Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055

March 1, 2017

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

Notice of Exempt Modification
7 West View Drive, Danbury, CT 06810
Latitude- 41.39600000
Longitude- -73.42380000

Dear Ms. Bachman,

T-Mobile currently maintains nine (9) existing antennas at the 50' level of the existing 100' lattice tower at 7 West View Drive, Danbury, CT. The tower and property is owned by Seven Tee, LLC. T-Mobile now tends to replace three (3) of its existing antennas with three (3) new 1900 MHz antennas. These antennas would be installed at the same 50' level of the tower. T-Mobile also intends to add one (1) hybrid cable.

This facility was approved by the City of Danbury. In a conversation with Joanne Read of the Planning and Zoning Department of the City of Danbury, it was indicated that there are no records of the approval of this facility on-file.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. 16-50j-72(b)(2). In accordance with R.C.S.A. 16-50j-73, a copy of this letter is being sent to Mark D. Boughton, Mayor of the City of Danbury, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2).

1. The proposed modification will not result in an increase in the height of the existing structure

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

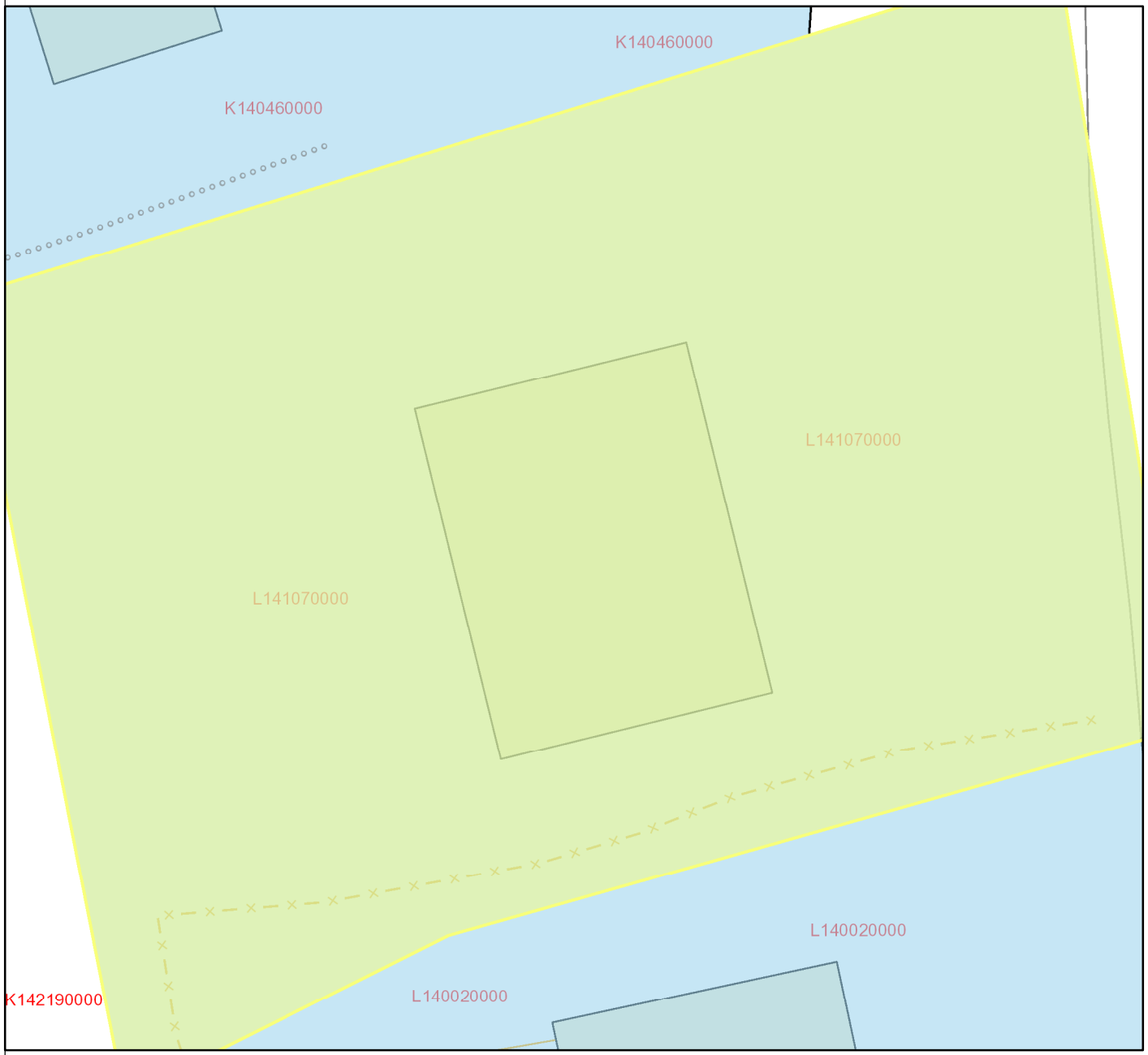
For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitute an exempt modification under R.C.S.A. 16-50j-72(b)(2).

Sincerely,

Kyle Richers

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
908-447-4716
krichers@transcendwireless.com

cc: Mark D. Boughton- as elected official
Sharon Calitro- as zoning official
Seven Tee LLC- as tower and property owner



Not a legal survey.

7 WESTVIEW DR

Location	7 WESTVIEW DR	**Mblu**	L14/ / 107/ /
Acct#		**Owner**	SEVEN T LLC
Assessment	$134,900	**Appraisal**	$192,700
PID	10750	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2012	$103,500	$89,200	$192,700
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2012	$72,500	$62,400	$134,900

Owner of Record

Owner	SEVEN T LLC
Co-Owner	
Address	39 PADANARAM RD DANBURY, CT 06811

Sale Price	$0
Book & Page	1579/ 817
Sale Date	08/27/2003
Instrument	03

Ownership History

Ownership History				
Owner	**Sale Price**	**Book & Page**	**Instrument**	**Sale Date**
SEVEN T LLC	$0	1579/ 817	03	08/27/2003
KAUFMAN ROBERT J	$0	0580/0698		05/05/1976

Building Information

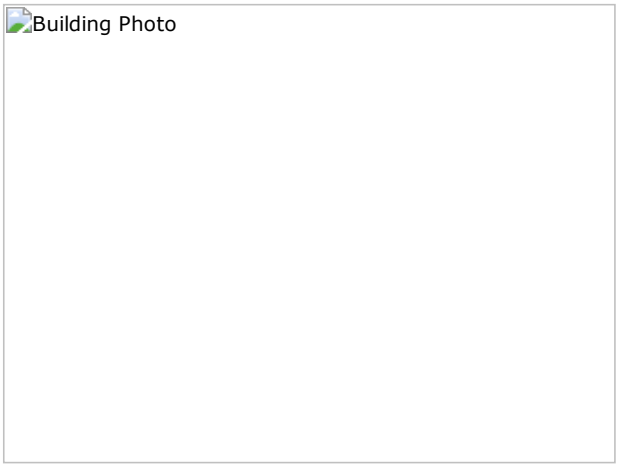
Building 1 : Section 1

Year Built:	1979
Living Area:	1,064
Replacement Cost:	$134,431
Building Percent Good:	77
Replacement Cost Less Depreciation:	$103,500

Building Attributes

Field	Description
Style	Cape Cod
Model	Residential
Grade:	Average
Stories:	1 1/2 Stories
Occupancy	
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure:	Gable
Roof Cover	Asphalt Shngl.
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Minimum/Plywd
Interior Flr 2	
Heat Fuel	Coal or Wood
Heat Type:	None
AC Type:	None
Total Bedrooms:	00
Total Bthrms:	0
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	1 Room
Bath Style:	Average
Kitchen Style:	Average
Fireplaces	
Whirlpool	
Addn'l Kitchen	
Bsm Gar	
Fin Bsm Area	
Fin Bsm Qual	
Nhbd	
MH Park	

Building Photo



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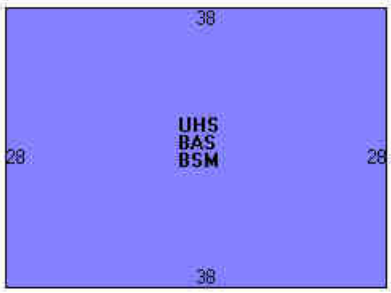
Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,064	1,064
BSM	Basement	1,064	0
UHS	Half Story, Unfinished	1,064	0
		3,192	1,064

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	201R	**Size (Acres)**	0.23
Description	Comm/Res MDL-01	**Frontage**	0
Zone	RA-8	**Depth**	0
Neighborhood		**Assessed Value**	$62,400
Alt Land Appr	No	**Appraised Value**	$89,200
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
CEL	Cell Tower			1 UNITS	$0	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$103,500	$89,200	$192,700
2013	$103,500	$89,200	$192,700
2012	$103,500	$89,200	$192,700

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$72,500	$62,400	$134,900
2013	$72,500	$62,400	$134,900
2012	$72,500	$62,400	$134,900

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11923C

CT923/W. View Dr_GT
7 West View Drive
Danbury, CT 06810

February 17, 2017

EBI Project Number: 6217000629

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	36.26 %

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

EBI Consulting
environmental | engineering | due diligence

February 17, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11923C – CT923/W. View Dr_GT**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **7 West View Drive, Danbury, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located 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 $\mu W/cm^2$ 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 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) 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 T-Mobile Wireless antenna facility located at **7 West View Drive, Danbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, 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 equipment was calculated using the following assumptions:

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

7) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF path an additional 1.30 dB of cable loss was factored into the calculations used for this analysis. This is based on manufacturers Specifications for 75 feet of 7/8" coax cable on each path.

8) 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.

9) For the following calculations the sample point was the top of a 6-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.

10) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B66A/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 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.

11) The antenna mounting height centerline of the proposed antennas is **50 feet** above ground level (AGL).

12) 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.

13) All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	50	Height (AGL):	50	Height (AGL):	50
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	17.34	Antenna B1 MPE%	17.34	Antenna C1 MPE%	17.34
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	50	Height (AGL):	50	Height (AGL):	50
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,398.96	ERP (W):	6,398.96	ERP (W):	6,398.96
Antenna A2 MPE%	11.88	Antenna B2 MPE%	11.88	Antenna C2 MPE%	11.88
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	50	Height (AGL):	50	Height (AGL):	50
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	3.44	Antenna B3 MPE%	3.44	Antenna C3 MPE%	3.44

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**32.66 %**
Existing On Site Measurements	3.60 %
Site Total MPE %:	**36.26 %**

T-Mobile Sector A Total:	32.66 %
T-Mobile Sector B Total:	32.66 %
T-Mobile Sector C Total:	32.66 %
Site Total:	36.26 %

T-Mobile _Max Values per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	50	86.69	AWS - 2100 MHz	1000	8.67%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	50	86.69	PCS - 1900 MHz	1000	8.67%
T-Mobile AWS - 2100 MHz UMTS	2	865.21	50	32.13	AWS - 2100 MHz	1000	3.21%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	50	43.35	PCS - 1950 MHz	1000	4.33%
T-Mobile PCS - 1950 MHz GSM	2	1,167.14	50	43.35	PCS - 1950 MHz	1000	4.33%
T-Mobile 700 MHz LTE	1	865.21	50	16.07	700 MHz	467	3.44%
						Total:	**32.66%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	32.66 %
Sector B:	32.66 %
Sector C:	32.66 %
T-Mobile Per Sector Maximum:	32.66 %
Site Total:	36.26 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **36.26%** of the allowable FCC established general public limit sampled at the ground level. This is based upon 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.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

100-ft Existing Lattice Tower

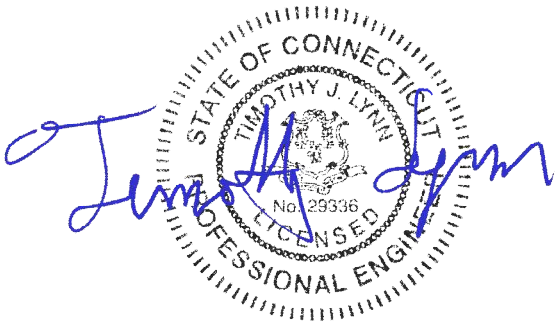
Proposed T-Mobile
Antenna Upgrade

T-Mobile Site Ref: CT11923C

7 West View Drive
Danbury, CT

CENTEK Project No. 17012.06

Date: February 10, 2017



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing self-supporting lattice tower located in Danbury, Connecticut.

The host tower is a 100-ft, three legged, tapered lattice tower. The tower geometry and structure member sizes were obtained from a previous structural report prepared by Hudson Design Group dated March 6, 2015. The foundation information was obtained from a previous structural analysis prepared by Tectonic 644.CT11923C dated July 7, 2013.

Antenna and appurtenance information were obtained the aforementioned Hudson structural report, verification conducted from grade by Centek personnel on January 24, 2017 and a T-Mobile RF sheet.

The tower is made up of four (4) tapered vertical steel sections consisting of A36 steel angle legs. Diagonal lateral support bracing consists of steel angle construction. The vertical tower sections are connected by bolted sleeve connections while the legs and bracing are connected by bolted connections. The tower face width is 8.5-ft at the top and 21.0-ft at the bottom.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (Existing):
  Antennas: One (1) ROHN 25 tower 55' long mounted to the tower extending 15-ft above top of tower.
- UNKNOWN (Existing):
  Antennas: One (1) 15-ft Omni-directional whip, two (2) 10-ft Omni-directional whips, two (2) 8-ft Omni-directional whips and one (1) 6-ft yagi antenna mounted to the top of the tower.
  Coax Cables: Two (2) 1-5/8" ∅ and four (4) 7/8" coax cables running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) DB292 yagi antenna pipe mounted with an elevation of 93-ft above the existing tower base.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) DB2225 dipole antenna pipe mounted with an elevation of 90-ft above the existing tower base.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) DB252 yagi antenna pipe mounted with an elevation of 89-ft above the existing tower base.
  Coax Cables: One (1) 7/8" ∅ coax cable running on the outside of the existing tower.

- UNKNOWN (Existing):
  Antennas: Two (2) grid dish antennas, one (1) DB633 Omni-directional whip and one (1) DB499 yagi antenna pipe mounted with an elevation of 85-ft above the existing tower base.
  Coax Cables: Two (2) 7/8" ∅ and two (2) 1/2" coax cables running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: Three (3) 8-ft Omni-directional whips, one (1) 15-ft Omni-directional whip and one (1) DB432 yagi antennas mounted on four (4) 6-ft side arms with an elevation of 83-ft above the existing tower base.
  Coax Cables: Five (5) 7/8" ∅ coax cables running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) 3-ft grid dish leg mounted with an elevation of 80-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: Three (2) TA-2304-2-DAB panel antennas pipe mounted with an elevation of 79-ft above the existing tower base.
  Coax Cables: Three (3) 1/2" coax cables running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: Two (2) Empty 6-ft side arms with an elevation of 74-ft above the existing tower base.
- UNKNOWN (Existing):
  Antennas: One (1) 10-ft Omni-directional whip antenna mounted on a 2-ft standoff mount with an elevation of 66-ft above the existing tower base.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) 4-ft dish mounted on a 2-ft standoff mount with an elevation of 60-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: Three (3) 15-ft Omni-directional whip antennas mounted on three (3) 6-ft side arms with an elevation of 58-ft above the existing tower base.
  Coax Cables: Three (3) 1/2" ∅ coax cables running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) 3-ft yagi antenna pipe mounted with an elevation of 38-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.

- UNKNOWN (Existing):
  Antennas: One (1) 4-ft dish mounted on a 2-ft standoff mount with an elevation of 38-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) 4-ft dish mounted on a 2-ft standoff mount with an elevation of 36-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) DB254 yagi antenna pipe mounted with an elevation of 34-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: Two (2) 4-ft dishes mounted on two (2) 2-ft standoff mounts with an elevation of 29-ft above the existing tower base.
  Coax Cables: Two (2) 1/2" coax cables running on the outside of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) 4-ft dish mounted on a 2-ft standoff mount with an elevation of 26-ft above the existing tower base.
  Coax Cables: One (1) 1/2" coax cable running on the outside of the existing tower.
- T-MOBILE (EXISTING TO REMAIN):
  Antennas: Three (3) Andrew LNX6515DS panel antennas, three (3) Ericsson KRC118023 (AIR21) panel antennas, three (3) Ericsson RRUS-11 remote radio units and three (3) TMAs mounted on three (3) 12-ft T-frames with a RAD center elevation of +/- 50-ft AGL.
  Cables: Twenty-four (24) 1-5/8" ∅ coax cables and one (1) 1-1/4" ∅ fiber cable.
- T-MOBILE (EXISTING TO REMOVE):
  Antennas: Three (3) Ericsson KRC118023 (AIR21) panel antennas mounted on three (3) 12-ft T-frames with a RAD center elevation of +/- 50-ft AGL.
- **T-MOBILE (PROPOSED):**
  Antennas: Three (3) Ericsson KRD901146 (AIR32) panel antennas mounted on three (3) 12-ft T-frames with a RAD center elevation of +/- 50-ft AGL.
  Cables: One (1) 1-1/4" ∅ fiber cable routed along the exterior of the tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Fairfield County; v = 90-100 mph (Nominal)	*[Annex B of TIA-222-G-2005]*
	Danbury; v = 93 mph (Nominal)	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 93 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. In Load Case 2, per tnxTower "Section Capacity Table", this tower was found to be at **58.2%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T5)	0'-0"- 15'-0"	48.4%	**PASS**
Diagonal (T5)	0'-0"- 15'-0"	58.2%	**PASS**

Foundation and Anchors

The existing foundation consists of three (3) 2.5-ft ∅ x 18.5-ft long reinforced concrete caissons. The sub-grade conditions used in the analysis of the existing foundation were obtained from a previous structural analysis prepared by Tectonic 644.CT11923C dated July 7, 2013. The tower legs are connected to the three (3) reinforced caissons by means of four (4) 1.5" ∅ ASTM A354-BC anchor bolts per leg embedded into the concrete foundation structure.

- The tower reactions developed from the governing Load Case 1 of the proposed reinforced tower condition were used in the verification of the foundation and anchor bolts:

Leg Reactions	Vector	Proposed Tower Reactions
Leg	Shear	**12 kips**
	Compression	**64 kips**
	Uplift	**53 kips**
Base	Shear	**32 kips**
	Compression	**26 kips**
	Moment	**1707 kip-ft**

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	14.4%	**PASS**

- The foundation was found to be within allowable limits.

Foundation Type	Design Limit	Limit/FS	Proposed Loading	Result
Reinforced Concrete Caisson (x3)	Uplift	1.00 (1)	2.18	**PASS**

Note 1: Minimum required Factor of Safety (FS) of 1.0 required per TIA-222-G section 9.4

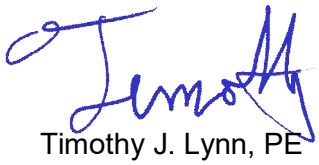
C o n c l u s i o n

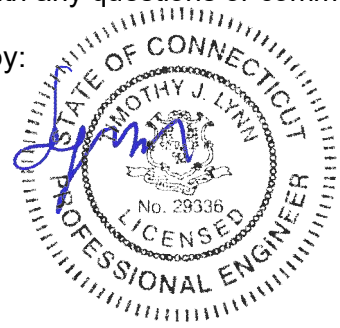
This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:





Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

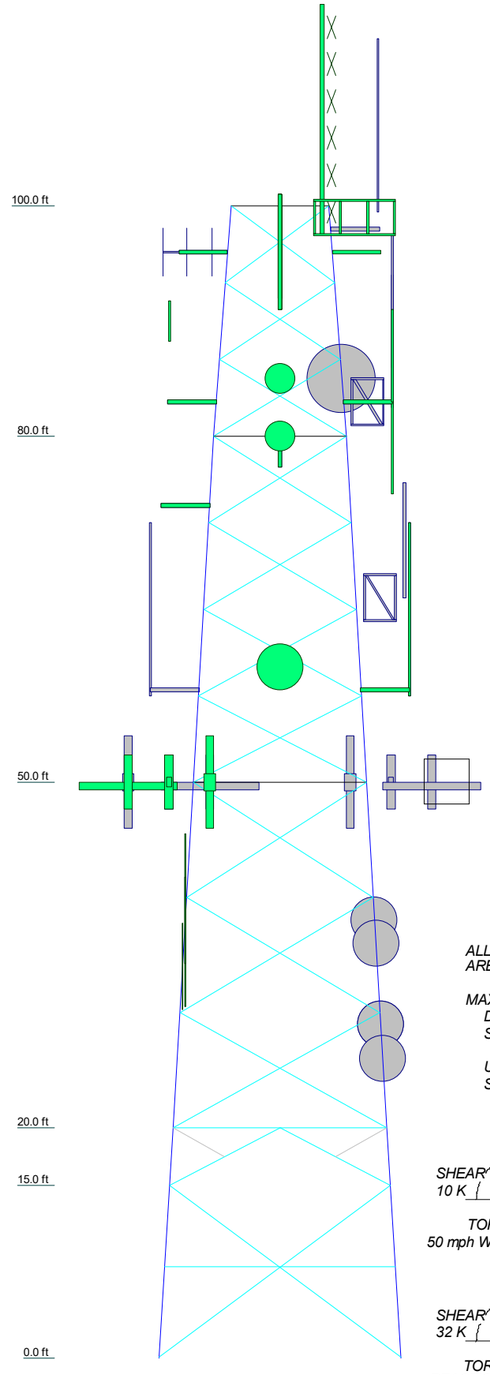
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

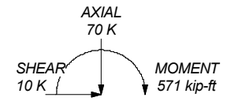
Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Horizontals	Sec. Horizontals	Red. Diagonals	Inner Bracing	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	L5x5x3/8	A36	L2x2 1/2x3/16	A36	L2 1/2x2 1/2x3/16	N.A.	N.A.	N.A.	N.A.	8.5	3 @ 6.66667	1.9
T2	L6x6x3/8		L2 1/2x2 1/2x3/16		L2x2 1/2x3/16	N.A.	N.A.	N.A.	N.A.	11.42	4 @ 7.5	3.4
T3	L6x6x9/16		L3x3 1/2x1/4		L2x3x3/16					15	3 @ 10	5.3
T4			A			L3x3x1/4		B	C	18.58	1 @ 5	1.4
T5	L6x6x1/2		L3 1/2x4x1/4		N.A.	N.A.	L3 1/2x3 1/2x1/4	N.A.	N.A.	19.19	1 @ 14.9167	2.9



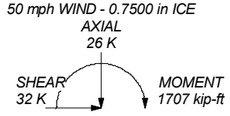
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS
DOWN: 64 K
SHEAR: 12 K

UPLIFT: -53 K
SHEAR: 10 K



TORQUE 4 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 12 kip-ft
REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
ROHN 25 tower 55'	107.5	6' Standoff Arm	58
15' x 3" Dia Omni	100	15' x 3" Dia Omni	58
Pirod 10' Box Arm	99	6' Standoff Arm	58
6' Standoff Arm	98	15' x 3" Dia Omni	58
6' Standoff Arm	96	6' Standoff Arm	58
6' Standoff Arm	96	15' x 3" Dia Omni	58
6' Yagi	96	AIR21 B2A/B4P (T-Mobile - Existing)	50
8' x 3" Dia Omni	96	AIR32 (T-Mobile - Proposed)	50
8' x 3" Dia Omni	96	LNX-6515DS (T-Mobile - Existing)	50
10' x 3" Dia Omni	96	TMA 10"x8"x3" (T-Mobile - Existing)	50
10' x 3" Dia Omni	96	RRUS-11 (T-Mobile - Existing)	50
6' Standoff Arm	96	AIR21 B2A/B4P (T-Mobile - Existing)	50
DB292-A	93	AIR32 (T-Mobile - Proposed)	50
DB225-2-A	90	LNX-6515DS (T-Mobile - Existing)	50
DB252	89	TMA 10"x8"x3" (T-Mobile - Existing)	50
DB499-A	85.5	RRUS-11 (T-Mobile - Existing)	50
DB633-C	85	AIR21 B2A/B4P (T-Mobile - Existing)	50
3-ft Grid Dish	85	AIR32 (T-Mobile - Proposed)	50
6'x3' Grid Dish	85	LNX-6515DS (T-Mobile - Existing)	50
DB432-A	84	TMA 10"x8"x3" (T-Mobile - Existing)	50
6' Standoff Arm	83	RRUS-11 (T-Mobile - Existing)	50
8' x 3" Dia Omni	83	Pirod 12' T-Frame Sector Mount (1) (T-Mobile - Existing)	50
2-ft Stand Off	83	Pirod 12' T-Frame Sector Mount (1) (T-Mobile - Existing)	50
15' x 3" Dia Omni	83	Pirod 12' T-Frame Sector Mount (1) (T-Mobile - Existing)	50
6' Standoff Arm	83	2" Std. x 7.5' Pipe	38
8' x 3" Dia Omni	83	3' Yagi	38
8' x 3" Dia Omni	83	4-ft Dish	38
6' Standoff Arm	83	2-ft Stand Off	38
6' Standoff Arm	83	4-ft Dish	36
3-ft Grid Dish	80	2-ft Stand Off	36
TA-2304-2-DAB	79	2" Std. x 7.5' Pipe	34
TA-2304-2-DAB	79	DB254-A	34
TA-2304-2-DAB	79	2-ft Stand Off	29
6' Standoff Arm	74	4-ft Dish	29
6' Standoff Arm	74	4-ft Dish	29
2-ft Stand Off	66	2-ft Stand Off	29
10' x 3" Dia Omni	66	4-ft Dish	26
2-ft Stand Off	60	2-ft Stand Off	26
4-ft Dish	60		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x1/4	C	L2x2 1/2x1/4
B	L2 1/2x2 1/2x1/8		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

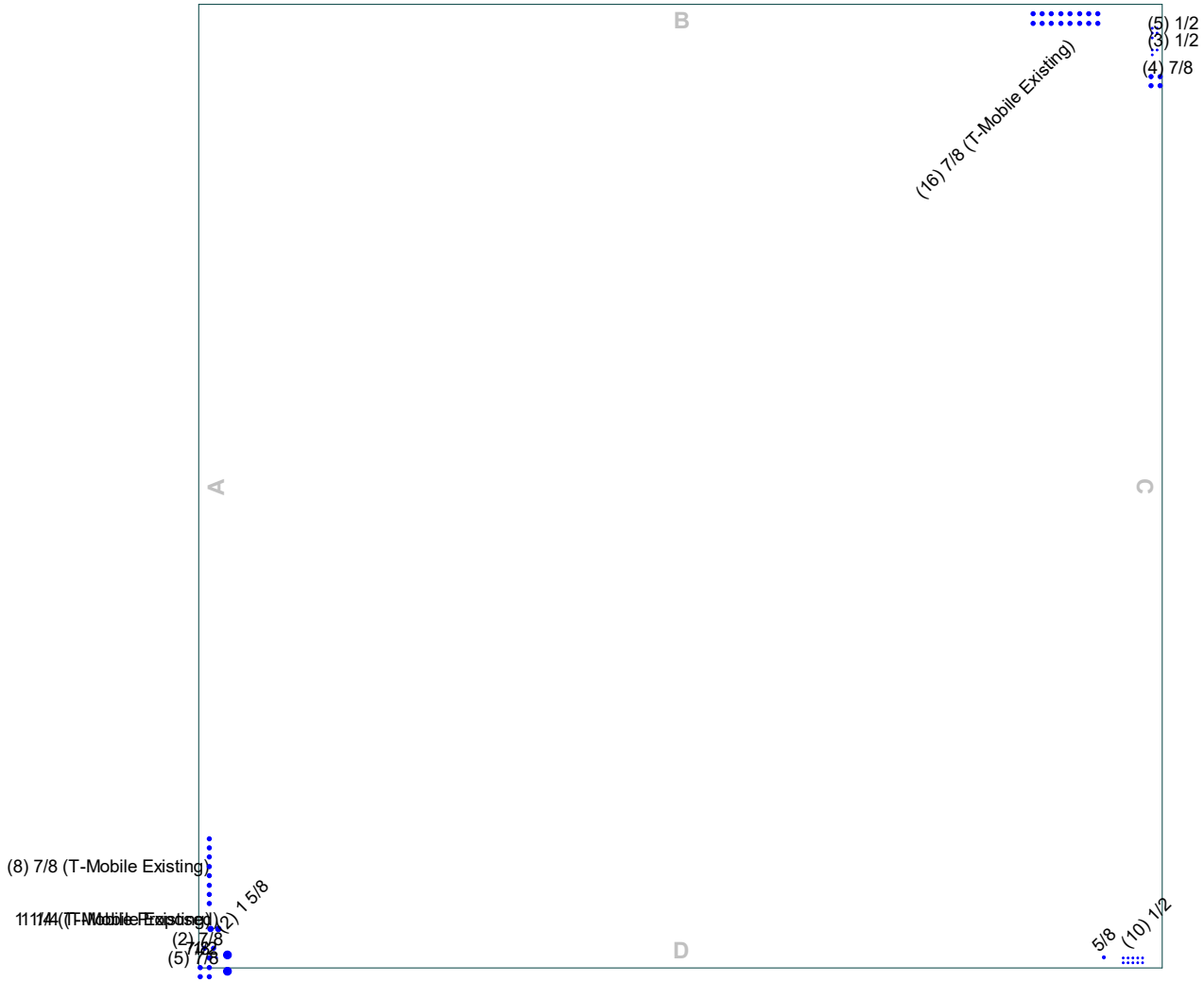
1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 58.2%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 17012.06 - CT11923C		
Project: 100' Lattice Tower 7 West View Dr., Danbury, CT		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 02/10/17	Scale: NTS
Path: J:\Jobs\1701\200.WI\06. CT11923C\06. Structural\Backup Documentation\ER Files\100' Lattice Tower Danbury, CT.eri		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



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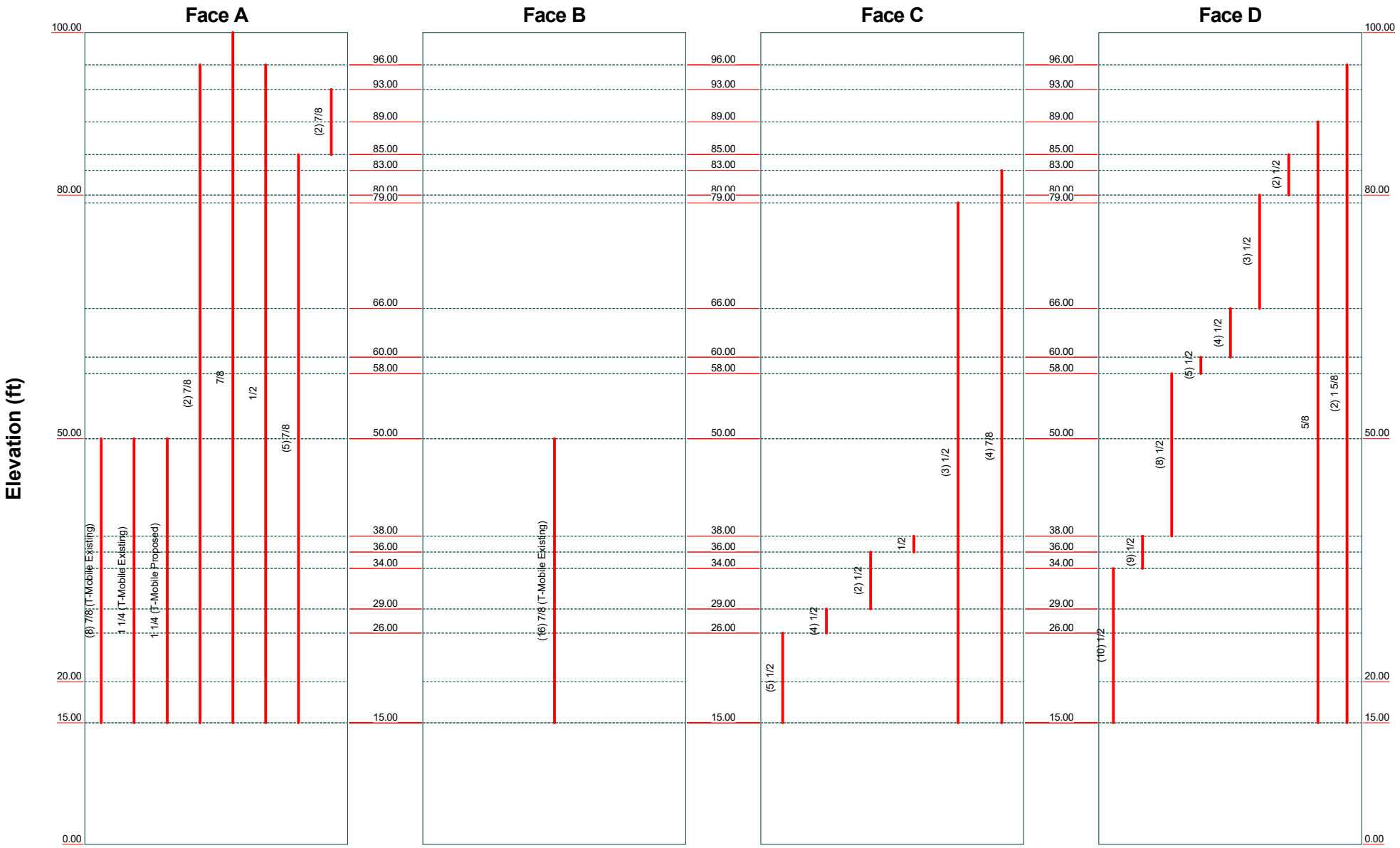
Path: J:\Jobs\17012\00.WI\06_CT11923C\05_Structural\Backup Documentation\ERI Files\100' Lattice Tower Danbury, CT.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 100'

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



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Path: J:\Jobs\17012\00.WI\06_CT11923C\05_Structural\Backup Documentation\ERI Files\100' Lattice Tower Danbury, CT.eri		Dwg No. E-7

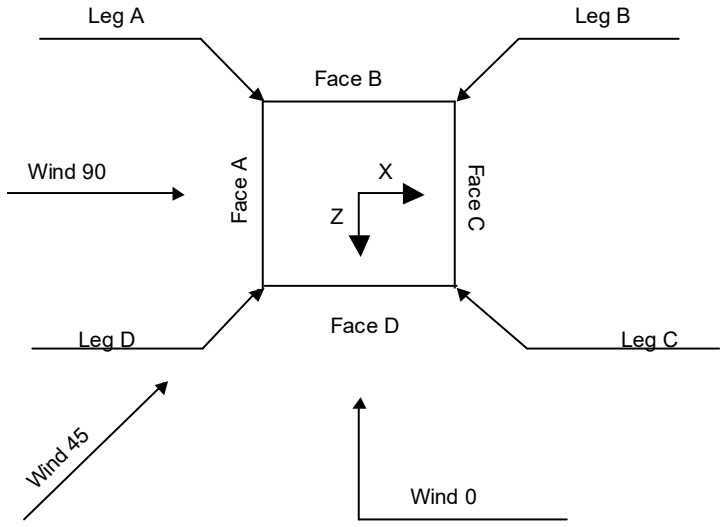
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 100.00 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 8.50 ft at the top and 21.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 93 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	100.00-80.00			8.50	1	20.00
T2	80.00-50.00			11.42	1	30.00
T3	50.00-20.00			15.00	1	30.00
T4	20.00-15.00			18.58	1	5.00
T5	15.00-0.00			19.19	1	15.00

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
T1	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T2	80.00-50.00	7.50	X Brace	No	No	0.0000	0.0000
T3	50.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T4	20.00-15.00	5.00	K1 Down	No	Yes	0.0000	0.0000
T5	15.00-0.00	14.92	X Brace	No	Yes	0.0000	1.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 100.00-80.00	Equal Angle	L5x5x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T2 80.00-50.00	Equal Angle	L6x6x3/8	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 50.00-20.00	Equal Angle	L6x6x9/16	A36 (36 ksi)	Single Angle	L3x3 1/2x1/4	A36 (36 ksi)
T4 20.00-15.00	Equal Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 15.00-0.00	Equal Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3 1/2x4x1/4	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 100.00-80.00	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 80.00-50.00	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T3 50.00-20.00	Single Angle	L2x3x3/16	A36 (36 ksi)	Solid Round		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
T4 20.00-15.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	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
T4 20.00-15.00	Solid Round		A36 (36 ksi)	Single Angle	L2x2 1/2x1/4	A36 (36 ksi)
T5 15.00-0.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T4 20.00-15.00	A36 (36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2 1/2x1/8	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	Double Angle Stitch Bolt Spacing Redundants in
T1 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1.02	1	1	36.0000	36.0000	36.0000
T2 80.00-50.00	0.00	0.0000	A36 (36 ksi)	1.02	1	1	36.0000	36.0000	36.0000
T3 50.00-20.00	0.00	0.0000	A36 (36 ksi)	1.02	1	1	36.0000	36.0000	36.0000
T4 20.00-15.00	0.00	0.0000	A36 (36 ksi)	1.02	1	1	36.0000	36.0000	36.0000
T5 15.00-0.00	0.00	0.0000	A36 (36 ksi)	1.02	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
80.00-50.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
50.00-20.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
20.00-15.00				1	1	1	1	1	1	1
T5 15.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		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
T1 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 80.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 50.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 20.00-15.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 15.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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 100.00-80.00	Sleeve SS	0.6250 A325N	12	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 80.00-50.00	Sleeve SS	0.6250 A325N	16	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 50.00-20.00	Sleeve SS	0.6250 A325N	16	0.6250 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 20.00-15.00	Sleeve SS	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T5 15.00-0.00	Sleeve SS	1.5000 A354-BC	4	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2

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
7/8 (T-Mobile Existing)	A	No	Ar (CaAa)	50.00 - 15.00	-2.0000	-0.4	8	8	1.1100	1.1100		0.54
7/8 (T-Mobile Existing)	B	No	Ar (CaAa)	50.00 - 15.00	-4.0000	0.4	16	8	1.1100	1.1100		0.54
1 1/4 (T-Mobile Existing)	A	No	Ar (CaAa)	50.00 - 15.00	-2.0000	-0.46	1	1	1.5500	1.5500		0.66
1 1/4 (T-Mobile Proposed)	A	No	Ar (CaAa)	50.00 - 15.00	-4.0000	-0.46	1	1	1.5500	1.5500		0.66
7/8	A	No	Ar (CaAa)	96.00 - 15.00	-3.0000	-0.48	2	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	100.00 - 15.00	-2.0000	-0.49	1	1	1.1100	1.1100		0.54
1/2	A	No	Ar (CaAa)	96.00 - 15.00	-4.0000	-0.49	1	1	0.5800	0.5800		0.25
1/2	C	No	Ar (CaAa)	26.00 - 15.00	-2.0000	-0.47	5	3	0.5800	0.5800		0.25
1/2	C	No	Ar (CaAa)	29.00 - 26.00	-2.0000	-0.47	4	2	0.5800	0.5800		0.25
1/2	C	No	Ar (CaAa)	36.00 - 29.00	-2.0000	-0.47	2	2	0.5800	0.5800		0.25

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
1/2	C	No	Ar (CaAa)	38.00 - 36.00	-2.0000	-0.47	1	1	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	34.00 - 15.00	-2.0000	-0.47	10	5	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	38.00 - 34.00	-2.0000	-0.47	9	5	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	58.00 - 38.00	-2.0000	-0.47	8	4	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	60.00 - 58.00	-2.0000	-0.47	5	3	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	66.00 - 60.00	-2.0000	-0.47	4	2	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	80.00 - 66.00	-2.0000	-0.47	3	2	0.5800	0.5800		0.25
1/2	D	No	Ar (CaAa)	85.00 - 80.00	-2.0000	-0.47	2	2	0.5800	0.5800		0.25
5/8	D	No	Ar (CaAa)	89.00 - 15.00	-2.0000	-0.44	1	1	0.8800	0.8800		0.40
1/2	C	No	Ar (CaAa)	79.00 - 15.00	-2.0000	-0.45	3	2	0.5800	0.5800		0.25
7/8	C	No	Ar (CaAa)	83.00 - 15.00	-2.0000	-0.42	4	2	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	85.00 - 15.00	-2.0000	-0.5	5	3	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	93.00 - 85.00	-2.0000	-0.5	2	2	1.1100	1.1100		0.54
1 5/8	D	No	Ar (CaAa)	96.00 - 15.00	-2.0000	0.47	2	1	1.9800	1.9800		1.04

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	100.00-80.00	A	0.000	0.000	11.251	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.332	0.000	0.01
		D	0.000	0.000	7.708	0.000	0.04
T2	80.00-50.00	A	0.000	0.000	28.380	0.000	0.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	18.366	0.000	0.09
		D	0.000	0.000	22.640	0.000	0.11
T3	50.00-20.00	A	0.000	0.000	64.320	0.000	0.31
		B	0.000	0.000	53.280	0.000	0.26
		C	0.000	0.000	21.904	0.000	0.10
		D	0.000	0.000	30.296	0.000	0.14
T4	20.00-15.00	A	0.000	0.000	10.720	0.000	0.05
		B	0.000	0.000	8.880	0.000	0.04
		C	0.000	0.000	4.540	0.000	0.02
		D	0.000	0.000	5.320	0.000	0.02
T5	15.00-0.00	A	0.000	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	0.000	0.000	0.000	0.000	0.00

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	100.00-80.00	A	1.658	0.000	0.000	45.971	0.000	0.58
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	3.525	0.000	0.05
		D		0.000	0.000	29.097	0.000	0.35
T2	80.00-50.00	A	1.605	0.000	0.000	94.724	0.000	1.24
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	60.064	0.000	0.70
		D		0.000	0.000	79.985	0.000	0.94

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
T3	50.00-20.00	A	1.509	0.000	0.000	194.323	0.000	2.48
		B		0.000	0.000	77.500	0.000	1.49
		C		0.000	0.000	72.819	0.000	0.80
		D		0.000	0.000	84.355	0.000	1.03
T4	20.00-15.00	A	1.408	0.000	0.000	31.483	0.000	0.38
		B		0.000	0.000	12.758	0.000	0.24
		C		0.000	0.000	14.027	0.000	0.15
		D		0.000	0.000	13.860	0.000	0.16
T5	15.00-0.00	A	1.293	0.000	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		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	100.00-80.00	-3.0577	3.7996	-3.7980	4.7230
T2	80.00-50.00	-1.2728	4.1680	-3.0631	5.3501
T3	50.00-20.00	0.7108	1.5769	-3.5737	5.1757
T4	20.00-15.00	1.1751	1.1389	-2.8963	4.4458
T5	15.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	5	7/8	80.00 - 96.00	0.6000	0.6000
T1	6	7/8	80.00 - 100.00	0.6000	0.6000
T1	7	1/2	80.00 - 96.00	0.6000	0.6000
T1	18	1/2	80.00 - 85.00	0.6000	0.6000
T1	19	5/8	80.00 - 89.00	0.6000	0.6000
T1	21	7/8	80.00 - 83.00	0.6000	0.6000
T1	22	7/8	80.00 - 85.00	0.6000	0.6000
T1	23	7/8	85.00 - 93.00	0.6000	0.6000
T1	24	1 5/8	80.00 - 96.00	0.6000	0.6000
T2	5	7/8	50.00 - 80.00	0.6000	0.6000
T2	6	7/8	50.00 - 80.00	0.6000	0.6000
T2	7	1/2	50.00 - 80.00	0.6000	0.6000
T2	14	1/2	50.00 - 58.00	0.6000	0.6000
T2	15	1/2	58.00 - 60.00	0.6000	0.6000
T2	16	1/2	60.00 - 66.00	0.6000	0.6000
T2	17	1/2	66.00 - 80.00	0.6000	0.6000
T2	19	5/8	50.00 - 80.00	0.6000	0.6000
T2	20	1/2	50.00 - 79.00	0.6000	0.6000
T2	21	7/8	50.00 - 80.00	0.6000	0.6000
T2	22	7/8	50.00 - 80.00	0.6000	0.6000
T2	24	1 5/8	50.00 - 80.00	0.6000	0.6000
T3	1	7/8	20.00 - 50.00	0.6000	0.6000
T3	2	7/8	20.00 - 50.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	3	1 1/4	20.00 - 50.00	0.6000	0.6000
T3	4	1 1/4	20.00 - 50.00	0.6000	0.6000
T3	5	7/8	20.00 - 50.00	0.6000	0.6000
T3	6	7/8	20.00 - 50.00	0.6000	0.6000
T3	7	1/2	20.00 - 50.00	0.6000	0.6000
T3	8	1/2	20.00 - 26.00	0.6000	0.6000
T3	9	1/2	26.00 - 29.00	0.6000	0.6000
T3	10	1/2	29.00 - 36.00	0.6000	0.6000
T3	11	1/2	36.00 - 38.00	0.6000	0.6000
T3	12	1/2	20.00 - 34.00	0.6000	0.6000
T3	13	1/2	34.00 - 38.00	0.6000	0.6000
T3	14	1/2	38.00 - 50.00	0.6000	0.6000
T3	19	5/8	20.00 - 50.00	0.6000	0.6000
T3	20	1/2	20.00 - 50.00	0.6000	0.6000
T3	21	7/8	20.00 - 50.00	0.6000	0.6000
T3	22	7/8	20.00 - 50.00	0.6000	0.6000
T3	24	1 5/8	20.00 - 50.00	0.6000	0.6000
T4	1	7/8	15.00 - 20.00	0.6000	0.6000
T4	2	7/8	15.00 - 20.00	0.6000	0.6000
T4	3	1 1/4	15.00 - 20.00	0.6000	0.6000
T4	4	1 1/4	15.00 - 20.00	0.6000	0.6000
T4	5	7/8	15.00 - 20.00	0.6000	0.6000
T4	6	7/8	15.00 - 20.00	0.6000	0.6000
T4	7	1/2	15.00 - 20.00	0.6000	0.6000
T4	8	1/2	15.00 - 20.00	0.6000	0.6000
T4	12	1/2	15.00 - 20.00	0.6000	0.6000
T4	19	5/8	15.00 - 20.00	0.6000	0.6000
T4	20	1/2	15.00 - 20.00	0.6000	0.6000
T4	21	7/8	15.00 - 20.00	0.6000	0.6000
T4	22	7/8	15.00 - 20.00	0.6000	0.6000
T4	24	1 5/8	15.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
3' Yagi	D	From Leg	0.00		0.0000	38.00	No Ice	2.08	2.08	0.03
			0.00				1/2" Ice	3.79	3.79	0.05
			0.00				1" Ice	5.52	5.52	0.09
2" Std. x 7.5' Pipe	D	From Leg	0.00		0.0000	38.00	No Ice	1.78	1.78	0.03
			0.00				1/2" Ice	2.56	2.56	0.04
			0.00				1" Ice	3.11	3.11	0.06
DB254-A	D	From Leg	0.00		0.0000	34.00	No Ice	1.10	1.10	0.01
			0.00				1/2" Ice	1.98	1.98	0.01
			0.00				1" Ice	2.86	2.86	0.02
2-ft Stand Off	D	From Face	0.00		0.0000	60.00	No Ice	1.07	1.07	0.02
			0.00				1/2" Ice	1.62	1.62	0.03
			0.00				1" Ice	2.17	2.17	0.04
2" Std. x 7.5' Pipe	D	From Leg	0.00		0.0000	34.00	No Ice	1.78	1.78	0.03
			0.00				1/2" Ice	2.56	2.56	0.04

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
			0.00			1" Ice	3.11	3.11	0.06
2-ft Stand Off	C	From Face	0.00	0.0000	38.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
2-ft Stand Off	C	From Face	0.00	0.0000	36.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
2-ft Stand Off	C	From Face	0.00	0.0000	29.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
2-ft Stand Off	C	From Face	0.00	0.0000	29.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
2-ft Stand Off	C	From Face	0.00	0.0000	26.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
ROHN 25 tower 55'	C	From Leg	0.00	0.0000	107.50	No Ice	20.00	20.00	0.40
			0.00			1/2" Ice	28.00	28.00	0.55
			0.00			1" Ice	36.00	36.00	0.70
Pirod 10' Box Arm	C	From Leg	3.00	0.0000	99.00	No Ice	5.00	5.00	0.25
			0.00			1/2" Ice	10.00	10.00	0.30
			0.00			1" Ice	15.00	15.00	0.35
6' Standoff Arm	C	From Leg	3.00	0.0000	96.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
8' x 3" Dia Omni	C	From Leg	6.00	0.0000	83.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			4.00			1" Ice	3.67	3.67	0.07
8' x 3" Dia Omni	C	From Leg	6.00	0.0000	83.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			-4.00			1" Ice	3.67	3.67	0.07
6' Standoff Arm	C	From Leg	3.00	0.0000	83.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
15' x 3" Dia Omni	C	From Leg	6.00	0.0000	58.00	No Ice	4.50	4.50	0.04
			0.00			1/2" Ice	6.03	6.03	0.07
			7.00			1" Ice	7.58	7.58	0.12
6' Standoff Arm	C	From Leg	3.00	0.0000	58.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
TA-2304-2-DAB	B	From Face	0.00	0.0000	79.00	No Ice	1.96	1.86	0.01
			0.00			1/2" Ice	2.22	2.12	0.02
			0.00			1" Ice	2.48	2.38	0.04
TA-2304-2-DAB	C	From Face	0.00	0.0000	79.00	No Ice	1.96	1.86	0.01
			0.00			1/2" Ice	2.22	2.12	0.02
			0.00			1" Ice	2.48	2.38	0.04
TA-2304-2-DAB	D	From Face	0.00	0.0000	79.00	No Ice	1.96	1.86	0.01
			0.00			1/2" Ice	2.22	2.12	0.02
			0.00			1" Ice	2.48	2.38	0.04
6' Standoff Arm	A	From Leg	3.00	0.0000	96.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
6' Yagi	A	From Leg	0.00	0.0000	96.00	No Ice	5.00	5.00	0.04
			0.00			1/2" Ice	6.50	6.50	0.06
			0.00			1" Ice	8.00	8.00	0.08
6' Standoff Arm	A	From Leg	3.00	0.0000	83.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07

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
			0.00			1" Ice	3.26	0.24	0.10
6' Standoff Arm	A	From Leg	3.00	0.0000	74.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
15' x 3" Dia Omni	A	From Leg	6.00	0.0000	58.00	No Ice	4.50	4.50	0.04
			0.00			1/2" Ice	6.03	6.03	0.07
			7.00			1" Ice	7.58	7.58	0.12
6' Standoff Arm	A	From Leg	3.00	0.0000	58.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
15' x 3" Dia Omni	B	From Leg	6.00	0.0000	100.00	No Ice	4.50	4.50	0.04
			0.00			1/2" Ice	6.03	6.03	0.07
			7.00			1" Ice	7.58	7.58	0.12
6' Standoff Arm	B	From Leg	3.00	0.0000	98.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
DB292-A	B	From Leg	2.00	0.0000	93.00	No Ice	1.80	1.80	0.01
			0.00			1/2" Ice	3.24	3.24	0.02
			0.00			1" Ice	4.68	4.68	0.02
8' x 3" Dia Omni	B	From Leg	6.00	0.0000	83.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			7.00			1" Ice	3.67	3.67	0.07
2-ft Stand Off	B	From Leg	3.00	0.0000	83.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
15' x 3" Dia Omni	B	From Leg	6.00	0.0000	83.00	No Ice	4.50	4.50	0.04
			0.00			1/2" Ice	6.03	6.03	0.07
			7.00			1" Ice	7.58	7.58	0.12
6' Standoff Arm	B	From Leg	3.00	0.0000	83.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
10' x 3" Dia Omni	B	From Leg	6.00	0.0000	66.00	No Ice	3.00	3.00	0.03
			0.00			1/2" Ice	4.03	4.03	0.05
			5.00			1" Ice	5.03	5.03	0.08
2-ft Stand Off	B	From Leg	3.00	0.0000	66.00	No Ice	1.07	1.07	0.02
			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
15' x 3" Dia Omni	B	From Leg	6.00	0.0000	58.00	No Ice	4.50	4.50	0.04
			0.00			1/2" Ice	6.03	6.03	0.07
			7.00			1" Ice	7.58	7.58	0.12
6' Standoff Arm	B	From Leg	3.00	0.0000	58.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
DB225-2-A	B	From Face	2.00	0.0000	90.00	No Ice	3.21	3.21	0.07
			0.00			1/2" Ice	5.78	5.78	0.10
			0.00			1" Ice	8.35	8.35	0.12
DB252	B	From Face	2.00	0.0000	89.00	No Ice	3.20	3.20	0.03
			0.00			1/2" Ice	5.76	5.76	0.03
			0.00			1" Ice	8.32	8.32	0.04
DB432-A	B	From Face	2.00	0.0000	84.00	No Ice	0.30	0.30	0.01
			0.00			1/2" Ice	0.54	0.54	0.01
			0.00			1" Ice	0.78	0.78	0.01
DB499-A	B	From Face	2.00	0.0000	85.50	No Ice	0.25	0.25	0.01
			0.00			1/2" Ice	0.45	0.45	0.01
			0.00			1" Ice	0.65	0.65	0.01
8' x 3" Dia Omni	D	None		0.0000	96.00	No Ice	2.40	2.40	0.03
						1/2" Ice	3.19	3.19	0.04

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
						1" Ice	3.67	3.67	0.07
8' x 3" Dia Omni	D	None		0.0000	96.00	No Ice	2.40	2.40	0.03
						1/2" Ice	3.19	3.19	0.04
						1" Ice	3.67	3.67	0.07
10' x 3" Dia Omni	D	None		0.0000	96.00	No Ice	3.00	3.00	0.03
						1/2" Ice	4.03	4.03	0.05
						1" Ice	5.03	5.03	0.08
10' x 3" Dia Omni	D	None		0.0000	96.00	No Ice	3.00	3.00	0.03
						1/2" Ice	4.03	4.03	0.05
						1" Ice	5.03	5.03	0.08
DB633-C	D	From Leg	6.00	0.0000	85.00	No Ice	0.65	0.65	0.01
			0.00			1/2" Ice	0.86	0.86	0.01
			5.00			1" Ice	1.09	1.09	0.02
6' Standoff Arm	D	From Leg	3.00	0.0000	96.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
6' Standoff Arm	D	From Leg	3.00	0.0000	83.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
6' Standoff Arm	D	From Leg	3.00	0.0000	74.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
AIR21 B2A/B4P	A	From Leg	3.00	0.0000	50.00	No Ice	6.05	4.36	0.08
(T-Mobile - Existing)			5.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR32	A	From Leg	3.00	0.0000	50.00	No Ice	6.51	4.71	0.13
(T-Mobile - Proposed)			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
LNX-6515DS	A	From Leg	3.00	0.0000	50.00	No Ice	11.45	7.70	0.06
(T-Mobile - Existing)			-5.00			1/2" Ice	12.06	8.29	0.12
			0.00			1" Ice	12.69	8.89	0.19
TMA 10"x8"x3"	A	From Leg	3.00	0.0000	50.00	No Ice	0.67	0.26	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
RRUS-11	A	From Leg	3.00	0.0000	50.00	No Ice	2.57	1.07	0.05
(T-Mobile - Existing)			-5.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
AIR21 B2A/B4P	B	From Leg	3.00	0.0000	50.00	No Ice	6.05	4.36	0.08
(T-Mobile - Existing)			5.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR32	B	From Leg	3.00	0.0000	50.00	No Ice	6.51	4.71	0.13
(T-Mobile - Proposed)			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
LNX-6515DS	B	From Leg	3.00	0.0000	50.00	No Ice	11.45	7.70	0.06
(T-Mobile - Existing)			-5.00			1/2" Ice	12.06	8.29	0.12
			0.00			1" Ice	12.69	8.89	0.19
TMA 10"x8"x3"	B	From Leg	3.00	0.0000	50.00	No Ice	0.67	0.26	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
RRUS-11	B	From Leg	3.00	0.0000	50.00	No Ice	2.57	1.07	0.05
(T-Mobile - Existing)			-5.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
AIR21 B2A/B4P	D	From Leg	3.00	0.0000	50.00	No Ice	6.05	4.36	0.08
(T-Mobile - Existing)			5.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR32	D	From Leg	3.00	0.0000	50.00	No Ice	6.51	4.71	0.13
(T-Mobile - Proposed)			0.00			1/2" Ice	6.89	5.07	0.18

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
			0.00			1" Ice	7.27	5.43	0.23
LNX-6515DS	D	From Leg	3.00	0.0000	50.00	No Ice	11.45	7.70	0.06
(T-Mobile - Existing)			-5.00			1/2" Ice	12.06	8.29	0.12
			0.00			1" Ice	12.69	8.89	0.19
TMA 10"x8"x3"	D	From Leg	3.00	0.0000	50.00	No Ice	0.67	0.26	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
RRUS-11	D	From Leg	3.00	0.0000	50.00	No Ice	2.57	1.07	0.05
(T-Mobile - Existing)			-5.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
Pirod 12' T-Frame Sector	A	From Leg	3.00	0.0000	50.00	No Ice	13.60	13.60	0.47
Mount (1)			5.00			1/2" Ice	18.40	18.40	0.60
(T-Mobile - Existing)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	B	From Leg	3.00	0.0000	50.00	No Ice	13.60	13.60	0.47
Mount (1)			5.00			1/2" Ice	18.40	18.40	0.60
(T-Mobile - Existing)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	D	From Leg	3.00	0.0000	50.00	No Ice	13.60	13.60	0.47
Mount (1)			5.00			1/2" Ice	18.40	18.40	0.60
(T-Mobile - Existing)			0.00			1" Ice	23.20	23.20	0.73

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
3-ft Grid Dish	D	Grid	From Face	0.00	Worst		85.00	2.83	No Ice	5.19	0.01
				0.00					1/2" Ice	6.67	0.04
				0.00					1" Ice	7.04	0.08
3-ft Grid Dish	D	Grid	From Face	0.00	Worst		80.00	2.83	No Ice	5.19	0.01
				0.00					1/2" Ice	6.67	0.04
				0.00					1" Ice	7.04	0.08
4-ft Dish	D	Paraboloid w/o Radome	From Face	0.00	Worst		60.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12
4-ft Dish	C	Paraboloid w/o Radome	From Face	0.00	Worst		38.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12
4-ft Dish	C	Paraboloid w/o Radome	From Face	0.00	Worst		36.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12
4-ft Dish	C	Paraboloid w/o Radome	From Face	0.00	Worst		29.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12
4-ft Dish	C	Paraboloid w/o Radome	From Face	0.00	Worst		29.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12
4-ft Dish	C	Paraboloid w/o Radome	From Face	0.00	Worst		26.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12

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 ft²	Weight K
6'x3' Grid Dish	C	Grid	From	0.00	Worst		85.00	6.00	No Ice	28.27	0.05
			Face	0.00					1/2" Ice	29.07	0.06
				0.00					1" Ice	29.86	0.35

Tower Pressures - No Ice

$G_H = 0.850$

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	90.00	1.238	23	203.840	A	30.539	0.000	16.755	54.87	11.251	0.000
100.00-80.00					B	30.539	0.000		54.87	0.000	0.000
					C	30.539	0.000		54.87	1.332	0.000
					D	30.539	0.000		54.87	7.708	0.000
T2 80.00-50.00	65.00	1.156	22	404.502	A	57.470	0.000	30.107	52.39	28.380	0.000
					B	57.470	0.000		52.39	0.000	0.000
					C	57.470	0.000		52.39	18.366	0.000
					D	57.470	0.000		52.39	22.640	0.000
T3 50.00-20.00	35.00	1.015	19	512.217	A	62.206	0.000	30.107	48.40	64.320	0.000
					B	62.206	0.000		48.40	53.280	0.000
					C	62.206	0.000		48.40	21.904	0.000
					D	62.206	0.000		48.40	30.296	0.000
T4 20.00-15.00	17.50	0.877	17	95.830	A	16.274	0.000	5.019	30.84	10.720	0.000
					B	16.274	0.000		30.84	8.880	0.000
					C	16.274	0.000		30.84	4.540	0.000
					D	16.274	0.000		30.84	5.320	0.000
T5 15.00-0.00	7.50	0.85	16	305.641	A	35.699	0.000	15.055	42.17	0.000	0.000
					B	35.699	0.000		42.17	0.000	0.000
					C	35.699	0.000		42.17	0.000	0.000
					D	35.699	0.000		42.17	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

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 100.00-80.00	90.00	1.238	7	1.6583	209.383	A	30.539	32.420	27.869	44.27	45.971	0.000
						B	30.539	32.420		44.27	0.000	0.000
						C	30.539	32.420		44.27	3.525	0.000
						D	30.539	32.420		44.27	29.097	0.000
T2 80.00-50.00	65.00	1.156	6	1.6052	412.542	A	57.470	50.390	46.216	42.85	94.724	0.000
						B	57.470	50.390		42.85	0.000	0.000
						C	57.470	50.390		42.85	60.064	0.000
						D	57.470	50.390		42.85	79.985	0.000
T3 50.00-20.00	35.00	1.015	6	1.5089	519.775	A	62.206	47.419	45.249	41.28	194.323	0.000
						B	62.206	47.419		41.28	77.500	0.000
						C	62.206	47.419		41.28	72.819	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
						D	62.206	47.419		41.28	84.355	0.000
T4 20.00-15.00	17.50	0.877	5	1.4078	97.006	A	16.274	13.824	7.374	24.50	31.483	0.000
						B	16.274	13.824		24.50	12.758	0.000
						C	16.274	13.824		24.50	14.027	0.000
						D	16.274	13.824		24.50	13.860	0.000
T5 15.00-0.00	7.50	0.85	5	1.2934	308.880	A	35.699	21.232	21.545	37.84	0.000	0.000
						B	35.699	21.232		37.84	0.000	0.000
						C	35.699	21.232		37.84	0.000	0.000
						D	35.699	21.232		37.84	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

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	90.00	1.238	10	203.840	A	30.539	0.000	16.755	54.87	11.251	0.000
100.00-80.00					B	30.539	0.000		54.87	0.000	0.000
					C	30.539	0.000		54.87	1.332	0.000
					D	30.539	0.000		54.87	7.708	0.000
T2 80.00-50.00	65.00	1.156	9	404.502	A	57.470	0.000	30.107	52.39	28.380	0.000
					B	57.470	0.000		52.39	0.000	0.000
					C	57.470	0.000		52.39	18.366	0.000
					D	57.470	0.000		52.39	22.640	0.000
T3 50.00-20.00	35.00	1.015	8	512.217	A	62.206	0.000	30.107	48.40	64.320	0.000
					B	62.206	0.000		48.40	53.280	0.000
					C	62.206	0.000		48.40	21.904	0.000
					D	62.206	0.000		48.40	30.296	0.000
T4 20.00-15.00	17.50	0.877	7	95.830	A	16.274	0.000	5.019	30.84	10.720	0.000
					B	16.274	0.000		30.84	8.880	0.000
					C	16.274	0.000		30.84	4.540	0.000
					D	16.274	0.000		30.84	5.320	0.000
T5 15.00-0.00	7.50	0.85	7	305.641	A	35.699	0.000	15.055	42.17	0.000	0.000
					B	35.699	0.000		42.17	0.000	0.000
					C	35.699	0.000		42.17	0.000	0.000
					D	35.699	0.000		42.17	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	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.10	1.89	A	0.15	3.206	23	1	1	30.539	2.18	108.99	D
100.00-80.00			B	0.15	3.206		1	1	30.539			
			C	0.15	3.206		1	1	30.539			
			D	0.15	3.206		1	1	30.539			
T2	0.33	3.41	A	0.142	3.242	22	1	1	57.470	4.22	140.52	D
80.00-50.00			B	0.142	3.242		1	1	57.470			
			C	0.142	3.242		1	1	57.470			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			D	0.142	3.242		1	1	57.470			
T3	0.81	5.31	A	0.121	3.342	19	1	1	62.206	5.03	167.62	D
50.00-20.00			B	0.121	3.342		1	1	62.206			
			C	0.121	3.342		1	1	62.206			
			D	0.121	3.342		1	1	62.206			
T4	0.14	1.38	A	0.17	3.113	17	1	1	16.274	0.96	191.74	D
20.00-15.00			B	0.17	3.113		1	1	16.274			
			C	0.17	3.113		1	1	16.274			
			D	0.17	3.113		1	1	16.274			
T5 15.00-0.00	0.00	2.87	A	0.117	3.365	16	1	1	35.699	1.63	108.91	D
			B	0.117	3.365		1	1	35.699			
			C	0.117	3.365		1	1	35.699			
			D	0.117	3.365		1	1	35.699			
Sum Weight:	1.38	14.86						OTM	675.22 kip-ft	14.02		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.10	1.89	A	0.15	3.206	23	1.112	1.112	33.970	2.40	119.88	D
100.00-80.00			B	0.15	3.206		1.112	1.112	33.970			
			C	0.15	3.206		1.112	1.112	33.970			
			D	0.15	3.206		1.112	1.112	33.970			
T2	0.33	3.41	A	0.142	3.242	22	1.107	1.107	63.594	4.58	152.76	D
80.00-50.00			B	0.142	3.242		1.107	1.107	63.594			
			C	0.142	3.242		1.107	1.107	63.594			
			D	0.142	3.242		1.107	1.107	63.594			
T3	0.81	5.31	A	0.121	3.342	19	1.091	1.091	67.872	5.34	177.87	D
50.00-20.00			B	0.121	3.342		1.091	1.091	67.872			
			C	0.121	3.342		1.091	1.091	67.872			
			D	0.121	3.342		1.091	1.091	67.872			
T4	0.14	1.38	A	0.17	3.113	17	1.127	1.127	18.347	1.05	209.85	D
20.00-15.00			B	0.17	3.113		1.127	1.127	18.347			
			C	0.17	3.113		1.127	1.127	18.347			
			D	0.17	3.113		1.127	1.127	18.347			
T5 15.00-0.00	0.00	2.87	A	0.117	3.365	16	1.088	1.088	38.826	1.78	118.45	D
			B	0.117	3.365		1.088	1.088	38.826			
			C	0.117	3.365		1.088	1.088	38.826			
			D	0.117	3.365		1.088	1.088	38.826			
Sum Weight:	1.38	14.86						OTM	732.11 kip-ft	15.14		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.98	6.50	A	0.301	2.588	7	1	1	49.963	1.01	50.50	D
100.00-80.00			B	0.301	2.588		1	1	49.963			
			C	0.301	2.588		1	1	49.963			
			D	0.301	2.588		1	1	49.963			
T2	2.88	11.12	A	0.261	2.731	6	1	1	87.094	2.02	67.47	D
80.00-50.00			B	0.261	2.731		1	1	87.094			
			C	0.261	2.731		1	1	87.094			
			D	0.261	2.731		1	1	87.094			
T3	5.80	13.39	A	0.211	2.934	6	1	1	89.542	2.44	81.34	D
50.00-20.00			B	0.211	2.934		1	1	89.542			
			C	0.211	2.934		1	1	89.542			
			D	0.211	2.934		1	1	89.542			
T4	0.94	3.95	A	0.31	2.554	5	1	1	24.599	0.43	86.05	D
20.00-15.00			B	0.31	2.554		1	1	24.599			
			C	0.31	2.554		1	1	24.599			
			D	0.31	2.554		1	1	24.599			
T5 15.00-0.00	0.00	6.69	A	0.184	3.048	5	1	1	47.842	0.57	38.21	D
			B	0.184	3.048		1	1	47.842			
			C	0.184	3.048		1	1	47.842			
			D	0.184	3.048		1	1	47.842			
Sum Weight:	10.60	41.65						OTM	319.69 kip-ft	6.48		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.98	6.50	A	0.301	2.588	7	1.2	1.2	59.955	1.16	57.90	D
100.00-80.00			B	0.301	2.588		1.2	1.2	59.955			
			C	0.301	2.588		1.2	1.2	59.955			
			D	0.301	2.588		1.2	1.2	59.955			
T2	2.88	11.12	A	0.261	2.731	6	1.196	1.196	104.172	2.27	75.78	D
80.00-50.00			B	0.261	2.731		1.196	1.196	104.172			
			C	0.261	2.731		1.196	1.196	104.172			
			D	0.261	2.731		1.196	1.196	104.172			
T3	5.80	13.39	A	0.211	2.934	6	1.158	1.158	103.706	2.64	87.83	D
50.00-20.00			B	0.211	2.934		1.158	1.158	103.706			
			C	0.211	2.934		1.158	1.158	103.706			
			D	0.211	2.934		1.158	1.158	103.706			
T4	0.94	3.95	A	0.31	2.554	5	1.2	1.2	29.518	0.48	96.24	D
20.00-15.00			B	0.31	2.554		1.2	1.2	29.518			
			C	0.31	2.554		1.2	1.2	29.518			
			D	0.31	2.554		1.2	1.2	29.518			
T5 15.00-0.00	0.00	6.69	A	0.184	3.048	5	1.138	1.138	54.455	0.65	43.50	D
			B	0.184	3.048		1.138	1.138	54.455			
			C	0.184	3.048		1.138	1.138	54.455			
			D	0.184	3.048		1.138	1.138	54.455			
Sum Weight:	10.60	41.65						OTM	357.52 kip-ft	7.20		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.10	1.89	A	0.15	3.206	10	1	1	30.539	0.91	45.36	D
100.00-80.00			B	0.15	3.206		1	1	30.539			
			C	0.15	3.206		1	1	30.539			
			D	0.15	3.206		1	1	30.539			
T2	0.33	3.41	A	0.142	3.242	9	1	1	57.470	1.75	58.49	D
80.00-50.00			B	0.142	3.242		1	1	57.470			
			C	0.142	3.242		1	1	57.470			
			D	0.142	3.242		1	1	57.470			
T3	0.81	5.31	A	0.121	3.342	8	1	1	62.206	2.09	69.77	D
50.00-20.00			B	0.121	3.342		1	1	62.206			
			C	0.121	3.342		1	1	62.206			
			D	0.121	3.342		1	1	62.206			
T4	0.14	1.38	A	0.17	3.113	7	1	1	16.274	0.40	79.81	D
20.00-15.00			B	0.17	3.113		1	1	16.274			
			C	0.17	3.113		1	1	16.274			
			D	0.17	3.113		1	1	16.274			
T5 15.00-0.00	0.00	2.87	A	0.117	3.365	7	1	1	35.699	0.68	45.33	D
			B	0.117	3.365		1	1	35.699			
			C	0.117	3.365		1	1	35.699			
			D	0.117	3.365		1	1	35.699			
Sum Weight:	1.38	14.86						OTM	281.05 kip-ft	5.83		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.10	1.89	A	0.15	3.206	10	1.112	1.112	33.970	1.00	49.90	D
100.00-80.00			B	0.15	3.206		1.112	1.112	33.970			
			C	0.15	3.206		1.112	1.112	33.970			
			D	0.15	3.206		1.112	1.112	33.970			
T2	0.33	3.41	A	0.142	3.242	9	1.107	1.107	63.594	1.91	63.58	D
80.00-50.00			B	0.142	3.242		1.107	1.107	63.594			
			C	0.142	3.242		1.107	1.107	63.594			
			D	0.142	3.242		1.107	1.107	63.594			
T3	0.81	5.31	A	0.121	3.342	8	1.091	1.091	67.872	2.22	74.03	D
50.00-20.00			B	0.121	3.342		1.091	1.091	67.872			
			C	0.121	3.342		1.091	1.091	67.872			
			D	0.121	3.342		1.091	1.091	67.872			
T4	0.14	1.38	A	0.17	3.113	7	1.127	1.127	18.347	0.44	87.35	D
20.00-15.00			B	0.17	3.113		1.127	1.127	18.347			
			C	0.17	3.113		1.127	1.127	18.347			
			D	0.17	3.113		1.127	1.127	18.347			
T5 15.00-0.00	0.00	2.87	A	0.117	3.365	7	1.088	1.088	38.826	0.74	49.30	D
			B	0.117	3.365		1.088	1.088	38.826			
			C	0.117	3.365		1.088	1.088	38.826			
			D	0.117	3.365		1.088	1.088	38.826			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	1.38	14.86						OTM	304.73 kip-ft	6.30		

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	6.98					
Bracing Weight	7.88					
Total Member Self-Weight	14.86			-4.85	-3.43	
Total Weight	21.52			-4.85	-3.43	
Wind 0 deg - No Ice		0.04	-18.82	-1009.70	-5.50	7.66
Wind 30 deg - No Ice		10.01	-17.30	-925.37	-536.02	5.94
Wind 45 deg - No Ice		14.14	-14.14	-757.07	-755.55	4.48
Wind 60 deg - No Ice		17.30	-10.01	-537.51	-923.83	2.71
Wind 90 deg - No Ice		18.82	-0.04	-6.92	-1008.13	-1.50
Wind 120 deg - No Ice		17.25	9.94	524.22	-921.76	-4.88
Wind 135 deg - No Ice		14.08	14.08	744.44	-752.62	-6.25
Wind 150 deg - No Ice		9.94	17.26	913.60	-532.43	-7.20
Wind 180 deg - No Ice		-0.04	18.82	999.99	-1.36	-7.66
Wind 210 deg - No Ice		-10.01	17.30	915.67	529.15	-5.94
Wind 225 deg - No Ice		-14.14	14.14	747.37	748.68	-4.48
Wind 240 deg - No Ice		-17.30	10.01	527.81	916.96	-2.71
Wind 270 deg - No Ice		-18.82	0.04	-2.78	1001.26	1.50
Wind 300 deg - No Ice		-17.25	-9.94	-533.93	914.89	4.88
Wind 315 deg - No Ice		-14.08	-14.08	-754.15	745.75	6.25
Wind 330 deg - No Ice		-9.94	-17.26	-923.30	525.56	7.20
Member Ice	26.79					
Total Weight Ice	65.84			7.05	1.24	
Wind 0 deg - Ice		0.01	-9.31	-520.35	0.77	4.13
Wind 30 deg - Ice		5.03	-8.70	-482.69	-281.76	3.89
Wind 45 deg - Ice		7.10	-7.10	-392.96	-398.74	3.46
Wind 60 deg - Ice		8.70	-5.03	-275.97	-488.46	2.78
Wind 90 deg - Ice		9.31	-0.01	6.58	-526.11	0.66
Wind 120 deg - Ice		8.68	5.01	289.26	-487.99	-1.17
Wind 135 deg - Ice		7.09	7.09	406.40	-398.07	-2.14
Wind 150 deg - Ice		5.01	8.69	496.32	-280.94	-2.96
Wind 180 deg - Ice		-0.01	9.31	534.45	1.72	-4.13
Wind 210 deg - Ice		-5.03	8.70	496.79	284.25	-3.89
Wind 225 deg - Ice		-7.10	7.10	407.07	401.23	-3.46
Wind 240 deg - Ice		-8.70	5.03	290.08	490.95	-2.78
Wind 270 deg - Ice		-9.31	0.01	7.53	528.60	-0.66
Wind 300 deg - Ice		-8.68	-5.01	-275.15	490.47	1.17
Wind 315 deg - Ice		-7.09	-7.09	-392.29	400.56	2.14
Wind 330 deg - Ice		-5.01	-8.69	-482.22	283.43	2.96
Total Weight	21.52			-4.85	-3.43	
Wind 0 deg - Service		0.02	-7.84	-425.41	-4.78	3.19
Wind 30 deg - Service		4.17	-7.20	-390.31	-225.59	2.47
Wind 45 deg - Service		5.88	-5.88	-320.26	-316.97	1.86
Wind 60 deg - Service		7.20	-4.17	-228.87	-387.01	1.13
Wind 90 deg - Service		7.83	-0.02	-8.02	-422.10	-0.62
Wind 120 deg - Service		7.18	4.14	213.06	-386.15	-2.03

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 135 deg - Service		5.86	5.86	304.72	-315.75	-2.60
Wind 150 deg - Service		4.14	7.18	375.13	-224.10	-3.00
Wind 180 deg - Service		-0.02	7.84	411.09	-3.05	-3.19
Wind 210 deg - Service		-4.17	7.20	375.99	217.76	-2.47
Wind 225 deg - Service		-5.88	5.88	305.94	309.14	-1.86
Wind 240 deg - Service		-7.20	4.17	214.55	379.18	-1.13
Wind 270 deg - Service		-7.83	0.02	-6.30	414.27	0.62
Wind 300 deg - Service		-7.18	-4.14	-227.38	378.32	2.03
Wind 315 deg - Service		-5.86	-5.86	-319.04	307.92	2.60
Wind 330 deg - Service		-4.14	-7.18	-389.45	216.27	3.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	100 - 80	Leg	Max Tension	15	3.58	0.22	0.17
			Max. Compression	41	-5.45	-0.01	-0.03
			Max. Mx	18	1.82	-0.41	-0.08
			Max. My	2	1.56	-0.08	-0.41
			Max. Vy	18	0.48	0.00	-0.00
			Max. Vx	2	0.51	0.00	-0.00
		Diagonal	Max Tension	2	1.62	0.00	0.00
			Max. Compression	2	-1.68	0.00	0.00
			Max. Mx	41	0.20	0.06	0.02
			Max. My	35	-0.20	0.06	-0.02
			Max. Vy	42	0.05	0.06	0.02
			Max. Vx	35	-0.01	0.00	0.00
		Top Girt	Max Tension	11	0.01	0.00	0.00
			Max. Compression	39	-0.10	0.00	0.00
			Max. Mx	34	-0.08	-0.13	0.00
			Max. My	43	-0.04	0.00	0.01
			Max. Vy	34	0.06	0.00	0.00
			Max. Vx	43	-0.00	0.00	0.00
T2	80 - 50	Leg	Max Tension	15	16.46	0.10	0.13
			Max. Compression	14	-20.46	-0.13	-0.14
			Max. Mx	20	5.18	0.25	0.14
			Max. My	32	4.94	0.15	0.25
			Max. Vy	18	-0.27	0.18	-0.03
			Max. Vx	2	-0.27	-0.02	0.18
		Diagonal	Max Tension	2	3.32	0.00	0.00
			Max. Compression	2	-3.36	0.00	0.00
			Max. Mx	40	0.79	0.11	-0.03
			Max. My	36	0.71	0.11	-0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	40	0.06	0.11	-0.03
			Max. Vx	44	0.01	0.00	0.00
		Top Girt	Max Tension	10	0.14	0.00	0.00
			Max. Compression	11	-0.11	0.00	0.00
			Max. Mx	34	0.06	-0.21	0.00
			Max. My	43	0.03	0.00	0.01
			Max. Vy	34	-0.07	0.00	0.00
			Max. Vx	43	-0.00	0.00	0.00
T3	50 - 20	Leg	Max Tension	7	34.71	0.21	0.29
			Max. Compression	6	-43.15	-0.25	-0.24
			Max. Mx	4	-14.76	-0.81	0.63
			Max. My	24	-14.75	0.63	-0.81
			Max. Vy	16	0.38	0.66	-0.47
			Max. Vx	4	0.38	-0.48	0.68
		Diagonal	Max Tension	18	5.59	0.00	0.00
			Max. Compression	18	-5.77	0.00	0.00
			Max. Mx	48	1.23	0.22	-0.06
			Max. My	36	0.35	0.22	-0.06
			Max. Vy	48	0.10	0.22	-0.06
			Max. Vx	36	-0.01	0.00	0.00
		Top Girt	Max Tension	18	0.27	0.00	0.00
			Max. Compression	18	-0.26	0.00	0.00
			Max. Mx	34	0.14	-0.37	0.00
			Max. My	43	0.08	0.00	0.02
			Max. Vy	34	0.10	0.00	0.00
			Max. Vx	43	-0.01	0.00	0.00
T4	20 - 15	Leg	Max Tension	7	38.44	0.18	0.19
			Max. Compression	6	-47.80	0.22	0.24
			Max. Mx	14	-5.64	1.41	-1.25
			Max. My	6	-5.32	-1.26	1.41
			Max. Vy	22	-0.47	1.40	-1.25
			Max. Vx	6	-0.47	-1.26	1.41
		Diagonal	Max Tension	19	5.25	0.00	0.00
			Max. Compression	18	-5.58	0.00	0.00
			Max. Mx	50	-2.02	0.05	-0.02
			Max. My	35	-2.24	0.05	-0.02
			Max. Vy	50	-0.04	0.05	-0.02
			Max. Vx	43	0.01	0.00	0.00
		Horizontal	Max Tension	18	4.87	0.06	0.00
			Max. Compression	19	-4.67	0.04	0.00
			Max. Mx	43	-0.20	0.21	-0.02
			Max. My	18	-0.70	0.08	-0.02
			Max. Vy	43	-0.09	0.21	-0.02
			Max. Vx	35	-0.01	0.21	-0.02
		Redund Diag 1 Bracing	Max Tension	6	0.40	0.00	0.00
			Max. Compression	6	-0.40	0.00	0.00
			Max. Mx	44	0.16	-0.03	0.00
			Max. My	35	0.14	0.00	0.00
			Max. Vy	44	0.02	0.00	0.00
			Max. Vx	35	-0.00	0.00	0.00
		Inner Bracing	Max Tension	31	0.00	0.00	0.00
			Max. Compression	48	-0.02	0.00	0.00
			Max. Mx	48	-0.02	-0.26	0.00
			Max. My	50	-0.02	0.00	-0.00
			Max. Vy	48	0.08	0.00	0.00
			Max. Vx	50	0.00	0.00	0.00
T5	15 - 0	Leg	Max Tension	7	53.28	-0.34	-0.35
			Max. Compression	6	-64.65	-0.00	0.00
			Max. Mx	14	-6.11	1.41	-1.26
			Max. My	6	-5.82	-1.26	1.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	2	5.46	-0.00	0.00
			Max. Vx	18	5.47	0.00	-0.00
		Diagonal	Max Tension	18	6.78	0.00	0.00
			Max. Compression	18	-6.94	0.00	0.00
			Max. Mx	43	2.05	0.27	0.07
			Max. My	44	2.26	0.24	0.07
			Max. Vy	43	0.11	0.27	0.07
			Max. Vx	44	-0.01	0.00	0.00
		Secondary Horizontal	Max Tension	6	0.86	0.00	0.00
			Max. Compression	6	-0.86	0.10	0.02
			Max. Mx	44	-0.33	0.17	0.07
			Max. My	45	0.00	0.17	0.08
			Max. Vy	44	-0.10	0.17	0.07
			Max. Vx	45	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg D	Max. Vert	22	63.43	8.21	-8.04
	Max. H_x	24	61.49	8.85	-6.88
	Max. H_z	5	-50.63	-6.28	7.91
	Min. Vert	7	-52.58	-7.45	7.27
	Min. H_x	9	-50.62	-8.08	6.11
	Min. H_z	20	61.49	7.04	-8.69
Leg C	Max. Vert	14	63.41	-7.97	-8.23
	Max. H_x	29	-50.26	7.91	6.21
	Max. H_z	33	-50.26	5.99	8.13
	Min. Vert	31	-52.21	7.21	7.44
	Min. H_x	12	61.47	-8.68	-7.00
	Min. H_z	16	61.47	-6.76	-8.93
Leg B	Max. Vert	6	63.91	-8.06	8.23
	Max. H_x	25	-50.27	7.96	-6.21
	Max. H_z	4	61.96	-6.83	8.93
	Min. Vert	23	-52.22	7.26	-7.43
	Min. H_x	8	61.96	-8.77	6.99
	Min. H_z	21	-50.27	6.04	-8.13
Leg A	Max. Vert	30	63.49	8.23	7.98
	Max. H_x	28	61.55	8.89	6.80
	Max. H_z	32	61.55	7.05	8.64
	Min. Vert	15	-52.14	-7.43	-7.21
	Min. H_x	13	-50.20	-8.08	-6.04
	Min. H_z	17	-50.20	-6.25	-7.86

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	21.52	0.00	0.00	-4.85	-3.43	0.00
1.2 Dead+1.6 Wind 0 deg - No	25.83	0.07	-30.12	-1611.51	-7.44	12.25

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
Ice 0.9 Dead+1.6 Wind 0 deg - No Ice	19.37	0.07	-30.12	-1609.84	-6.41	12.24
1.2 Dead+1.6 Wind 30 deg - No Ice	25.83	16.02	-27.68	-1476.70	-855.13	9.50
0.9 Dead+1.6 Wind 30 deg - No Ice	19.37	16.02	-27.68	-1475.04	-853.99	9.51
1.2 Dead+1.6 Wind 45 deg - No Ice	25.83	22.62	-22.62	-1207.78	-1205.91	7.16
0.9 Dead+1.6 Wind 45 deg - No Ice	19.37	22.62	-22.62	-1206.17	-1204.72	7.16
1.2 Dead+1.6 Wind 60 deg - No Ice	25.83	27.68	-16.02	-856.95	-1474.80	4.33
0.9 Dead+1.6 Wind 60 deg - No Ice	19.37	27.68	-16.02	-855.38	-1473.56	4.33
1.2 Dead+1.6 Wind 90 deg - No Ice	25.83	30.12	-0.07	-9.13	-1609.58	-2.40
0.9 Dead+1.6 Wind 90 deg - No Ice	19.37	30.12	-0.07	-7.68	-1608.33	-2.40
1.2 Dead+1.6 Wind 120 deg - No Ice	25.83	27.61	15.90	839.57	-1471.48	-7.81
0.9 Dead+1.6 Wind 120 deg - No Ice	19.37	27.61	15.90	840.91	-1470.25	-7.81
1.2 Dead+1.6 Wind 135 deg - No Ice	25.83	22.52	22.52	1191.45	-1201.23	-10.00
0.9 Dead+1.6 Wind 135 deg - No Ice	19.37	22.52	22.52	1192.75	-1200.04	-10.00
1.2 Dead+1.6 Wind 150 deg - No Ice	25.83	15.90	27.61	1461.75	-849.39	-11.51
0.9 Dead+1.6 Wind 150 deg - No Ice	19.37	15.90	27.61	1463.00	-848.25	-11.52
1.2 Dead+1.6 Wind 180 deg - No Ice	25.83	-0.07	30.12	1599.87	-0.81	-12.25
0.9 Dead+1.6 Wind 180 deg - No Ice	19.37	-0.07	30.12	1601.11	0.22	-12.24
1.2 Dead+1.6 Wind 210 deg - No Ice	25.83	-16.02	27.68	1465.06	846.89	-9.51
0.9 Dead+1.6 Wind 210 deg - No Ice	19.37	-16.02	27.68	1466.31	847.81	-9.50
1.2 Dead+1.6 Wind 225 deg - No Ice	25.83	-22.62	22.62	1196.14	1197.67	-7.16
0.9 Dead+1.6 Wind 225 deg - No Ice	19.37	-22.62	22.62	1197.44	1198.54	-7.16
1.2 Dead+1.6 Wind 240 deg - No Ice	25.83	-27.68	16.02	845.31	1466.56	-4.33
0.9 Dead+1.6 Wind 240 deg - No Ice	19.37	-27.68	16.02	846.65	1467.38	-4.33
1.2 Dead+1.6 Wind 270 deg - No Ice	25.83	-30.12	0.07	-2.51	1601.33	2.40
0.9 Dead+1.6 Wind 270 deg - No Ice	19.37	-30.12	0.07	-1.05	1602.15	2.40
1.2 Dead+1.6 Wind 300 deg - No Ice	25.83	-27.61	-15.90	-851.21	1463.24	7.80
0.9 Dead+1.6 Wind 300 deg - No Ice	19.37	-27.61	-15.90	-849.65	1464.07	7.81
1.2 Dead+1.6 Wind 315 deg - No Ice	25.83	-22.52	-22.52	-1203.10	1192.98	10.00
0.9 Dead+1.6 Wind 315 deg - No Ice	19.37	-22.52	-22.52	-1201.48	1193.86	10.00
1.2 Dead+1.6 Wind 330 deg - No Ice	25.83	-15.90	-27.61	-1473.39	841.15	11.52

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
0.9 Dead+1.6 Wind 330 deg - No Ice	19.37	-15.90	-27.61	-1471.73	842.07	11.51
1.2 Dead+1.0 Ice+1.0 Temp	70.15	-0.00	-0.00	6.09	0.56	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	70.15	0.01	-9.31	-521.03	0.08	4.13
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	70.15	5.03	-8.70	-483.37	-282.29	3.89
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	70.15	7.10	-7.10	-393.69	-399.21	3.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	70.15	8.70	-5.03	-276.77	-488.88	2.78
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	70.15	9.31	-0.01	5.63	-526.53	0.66
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	70.15	8.68	5.01	288.15	-488.40	-1.17
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	70.15	7.09	7.09	405.22	-398.53	-2.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	70.15	5.01	8.69	495.10	-281.47	-2.95
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	70.15	-0.01	9.31	533.23	1.03	-4.13
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	70.15	-5.03	8.70	495.57	283.41	-3.89
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	70.15	-7.10	7.10	405.89	400.32	-3.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	70.15	-8.70	5.03	288.97	489.99	-2.78
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	70.15	-9.31	0.01	6.57	527.65	-0.66
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	70.15	-8.68	-5.01	-275.95	489.52	1.17
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	70.15	-7.09	-7.09	-393.02	399.65	2.13
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	70.15	-5.01	-8.69	-482.90	282.58	2.95
Dead+Wind 0 deg - Service	21.52	0.02	-7.84	-422.52	-4.30	3.19
Dead+Wind 30 deg - Service	21.52	4.17	-7.20	-387.46	-224.80	2.47
Dead+Wind 45 deg - Service	21.52	5.88	-5.88	-317.50	-316.04	1.86
Dead+Wind 60 deg - Service	21.52	7.20	-4.17	-226.24	-385.99	1.13
Dead+Wind 90 deg - Service	21.52	7.83	-0.02	-5.71	-421.05	-0.62
Dead+Wind 120 deg - Service	21.52	7.18	4.14	215.05	-385.13	-2.03
Dead+Wind 135 deg - Service	21.52	5.86	5.86	306.58	-314.82	-2.60
Dead+Wind 150 deg - Service	21.52	4.14	7.18	376.89	-223.31	-3.00
Dead+Wind 180 deg - Service	21.52	-0.02	7.84	412.82	-2.57	-3.19
Dead+Wind 210 deg - Service	21.52	-4.17	7.20	377.76	217.93	-2.47
Dead+Wind 225 deg - Service	21.52	-5.88	5.88	307.80	309.17	-1.86
Dead+Wind 240 deg - Service	21.52	-7.20	4.17	216.54	379.12	-1.13
Dead+Wind 270 deg - Service	21.52	-7.83	0.02	-3.99	414.18	0.62
Dead+Wind 300 deg - Service	21.52	-7.18	-4.14	-224.75	378.26	2.03
Dead+Wind 315 deg - Service	21.52	-5.86	-5.86	-316.28	307.95	2.60
Dead+Wind 330 deg - Service	21.52	-4.14	-7.18	-386.59	216.44	3.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-21.52	0.00	-0.00	21.52	-0.00	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
2	0.07	-25.83	-30.12	-0.07	25.83	30.12	0.000%
3	0.07	-19.37	-30.12	-0.07	19.37	30.12	0.000%
4	16.02	-25.83	-27.68	-16.02	25.83	27.68	0.000%
5	16.02	-19.37	-27.68	-16.02	19.37	27.68	0.000%
6	22.62	-25.83	-22.62	-22.62	25.83	22.62	0.000%
7	22.62	-19.37	-22.62	-22.62	19.37	22.62	0.000%
8	27.68	-25.83	-16.02	-27.68	25.83	16.02	0.000%
9	27.68	-19.37	-16.02	-27.68	19.37	16.02	0.000%
10	30.12	-25.83	-0.07	-30.12	25.83	0.07	0.000%
11	30.12	-19.37	-0.07	-30.12	19.37	0.07	0.000%
12	27.61	-25.83	15.90	-27.61	25.83	-15.90	0.000%
13	27.61	-19.37	15.90	-27.61	19.37	-15.90	0.000%
14	22.52	-25.83	22.52	-22.52	25.83	-22.52	0.000%
15	22.52	-19.37	22.52	-22.52	19.37	-22.52	0.000%
16	15.90	-25.83	27.61	-15.90	25.83	-27.61	0.000%
17	15.90	-19.37	27.61	-15.90	19.37	-27.61	0.000%
18	-0.07	-25.83	30.12	0.07	25.83	-30.12	0.000%
19	-0.07	-19.37	30.12	0.07	19.37	-30.12	0.000%
20	-16.02	-25.83	27.68	16.02	25.83	-27.68	0.000%
21	-16.02	-19.37	27.68	16.02	19.37	-27.68	0.000%
22	-22.62	-25.83	22.62	22.62	25.83	-22.62	0.000%
23	-22.62	-19.37	22.62	22.62	19.37	-22.62	0.000%
24	-27.68	-25.83	16.02	27.68	25.83	-16.02	0.000%
25	-27.68	-19.37	16.02	27.68	19.37	-16.02	0.000%
26	-30.12	-25.83	0.07	30.12	25.83	-0.07	0.000%
27	-30.12	-19.37	0.07	30.12	19.37	-0.07	0.000%
28	-27.61	-25.83	-15.90	27.61	25.83	15.90	0.000%
29	-27.61	-19.37	-15.90	27.61	19.37	15.90	0.000%
30	-22.52	-25.83	-22.52	22.52	25.83	22.52	0.000%
31	-22.52	-19.37	-22.52	22.52	19.37	22.52	0.000%
32	-15.90	-25.83	-27.61	15.90	25.83	27.61	0.000%
33	-15.90	-19.37	-27.61	15.90	19.37	27.61	0.000%
34	0.00	-70.15	0.00	0.00	70.15	0.00	0.000%
35	0.01	-70.15	-9.31	-0.01	70.15	9.31	0.000%
36	5.03	-70.15	-8.70	-5.03	70.15	8.70	0.000%
37	7.10	-70.15	-7.10	-7.10	70.15	7.10	0.000%
38	8.70	-70.15	-5.03	-8.70	70.15	5.03	0.000%
39	9.31	-70.15	-0.01	-9.31	70.15	0.01	0.000%
40	8.68	-70.15	5.01	-8.68	70.15	-5.01	0.000%
41	7.09	-70.15	7.09	-7.09	70.15	-7.09	0.000%
42	5.01	-70.15	8.69	-5.01	70.15	-8.69	0.000%
43	-0.01	-70.15	9.31	0.01	70.15	-9.31	0.000%
44	-5.03	-70.15	8.70	5.03	70.15	-8.70	0.000%
45	-7.10	-70.15	7.10	7.10	70.15	-7.10	0.000%
46	-8.70	-70.15	5.03	8.70	70.15	-5.03	0.000%
47	-9.31	-70.15	0.01	9.31	70.15	-0.01	0.000%
48	-8.68	-70.15	-5.01	8.68	70.15	5.01	0.000%
49	-7.09	-70.15	-7.09	7.09	70.15	7.09	0.000%
50	-5.01	-70.15	-8.69	5.01	70.15	8.69	0.000%
51	0.02	-21.52	-7.84	-0.02	21.52	7.84	0.000%
52	4.17	-21.52	-7.20	-4.17	21.52	7.20	0.000%
53	5.88	-21.52	-5.88	-5.88	21.52	5.88	0.000%
54	7.20	-21.52	-4.17	-7.20	21.52	4.17	0.000%
55	7.83	-21.52	-0.02	-7.83	21.52	0.02	0.000%
56	7.18	-21.52	4.14	-7.18	21.52	-4.14	0.000%
57	5.86	-21.52	5.86	-5.86	21.52	-5.86	0.000%
58	4.14	-21.52	7.18	-4.14	21.52	-7.18	0.000%
59	-0.02	-21.52	7.84	0.02	21.52	-7.84	0.000%
60	-4.17	-21.52	7.20	4.17	21.52	-7.20	0.000%
61	-5.88	-21.52	5.88	5.88	21.52	-5.88	0.000%
62	-7.20	-21.52	4.17	7.20	21.52	-4.17	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
63	-7.83	-21.52	0.02	7.83	21.52	-0.02	0.000%
64	-7.18	-21.52	-4.14	7.18	21.52	4.14	0.000%
65	-5.86	-21.52	-5.86	5.86	21.52	5.86	0.000%
66	-4.14	-21.52	-7.18	4.14	21.52	7.18	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001

48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	0.289	54	0.0160	0.0031
T2	80 - 50	0.219	53	0.0150	0.0022
T3	50 - 20	0.113	52	0.0113	0.0007
T4	20 - 15	0.034	53	0.0057	0.0003
T5	15 - 0	0.020	53	0.0044	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.50	ROHN 25 tower 55'	54	0.289	0.0160	0.0031	Inf
100.00	15' x 3" Dia Omni	54	0.289	0.0160	0.0031	Inf
99.00	Pirod 10' Box Arm	54	0.286	0.0159	0.0031	Inf
98.00	6' Standoff Arm	54	0.282	0.0159	0.0030	Inf
96.00	6' Standoff Arm	54	0.275	0.0158	0.0029	Inf
93.00	DB292-A	53	0.265	0.0157	0.0028	Inf
90.00	DB225-2-A	53	0.254	0.0156	0.0027	790727
89.00	DB252	53	0.251	0.0155	0.0027	718842
85.50	DB499-A	53	0.239	0.0153	0.0025	545327
85.00	3-ft Grid Dish	53	0.237	0.0153	0.0025	527148
84.00	DB432-A	53	0.233	0.0153	0.0024	494856
83.00	8' x 3" Dia Omni	53	0.230	0.0152	0.0024	469808
80.00	3-ft Grid Dish	53	0.219	0.0150	0.0022	455623
79.00	TA-2304-2-DAB	52	0.215	0.0149	0.0022	480061
74.00	6' Standoff Arm	52	0.197	0.0145	0.0019	Inf
66.00	10' x 3" Dia Omni	52	0.167	0.0135	0.0014	568086
60.00	4-ft Dish	52	0.145	0.0128	0.0011	314418
58.00	15' x 3" Dia Omni	52	0.138	0.0125	0.0010	273682
50.00	AIR21 B2A/B4P	52	0.113	0.0113	0.0007	192323
38.00	4-ft Dish	53	0.080	0.0094	0.0006	776557

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
36.00	4-ft Dish	53	0.075	0.0091	0.0005	Inf
34.00	DB254-A	53	0.071	0.0087	0.0005	Inf
29.00	4-ft Dish	53	0.058	0.0078	0.0005	429537
26.00	4-ft Dish	53	0.050	0.0072	0.0005	289574

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	1.099	6	0.0591	0.0120
T2	80 - 50	0.834	6	0.0566	0.0085
T3	50 - 20	0.430	6	0.0427	0.0028
T4	20 - 15	0.130	6	0.0218	0.0013
T5	15 - 0	0.076	6	0.0166	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.50	ROHN 25 tower 55'	6	1.099	0.0591	0.0120	474353
100.00	15' x 3" Dia Omni	6	1.099	0.0591	0.0120	474353
99.00	Pirod 10' Box Arm	6	1.086	0.0590	0.0118	474353
98.00	6' Standoff Arm	6	1.073	0.0590	0.0117	474353
96.00	6' Standoff Arm	6	1.047	0.0588	0.0113	474353
93.00	DB292-A	6	1.008	0.0586	0.0109	338825
90.00	DB225-2-A	6	0.969	0.0583	0.0104	237177
89.00	DB252	6	0.956	0.0582	0.0102	215616
85.50	DB499-A	6	0.909	0.0577	0.0096	163571
85.00	3-ft Grid Dish	6	0.902	0.0577	0.0095	158118
84.00	DB432-A	6	0.889	0.0575	0.0093	148445
83.00	8' x 3" Dia Omni	6	0.875	0.0573	0.0091	141014
80.00	3-ft Grid Dish	6	0.834	0.0566	0.0085	138073
79.00	TA-2304-2-DAB	6	0.820	0.0563	0.0083	146694
74.00	6' Standoff Arm	6	0.750	0.0547	0.0072	417631
66.00	10' x 3" Dia Omni	6	0.637	0.0513	0.0055	161699
60.00	4-ft Dish	6	0.554	0.0482	0.0042	83705
58.00	15' x 3" Dia Omni	6	0.528	0.0471	0.0039	72111
50.00	AIR21 B2A/B4P	6	0.430	0.0427	0.0028	50617
38.00	4-ft Dish	6	0.308	0.0357	0.0022	213679
36.00	4-ft Dish	6	0.289	0.0344	0.0021	546539
34.00	DB254-A	6	0.270	0.0331	0.0020	731542
29.00	4-ft Dish	6	0.223	0.0295	0.0019	117520
26.00	4-ft Dish	6	0.194	0.0271	0.0018	78158

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	100	Leg	A325N	0.6250	12	0.91	12.43	0.073 ✔	1	Bolt SS
		Diagonal	A325N	0.6250	2	0.81	10.44	0.078 ✔	1	Member Bearing
		Top Girt	A325N	0.6250	2	0.05	12.43	0.004 ✔	1	Bolt Shear
T2	80	Leg	A325N	0.6250	16	2.56	12.43	0.206 ✔	1	Bolt SS
		Diagonal	A325N	0.6250	2	1.66	10.44	0.159 ✔	1	Member Bearing
		Top Girt	A325N	0.6250	2	0.07	10.44	0.007 ✔	1	Member Bearing
T3	50	Leg	A325N	0.6250	16	5.39	12.43	0.434 ✔	1	Bolt SS
		Diagonal	A325N	0.6250	2	2.88	12.43	0.232 ✔	1	Bolt Shear
		Top Girt	A325N	0.6250	2	0.14	10.44	0.013 ✔	1	Member Bearing
T4	20	Diagonal	A325N	0.6250	2	2.79	12.43	0.225 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	4.87	10.44	0.467 ✔	1	Member Bearing
T5	15	Leg	A354-BC	1.5000	4	32.33	67.42	0.479 ✔	1	Bearing
		Diagonal	A325N	0.6250	2	3.47	12.43	0.279 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	2	0.43	12.43	0.035 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L5x5x3/8	20.11	6.70	81.2 K=1.00	3.6100	-5.45	82.64	0.066 [1] ✔
T2	80 - 50	L6x6x3/8	30.11	7.53	75.9 K=1.00	4.3600	-20.46	101.82	0.201 [1] ✔
T3	50 - 20	L6x6x9/16	30.11	10.04	102.1 K=1.00	6.4300	-43.15	120.40	0.358 [1] ✔
T4	20 - 15	L6x6x1/2	5.02	5.02	51.0 K=1.00	5.7500	-47.80	162.43	0.294 [1] ✔
T5	15 - 0	L6x6x1/2	15.05	7.82	79.5 K=1.00	5.7500	-64.65	133.53	0.484 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L2x2 1/2x3/16	12.81	6.25	162.5 K=0.92	0.8090	-1.68	6.92	0.242 [1] ✔
T2	80 - 50	L2 1/2x2 1/2x3/16	16.38	7.96	175.7 K=0.91	0.9020	-3.36	6.60	0.510 [1] ✔
T3	50 - 20	L3x3 1/2x1/4	20.59	10.15	175.7 K=0.91	1.5600	-5.77	11.42	0.505 [1] ✔
T4	20 - 15	L2 1/2x2 1/2x1/4	10.82	10.15	143.6 K=0.91	1.1900	-5.58	13.04	0.428 [1] ✔
T5	15 - 0	L3 1/2x4x1/4	25.04	12.57	185.2 K=0.90	1.8100	-6.94	11.92	0.582 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	20 - 15	L3x3x1/4	18.58	8.92	180.8 K=1.00	1.4400	-4.67	9.95	0.469 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	15 - 0	L3 1/2x3 1/2x1/4	20.05	19.15	175.9 K=0.83	1.6900	-0.86	12.34	0.070 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L2 1/2x2 1/2x3/16	8.50	7.69	160.8 K=0.86	0.9020	-0.10	7.88	0.013 [1] ✔
T2	80 - 50	L2x2 1/2x3/16	11.42	10.61	229.5 K=0.77	0.8090	-0.11	3.47	0.033 [1] ✔
T3	50 - 20	KL/R > 200 (C) - 40 L2x3x3/16	15.00	14.10	283.3	0.9020	-0.26	2.54	0.104 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
					K=0.73				✔
		KL/R > 200 (C) - 79							

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T4	20 - 15	L2 1/2x2 1/2x1/8	5.14	4.86	118.4	0.6094	-0.40	8.58	0.046 [1]
					K=1.01				✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T4	20 - 15	L2x2 1/2x1/4	13.14	13.14	371.8	1.0600	-0.02	1.73	0.014 [1]
					K=1.00				✔
		KL/R > 250 (C) - 130							

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	100 - 80	L5x5x3/8	20.11	6.70	51.6	3.6100	3.58	116.96	0.031 [1] ✔
T2	80 - 50	L6x6x3/8	30.11	7.53	48.0	4.3600	16.46	141.26	0.117 [1] ✔
T3	50 - 20	L6x6x9/16	30.11	10.04	65.1	6.4300	34.71	208.33	0.167 [1] ✔
T4	20 - 15	L6x6x1/2	5.02	5.02	32.4	5.7500	38.44	186.30	0.206 [1] ✔
T5	15 - 0	L6x6x1/2	15.05	7.82	50.5	4.1250	53.28	179.44	0.297 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L2x2 1/2x3/16	12.81	6.25	129.0	0.5013	1.62	21.81	0.074 [1]
T2	80 - 50	L2 1/2x2 1/2x3/16	16.38	7.96	125.9	0.5710	3.32	24.84	0.134 [1]
T3	50 - 20	L3x3 1/2x1/4	20.59	10.15	136.0	1.0294	5.59	44.78	0.125 [1]
T4	20 - 15	L2 1/2x2 1/2x1/4	10.82	10.15	164.5	0.7519	5.25	32.71	0.161 [1]
T5	15 - 0	L3 1/2x4x1/4	25.04	12.57	142.6	1.2169	6.78	52.93	0.128 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	20 - 15	L3x3x1/4	18.58	8.92	175.0	0.9394	4.87	40.86	0.119 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	15 - 0	L3 1/2x3 1/2x1/4	20.05	19.15	215.2	1.1269	0.86	49.02	0.018 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	100 - 80	L2 1/2x2 1/2x3/16	8.50	7.69	124.7	0.5710	0.01	24.84	0.000 [1] ✔
T2	80 - 50	L2x2 1/2x3/16	11.42	10.61	220.2	0.5013	0.14	21.81	0.006 [1] ✔
T3	50 - 20	L2x3x3/16	15.00	14.10	298.3	0.5710	0.27	24.84	0.011 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T4	20 - 15	L2 1/2x2 1/2x1/8	5.14	4.86	74.0	0.6094	0.40	19.74	0.020 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T4	20 - 15	L2x2 1/2x1/4	13.14	13.14	266.1	1.0600	0.00	34.34	0.000 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	100 - 80	Leg	L5x5x3/8	2	-5.45	82.64	6.6 7.3 (b)	Pass
T2	80 - 50	Leg	L6x6x3/8	34	-20.46	101.82	20.1 20.6 (b)	Pass
T3	50 - 20	Leg	L6x6x9/16	75	-43.15	120.40	35.8 43.4 (b)	Pass
T4	20 - 15	Leg	L6x6x1/2	107	-47.80	162.43	29.4	Pass
T5	15 - 0	Leg	L6x6x1/2	135	-64.65	133.53	48.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	100 - 80	Diagonal	L2x2 1/2x3/16	12	-1.68	6.92	24.2	Pass
T2	80 - 50	Diagonal	L2 1/2x2 1/2x3/16	44	-3.36	6.60	51.0	Pass
T3	50 - 20	Diagonal	L3x3 1/2x1/4	83	-5.77	11.42	50.5	Pass
T4	20 - 15	Diagonal	L2 1/2x2 1/2x1/4	115	-5.58	13.04	42.8	Pass
T5	15 - 0	Diagonal	L3 1/2x4x1/4	139	-6.94	11.92	58.2	Pass
T4	20 - 15	Horizontal	L3x3x1/4	114	-4.67	9.95	46.9	Pass
T5	15 - 0	Secondary Horizontal	L3 1/2x3 1/2x1/4	146	-0.86	12.34	7.0	Pass
T1	100 - 80	Top Girt	L2 1/2x2 1/2x3/16	6	-0.10	7.88	1.3	Pass
T2	80 - 50	Top Girt	L2x2 1/2x3/16	40	-0.11	3.47	3.3	Pass
T3	50 - 20	Top Girt	L2x3x3/16	79	-0.26	2.54	10.4	Pass
T4	20 - 15	Redund Diag 1 Bracing	L2 1/2x2 1/2x1/8	118	-0.40	8.58	4.6	Pass
T4	20 - 15	Inner Bracing	L2x2 1/2x1/4	130	-0.02	1.73	1.4	Pass
							Summary	
						Leg (T5)	48.4	Pass
						Diagonal (T5)	58.2	Pass
						Horizontal (T4)	46.9	Pass
						Secondary Horizontal (T5)	7.0	Pass
						Top Girt (T3)	10.4	Pass
						Redund Diag 1 Bracing (T4)	4.6	Pass
						Inner Bracing (T4)	1.4	Pass
						Bolt Checks	47.9	Pass
						RATING =	**58.2**	**Pass**

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Subject:	Anchor Bolt Analysis
Location:	100-ft Lattice Tower Danbury, CT
Rev. 0: 2/9/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17012.06

Anchor Bolt Analysis:

Input Data:

Tower Reactions:

Tension Force =	Tension := 53·kips	(Input From tnxTower)
Compression Force =	Compression := 64·kips	(Input From tnxTower)
Shear Force =	Shear := 12·kips	(Input From tnxTower)

Anchor Bolt Data:

ASTM A354-BC

Number of Anchor Bolts =	N := 4	(User Input)
Bolt Ultimate Strength =	F_u := 125·ksi	(User Input)
Bolt Yield Strength =	F_y := 90·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Anchor Bolts =	D := 1.5·in	(User Input)
Threads per Inch =	n := 6	(User Input)
	η := 0.7	

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 1.767 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 1.405 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 1.338 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.334 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.235 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := \frac{Tension}{N} = 13.3 \cdot kips$

Maximum Compressive Force = $C_{Max} := \frac{Compression}{N} = 16 \cdot kips$

Maximum Shear Force = $V_{Max} := \frac{Shear}{N} = 3 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 140.525 \cdot k$

Bolt % of Capacity = $\frac{\left(C_{Max} + \frac{V_{Max}}{\eta} \right)}{\Phi R_{nt}} \cdot 100 = 14.4$

Condition1 = $Condition1 := if\left[\frac{\left(C_{Max} + \frac{V_{Max}}{\eta} \right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed" \right]$

Condition1 = "OK"

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63-2 North Branford Road P: (203) 488-0580
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Subject:	FOUNDATION ANALYSIS
Location:	100-ft Lattice Tower Danbury, CT
Rev. 0: 2/9/17	Prepared by: T.J.L Checked by: C.F.C. Job no. 17012.06

Caisson Foundation:

Input Data:

Tower Data

Uplift =	$Uplift := 53 \cdot kips$	(User Input)
Compression =	$Comp := 64 \cdot kips$	(User Input)
Shear Force =	$Shear := 12 \cdot kips$	(User Input)
Tower Height =	$H_t := 100 \cdot ft$	(User Input)

Footing Data:

Length of Caisson =	$L_c := 18.5 \cdot ft$	(User Input)
Extension of Caisson Above Grade =	$L_{cag} := 1.5 \cdot ft$	(User Input)
Diameter of Caisson =	$d_c := 2.5 \cdot ft$	(User Input)
Length of Caisson Above Wate Table =	$L_{c.AWT} := 18.5 \cdot ft$	(User Input)
Length of Caisson Above Wate Table =	$L_{c.BWT} := 0 \cdot ft$	(User Input)

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)
Ultimate Skin Friction =	$\mu := 1.35 \cdot ksf$	(User Input)
Ultimate Soil Bearing Capacity =	$q_u := 40000 \cdot psf$	(User Input)
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)
Depth to Neglect =	$n := 4 \cdot ft$	(User Input)
Resistance Factor for Bearing =	$\Phi_{sBearing} := 0.75$	(TIA-222-G 9.4.1)
Resistance Factor for Friction =	$\Phi_{sFriction} := 0.75$	(TIA-222-G 9.4.1)

Calculated Properties:

Adjusted Concrete Unit Weight = $\gamma_c := \gamma_{conc} - 62.4pcf = 87.6 \cdot pcf$

Weight of Concrete Caisson (no water) = $WT_{c.comp} := \frac{\pi}{4} \cdot \left(d_c^2 L_c \right) \cdot \gamma_{conc} = 13.622 \cdot kip$

Weight of Concrete Caisson (water) = $WT_{c.uplift} := \frac{\pi}{4} \cdot \left[\left(d_c^2 L_{c.AWT} \right) \cdot \gamma_{conc} + \left(d_c^2 L_{c.BWT} \right) \cdot \gamma_c \right] = 13.622 \cdot kip$

Check Uplift:

Uplift Resistance from Concrete Weight = $Uplift_{conc} := WT_{c.uplift} \cdot 0.9 = 12.26 \cdot kips$

Uplift Resistance from Skin Friction = $Uplift_{SF} := \pi \cdot d_c \cdot \left(L_c - L_{cag} - n \right) \cdot \mu \cdot \Phi_{sFriction} = 103.378 \cdot kips$

Total Uplift Resistance = $Uplift_R := Uplift_{conc} + Uplift_{SF} = 115.638 \cdot kips$

Uplift Check = $\frac{Uplift}{Uplift_R} = 45.83 \cdot \%$

$Uplift\_Check := if\left(\frac{Uplift_R}{Uplift} \geq 1.0, "Okay", "No\ Good" \right)$

Uplift_Check = "Okay"

Check Compression:

Total Compression Force = $Comp_{tot} := WT_{c.comp} + Comp = 77.622 \cdot kips$

Compression Resistance from Bearing = $Comp_{bearing} := \frac{\pi}{4} \cdot d_c^2 \cdot q_u \cdot \Phi_{sBearing} = 147.262 \cdot kips$

Compression Resistance from Skin Friction = $Comp_{SF} := \pi \cdot d_c \cdot \left(L_c - L_{cag} - n \right) \cdot \mu \cdot \Phi_{sFriction} = 103.378 \cdot kips$

Total Compression Resistance = $Comp_R := Comp_{bearing} + Comp_{SF} = 250.64 \cdot kips$

Compression Check = $\frac{Comp_{tot}}{Comp_R} = 30.97 \cdot \%$

$Compression\_Check := if\left(\frac{Comp_R}{Comp_{tot}} \geq 1.0, "Okay", "No\ Good" \right)$

Compression_Check = "Okay"

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Section 1 - Site Information

Site ID: CT11923C
Status: Draft
Version: 1.1
Project Type: Capacity
Approved: Not Approved
Approved By: Not Approved
Last Modified: 12/19/2016 1:31:38 PM
Last Modified By: GSM1900\VJaini

Site Name: CT923/W. View Dr_GT
Site Class: Guyed Tower
Site Type: Structure Non Building
Solution Type:
Plan Year:
Market: CONNECTICUT
Vendor: Ericsson
Landlord: Steven T, LLC

Latitude: 41.39600000
Longitude: -73.42380000
Address: 7 West View Dr
City, State: Danbury, CT
Region: NORTHEAST

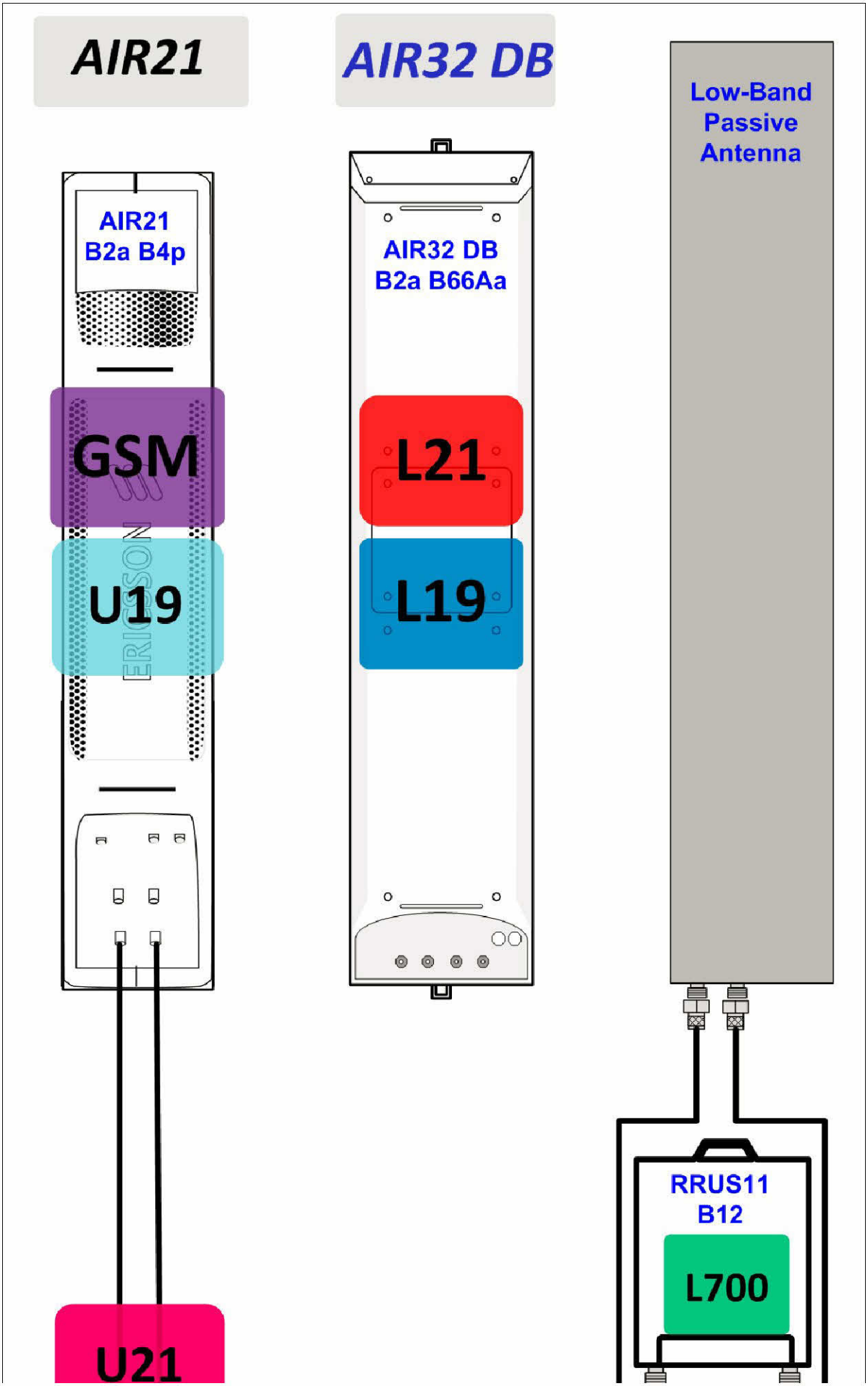
RAN Template: 792DB Outdoor			AL Template: 792DB_2xAIR+1DP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 6	**TMA Count:** 3	**RRU Count:** 3

Section 2 - Existing Template Images

----- This section is intentionally blank. -----

Section 3 - Proposed Template Images

792DB.png


AIR21
AIR32 DB
Low-Band
Passive
Antenna
AIR21
B2a B4p
AIR32 DB
B2a B66Aa
GSM
U19
L21
L19
U21
RRUS11
B12
L700

Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Section 5 - RAN Equipment

Existing RAN Equipment			
Template: 702Cu Outdoor			
Enclosure	1	2	3
Enclosure Type	RBS 3106	Tower Top Mount	Tower Top Mount
Baseband	DUG20 (G1900), DUW30 (U1900), DUW30 (U2100), DUS41 (L2100, L700)		
Hybrid Cable System			Ericsson 9x18 HCS *Select Length*
Radio	RU22 (x6) (U2100)	RRUS11 B12 (x3) (L700)	

Proposed RAN Equipment		
Template: 792DB Outdoor		
Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment
Baseband	DUS41 (x2), DUW30 (x2), DUG20	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length* Ericsson 6x12 HCS *Select Length & AWG*
Multiplexer	XMU	
Radio	RU22 (x5)	

RAN Scope of Work:

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Section 6 - A&L Equipment

Existing Template: 702Cu
Proposed Template: 792DB_2xAIR+1DP

Sector 1 (Existing) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1		2		3
Antenna Model	KRC118023-1_B2A_B4P (Quad)		KRC118023-1_B2P_B4A (Quad)		LNX-6515DS-A1M (Dual)
Azimuth	40		40		40
M. Tilt	0		0		0
Height	50		50		50
Ports	P1	P2	P3	P4	P5
Active Tech.	U1900 G1900	U2100	L2100		L700
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2		2
Cables		Coax Feeder Coax Feeder			
TMAs		Generic Style 1B - Twin AWS			
Diplexers / Combiners					
Radio					
Sector Equipment					

Unconnected Equipment:

Scope of Work:

Add a B12 passive antenna.Add RRU's at antenna. Use spare fiber for L700.

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Sector 1 (Proposed) view from behind							
Coverage Type	A - Outdoor Macro						
Antenna	1		2				3
Antenna Model	KRC118023-1_B2A_B4P (Quad)		KRD901146-1_B66A_B2A (Octa)				LNX-6515DS-A1M (Dual)
Azimuth	40		40				40
M. Tilt	0		0				0
Height	50		50				50
Ports	P1	P2	P3	P4	P5	P6	P7
Active Tech.	U1900 G1900	U2100	L2100		L1900		L700
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2		2		2
Cables		Coax Feeder Coax Feeder					
TMAs		Generic Style 1B - Twin AWS					
Diplexers / Combiners							
Radio							RRUS11 B12
Sector Equipment							

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Sector 2 (Existing) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1		2		3
Antenna Model	KRC118023-1_B2A_B4P (Quad)		KRC118023-1_B2P_B4A (Quad)		Low-band Dual Port Antenna (Dual)
Azimuth	170		170		170
M. Tilt	0		0		0
Height	50		50		50
Ports	P1	P2	P3	P4	P5
Active Tech.	U1900 G1900	U2100	L2100		L700
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2		2
Cables		Coax Feeder Coax Feeder			
TMAs		Generic Style 1B - Twin AWS			
Diplexers / Combiners					
Radio					
Sector Equipment					

Unconnected Equipment:

Scope of Work:

Add a B12 passive antenna.Add RRU's at antenna. Use spare fiber for L700.

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Sector 2 (Proposed) view from behind							
Coverage Type	A - Outdoor Macro						
Antenna	1		2				3
Antenna Model	KRC118023-1_B2A_B4P (Quad)		KRD901146-1_B66A_B2A (Octa)				LNX-6515DS-A1M (Dual)
Azimuth	170		170				170
M. Tilt	0		0				0
Height	50		50				50
Ports	P1	P2	P3	P4	P5	P6	P7
Active Tech.	U1900 G1900	U2100	L2100		L1900		L700
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2		2		2
Cables		Coax Feeder Coax Feeder					
TMAs		Generic Style 1B - Twin AWS					
Diplexers / Combiners							
Radio							RRUS11 B12
Sector Equipment							

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Sector 3 (Existing) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1		2		3
Antenna Model	KRC118023-1_B2A_B4P (Quad)		KRC118023-1_B2P_B4A (Quad)		Low-band Dual Port Antenna (Dual)
Azimuth	290		290		290
M. Tilt	0		0		0
Height	50		50		50
Ports	P1	P2	P3	P4	P5
Active Tech.	U1900 G1900	U2100	L2100		L700
Dark Tech.					
Restricted Tech.					
Decomm. Tech.					
E. Tilt	2	2	2		2
Cables		Coax Feeder Coax Feeder			
TMAs		Generic Style 1B - Twin AWS			
Diplexers / Combiners					
Radio					
Sector Equipment					

Unconnected Equipment:

Scope of Work:

Add a B12 passive antenna.Add RRU's at antenna. Use spare fiber for L700.

RAN Template:	A&L Template:
792DB Outdoor	792DB_2xAIR+1DP

CT11923C_1.1_Capacity

Sector 3 (Proposed) view from behind							
Coverage Type	A - Outdoor Macro						
Antenna	1		2				3
Antenna Model	KRC118023-1_B2A_B4P (Quad)		KRD901146-1_B66A_B2A (Octa)				LNX-6515DS-A1M (Dual)
Azimuth	290		290				290
M. Tilt	0		0				0
Height	50		50				50
Ports	P1	P2	P3	P4	P5	P6	P7
Active Tech.	U1900 G1900	U2100	L2100		L1900		L700
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2		2		2
Cables		Coax Feeder Coax Feeder					
TMAs		Generic Style 1B - Twin AWS					
Diplexers / Combiners							
Radio							RRUS11 B12
Sector Equipment							

Unconnected Equipment:

Scope of Work:

SE4192-SWBP4LDF(DXX) Enclosed dipole, Offset, 12.5 dBd, Low PIM, 746-960 MHz

- New wide band design covers 746-960 MHz band
- Compact, enclosed antenna with excellent low intermodulation performance
- PIM certified and Peak Instantaneous Power (PIP) rated
- 0-10º electrical downtilt available

One wideband antenna for your 700, 800, 900 MHz systems. Sinclair's SE4192-WBL series of enclosed dipole arrays offer excellent intermodulation performance covering 746-960 MHz in a single antenna. These highly versatile antennas are particularly well suited to communication systems where a specific coverage pattern is required. These include cellular systems, trunked radio, paging, and data transmission, where predictable and highly reliable performance is a must. Desgined for multi-channel systems, the PIP rated SE4192-WBL series features with low intermodulation products, highly rated average power and peak instantaneous power.

The SE4192-WBL series is also available with field adjustable reflectors that provide horizontal beamwidths between 60 and 160 degrees (See SE4192-WBAL). The creative design and construction permits excellent pattern control and greater efficiency.

This antenna should be mounted in an upright position.

When ordering, please refer to the chart below for the model number. Downtilt configurations are subject to various list price. Please contact your Sinclair Sales Representative or Customer Service Representative for more information.

Model Number	Downtilt
SE4192-SWBP4LDF(D00)	0º
SE4192-SWBP4LDF(D01)	1º
SE4192-SWBP4LDF(D02)	2º
SE4192-SWBP4LDF(D03)	3º
SE4192-SWBP4LDF(D04)	4º
SE4192-SWBP4LDF(D05)	5º
SE4192-SWBP4LDF(D06)	6º
SE4192-SWBP4LDF(D07)	7º
SE4192-SWBP4LDF(D08)	8º
SE4192-SWBP4LDF(D09)	9º
SE4192-SWBP4LDF(D10)	10º

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

Electrical Specifications

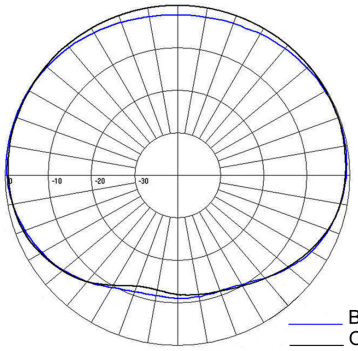
Frequency Range	MHz	746 to 960
Bandwidth	MHz	214
Connector		7/16 DIN-Female
Gain (nominal)	dBd (dBi)	12.5 (14.6)
Input VSWR (max)		1.5:1
Polarization		vertical
Impedance	Ω	50
Pattern		Offset
Horizontal beamwidth (typ)	degrees	180
Vertical beamwidth (typ)	degrees	4
Average Power Input (max)	W	500
Passive intermod. (2x20W, 3rd ord.)	dBc	-150
Lightning protection		DC ground
PIP(KW, max)		25
Electrical tilt (available)		0 to 10 degrees

Notes
*1 : Clamps not included in measurement
*2 : Clamps not included in measurement

Ordering Information
When ordering, please refer to the model list on the previous page for specific model numbers and downtilt configurations.

Mechanical Specifications

Width	in (mm)	2.9 (74)	*1
Depth	in (mm)	8.5 (216)	*2
Length/ Height	in (mm)	216 (5486)	
Base pipe diameter	in (mm)	2.88 (73)	
Base pipe mounting length	in (mm)	176.5 (4483)	
Radiating element material		prntd circuit bd	
Weight	lbs (kg)	56 (25.42)	
Weight iced (1/2" ice)	lbs (kg)	135 (61.29)	
Mounting Hardware (Included)		Clamp130	
Shipping dimensions	in (mm)	219x13x15 (5563x330x381)	
Mounting configurations		upright	



H-Plane (Azmuth)

Environmental Specifications

Temperature range	°F (°C)	-40 to +140 (-40 to +60)
Wind Loading Area (Flat Plate Equivalent)	ft² (m²)	8.37 (0.78)
Wind Loading Area (1/2" ice)	ft² (m²)	10.59 (0.98)
Rated wind velocity (no ice)	mph (km/h)	100 (161)
Rated wind velocity (1/2" radial ice)	mph (km/h)	85 (137)
Lateral thrust (100 mph No Ice)	lbs (N)	438 (1948.2)
Torsional moment (100 mph No Ice)	ft-lbs (Nm)	188 (253.8)

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

SE419-SWBP4LDF(D00) Enclosed dipole, offset, 10 dBd, Low PIM, 746-960 MHz

- New wide band design covers 746-960 MHz band
- Compact, enclosed antenna with excellent low intermodulation performance
- Peak Instantaneous Power (PIP) rated
- 0-10º electrical downtilt available

One wideband antenna for your 700, 800, 900 MHz systems. Sinclair's SE419-WBL series of enclosed dipole arrays offer excellent intermodulation performance covering 746-960 MHz in a single antenna. These highly versatile antennas are particularly well suited to communication systems where a specific coverage pattern is required. These include cellular systems, trunked radio, paging, and data transmission, where predictable and highly reliable performance is a must. Desgined for multi-channel systems, the PIP rated SE419-WBL series features with low intermodulation products, highly rated average power and peak instantaneous power.

The SE419-WBL series is also available with field adjustable reflectors that provide horizontal beamwidths between 60 and 160 degrees (See SE419-WBAL). The creative design and construction permits excellent pattern control and greater efficiency.

This antenna shall be mounted in an upright position.
Electrical downtilt is available upon request.
Clamps for mechanical downtilt can be ordered separately.

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

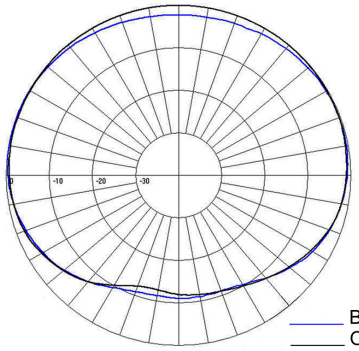
Electrical Specifications

Frequency Range	MHz	746 to 960
Bandwidth	MHz	214
Connector		7/16 DIN-Female
Gain (nominal)	dBd (dBi)	10 (12.1)
Input VSWR (max)		1.5:1
Polarization		vertical
Impedance	Ω	50
Pattern		Offset
Horizontal beamwidth (typ)	degrees	180
Vertical beamwidth (typ)	degrees	7.5
Average Power Input (max)	W	500
Passive intermod. (2x20W, 3rd ord.)	dBc	-150
Lightning protection		DC ground
PIP(KW, max)		25
Electrical tilt (available)		0 to 10 degrees

Notes
*1 : Clamps not included in measurement
*2 : Clamps not included in measurement

Mechanical Specifications

Width	in (mm)	2.9 (74)	*1
Depth	in (mm)	8.5 (216)	*2
Length/ Height	in (mm)	103 (2616)	
Base pipe diameter	in (mm)	2.88 (73)	
Base pipe mounting length	in (mm)	85.95 (2183)	
Radiating element material		prntd circuit bd	
Weight	lbs (kg)	24 (10.9)	
Weight iced (1/2" ice)	lbs (kg)	61 (27.69)	
Mounting Hardware (Included)		Clamp130	
Shipping dimensions	in (mm)	108x13x15 (2743x330x381)	
Mounting configurations		upright	



H-Plane (Azmuth)

Environmental Specifications

Temperature range	°F (°C)	-40 to +140 (-40 to +60)
Wind Loading Area (Flat Plate Equivalent)	ft² (m²)	5.9 (0.55)
Wind Loading Area (1/2" ice)	ft² (m²)	7.5 (0.7)
Rated wind velocity (no ice)	mph (km/h)	155 (250)
Rated wind velocity (1/2" radial ice)	mph (km/h)	140 (225)
Lateral thrust (100 mph No Ice)	lbs (N)	239 (1063.1)
Torsional moment (100 mph No Ice)	ft-lbs (Nm)	97 (131)

Region	United States	Europe, Middle East and Africa	Caribbean and Latin America	Canada and rest of the world
Telephone	USA: 1 800 263 3275	International: +44 (0) 1487 84 28 19	International: +1 905 726 7676	Canada: 1 800 263 3275 International: +1 905 727 0165
E-mail	salesusa@sinctech.com	salesuk@sinctech.com	salesla@sinctech.com	salescan@sinctech.com

Bird Technologies® TX RX Systems Brand

Dual Diversity Tower Top Amplifier System

432E-83E Series, TTA02, RMC02, RMC04

Bird Technologies, TX RX Systems brand, Dual Diversity Tower-Top Amplifier (TTA) system is a high performance, two channel quadrature-coupled Low Noise Amplifier (LNA) designed to increase the performance of diversity Base Transceiver Stations (BTS) while ensuring reliable communications for critical Public Safety applications. This increase in sensitivity can make up for the imbalance between mobile and handheld users in critical systems and improve marginal in-building penetration. The signal paths of the two channels are carefully matched to maximize the aperture gain of a dual diversity radio system.

The TTA consists of two components: the Tower-Top Amplifier mounted close to the antenna and the Control Monitoring Unit (CMU)or the Multicoupler Control Unit (MCU). The CMU is specifically designed to interface directly with one or two GTR8000 ESS receive networks. The MCU is designed to interface directly to 16 individual receivers operating in dual diversity mode or single mode. Each of the LNA's within the TTA are quadrature design with separate bias circuits for maximum redundancy and superior intermodulation (IM) performance. LNA current monitoring of each amplifier is performed in the Control Unit to assess the health of the TTA system. Dry relay contact closure alarms are generated in the rare occurrence of a system fault. An auxiliary "Test" transmission line is used to help measure receiver sensitivity or diagnose damage or degradation of the primary transmission line. This system can be used in any P25 land mobile radio application, HPD, and standard systems.

FEATURES

- Two channels of Redundant, quadrature LNA's ensures reliable communications.
- PolyPhaser™ impulse suppressors provide protection from lightning damage on all I/O ports.
- RF test port enables gain, sensitivity and degradation measurements from ground level.
- Ethernet
- Multiple Real-Time Status and Alarm Annuciation Methods:
  - Secure SNMP (v3.0) Trap Messaging (compliant with Genesis and other SNMP Managers)
  - Form-C contacts
  - Front Panel Status Indicators
- Test Output on each channel allows simple monitoring of actual signal levels into BTS radios.
- Expandable as needed to 32 ports.

PROBLEMS ▸ SOLUTIONS

Your tower is high and feed-line loss degrades noise figure.

- TTA establishes superior noise figure prior to feed-line loss.

New Diversity Radio systems have critical requirements.

- The Dual Diversity TTA conforms to all Motorola requirements for a P25 diversity radio system.

Dual Diversity Tower Top System

432E Series, TTA02, RMC02, RMC04

SYSTEM SPECIFICATIONS

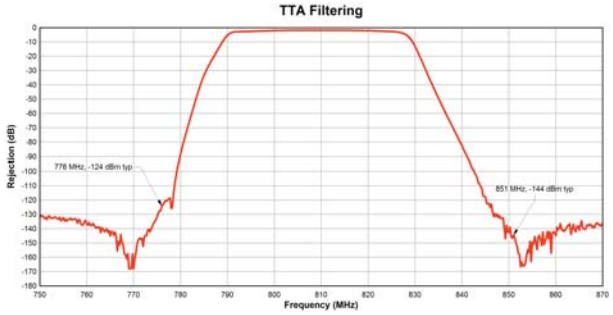
Bandwidth		796 – 824 MHz
System Noise Figure		2.7 dB Max
System IIP3		+15 dBm min
System Gain	MCU CMU	15.0 +1 / -0.25 dB 8.0 +/- 0.5 dB
Filter Rejection		110 dB min, 776 and 851 MHz
Current Draw @110V		199 ma Typ.
Current Draw @48V		517 ma Typ.

TOWER TOP AMPLIFIER SPECIFICATIONS

Frequency Range	796-824 MHz
Integrated Test Port Coupling	30 dB -/+ 2 dB
Antenna Port RL	14 dB min
Power Requirements	12 VDC @ 875 ma
Lightning Protection	Impulse suppression on all external connectors
Operating Temp Range	-30°C to +60°C
Enclosure Modified NEMA 4X	Water resistant Polyester Housing
Connectors	N-Female
Dimensions (HWD)	12"x12"x7.5"
Weight	25 lbs

PRESELECTOR SPECIFICATIONS

Frequency Range	MCU/CMU	796 – 824 MHz
Insertion Loss	MCU/CMU	< 0.8 dB
Return Loss	MCU/CMU	>15 dB
Stopband Rejection	MCU/CMU	>60 dB @ 776 and 851 MHz



A steep skirted TEM bandpass filter in the tower box augmented by a ceramic filter in the base unit provide a selective 32 MHz system window.

BASE UNIT SPECIFICATIONS

MULTICOUPLER UNIT (MCU) CONTROL MONITORING UNIT (CMU)

Input Return Loss	MCU/CMU	>14 dB
Output IP3	MCU	> +45 dBm
RF Input Impedance	MCU/CMU	50 ohms
A and B Channel distribution amps	MCU	Quadrature-Coupled Dual Stage LNA

RESERVE GAIN ADJUSTMENT (EACH CHANNEL)

Fine	MCU/CMU	0-0.8 dB in < 0.1 dB steps (Fine adjustment accommodates accurate channel to channel amplitude balance distance gain atten.)

CONNECTORS

16 BNC Female Outputs for each channel	MCU	Labeled RxA-1 through RxA-16 and RxB-1 through RxB-16
2 BNC Female	MCU	Outputs for splitting expansion
2 N Female Outputs for each channel	CMU	Labeled RxA, RxA-Test, RxB, RxB-Test
N-Female RF Connections	MCU/CMU	TTA, A, B and Test Lines
BNC Female	MCU/CMU	Input to Test Line (on front panel) Outputs to BTS radios
Ethernet RJ45	MCU/CMU	Access from front panel
Alarm Contacts	MCU/CMU	Two Form C Contacts. Separate alarms for A and B Channels
Power Requirements	MCU/CMU	± 48 VDC or 85-250 VAC 50/60 Hz, depending upon model
Operating Temperature	MCU/CMU	0°C to +50°C at non-condensing humidity
Enclosure Standard		EIA 19" Rack Mounting
Dimensions (HWD)	MCU CMU	2 RU x 19" x 18" 1 RU x 19" x 18"
Weight		11.5 lbs

PRODUCT PART NUMBER

Model Numbers	Motorola Model Numbers	Description	Power Req
432E-83I-01-T	DS432E83I01T	Dual Diversity Tower Unit	
432E-83I-01-C-110	DS432E83I01C110	2-Port Control Unit	AC
432E-83I-01-M-110	DS432E83I01M110	Multicoupler Control Unit, Dual 16 port output	AC
432E-83I-01-M-48	DS432E83I01M48	Multicoupler Control Unit, Dual 16 port output	-48
432E-83I-01-C-48	DS432E83I01C48	2-Port Control Unit	-48
75-83I-432E	DS7583I432E	Expansion Kit, Dual Diversity 16-32 ports	

Bird Technologies®

30303 Aurora Rd. | Solon, OH 44139 | 866.695.4569 | www.bird-technologies.com

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

CT923/W. VIEW DR_GT

SITE ID: CT11923C - L1900

7 WEST VIEW DR

DANBURY, CT 06810

T-MOBILE RF CONFIGURATION
792DB_2xAIR+1DP

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   A. REMOVE AND REPLACE EXISTING POSITION THREE (3) ANTENNA, TYPICAL OF (3)/(1) PER SECTOR, WITH (3) NEW AIR 32 ANTENNAS.
   B. REMOVE THREE (3) EXISTING T-MOBILE ANTENNAS, POSITION 2, AND REPLACE WITH THREE (3) PROPOSED AIR 32 ANTENNAS, (1) PER SECTOR.
   C. INSTALL (1) ERICSSON 6X12 HYBRID CABLE SYSTEM (HCS) FROM GROUND EQUIPMENT LOCATION ROUTED UP THE LATTICE TOWER AND TO EACH SECTOR.
   D. REMOVE AND REPLACE EXISTING ELECTRICAL BREAKER FOR PROPOSED 100A BREAKER.

PROJECT INFORMATION

SITE NAME:	CT923/W. VIEW DR_GT
SITE ID:	CT11923C
SITE ADDRESS:	7 WEST VIEW DR DANBURY, CT 06810
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	JAIME FORD (PROJECT MANAGER) VERTICAL DEVELOPMENT, LLC (774) 248-5373
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-23'-45.39" N LONGITUDE: 73°-25'-26.28" W GROUND ELEVATION: 633'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

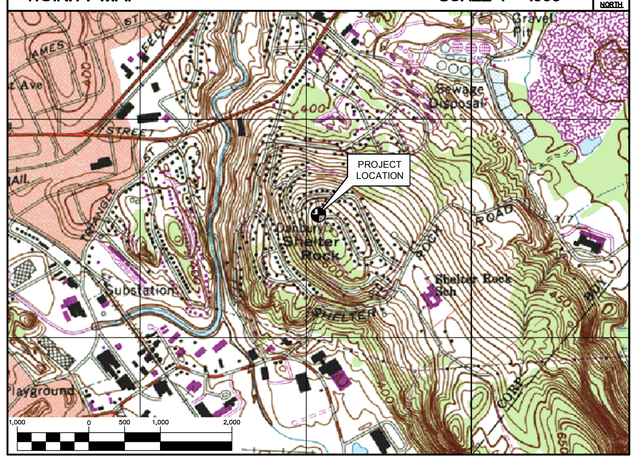
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 7 WEST VIEW DR
DANBURY, CT 06810

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.21 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187	1.89 MI.
4.	TURN LEFT ONTO CT-305/OLD WINDSOR RD.	2.32 MI.
5.	STAY STRAIGHT TO GO ONTO BLOOMFIELD AVE/CT-305.	0.01 MI.
6.	MERGE ONTO I-91 S TOWARD HARTFORD	5.66 MI.
7.	MERGE ONTO I-84 W via EXIT 32A TOWARD WATERBURY	13.29 MI.
8.	KEEP LEFT TO TAKE I-84 TOWARD WATERBURY	40.69 MI.
9.	MERGE ONTO NEWTOWN RD via EXIT 8 TOWARD BETHEL	1.68 MI.
10.	TURN LEFT ONTO OLD SHELTER ROCK RD	0.14 MI.
11.	TAKE THE 1ST LEFT ONTO WOODSIDE AVE	0.02 MI.
12.	TAKE THE 1ST RIGHT ONTO TOPSTONE DR.	0.17 MI.
13.	TAKE THE 1ST RIGHT TO STAY ON TOPSTONE DR.	0.17 MI.
14.	TAKE THE 1ST RIGHT ONTO WESTVIEW DR.	0.06 MI.

VICINITY MAP

SCALE: 1" = 1000'



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SITE ID: CT11923C
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DANBURY, CT 06810

DATE: 02/01/17
SCALE: AS NOTED
JOB NO. 17012.06

TITLE SHEET

T-1

Sheet No. 1 of 5

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90–110 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325–N
   G. U–BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

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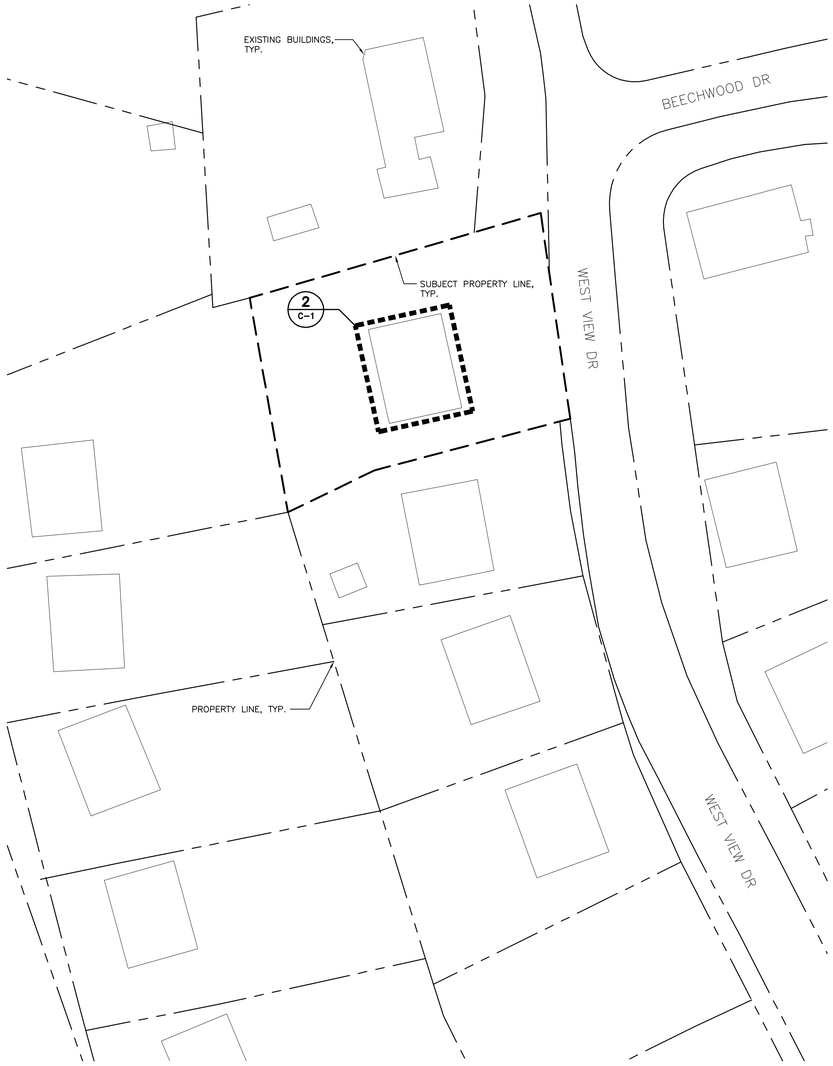
JOB NO. 17012.06

DESIGN BASIS AND SITE NOTES

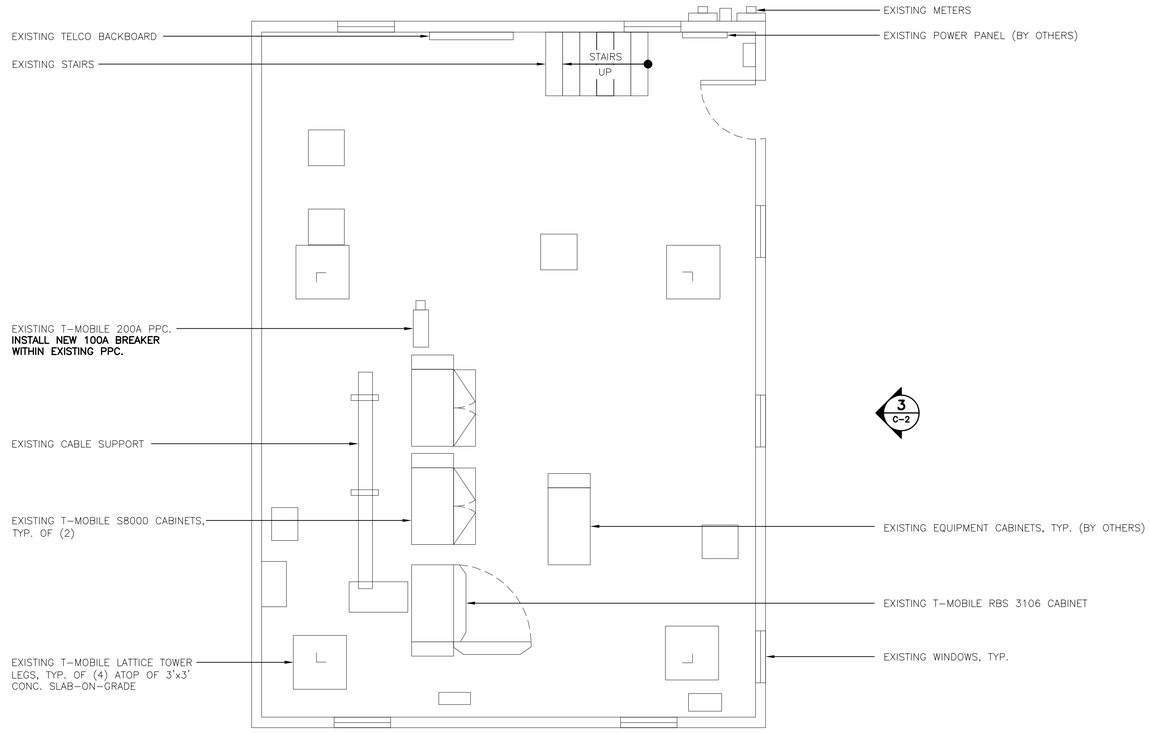
N–1



1 C-1 **SITE LOCATION PLAN**
SCALE: 1" = 30'

APPROX. NORTH

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.



2 C-1 **SITE PLAN**
SCALE: 1/4" = 1'

TRUE NORTH

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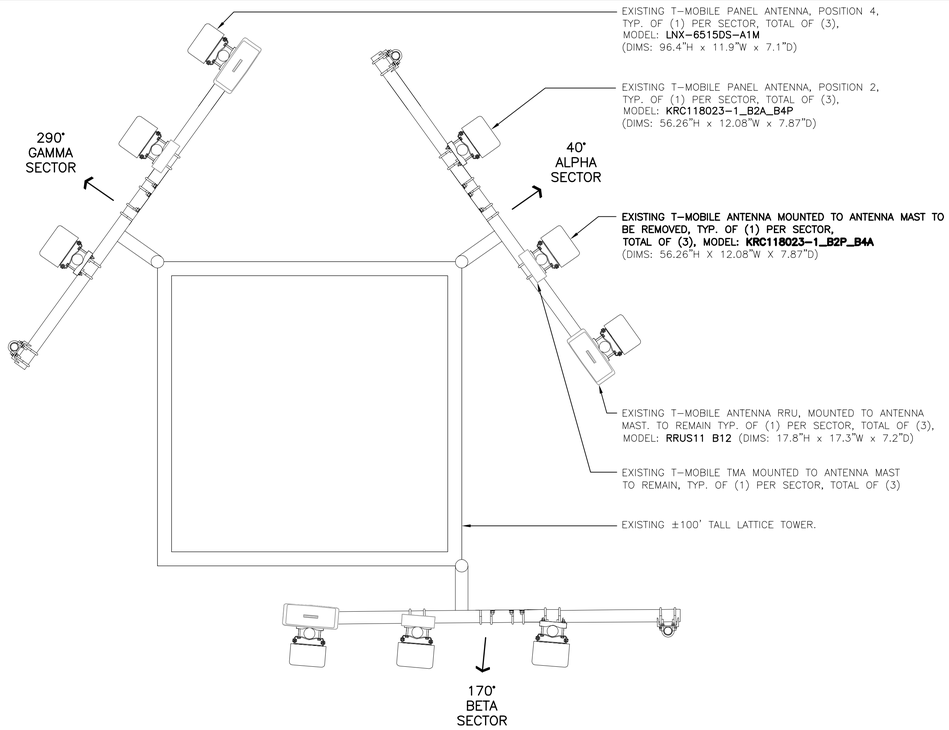
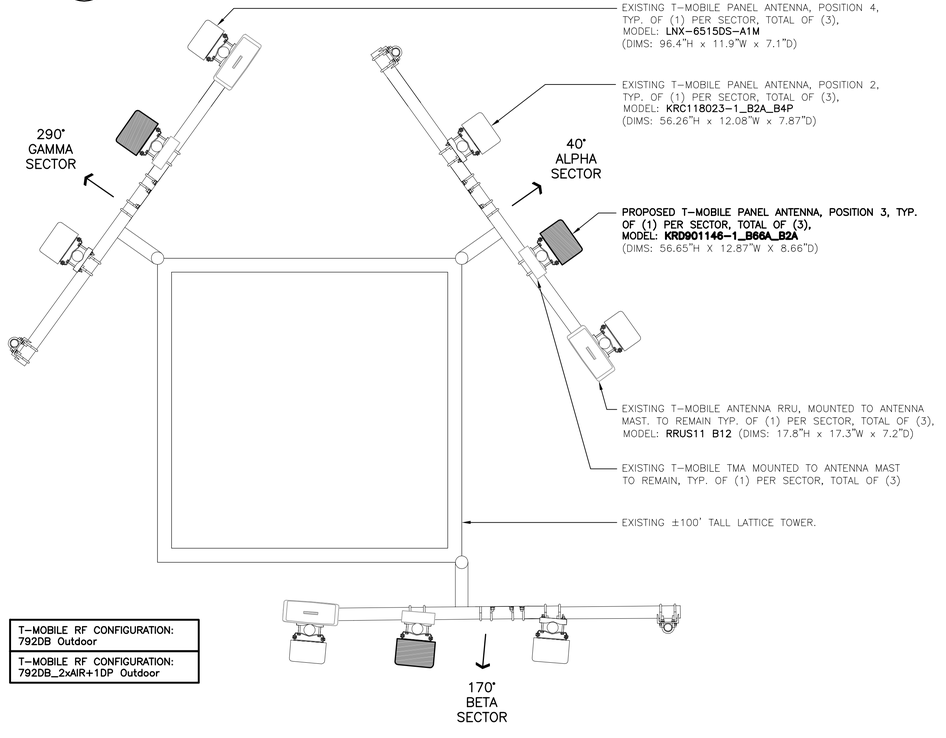
SITE LOCATION PLAN AND SITE PLAN

C-1

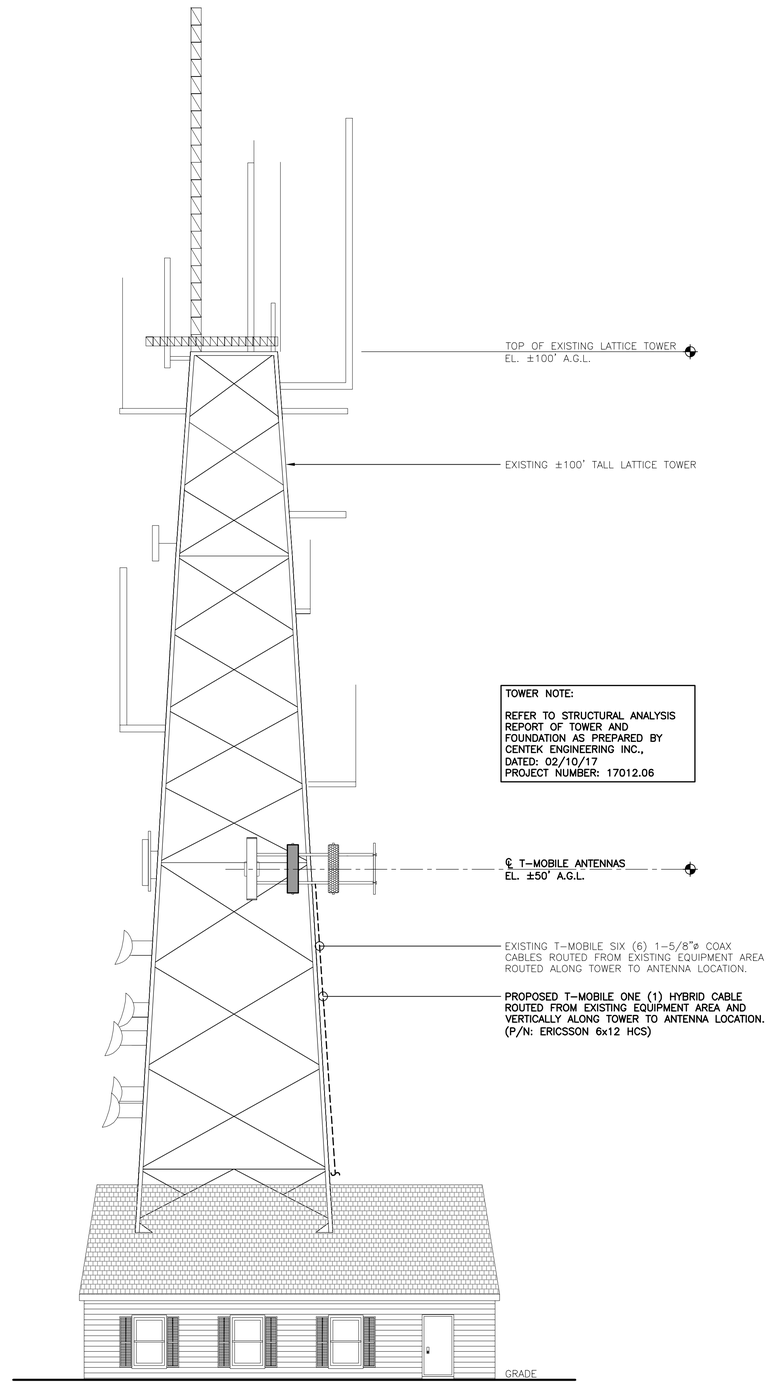
Sheet No. 3 of 5



1 C-2 **EXISTING ANTENNA MOUNTING CONFIGURATION** 50' ELEVATION
SCALE: 1/2" = 1'
TRUE NORTH



2 C-2 **PROPOSED ANTENNA MOUNTING CONFIGURATION** 50' ELEVATION
SCALE: 1/2" = 1'
TRUE NORTH



3 C-2 **WEST TOWER ELEVATION**
SCALE: 1" = 7'

GRAPHIC SCALE
7 0 3.5 7 14 28
(IN FEET)
1 inch = 7 ft.

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ANTENNA MOUNTING CONFIG. AND ELEVATION

C-2

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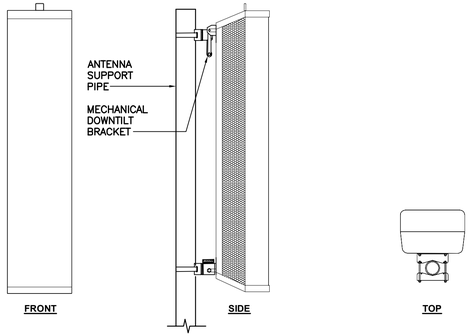
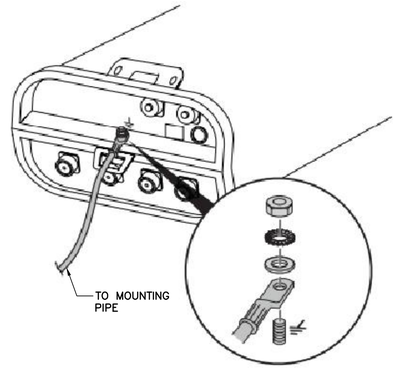
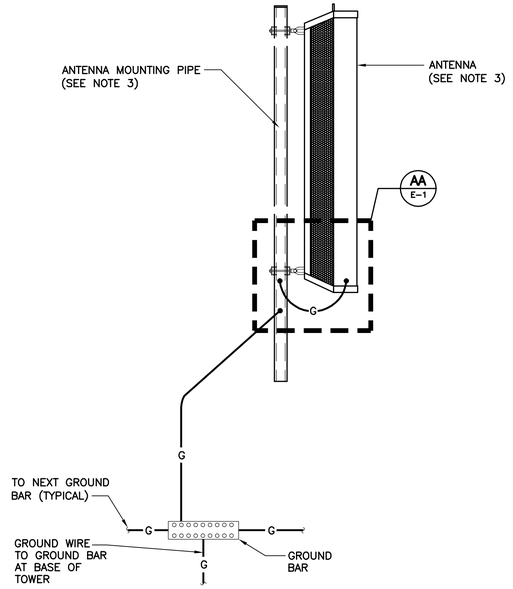


ALPHA/BETA/GAMMA/DELTA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: KRD901146-1_B66A_B2A	56.65"L x 12.87"W x 8.66"D	132.2 LBS.

2 / E-1 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE



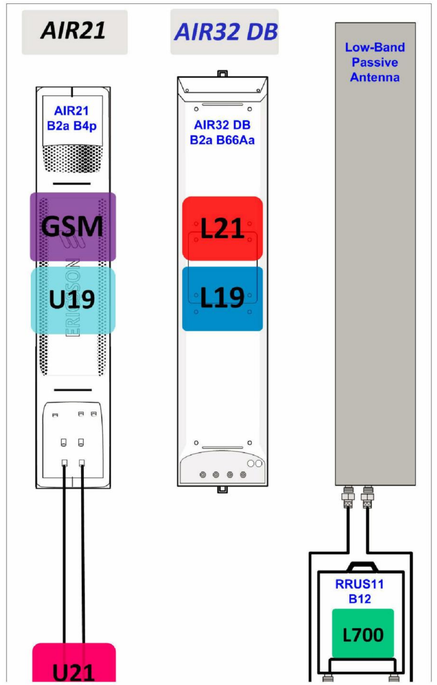
AA / E-1 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 / E-1 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



3 / E-1 **PROPOSED PLUMBING DIAGRAM**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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