizontal	L3 1/2x3 1/2x1/4	309	-5.48	8.35	65.7	Pass
T17	30 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	325	-5.90	7.69	76.7	Pass
T18	20 - 10	Secondary Horizontal	L3 1/2x3 1/2x1/4	350	-6.17	7.11	86.9	Pass
T1	180 - 170	Top Girt	L2x2x3/16	5	0.51	16.65	3.0	Pass
T2	170 - 163.573	Top Girt	L2x2x3/16	27	-0.73	6.76	10.8	Pass
T3	163.573 - 159.049	Top Girt	L2x2x3/16	42	-0.90	6.98	12.9	Pass
T6	150 - 140	Top Girt	L2 1/2x2 1/2x3/16	84	-0.91	9.49	9.5	Pass
T7	140 - 130	Top Girt	L2 1/2x2 1/2x3/16	106	-0.92	15.38	6.0	Pass
T13	80 - 60	Top Girt	L2 1/2x2 1/2x1/4	225	-0.87	14.00	6.2	Pass
T16	40 - 30	Top Girt	2L2x2x3/16	292	3.04	33.31	9.1	Pass
T19	10 - 0	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	378	-6.40	14.43	44.4	Pass
T19	10 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	385	-6.38	8.70	73.3	Pass
T19	10 - 0	Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	372	-0.03	8.44	0.3	Pass
T19	10 - 0	Redund Sub Horz Bracing	L3x3x5/16	389	-7.43	10.86	68.4	Pass
T7	140 - 130	Inner Bracing	L2x2x3/16	112	-0.17	5.19	3.3	Pass
T9	120 - 110	Inner Bracing	L2 1/2x2x3/16	151	-0.11	4.90	2.3	Pass
T11	100 - 90	Inner Bracing	L2 1/2x2x3/16	192	-0.12	3.66	3.3	Pass
T13	80 - 60	Inner Bracing	2L2x2x3/16	229	-0.16	10.46	1.5	Pass
T14	60 - 50	Inner Bracing	2L2x2x3/16	258	-0.15	8.35	1.8	Pass
T16	40 - 30	Inner Bracing	2L2x2x3/16	297	-0.20	6.82	2.9	Pass
T18	20 - 10	Inner Bracing	2L2x2 1/2x3/16	336	-0.06	6.07	1.0	Pass
T19	10 - 0	Inner Bracing	2L2x2 1/2x3/16	395	-0.20	5.57	3.5	Pass
							Summary	
						Leg (T19)	99.3	Pass
						Diagonal (T12)	84.8	Pass
						Horizontal (T19)	53.5	Pass
						Secondary Horizontal (T18)	86.9	Pass
						Top Girt (T3)	12.9	Pass
						Redund Horz 1 Bracing (T19)	44.4	Pass
						Redund Diag 1 Bracing (T19)	73.3	Pass
						Redund Hip 1 Bracing (T19)	0.3	Pass
						Redund Sub Horz Bracing (T19)	68.4	Pass
						Inner Bracing (T19)	3.5	Pass
						Bolt Checks	56.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
						RATING =	**99.3**	**Pass**

Program Version 6.0.0.8 - 9/7/2011 File:W:/Transcend_Wireless_TWS/36928700-TWS015_Wilton/08/ERI Files/180' Lattice Wilton CSP.eri

ANCHOR BOLT EVALUATION

ANCHOR BOLT ANALYSIS

Input Data

Max Pier Reactions:

Uplift:	Uplift := 404·kips	*user input*
Shear:	Shear := 43·kips	*user input*
Compression:	Compression := 453kips	*user input*

Anchor Bolt Data:

Use ASTM A36

Number of Anchor Bolts = N	N := 4	*user input*	
Bolt Ultimate Strength:	F_u := 58·ksi	*user input*	
Bolt Yield Strength:	Fy := 36·ksi	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	
Thickness of Anchor Bolts	D := 2.5in	*user input*	
Threads per Inch:	n := 4	*user input*	
Coefficient of Friction:	μ := 0.55	*user input*	(for baseplate with grout ASCE 10-97)

Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4} \cdot D^2 \qquad A_g = 4.909 \cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 \qquad A_n = 3.999 \cdot in^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$AllowableTension := 1.33 \cdot \left(0.33 \cdot A_g \cdot F_u \right) \qquad AllowableTension = 125.0 \cdot kips$$

Note: 1.33 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{net.area} := 1.33 \cdot \left(0.60 \cdot A_n \cdot Fy \right) \qquad F_{net.area} = 114.9 \cdot kips$$

Note: 1.33 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{Uplift}{N} \qquad MaxTension = 101.0 \cdot kips$$

Check Stresses:

$$\frac{MaxTension}{F_{net.area}} = 0.88$$

$$Condition1 := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed" \right)$$

$$Condition1 = "OK"$$

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Stell Transmission Structures

Required Area:

$$A_{s1} := \frac{Uplift}{Fy} + \frac{Shear}{\mu \cdot 0.85 \cdot Fy} \qquad A_{s1} = 13.8 \cdot in^2$$

$$A_{s2} := \left| \frac{Shear - (0.3 \cdot Compression)}{\mu \cdot 0.85 \cdot Fy} \right| \qquad A_{s2} = 5.5 \cdot in^2$$

Provided Area:

$$A_{sprovided} := A_n \cdot N \qquad A_{sprovided} = 16.0 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s1}}{A_{sprovided}} = 0.86$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s2}}{A_{sprovided}} = 0.35$$

Condition3 = "OK"

FOUNDATION ANALYSIS

FOOTING WITH FOUR CONCRETE PIERS

INPUT DATA

TOWER FORCES:

Moment Caused by Tower	$M_t := 10769 \cdot kip \cdot ft$
Shear at Base of Tower	$S_t := 99kip$
Max Compressive Force	$C_t := 453kip$
Max Uplift	$U_t := 404kip$
Max Pier Shear	$S_p := 43kip$
Height of Tower	$H_t := 180 \cdot ft$
Width of Tower at Base	$W_t := 17.729 \cdot ft$
Weight of Tower	$WT_t := 1 \cdot kip$

NOTE: Weight of Tower is incorporated into the other loads listed above and is therefore set equal to one for programming.

FOOTING DIMENSIONS:

Width of Footing	$W_f := 37 \cdot ft + 0ft$
Overall Depth of Footing	$D_f := 9.5ft$
Length of Pier	$L_p := 6.5 \cdot ft - 0ft$
Extension of Pier Above Grade	$L_{pag} := 1.0 \cdot ft$
Square Dimension of Pier	$d_p := 4.0 \cdot ft$
Thickness of Footing	$T_f := 3.0 \cdot ft + 0ft$
Reinforement Cover:	$Cvr := 3in$
Ftg. Edge To Pier CL:	$X_t := 8.635ft$

MATERIAL PROPERTIES:

Compressive Strength of Concrete	$f'c := 3000 \cdot psi$	Unit Weight of Soil	$\gamma_s := 100pcf$
Yield Strength of Steel Reinforcement	$fy := 60000 \cdot psi$	Unit Weight of Concrete	$\gamma_c := 150 \cdot pcf$
Internal Friction Angle of Soil	$\phi_s := 30 \cdot deg$	Depth to Neglect	$n := 1.5 \cdot ft$
Allowable Bearing Capacity	$q_s := 3400 \cdot psf$	Cohesion of Clay Type Soil	$c := 0 \cdot ksf$
		Note: Use 0 for Sandy Soil	
Stability Factor of Safety	$FS_{req} := 2.0$		
Coefficient of Lateral Soil Pressure	$K_p := \frac{1 + \sin(\phi_s)}{1 - \sin(\phi_s)}$	$K_p = 3$	

What is Position of Center of Tower with respect to Center of Pad? 1=Offset 2=Not Offset $Pos_{tower} := 1$

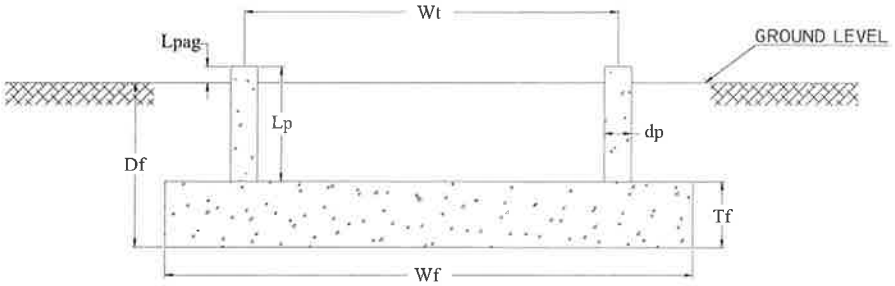
PIER REINFORCEMENT:

Bar Size	$BSpier := 9$	Bar Diameter	$d_{bpier} := 1.128 \cdot in$
Number of Bars	$NBpier := 24$	Bar Area	$A_{bpier} := 1.00 \cdot in^2$

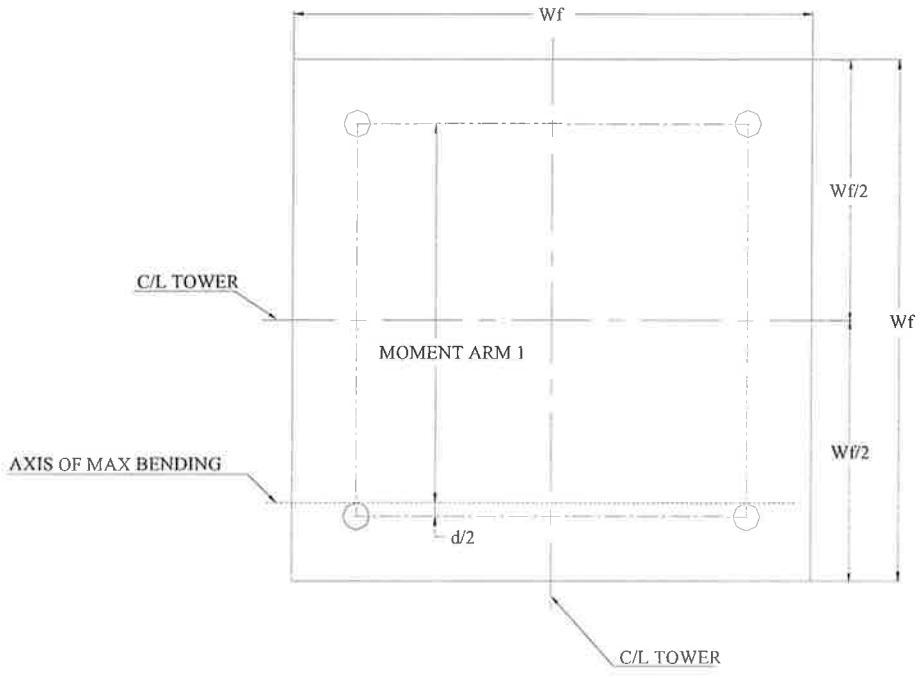
PAD REINFORCEMENT:

Bar Size	$BS_{pad} := 9$	Bar Diameter	$d_{bpad} := 1.128 \cdot in$
Number of Bars	$NB_{pad} := 42$	Bar Area	$A_{bpad} := 1.00 \cdot in^2$

Typical Footing Plan and Elevation:



ELEVATION



PLAN

STABILITY OF FOOTING

Passive Pressure:

Pressure at Neglect: $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p}$ $P_{pn} = 0.45 \cdot ksf$

Pressure at Footing Top: $P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p}$ $P_{pt} = 1.95 \cdot ksf$

Pressure at Top: $P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}]$ $P_{top} = 1.95 \cdot ksf$

Pressure at Bottom: $P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p}$ $P_{bot} = 2.85 \cdot ksf$

Average Pressure: $P_{ave} := \frac{P_{top} + P_{bot}}{2}$ $P_{ave} = 2.4 \cdot ksf$

Soil Shear:

Effective Soil Depth: $T_{pp} := if[n < (D_f - T_f), T_f, (D_f - n)]$ $T_{pp} = 3 \cdot ft$

Area of Resistance: $A_{pp} := W_f \cdot T_{pp}$ $A_{pp} = 111 \cdot ft^2$

Shear Resistance: $S_u := P_{ave} \cdot A_{pp}$ $S_u = 266.4 \cdot kip$

Stabilizing Dead Load:

Weight of Concrete Pad: $WT_c := (W_f^2 \cdot T_f) \cdot \gamma_c$ $WT_c = 616.05 \cdot kip$

Weight of Soil above Footing: $Depth := \begin{cases} D_f - n - T_f & \text{if } n < (D_f - T_f) \\ 0 & \text{otherwise} \end{cases}$ $Depth = 5 \cdot ft$

$WT_{s1} := W_f^2 \cdot Depth \cdot \gamma_s$ $WT_{s1} = 684.5 \cdot kip$

Weight of Soil Wedge at Back Face: $WT_{s2} := \left[\frac{(D_f - n)^2 \cdot \tan(\phi_s)}{2} \cdot W_f\right] \cdot \gamma_s$ $WT_{s2} = 68.3583 \cdot kip$

Distance to center of Tower Leg from Edge of Footing: $X_{t1} := \frac{W_f}{2} - \frac{W_t}{2}$ $X_{t2} := \frac{W_f}{2} - \frac{W_t}{2}$ $X_t := if(Pos_{tower} = 1, X_{t1}, X_{t2})$

Additional Offset of Footing: $X_{off1} := \frac{W_f}{2} - \left(\frac{W_t \cdot \cos(30 \cdot deg)}{3} + X_t\right)$ $X_{off1} := 10.63541667\,ft$ $X_{off2} := 0$

$X_{off} := if(Pos_{tower} = 1, X_{off1}, X_{off2})$ $X_{off} = 10.6354 \cdot ft$

Stability Analysis:

Resisting Moment: $M_r := (WT_c + WT_{s1}) \cdot \frac{W_f}{2} + WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + S_u \cdot \frac{T_{pp}}{3} + WT_{s2} \cdot \left(W_f + \frac{T_{pp} \cdot \tan(\phi_s)}{3}\right)$

$M_r = 26903.1623 \cdot kip \cdot ft$

Overturning Moment: $M_{ot} := M_t + S_t \cdot (L_p + T_f) + WT_t \cdot X_{off}$ $M_{ot} = 11720.1354 \cdot kip \cdot ft$

Factor of Safety: $FS := \frac{M_r}{M_{ot}}$ $FS = 2.3$

$SafetyCheck := if(FS > FS_{req}, "Okay", "No Good")$ $SafetyCheck = "Okay"$

BEARING PRESSURES

Loading Eccentricity:

Total Axial Load: $LOAD_{tot} := WT_c + WT_{s1} + WT_t$ → $LOAD_{tot} = 1301.55 \cdot kip$

Total Moment: $M_{ot} := M_t + S_t \cdot (L_p + T_f) + WT_t$ → $M_{ot} = 11710.5 \cdot kip \cdot ft$

Eccentricity: $e := \frac{M_{ot}}{LOAD_{tot}}$ → $e = 8.9973 \cdot ft$

Dist. From Ftg. CL to Kern Edge: $X_k := \frac{W_f}{6}$ → $X_k = 6.1667 \cdot ft$

Calculate Soil Pressures:

Maximum Contact Pressure:

$$P_{max} := \begin{cases} \frac{LOAD_{tot}}{W_f^2} \cdot \left(1 + \frac{6 \cdot e}{W_f}\right) & \text{if } e \le X_k \\ \frac{2 \cdot LOAD_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} & \text{otherwise} \end{cases}$$

$P_{max} = 2.4679 \cdot ksf$

Minimum Contact Pressure:

$$P_{min} := \begin{cases} \frac{LOAD_{tot}}{W_f^2} \cdot \left(1 - \frac{6 \cdot e}{W_f}\right) & \text{if } e \le X_k \\ 0ksf & \text{otherwise} \end{cases}$$

$P_{min} = 0 \cdot ksf$

Length of Applied Pressure:

$$X_p := \begin{cases} W_f & \text{if } e \le X_k \\ 3 \cdot \left(\frac{W_f}{2} - e\right) & \text{otherwise} \end{cases}$$

$X_p = 28.508 \cdot ft$

Pressure Slope:

$$m_p := \frac{P_{max} - P_{min}}{X_p}$$

$m_p = 0.0866 \cdot ksf$

Soil Bearing Pressure Check:

$BearingStatus := if(P_{max} < q_s, "Okay", "No Good")$ → $BearingStatus = "Okay"$

Concrete Bearing Capacity (ACI 10.17):

(ACI 9.3.2.2) $\phi_c := 0.75$

$P_b := \phi_c \cdot 0.85 \cdot f'c \cdot \frac{d_p^{\,2} \cdot \pi}{4}$ $\quad P_b = 3460.7785 \cdot kip$

$BearingCheck := if(P_b > C_t, "Okay", "No Good")$ $\quad BearingCheck = "Okay"$

SHEAR STRENGTH OF CONCRETE

Beam (One-Way) Shear Action (ACI 11.3.1.1):

Load Factor (EIA 3.1.1):
$LF := if\left[H_t \le 700 \cdot ft, 1.3, if\left[H_t \ge 1200, 1.7, 1.3 + \left(\frac{H_t - 700}{1200 - 700}\right) \cdot 0.4\right]\right]$ $\quad LF = 1.3$

"d" Distance:
$d := T_f - Cvr - .5 \cdot in$ $\quad d = 32.5 \cdot in$

Factored Pressure at "d" Distance:
$P_d := LF \cdot \left[P_{max} - \left(X_t - \frac{d_p}{2} - d\right) \cdot m_p\right]$ $\quad P_d = 2.6537 \cdot ksf$

Factored Pressure at Edge:
$P_{edge} := LF \cdot P_{max}$ $\quad P_{edge} = 3.2082 \cdot ksf$

Average Pressure:
$P_{ave} := \frac{P_d + P_{edge}}{2}$ $\quad P_{ave} = 2.931 \cdot ksf$

Capacity Reduction Factor (ACI 9.3.2.3):
$\phi_{vc} := .85$

Applied Shear Force:
$V_{req} := \frac{P_{ave} \cdot \left(X_t - 0.5 \cdot d_p - d\right) \cdot W_f}{\phi_c}$ $\quad V_{req} = 628.6289 \cdot kip$

Available Shear (ACI 11.3.1.1):
$V_{Avail} := 2 \cdot \sqrt{f'c \cdot psi} \cdot W_f \cdot d$ $\quad V_{Avail} = 1580.7273 \cdot kip$

Check Capacity:
$BeamShearCheck := if(V_{req} < V_{Avail}, "Okay", "No Good")$

$BeamShearCheck = "Okay"$

Punching (Two-Way) Shear Action (ACI 11.12.2.1):

Critical Perimeter: $b_o := 4(d_p + d)$ → $b_o = 26.8333 \cdot ft$

Capacity Reduction Factor: (ACI 9.3.2.3) $\phi_c := .85$ $C_t = 453 \cdot kip$

Factored Maximum Punching Shear Force $FL := \frac{LF \cdot C_t}{\phi_c}$ → $FL = 692.8235 \cdot kip$

Available Shear: $V_{Avail} := 4 \cdot \sqrt{f'c \cdot psi} \cdot b_o \cdot d$ → $V_{Avail} = 2292.7666 \cdot kip$

Check Capacity: $PunchingShearCheck := if(V_{req} < V_{Avail}, "Okay", "No Good")$

$PunchingShearCheck = "Okay"$

BENDING

Maximim Bending Moment:

Distance From Edge of FTG To Face of Pier: $X_b := \frac{W_f}{2} - e - \frac{d_p}{2}$ → $X_b = 7.5027 \cdot ft$

Moment Due To Overturning:

Factored Pressure at "d" Distance: $P_{face} := LF \cdot (P_{max} - X_b \cdot m_p)$ → $P_{face} = 2.3639 \cdot ksf$

Factored Pressure at Edge: $P_{edge} := LF \cdot P_{max}$ → $P_{edge} = 3.2082 \cdot ksf$

Moment Due To Rectangular Loading: $M_1 := (P_{face} \cdot X_b \cdot W_f) \cdot \left(\frac{1}{2} \cdot X_b\right)$ → $M_1 = 2461.674 \cdot kip \cdot ft$

Moment Due to Triangular Loading: $M_2 := \left[\frac{1}{2} \cdot X_b \cdot (P_{edge} - P_{face})\right] \cdot \left(\frac{2}{3} \cdot X_b\right)$ → $M_2 = 15.8425 \cdot kip \cdot ft$

Sum Moments: $M_{ot} := M_1 + M_2$ → $M_{ot} = 2477.5165 \cdot kip \cdot ft$

Moment Due To Uplift:

Pier Forces:

$$M_{nT} := LF\cdot\left[U_t\cdot\left(W_f - 2\cdot X_b - \frac{d}{2} - d\right) + S_t\cdot\left(D_f + L_{pag}\right)\right] \qquad M_{nT} = 10769.3407\cdot kip\cdot ft$$

Concrete Resistance:

$$M_{nS} := \frac{1}{2}\cdot\left(W_f - X_b - d_p\right)^2\cdot\left(T_f\cdot W_f\right)\cdot\gamma_s \qquad M_{nS} = 3608.1373\cdot kip\cdot ft$$

Soil Resistance:

$$M_{nC} := \frac{1}{2}\cdot\left(W_f - X_b - d_p\right)^2\cdot\left(T_f\cdot W_f\right)\cdot\gamma_c \qquad M_{nC} = 5412.2059\cdot kip\cdot ft$$

Sum Moments

$$M_{uplift} := M_{nT} - M_{nS} - M_{nC} \qquad M_{uplift} = 1748.9976\cdot kips\cdot ft$$

Select Controlling Moment:

$$M_u := \begin{cases} M_{ot} & \text{if } M_{ot} \geq M_{uplift} \\ M_{uplift} & \text{otherwise} \end{cases} \qquad M_u = 2477.5165\cdot kips\cdot ft$$

Strength Reduction Factor:
(ACI 9.3.2.2)

$$\phi_m := .90$$

Design Moment:

$$M_n := \frac{M_u}{\phi_m} \qquad M_n = 2752.7961\cdot kips\cdot ft$$

Size Reinforcing Steel:

Effective Width:

$$b_{eff} := W_f \qquad b_{eff} = 444\cdot in$$

Stress Block:

$$a := d\cdot\left(1 - \sqrt{1 - 2.3529\cdot\frac{M_n}{f'c\cdot b_{eff}\cdot d^2}}\right) \qquad a = 0.9105\cdot in$$

Steel Req'd For Bending:

$$A_s := \frac{M_n}{fy\cdot\left(d - \frac{a}{2}\right)} \qquad A_s = 17.1809\cdot in^2$$

Reinforcement Ratio:

$$\rho := \frac{A_s}{b_{eff}\cdot d} \qquad \rho = 0.0012$$

Steel Req'd For
Temperature and Shrinkage:
(ACI 7.12.2.1b)

$$\rho_{sh} := \text{if}(fy \geq 60000\cdot psi, 0.0018, 0.0020) \qquad \rho_{sh} = 0.0018$$

$$As := \text{if}\left(\rho \geq \rho_{sh}, A_s, \rho_{sh}\cdot b_{eff}\cdot d\right) \qquad As = 25.974\cdot in^2$$

$$As_{prov} := A_{bpad}\cdot NB_{pad} \qquad As_{prov} = 42\cdot in^2$$

Check Provided Steel:

$$PadReinforcement := \text{if}\left(As_{prov} > As, \text{"Okay"}, \text{"No Good"}\right)$$

$$PadReinforcement = \text{"Okay"}$$

DEVELOPMENT LENGTH OF PAD REINFORCEMENT

TENSION (ACI 12.2.3)

Bar Spacing:

$$B_{sPad} := \frac{W_f - 2\cdot Cvr - NB_{pad}\cdot d_{bpad}}{NB_{pad} - 1}$$

$B_{sPad} = 9.5274\cdot in$

Development Length Factors:

Reinforcement Location Factor	$\alpha := 1.0$
Coating Factor	$\beta := 1.0$
Concrete strength Factor	$\lambda := 1.0$
Reinforcement Size Factor	$\gamma := 1.0$

Spacing or Cover Dimension:

$$c := if\left(Cvr < \frac{B_{sPad}}{2}, Cvr, \frac{B_{sPad}}{2}\right)$$

$c = 3\cdot in$

Transverse Reinforcement Index: As allowed by ACI 12.2.4 $k_{tr} := 0$

$$L_{dbt} := \frac{3}{40}\cdot\frac{fy}{\sqrt{f'c\cdot psi}}\cdot\frac{\alpha\cdot\beta\cdot\gamma\cdot\lambda}{\frac{c+k_{tr}}{d_{bpad}}}\cdot d_{bpad}$$

$L_{dbt} = 34.8457\cdot in$

$L_{dbmin} := 12\cdot in$

Minimum Development Length: (ACI 12.2.1)

$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right)$ $L_{dbtCheck} = "Use\ L.dbt"$

Available Length in Pad:

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr$$

$L_{Pad} = 112.626\cdot in$

$LpadTension := if\left(L_{Pad} > L_{dbt}, "Okay", "No\ Good"\right)$ $LpadTension = "Okay"$

REINFORCEMENT IN PIER

Pier Area:

(ACI 10.8.4 and 10.9.1)

$$A_p := \frac{\pi\cdot d_p^{\,2}}{4}$$

$A_p = 1809.5574\cdot in^2$

$A_{smin} := 0.01\cdot 0.5\cdot A_p$

$A_{smin} = 9.0478\cdot in^2$

$A_{sprov} := NBpier\cdot A_{bpier}$

$A_{sprov} = 24\cdot in^2$

$SteelAreaCheck := if\left(A_{sprov} > A_{smin}, "Okay", "No\ Good"\right)$ $SteelAreaCheck = "Okay"$

NOTE: Anchor Bolts are not accounted for in reinforcement calculation and will provide additional reinforcement to satisfy minimum requirement of steel.

Bar Spacing In Pier: $B_{sPier} := \frac{d_p \cdot \pi}{NBpier} - d_{bpier}$ $B_{sPier} = 5.1552 \cdot in$

Diameter of Reinforcement Cage: $Diam_{cage} := d_p - 2 \cdot Cvr$ $Diam_{cage} = 42 \cdot in$

Maximum Moment in Pier: $M_p := (S_p \cdot L_p) \cdot LF$ $M_p = 4360 \cdot kips \cdot in$

Pier Check evaluated from outside program and results are listed below;

(defined variables) $(f'_c \;\; f_y \;\; cl \;\; Spiral) = (3 \;\; 60 \;\; 4 \;\; 0)$

The required input is column diameter in inches, number of reinforcing bars, bar size number, factored axial load in kips and moment in kip inches: $(D \;\; N \;\; n \;\; P_u \;\; M_{xu}) := (48 \;\; 24 \;\; 9 \;\; 144 \;\; 16045)$

Clears any previous output: $(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := (0 \;\; 0 \;\; 0 \;\; 0)$

$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := \phi P'_n(D, N, n, P_u, M_{xu})^T$

The Output is given as useable axial load in kips, moment capacity in kip inches, splicing stress in ksi, and reinforcement ratio: $(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) = (208.5987 \;\; 23242.8205 \;\; -60 \;\; 0.0133)$

Column size and reinforcement may be changed to match capacity to the applied load.

$AxialLoadCheck := if(\phi P_n \geq P_u, "Okay", "No Good")$ $AxialLoadCheck = "Okay"$

$BendingCheck := if(\phi M_{xn} \geq M_{xu}, "Okay", "No Good")$ $BendingCheck = "Okay"$

DEVELOPMENT LENGTH OF PIER REINFORCEMENT

TENSION (ACI 12.2.3)

Spacing and Cover: $Cvr = 3 \cdot in$ $B_{sPier} = 5.1552 \cdot in$

Factors for development:

Reinforcement Location Factor	$\alpha := 1.0$	
Coating Factor	$\beta := 1.0$	
Concrete strength Factor	$\lambda := 1.0$	
Reinforcement Size Factor	$\gamma := 1.0$	

Spacing or Cover Dimension: $c := if\left(Cvr < \frac{B_{sPier}}{2}, Cvr, \frac{B_{sPier}}{2}\right)$ $c = 2.5776 \cdot in$

Transverse Reinforcement: As allowed by ACI 12.2.4 $k_{tr} := 0$

$$L_{dbt} := \frac{3}{40} \cdot \frac{fy}{\sqrt{f'c \cdot psi}} \cdot \frac{\alpha \cdot \beta \cdot \gamma \cdot \lambda}{\frac{c + k_{tr}}{d_{bpier}}} \cdot d_{bpier} \qquad L_{dbt} = 40.5561 \cdot in$$

Minimum Development Length: (ACI 12.2.1) $L_{dbmin} := 12 \cdot in$

$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, \text{"Use L.dbt"}, \text{"Use L.dbmin"}\right)$ $L_{dbtCheck} = \text{"Use L.dbt"}$

COMPRESSION: (ACI 12.3.2)

$$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot fy}{\sqrt{f'c \cdot psi}} \qquad L_{dbc1} = 24.7132 \cdot in$$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot fy\right)$ $L_{dbmin} = 20.304 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right)$ $L_{dbc} = 24.7132 \cdot in$

Available Length in Pier: $L_{pier} := L_p - 3 \cdot in$ $L_{pier} = 75 \cdot in$

Available Length in Pad: $L_{pad} := T_f - 3 \cdot in$ $L_{pad} = 33 \cdot in$

Available Length: $L_{total} := L_{pad} + L_{pier}$ $L_{total} = 108 \cdot in$

$L_{tension} := if\left(L_{total} > L_{dbt}, \text{"Okay"}, \text{"No Good"}\right)$ $L_{tension} = \text{"Okay"}$

$L_{compression} := if\left(L_{total} > L_{dbc}, \text{"Okay"}, \text{"No Good"}\right)$ $L_{compression} = \text{"Okay"}$

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PROJECT: 2.5 EQUIPMENT DEPLOYMENT

SITE NAME: CTS

SITE CASCADE: CT03XC360-E

SITE ADDRESS: 46 FERNWOOD LANE
WILTON, CT 06897

SITE TYPE: 180'-0" SELF SUPPORT TOWER

SITE INFORMATION

PROPERTY OWNER:
THE STATE OF CONNECTICUT DEPARTMENT OF
PUBLIC SAFETY DIVISION OF STATE POLICE
1111 COUNTY CLUB ROAD
MIDDLETOWN, CT 06457

SITE ADDRESS:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

GEOGRAPHIC COORDINATES:
LATITUDE: 41° 10' 20.7798" (41.1724393 N)
LONGITUDE: 73° 26' 3.6954" (-73.4343597 W)

ZONING JURISDICTION:
THE CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE
NEW BRITAIN, CT 06051

ZONING DISTRICT:
CSC APPROVED

POWER COMPANY:
NORTHEAST UTILITIES (CONNECTICUT LIGHT & POWER)
PH.: (800) 286-2000

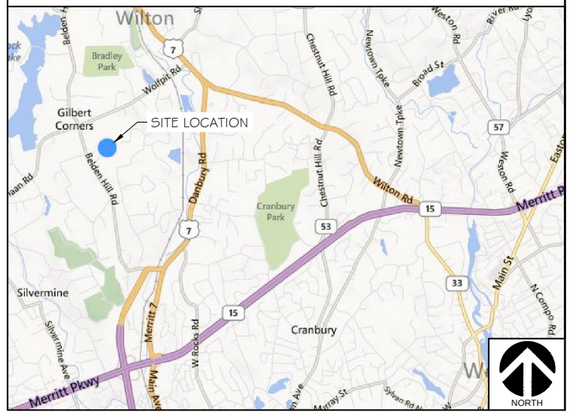
AAV PROVIDER:
FIBERTECH
PH.: (866) 697-5100

SPRINT CONSTRUCTION MANAGER:
NAME: GARY WOOD
PHONE: (860) 940-9168
E-MAIL: gary.wood@sprint.com

EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600-700 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974
PH.: (908) 508-8080

PLANS PREPARED BY:
RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK, PROJECT MANAGER
PH.: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

AREA MAP



LOCATION MAP

PROJECT DESCRIPTION

- INSTALL NEW 2.5 EQUIPMENT IN EXISTING BTS CABINET
  *(1) RECTIFIER SHELF AND (3) RECTIFIERS
  *(1) BASE BAND UNIT
- INSTALL (2) NEW BATTERY STRINGS IN EXISTING BATTERY CABINET
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRH'S ON TOWER
- INSTALL (2) FIBER CABLES AND (3) FIBER JUMPERS
- INSTALL (27) ANTENNA / RRH JUMPERS

APPLICABLE CODES

* ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

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SHEET INDEX

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SP-2	SPRINT SPECIFICATIONS	B	JRS
SP-3	SPRINT SPECIFICATIONS	B	JRS
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Transcend Wireless
48 SPRUCE STREET
OAKLAND, NJ 07346

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

Signature: Date: 8/08/2014

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL
DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
TITLE SHEET

SCALE: NONE

PROJECT NUMBER: 28731
SHEET NUMBER: T-1

I:\28700\28731\CAD\Sprint 2.5\28731 Sprint 2.5 CD.dwg Printed by: steves on Aug 08, 2014 - 11:28am

DRAWN BY: TWS
CHECKED BY: KAB

SECTION 01 100 - SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND THE SITE SPECIFIC WORK ORDER, DESCRIBE THE WORK TO BE PERFORMED BY THIS CONSTRUCTION CONTRACTOR (SUPPLIER).

RELATED DOCUMENTS:
A. THE REQUIREMENTS OF EACH SECTION OF THIS SPECIFICATION APPLY TO ALL SECTIONS, INDIVIDUALLY AND COLLECTIVELY.
B. RELATED DOCUMENTS: THE CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE FOLLOWING SUPPLEMENTAL REQUIREMENTS FOR INSTALLATION AND TESTING.
   1. EN-2012-001: (FIBER OPTIC, DC CABLE, AND DC CIRCUIT BREAKER TAGGING STANDARDS)
   2. TS-0200 - (TRANSMISSION ANTENNA LINE ACCEPTANCE STANDARDS)
   3. EL-0568: (FIBER TESTING POLICY)
   4. NP-312-201: (EXTERIOR GROUNDING SYSTEM TESTING)
   5. NP-760-500: ETHERNET, MICROWAVE, TESTING AND ACCEPTANCE

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

NATIONALLY RECOGNIZED CODES AND STANDARDS:
THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
D. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
G. AMERICAN CONCRETE INSTITUTE (ACI)
H. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
I. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
O. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
P. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
Q. DOOR AND HARDWARE INSTITUTE (DHI)
R. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
S. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

DEFINITIONS:
A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: "SPRINT"; SPRINT NEXTEL CORPORATION AND IT'S OPERATING ENTITIES.
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR, SUPPLIER, CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. CONSTRUCTION MANAGER - ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

POINT OF CONTACT:
COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

DRAWINGS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

USE OF JOB SITE:
THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

UTILITY SERVICES:
WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

PERMITS/FEES:
WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR:
CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

TEMPORARY UTILITIES AND FACILITIES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSOR'S OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

ACCESS TO WORK:
THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

DIMENSIONS:
VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

EXISTING CONDITIONS:
NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:
COMPANY FURNISHED MATERIALS AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR (OFIC) IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
   1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
   2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
   3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
C. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
D. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

DELIVERABLES:
A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S ISSUANCE OF THE WORK ORDER.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

GENERAL REQUIREMENTS FOR CONSTRUCTION:
A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
   1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
   2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

FUNCTIONAL REQUIREMENTS:
A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
   2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
   3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
   4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
   5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
   6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
   7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
   8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
   9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
   10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
   11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
   12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
   13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
   14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
   15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
   16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
   17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
   18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
   19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
   20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
   1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION IF REQUESTED BY SPRINT
   2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON-LINE FORMS AND COMPLETE DOCUMENT UP-LOADS. UPLOAD ALL REQUIRED CLOSEOUT DOCUMENTS AND FINAL SITE PHOTOS
   3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT LEFT ON SITE INSIDE BASE OF MAIN RF CABINET IN A PROTECTIVE POUCH.
   4. ALL REQUIRED TEST REPORTS.
   5. REQUIRED CLOSEOUT DOCUMENTATION INCLUDING BUT NOT LIMITED TO:
      a. ALL JURISDICTIONAL PERMITTING AND OCCUPANCY INFORMATION
      b. PDF SCAN OF REDLINES PRODUCED IN THE FIELD
      c. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS
      d. LIEN WAIVERS
      e. FINAL PAYMENT APPLICATION
      f. REQUIRED FINAL CONSTRUCTION PHOTOS
      g. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
      h. LISTS OF SUBCONTRACTORS
B. PROVIDE ADDITIONAL DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
   1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
   2. PROJECT PROGRESS REPORTS.
   3. PRE-CONSTRUCTION MEETING NOTES.

SECTION 01 400 - TESTS, INSPECTIONS, SUBMITTALS, AND PROJECT CLOSEOUT

TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. COAX SWEEPS AND FIBER TESTS PER TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS
   2. POST CONSTRUCTION HEIGHT VERIFICATION, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
   3. CONCRETE BREAK TESTS
   4. SITE RESISTANCE TO EARTH TEST
   5. STRUCTURAL BACKFILL COMPACTION TESTS
   6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
   7. ADDITIONAL TESTING AS REQUIRED ELSEWHERE IN THIS SPECIFICATION.

SUBMITTALS:
A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
B. UPLOAD THE FOLLOWING TO SITERRA AS APPLICABLE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
   2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
   3. CHEMICAL GROUNDING SYSTEM .
   4. REINFORCEMENT CERTIFICATIONS
   5. STRUCTURAL BACKFILL TEST RESULTS
   6. SWEEP AND FIBER TESTS
   7. ANTENNA AZIMUTH AND DOWN-TILT VERIFICATION
   8. POST CONSTRUCTION HEIGHT VERIFICATION
   9. ADDITIONAL SUBMITTALS MAY BE REQUIRED FOR SPECIAL CONSTRUCTION OR MINOR MATERIALS
C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
   1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
   2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
   3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
   1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
   2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
   3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
   4. REBAR PLACEMENT VERIFICATION WITH REPORT
   5. TESTING TENSION STUDY FOR ROCK ANCHORS
   6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
   1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
   2. FIBER TESTS PER SPRINT STANDARD EL-0568
   3. MICROWAVE LINK TESTS PER NP-760-500
   4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999
www.Ramaker.com

Transcend Wireless
48 SPRUCE STREET
OAKLAND, NJ 07346

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

James R. Skowronski 8/08/2014
Signature: Date:

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL
DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28731
SHEET NUMBER: SP-1

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DRAWN BY: TWS CHECKED BY: KAB

5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION

D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING

E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

PROJECT CLOSEOUT:

A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.

B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:
1. COAX SWEEP TESTS:
2. FIBER TESTS:
3. JURISDICTION FINAL INSPECTION DOCUMENTATION
4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
6. LIEN WAIVERS AND RELEASES.
7. POST -CONSTRUCTION HEIGHT VERIFICATION
8. JURISDICTION CERTIFICATE OF OCCUPANCY
9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
11. CELL SITE UTILITY SETUP
12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
14. LIST OF SUB CONTRACTORS
15. APPROVED PERMITTING DOCUMENTS
16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
    a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX/CABLE LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    b. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
    c. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
    d. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:

A. PROVIDE PROJECT CLOSEOUT GENERAL ARRANGEMENT PHOTOS OF ALL NEW WORK. THE FOLLOWING LIST REPRESENTS MINIMUM REQUIREMENTS AND MINIMUM QUANTITY. ADDITIONAL PHOTOS MAY BE REQUIRED TO ADEQUATELY DOCUMENT THE WORK.
1. ASR AND RF MPE SIGNAGE (IF NOT IN PLACE, SUPPLIER NOTIFIES EMS FIELD REPRESENTATIVE)
2. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR)
3. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR) CLOSE UP SHOWING WEATHERPROOFING AND GROUNDING (AS REQUIRED). CLOSE-UP OF BACK SIDE OF EACH PERMANENT RRU SHOWING SERIAL NUMBER/BAR CODE.
4. VIEW (1 EACH SECTOR) ALONG THE AZIMUTH AND TILT OF THE ANTENNAS
5. TOP OF TOWER FROM GROUND, 1 EACH SECTOR
6. MAINLINE HYBRID CABLE ROUTE DOWN TOWER SHOWING FASTENERS AND SUPPORT
7. MAINLINE/HYBRID CABLE ROUTE ALONG ICE BRIDGE OR IN CABLE TRAY SHOWING FASTENERS AND SUPPORT
8. GROUND MOUNTED RRU RACKS (FRONT AND BACK)
9. FRONT, SIDE AND BACK ELEVATIONS OF ALL GROUND CABINETS
10. VIEW OF COMPOUND FROM A DISTANCE
11. VIEW OF EACH GROUND CABINET (POWER, RF, FIBER SPOOL, PPC POWER, PPC TELCO WITH DOOR OPEN)
12. BACKHAUL FIBER MEET-ME-POINT AND CONDUIT ROUTE (MICROWAVE INSTALLATION IF NOT FIBER)
13. AAV NETWORK INTERFACE DEVICE OR MICROWAVE RADIO INSTALLATION

DEFICIENCY CORRECTIONS:

CONTRACTOR IS RESPONSIBLE FOR ALL CORRECTIONS TO DEFICIENCIES IDENTIFIED THROUGH TESTING, REVIEW OF SUBMITTALS, INSPECTIONS AND CLOSEOUT REVIEWS.

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:

A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.

B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINTS LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

PROJECT CONFERENCE CALLS:

SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINTS FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN. LENGTH FOR JUMPER SHALL BE 10'-0".

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
    a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 (CURRENT VERSION).
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

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1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999
www.Ramaker.com

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Certification & Seal:
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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · No. 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 8/08/2014

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28731
SHEET NUMBER: SP-2

I:\28700\28731\CAD\Sprint 2.5\28731 Sprint 2.5 CD.dwg Printed by: steves on Aug 08, 2014 - 11:29am

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.

2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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1120 Dallas Street, Sauk City, WI 53583
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www.Ramaker.com

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OAKLAND, NJ 07346

Certification & Seal:
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STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

Signature: 8/08/2014 Date:

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL — DATE ISSUED: 08/08/2014

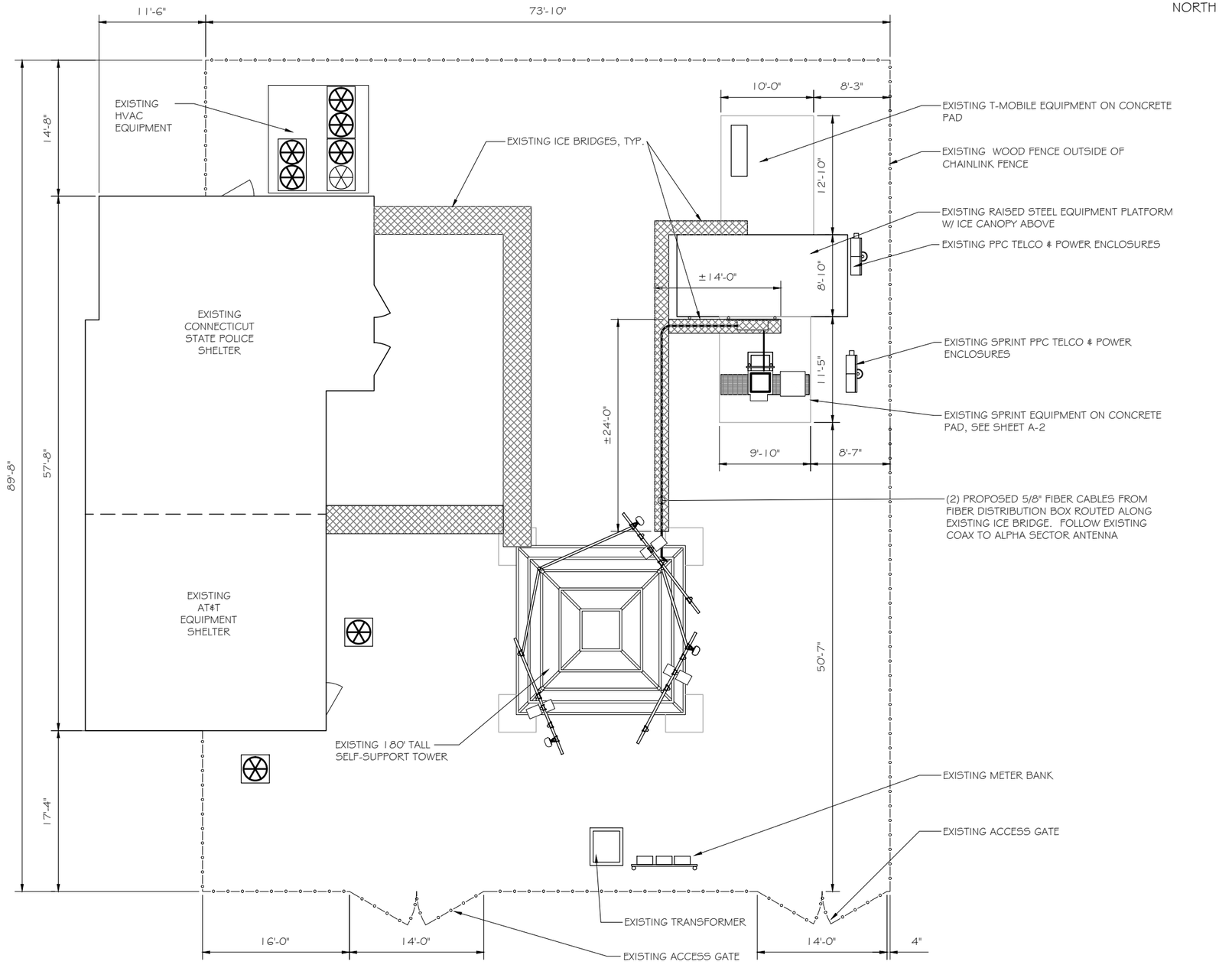
PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28731
SHEET NUMBER: SP-3



SITE PLAN
SCALE: 1" = 12.5'

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ISSUE PHASE: FINAL
DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

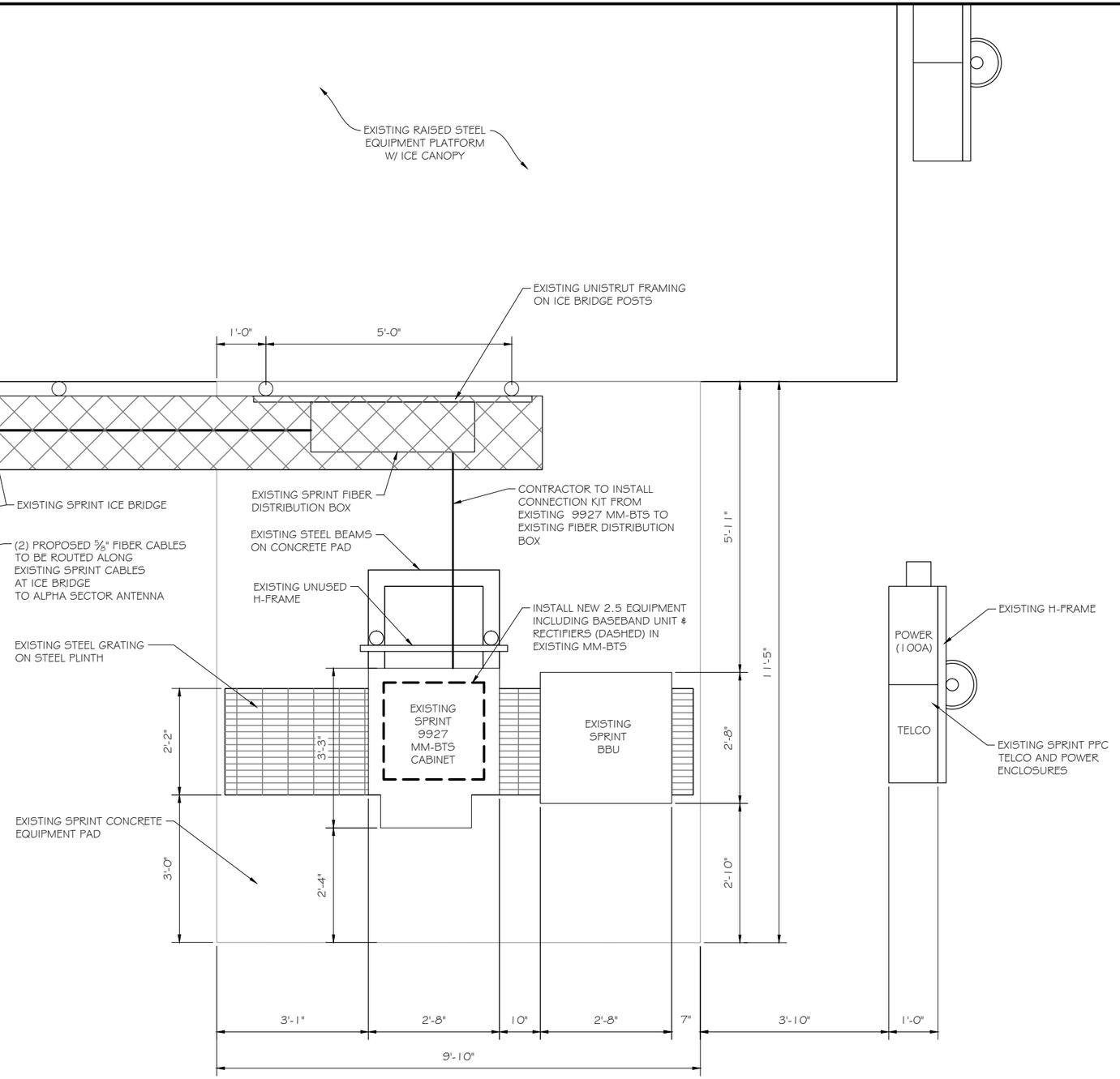
PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
SITE PLAN

0 6.25' 12.5' 25'
11" x 17" - 1" = 12.5'
22" x 34" - 1" = 6.25'

PROJECT NUMBER: 28731
SHEET NUMBER: A-1

DRAWN BY: TWS CHECKED BY: KAB



EQUIPMENT PLAN
SCALE: 1" = 2.5'

NORTH

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ISSUE PHASE: FINAL
DATE ISSUED: 08/08/2014

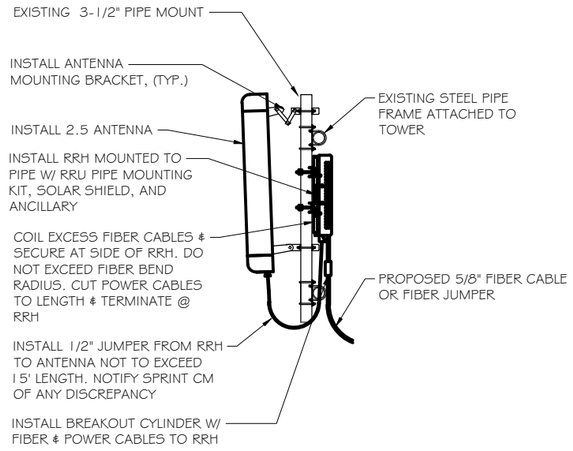
PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

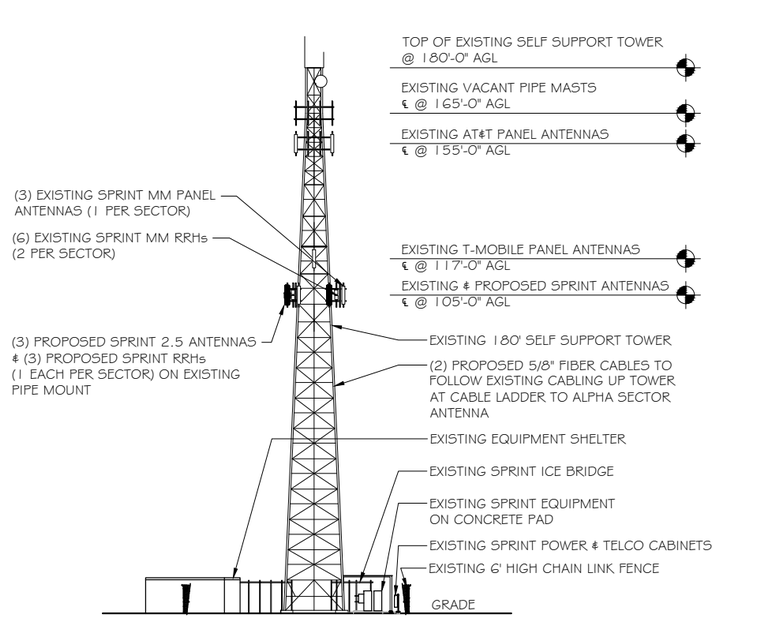
SHEET TITLE:
EQUIPMENT PLAN

0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

PROJECT NUMBER: 28731
SHEET NUMBER: A-2



ANTENNA & RRH MOUNTING DETAILS (1)
SCALE: NTS



BUILDING ELEVATION (2)
SCALE: 1" = 50'

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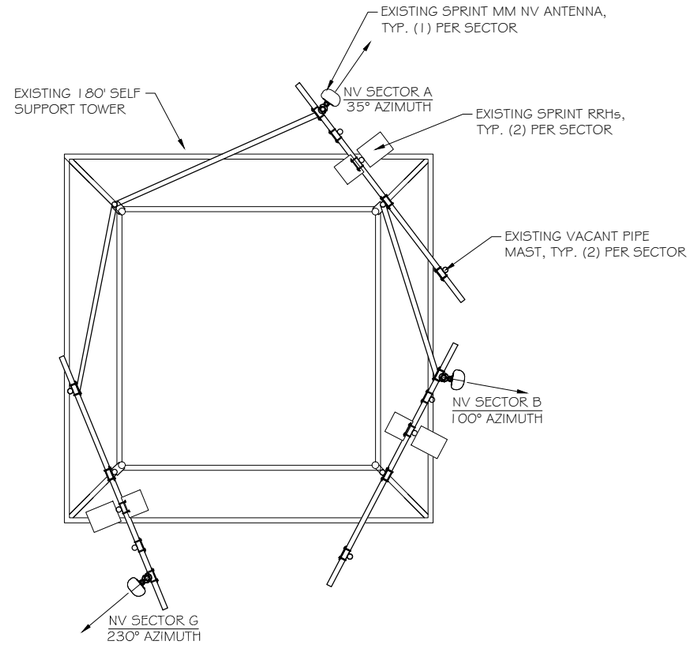
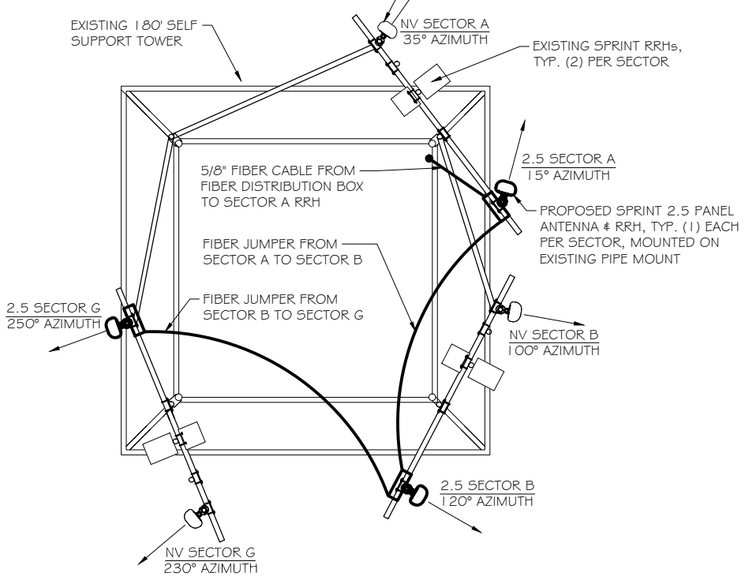
11" x 17" - 1" = 50'
22" x 34" - 1" = 25'



NORTH

EXISTING ANTENNA ARRAY (3)
SCALE: NTS



NORTH

PROPOSED ANTENNA ARRAY (4)
SCALE: NTS

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ISSUE PHASE: FINAL
DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
BUILDING ELEVATIONS & ANTENNA DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: A-3

Sprint

RFDS Sheet

General Site Information

Site ID	CT03XC360	Equipment Vendor	Alcatel-Lucent
Market	Southern Connecticut	Lattitude	41.1724393
Region	Northeast	Longitude	-73.4343597
MLA	N/A	LL SITE ID	N/A
Structure Type	Lattice Tower		
BTS Type			

				Incremental Power Draw needed by added Equipment
Solution ID		Siterra SR Equipment type		
		Equipment Vendor	Alcatel-Lucent	N/A

Base Equipment

BBU Kit	ALU BBU Kit	Top Hat	None
BBU Kit Qty	1	Top Hat Qty	N/A
		Top Hat Dimenstions	N/A
Growth Cabinet	None	Top Hat Weight (lbs)	N/A
Growth Cabinet Qty	N/A		
Growth Cabinet Dimensions	N/A		
Growth Cabinet Weight	N/A		

RF Path Information

RRH	TD-RRH8x20-25	
RRH Qty	3	
RRH Dimensions	25.4"x17.5"x5.7"	
RRH Weight. lbs.	66	
RRH Mount Weight. Lbs.	TBD	
Power and Fiber Cable	ALU Fiber Only	
Cable Qty	2	
Weight per foot. Lbs.	0.242	
Diameter. Inches.	0.73	
Length Ft.	175'	(calculated as antenna height plus 20%)
Coax Jumper	TBD	
Coax Jumper Qty	27	
Coax Jumper Length. Feet.	8	
Coax Jumper Weight	TBD	
Coax Jumper Diameter. Inches	0.5	
AISG Cable	Commscope ATCB-B01-006	
AISG Cable Qty	3	
AISG Diameter. Inches.	0.315	
AISG Cable length.	8	
Weight of entire AISG cable. Lbs.	1.3	

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna make/model	RFS APXVTM14-C-I20	RFS APXVTM14-C-I20	RFS APXVTM14-C-I20
Antenna qty	1	1	1
Antenna Dimensions. Inches	56.3"x12.6"x7.9"	56.3"x12.6"x7.9"	56.3"x12.6"x7.9"
Antenna Weight. Lbs	54	54	54
Antenna Mounting Kit Weight. Lbs.	11	11	11
CL Height	105	105	105
Antenna Azimuth	15	120	250
Antenna Mechanical Downtilt	0	0	0
Antenna etilt	-2	-2	-2

*RFDS SHEET WAS GENERATED BY RAMAKER & ASSOCIATES FROM PLAN OF RECORD (POR) PROVIDED BY SPRINT. CONTRACTOR SHALL VERIFY AND OBTAIN FINAL RFDS FROM SPRINT CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.

NOTES:

1. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND C/L HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5GHZ ANTENNA AT SAME C/L HEIGHT AS 1.9GHZ ANTENNA AND EMAIL CORRECT C/L HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT C/L HEIGHT. ALSO EMAIL CORRECT 1.9GHZ AND 800MHZ ANTENNA C/L HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
2. AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5GHZ. TEST TO INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
3. GENERAL CONTRACTOR MUST ENSURE THAT NO OBJECT IS LOCATED WITHIN 45 DEGREES OF LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5GHZ ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
4. 2.5GHZ ANTENNA MUST BE AT LEAST 6' FROM 1.9GHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30" FROM DUAL BAND 1.9GHZ AND 800MHZ ANTENNA.
5. GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL.

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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www.Ramaker.com

Transcend Wireless
48 SPRUCE STREET
OAKLAND, NJ 07346

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 8/08/2014

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL DATE ISSUED: 08/08/2014

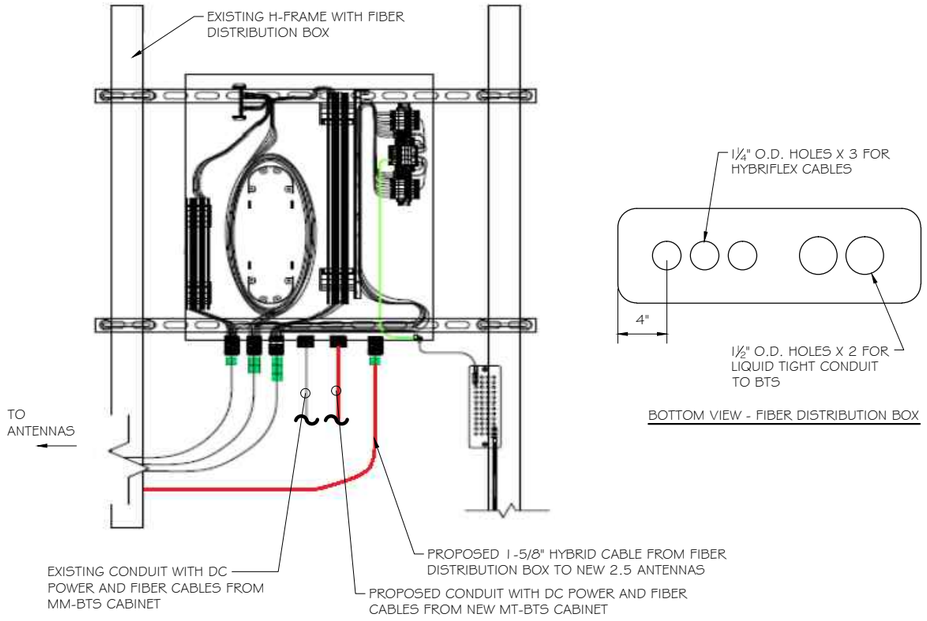
PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
RF DATA SHEET

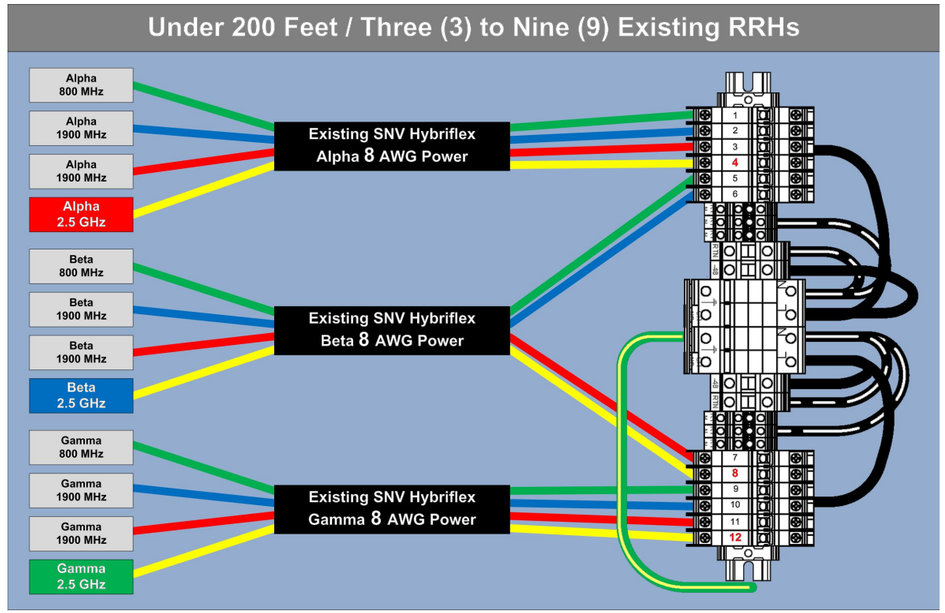
SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: A-4

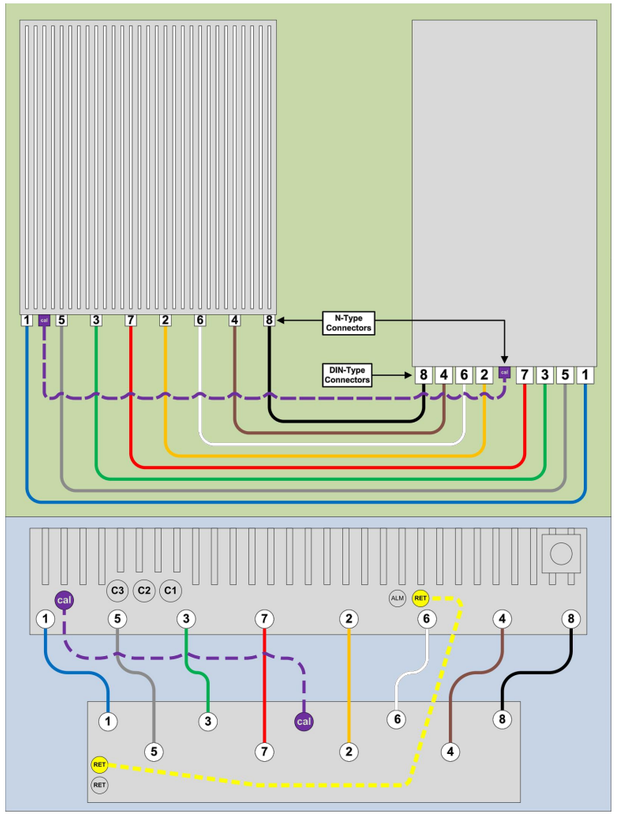


BOTTOM VIEW - FIBER DISTRIBUTION BOX

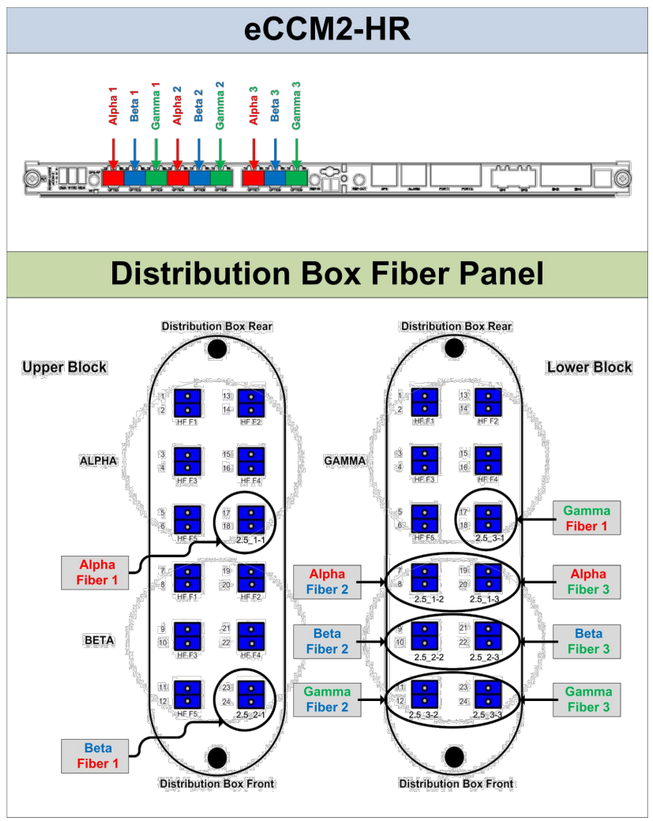
TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)
SCALE: NTS



RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL (2)
SCALE: NTS



8T8R DETAIL (3)
SCALE: NTS



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)
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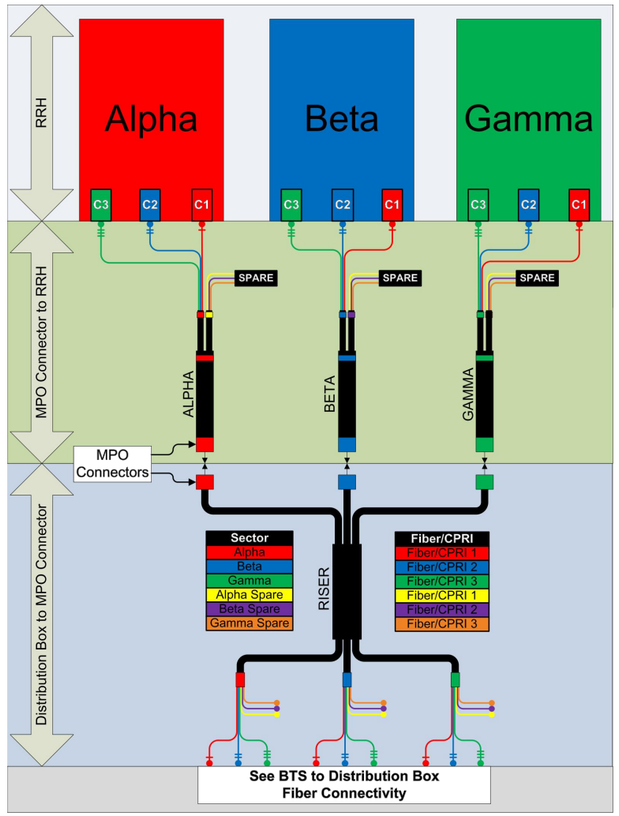

RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)
SCALE: NTS

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1120 Dallas Street, Sauk City, WI 53583
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OAKLAND, NJ 07346

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Signature: Date:

MARK	DATE	DESCRIPTION
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ISSUE PHASE: FINAL — DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
FIBER PLUMBING DIAGRAM

SCALE:
AS NOTED

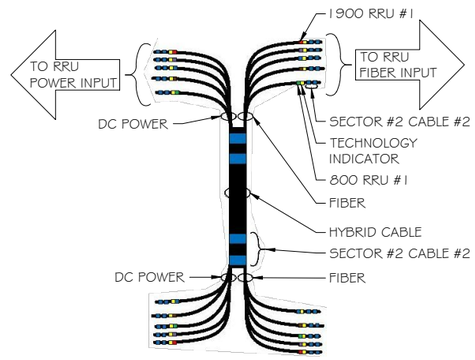
PROJECT NUMBER: 28731
SHEET NUMBER: A-5

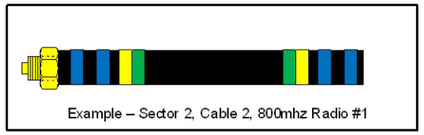
I:\28700\28731\CAD\Sprint 2.5\28731 Sprint 2.5 CD.dwg Printed by: steves on Aug 08, 2014 - 11:29am

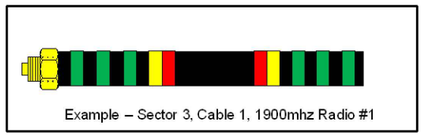
Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

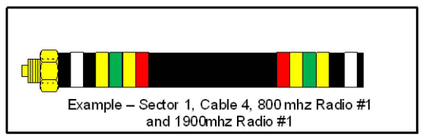
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL




Example – Sector 2, Cable 2, 800mhz Radio #1


Example – Sector 3, Cable 1, 1900mhz Radio #1


Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

COLOR CODING CHARTS (1)
SCALE: NTS

CABLE MARKING NOTES

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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Certification & Seal:
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STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 ★ LICENSED PROFESSIONAL ENGINEER

Signature: James R Skowronski Date: 8/08/2014

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL
DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: A-6

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF:RFS

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
*Fiber Only	Varies	Use NV Hybriflex	5/8"
Hybriflex	<200'	8 AWG	1-1/4"
Hybriflex	225-300'	6 AWG	1-1/4"
Hybriflex	325-375'	4 AWG	1-1/4"

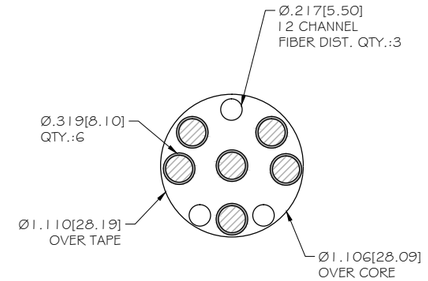
RFS HYBRIFLEX RISER CABLE SCHEDULE

FIBER ONLY (EXISTING DC POWER)	Hybrid cable MN:HB058-M12-050F 12x multi-mode fiber pairs, Top:Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50 ft	50 ft
	MN:HB058-M12-075F	75 ft
	MN:HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	*MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN:HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 50 ft	50 ft
	MN:HB114-08U3M12-075F	75 ft
	MN:HB114-08U3M12-100F	100 ft
	MN:HB114-08U3M12-125F	125 ft
	MN:HB114-08U3M12-150F	150 ft
	MN:HB114-08U3M12-175F	175 ft
	MN:HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN:HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 225 ft	225 ft
	MN:HB114-13U3M12-250F	250 ft
	MN:HB114-13U3M12-275F	275 ft
	MN:HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN:HB114-21U3M12-325F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC connectors. 1 1/4 cable, 325 ft	325 ft
	MN:HB114-21U3M12-350F	350 ft
	MN:HB114-21U3M12-375F	375 ft

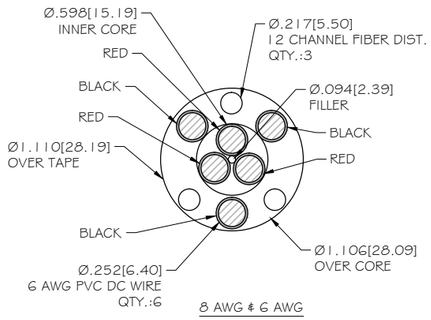
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

FIBER ONLY	Hybrid Jumper cable MN:HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN:HBF012-M3-10F1	10 ft
	*MN:HBF012-M3-15F1	15 ft
	MN:HBF012-M3-20F1	20 ft
	MN:HBF012-M3-30F1	30 ft
8 AWG POWER	Hybrid Jumper cable MN:HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-08U1M3-10F1	10 ft
	MN:HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
6 AWG POWER	Hybrid Jumper cable MN:HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-13U1M3-10F1	10 ft
	MN:HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
4 AWG POWER	Hybrid Jumper cable MN:HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 7/8 cable	5 ft
	MN:HBF078-21U1M3-10F1	10 ft
	MN:HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	

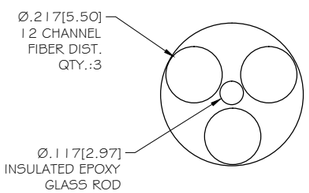
*NOTE: SPRINT CM TO CONFIRM HYBRID/FIBER RISER CABLE & HYBRID/FIBER JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.



4 AWG



8 AWG & 6 AWG

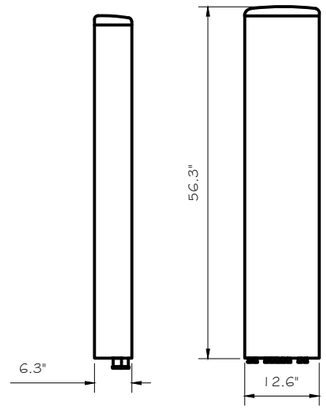


FIBER ONLY

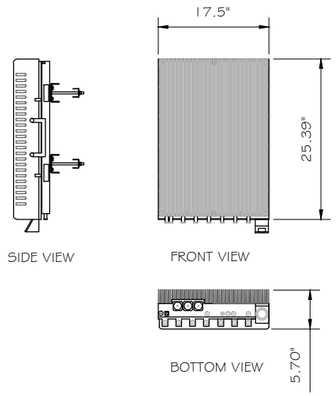
FIBER CABLE CROSS SECTION & DATA
SCALE: NTS — (1)

RFS: APXV9TM14-ALU-120

DIMENSIONS, HxWxD:	56.3" x 12.6" x 6.3"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	55.12 lbs
CONNECTOR:	(9) MINI-DIN FEMALE/BOTTOM



2.5 ANTENNA DETAIL
SCALE: NTS — (2)



ALCATEL-LUCENT: TD-RRH8x20

HxWxD = (25.3" x 17.5" x 5.7")

WEIGHT = 66.13 lbs.

2.5 RRH DETAIL
SCALE: NTS — (3)

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OAKLAND, NJ 07346

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
No. 26266
LICENSED
PROFESSIONAL ENGINEER

Signature: 8/08/2014 Date:

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL — DATE ISSUED: 08/08/2014

PROJECT TITLE:
CTS
CT03XC360-A

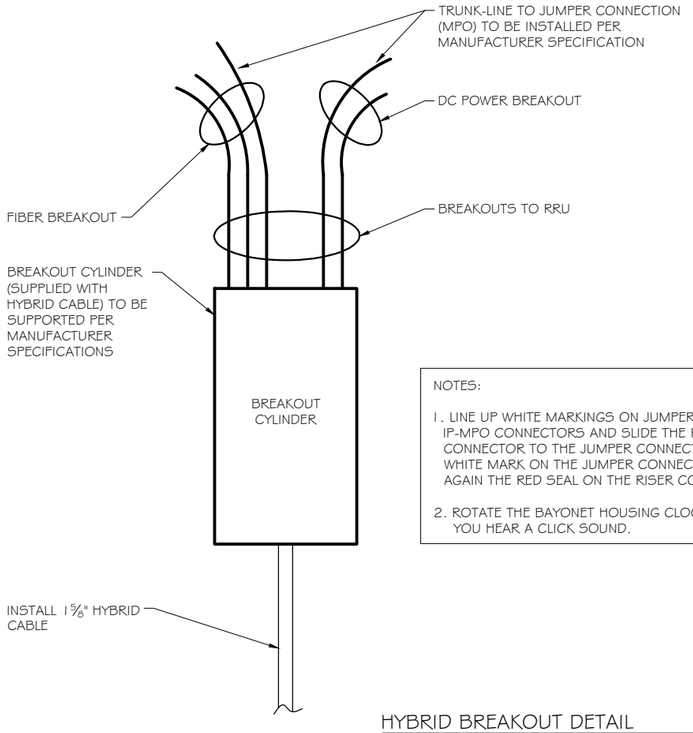
PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
ANTENNA & HYBRID CABLE DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: A-7

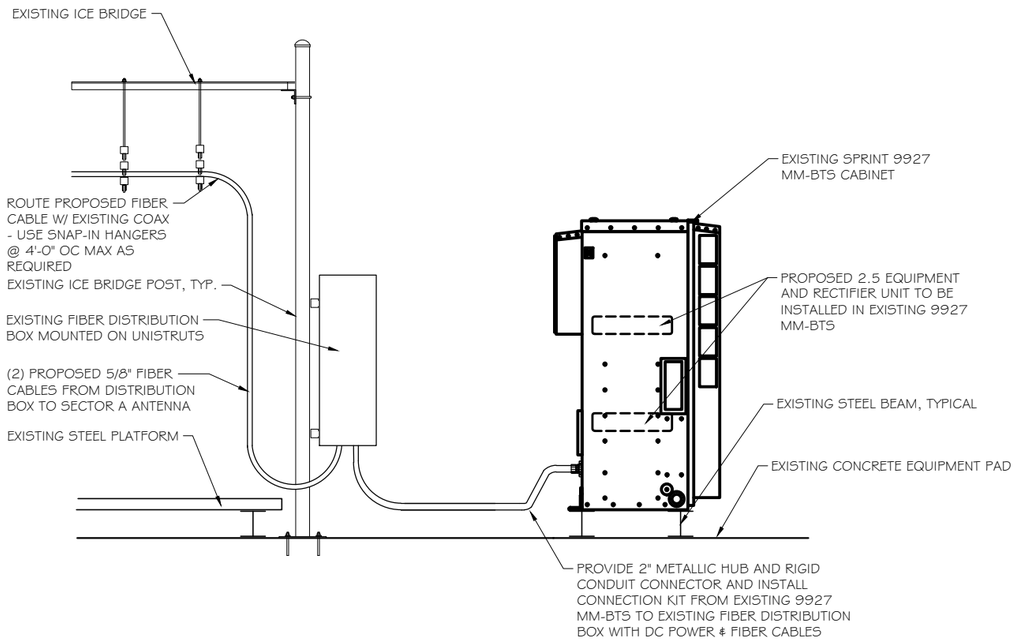
DRAWN BY: TWS CHECKED BY: KAB



NOTES:

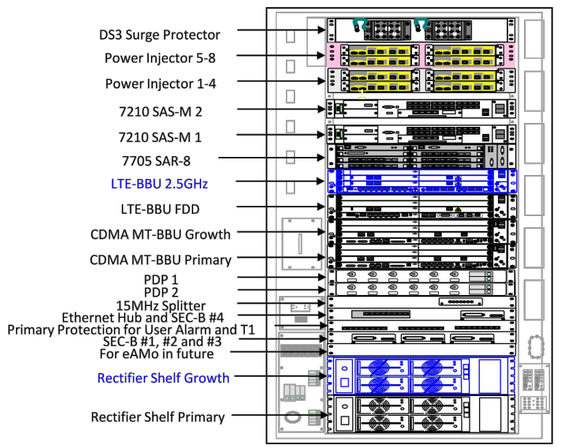
1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.
2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

HYBRID BREAKOUT DETAIL (1)
SCALE: NTS



CABLE ROUTE FROM CABINET (2)
SCALE: NTS

EXISTING BBU CABINET (3)
SCALE: NTS



EXISTING MMBS CABINET (4)
SCALE: NTS

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OVERLAND PARK, KANSAS 66251

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ISSUE PHASE: FINAL
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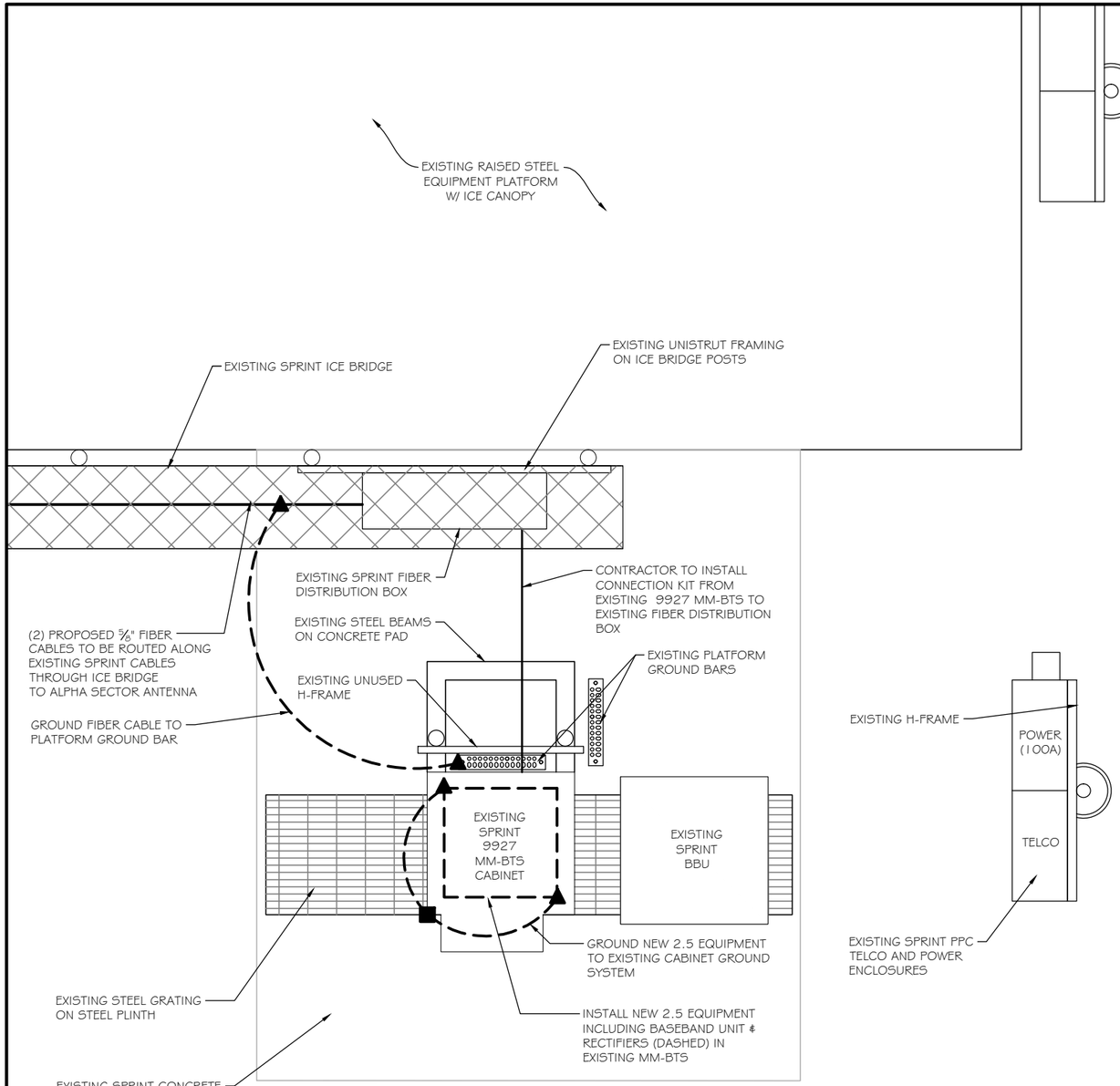
PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

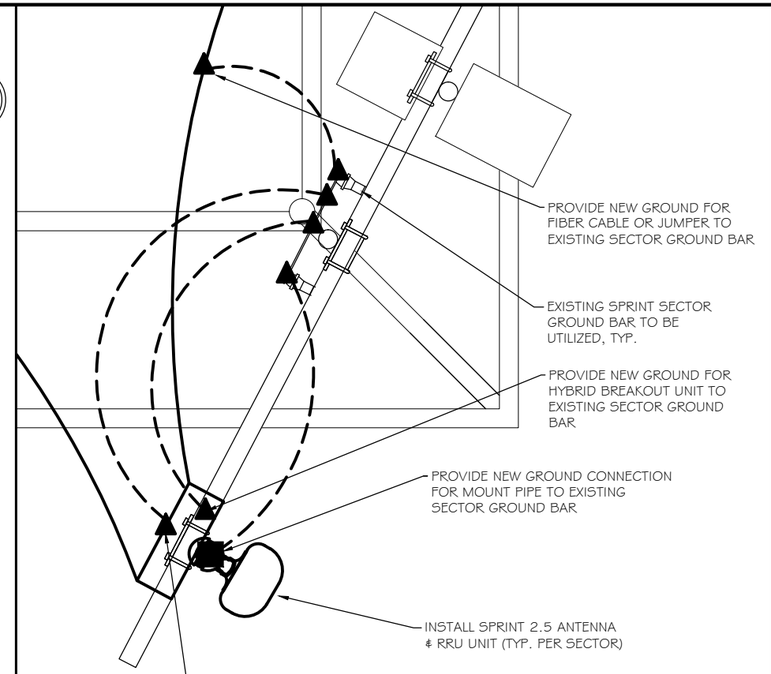
SHEET TITLE:
EQUIPMENT DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: A-8



EQUIPMENT UTILITY & GROUNDING PLAN (1)
SCALE: NTS



ANTENNA GROUNDING DETAIL (2)
SCALE: NTS

GROUNDING NOTES:

1. CONTRACTOR TO ENSURE PROPER SEQUENCING OF GROUNDING AND UNDERGROUND CONDUIT INSTALLATION TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM AND/OR DAMAGE TO THE CONDUIT.
2. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS NOTED OTHERWISE.
3. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
4. ALL GROUND CONNECTIONS ABOVE GRADE AND/OR INTERIOR SHALL BE COMPRESSION TYPE, TWO-HOLE LUGS OR DOUBLE-CRIMP "C" TAPS.
5. CONTACT AREAS WHERE CONNECTIONS ARE MADE SHALL BE PREPARED TO A BARE BRIGHT FINISH AND COATED WITH AN ANTI-OXIDATION MATERIAL BEFORE CONNECTIONS ARE MADE.
6. MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS.
7. WHERE GROUNDING CONNECTIONS ARE MADE TO PAINTED METAL SURFACES, PAINT SHALL BE REMOVED TO BEAR METAL TO ENSURE PROPER CONTACT AND RESTORED/PAINTED TO ORIGINAL FINISH.
8. GROUND DEPTH SHALL BE 30" MINIMUM BELOW FINISHED GRADE, OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.

LEGEND:	
– – – – – – – – – – – – –	EXISTING GROUND CABLE
▬▬▬▬▬▬▬▬▬▬▬▬▬	PROPOSED GROUND CABLE
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION
—E—E—E—E—	PROPOSED ELECTRIC

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Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT ★ JAMES R. SKOWRONSKI ★ No. 26266 LICENSED PROFESSIONAL ENGINEER

James R Skowronski 8/08/2014
Signature: Date:

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL DATE ISSUED: 08/08/2014

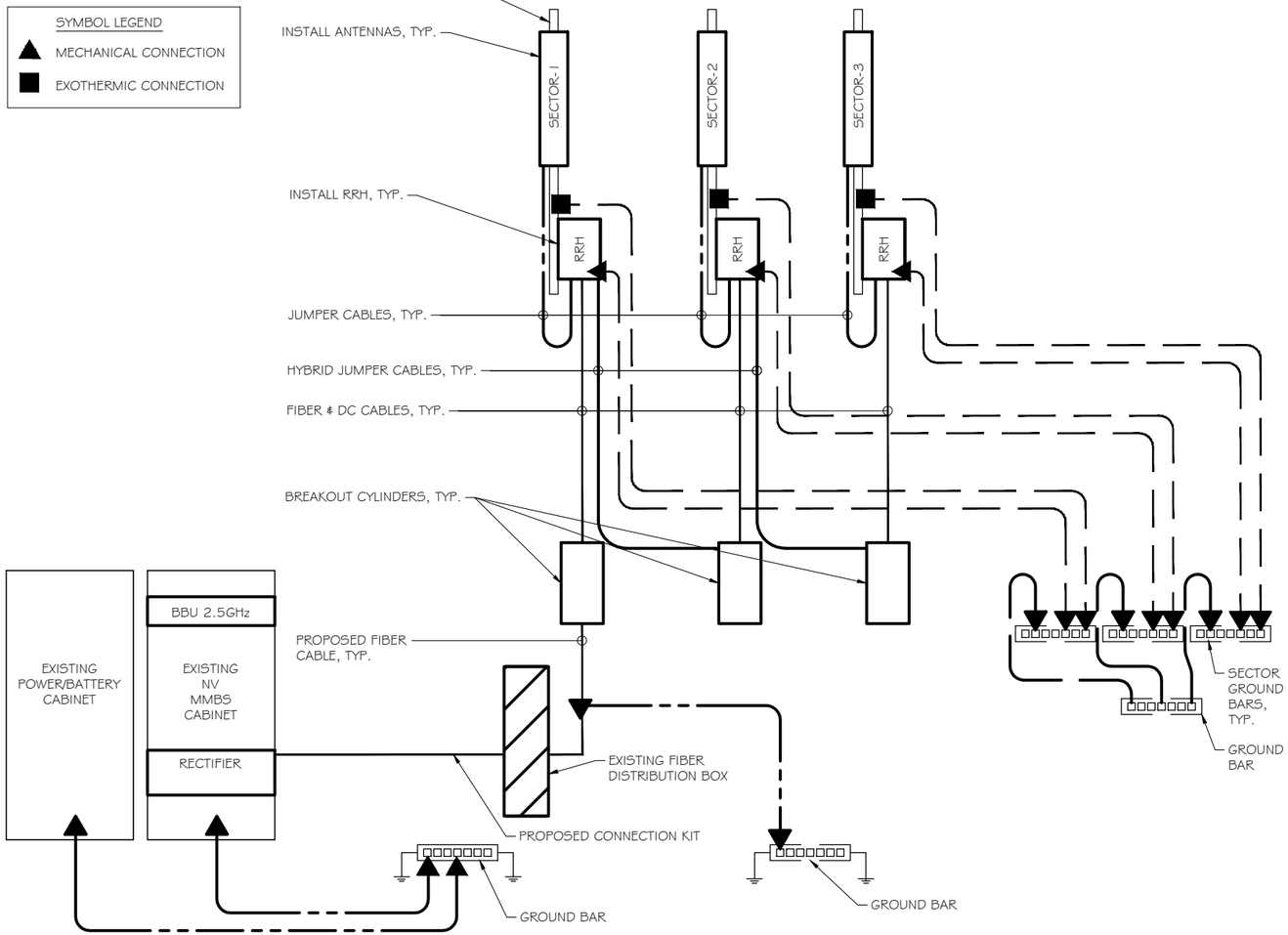
PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

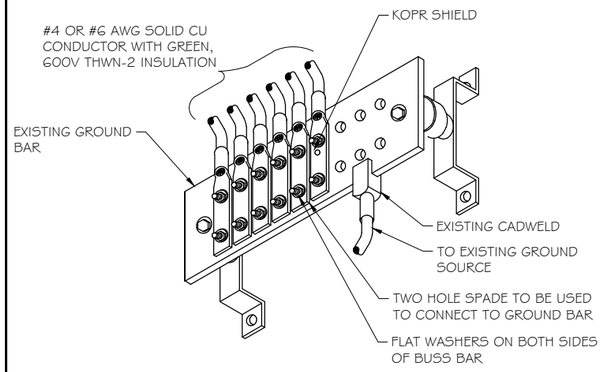
SHEET TITLE:
EQUIPMENT UTILITY & GROUNDING PLAN

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: E-1



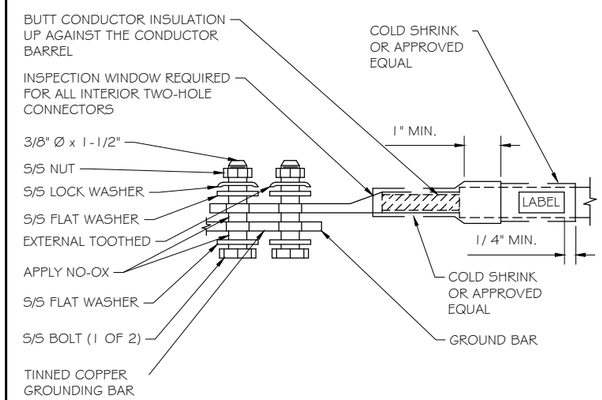
GROUNDING RISER DIAGRAM (1)
SCALE: NTS



NOTES:
1. APPLY NO-OX TO LUG AND GROUND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.

2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

GROUNDING CONDUCTOR INSTALLATION (2)
SCALE: NTS



TWO-HOLE LUG (3)
SCALE: NTS

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
No. 26266
LICENSED
PROFESSIONAL ENGINEER

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ISSUE PHASE: FINAL
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PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
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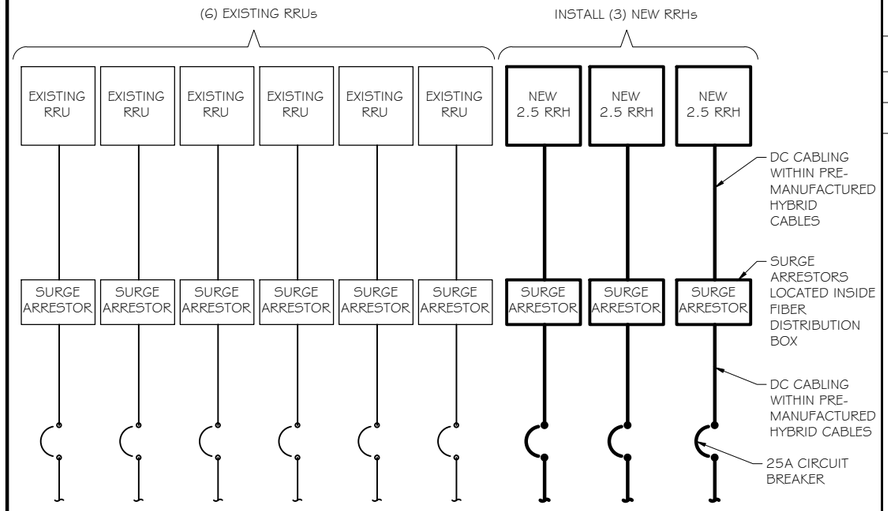
FAIRFIELD COUNTY

SHEET TITLE:
GROUNDING DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: E-2



DC ONE-LINE DIAGRAM 1
SCALE: NTS

A/C PANEL SCHEDULE

VOLTAGE:	240V/120		PANEL STATUS:	EXISTING		N TO GROUND BOND:	YES
MAIN BREAKER:	100 AMP		MODEL NUMBER:	TBD		INTERNAL TVSS:	YES
MOUNT:	GROUND		PHASE:	1		WIRE:	3
ENCLOSURE TYPE:	NEMA 3R		BUSS RATING:	200 AMP		GROUND BAR:	YES
			NEUTRAL BAR:	YES			

CKT	DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	PHASE A VA	PHASE B VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	DESCRIPTION	CKT
1	BLANK (UNUSED)	-	-	-							7
2	MMBTS	100	2	ON			ON	2	60	SURGE PROTECTOR	8
3							ON	1	20	TOWER LIGHT	9
4	BLANK (UNUSED)	-	-	-			ON	1	20	NOT LABELED	10
5	GEN CHARGER	20	1	ON			ON	1	20	GFI	11
6	FAN	10	1	ON			-	-	-	BLANK (UNUSED)	12

AC PANEL SCHEDULE 2
SCALE: NTS

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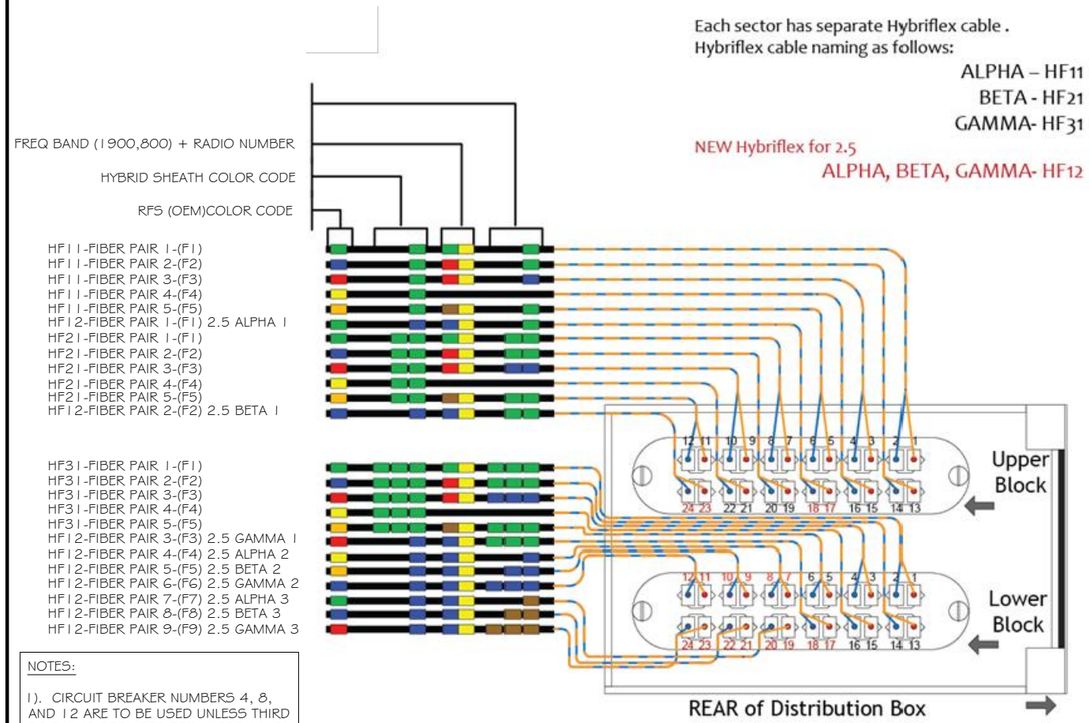
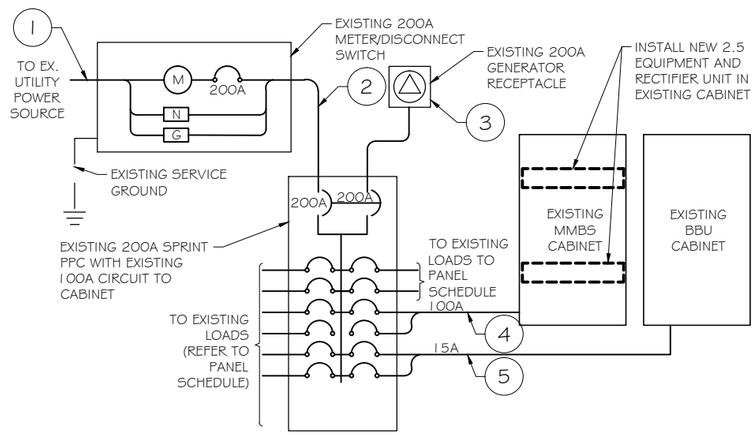


NOTES:

1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

TYPICAL FIBER DISTRIBUTION 3
SCALE: NTS



CIRCUIT SCHEDULE			
NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/ DISCONNECT	EXISTING
2	METER/ DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EX. MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1½" CONDUIT
5	TRANSFER & LOAD CENTER	EX. BBU CABINET	(2) #12 AWG, (1) #12 GND IN ¾" CONDUIT

ELECTRICAL ONE-LINE DIAGRAM 4
SCALE: NTS

MARK	DATE	DESCRIPTION
A	08/08/14	FINAL CONSTRUCTION DRAWINGS

ISSUE PHASE: FINAL
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PROJECT TITLE:
CTS
CT03XC360-A

PROJECT INFORMATION:
46 FERNWOOD LANE
WILTON, CT 06897
FAIRFIELD COUNTY

SHEET TITLE:
DC POWER DETAILS & PANEL SCHEDULES

SCALE:
AS NOTED

PROJECT NUMBER: 28731
SHEET NUMBER: E-3