February 16, 2016

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

Re:	**Notice of Exempt Modification – Antenna Swap**
Property Address:	**46 Meadow Rd Clinton, CT 06413 (the "Property")**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 150-feet on an existing 195 – self-support lattice tower, owned by American Tower and located at 46 Meadow Rd, Clinton, CT 06413. AT&T now intends to replace (3) KMW AM-X-CD-14-65-00T-RETwith three (3) Andrew SBNHH-1D65Apanel antennas on the existing mounts. The other six (6) will remain as is (for a total of (9) panel antennas), at the 150-foot level. AT&T also intends to install three (3) RRU-32's, three (3) on the existing antenna masts mounted on unistrut and, three (3) A-2 modules. AT&T will also install one (1) Argus converter module and one (1) LTE DUS in the existing equipment area.

This facility was approved the Clinton Planning and Zoning Commission in CAM 99-450 and Site Plan Application 99-450 on November 8, 1999 for a certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of telecommunications antennas, associated equipment, and building to provide Domestic Public Cellular radio Telecommunication service in the Connecticut- New England area. This approval included the following original conditions, including the total facility height or mounting restrictions. This modification complies with the aforementioned conditions.

1. If the tower is abandoned, it is to be removed within one year by the owner; otherwise the town will remove it at the expense of the property owner.
2. Should the existing fence fall into disrepair on the Southwest corner of the property, the applicant (SBA, Inc.) shall replace the fence.

The following is a list of subsequent decisions:

EM-CING-027-040309 - Southwestern Bell Mobile Systems, LLC notice of intent to modify an existing telecommunications facility located at 46 Meadow Road, Clinton, Connecticut.

EM-CING-027-027-059-137-137-070717 – New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunication facilities located at 46 Meadow Road, **Clinton**; 48 Cow Hill Road, **Clinton**; 78 Roberts Road, Groton; 72 Jerry Brown Road, Stonington; and 171 S. Broad Street, Stonington, Connecticut

EM-CING-027-110314 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 46 Meadow Road, **Clinton**, Connecticut.

EM-AT&T-027-131213 - American Telephone and Telegraph Company (AT&T) notice of intent to modify an existing telecommunications facility located at 46 Meadow Road, **Clinton**, Connecticut.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b)(2). In accordance with R.C.S.A., a copy of this letter is being sent to Bruce N. Farmer, First Selectman, Town of Clinton, 54 East Main St Clinton, CT 06413. A copy of this letter is also being sent to American Tower Corporation-Tower Owner- at 116 Huntington Ave., 11th floor, Boston, MA 02116 and Nichols Auto Parts Inc., 46 Meadow Rd, Clinton, CT 06413

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 150-foot level of the 195-foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

David Barbagallo

Enclosures
CC w/enclosures:
Bruce N. Farmer, First Selectman Town of Clinton
Tower Owner - American Tower Corporation
Property Owner – Nichols Auto Parts Inc.

SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

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703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com

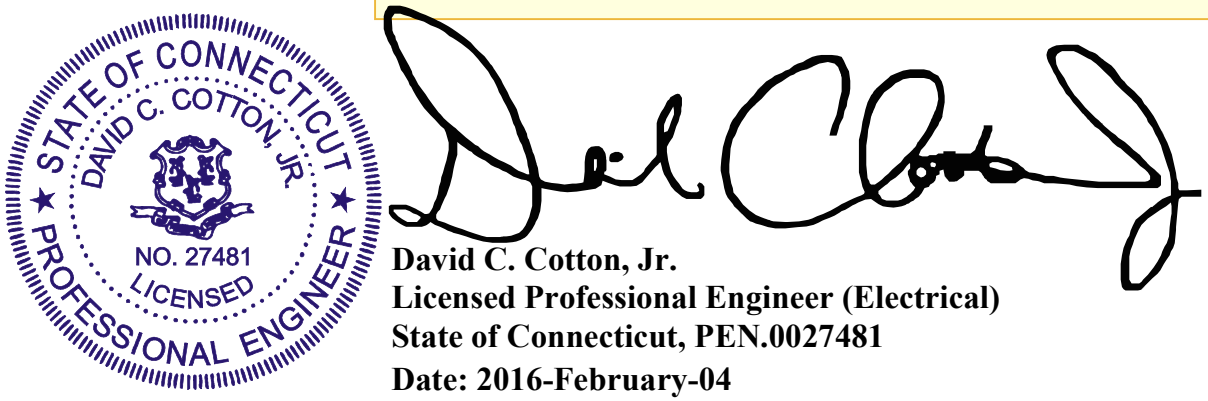
SmartLink, LLC on behalf of AT&T Mobility, LLC
Site FA – 10049127
Site ID – CTV2230 (2C)
USID – 59449
Site Name – Clinton Meadow Rd
Site Compliance Report

46 Meadow Road
Clinton, CT 06413

Latitude: N41-16-30.71
Longitude: W72-29-51.75
Structure Type: Self-Support

Report generated date: February 4, 2016
Report by: Kylie Davenport
Customer Contact: Kristen Smith

AT&T Mobility, LLC will be compliant when the remediation recommended in section 5.2 or other appropriate remediation is implemented.



David C. Cotton, Jr.
Licensed Professional Engineer (Electrical)
State of Connecticut, PEN.0027481
Date: 2016-February-04

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Unknown
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated Radio Frequency Exposure (RFE) level on the Ground	<5% of General Public limit
FCC & AT&T Compliant?	Will Be Compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTV2230_2016-LTE-Next-Carrier_LTE-2C_om636a_2051A03KA1_10049127_59449_10-02-2015_Preliminary-Approved_v1.00

CD's: 10049127_AE201_011116_CT2230_REV0

RF Configuration Datasheet: CT_33 sites with power density form

2 Map of Site

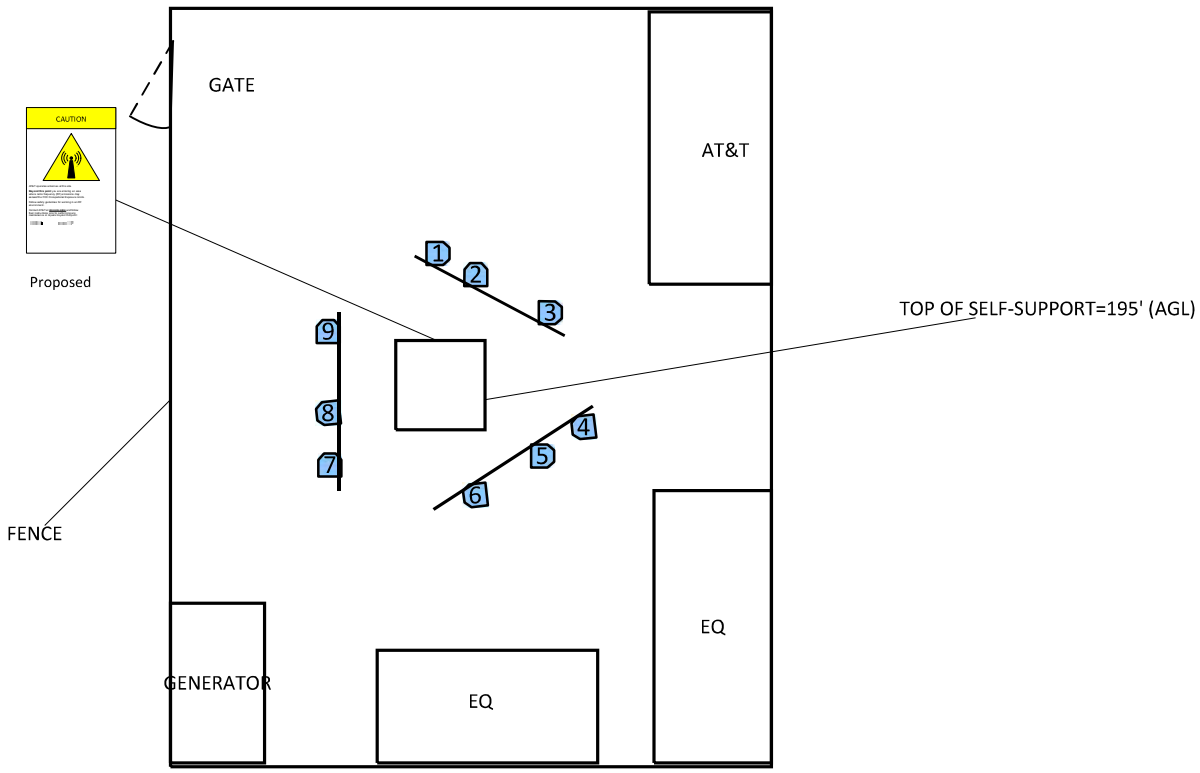
In the RF Emissions Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

The following diagrams are included:

- Site Map
- RF Emissions Diagram
- Elevation view

Site Map For: Clinton Meadow Rd



N

(Feet)

0 11.1 22.3

www.sitesafe.com
Site Name:Clinton Meadow Rd

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

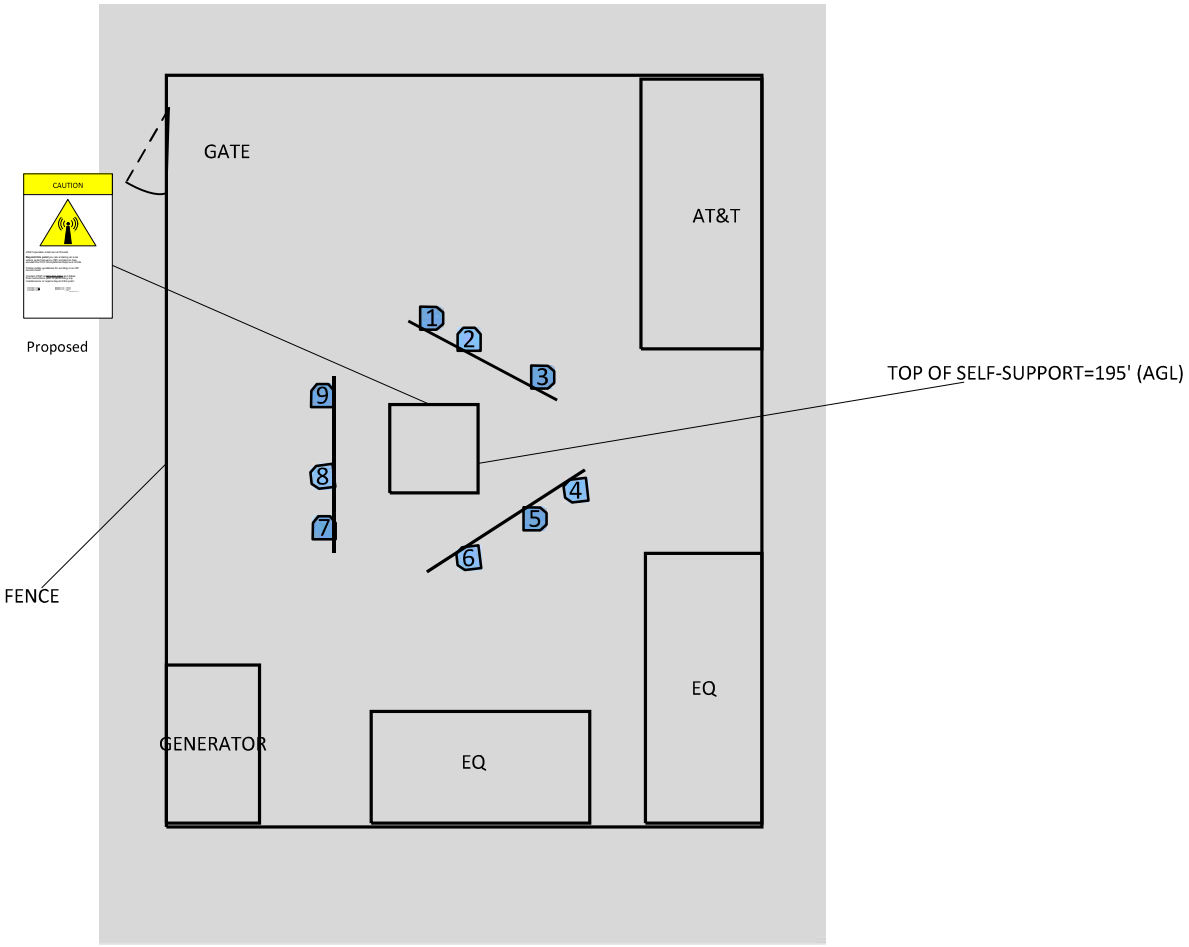
3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	90	82	4.6	11.51	0	2	0	324.4	131.2'	174.5'	147.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	90	86	4.6	13.41	0	1	0	226.2	131.2'	174.5'	147.7'
2	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	0	66	4.6	11.29	0	0	1	383.5	135.6'	172'	147.7'
2	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	0	65	4.6	14.65	0	0	1	1300.6	135.6'	172'	147.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	90	82	4.6	11.51	1	0	0	78.7	144.2'	167.6'	147.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	90	86	4.6	13.41	1	0	0	331.1	144.2'	167.6'	147.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	0	2	0	329.3	148'	154.3'	147.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	1	0	231.7	148'	154.3'	147.7'
5	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	90	66	4.6	11.29	0	0	1	383.5	143.3'	151'	147.7'
5	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	90	65	4.6	14.65	0	0	1	1300.6	143.3'	151'	147.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	1	0	0	79.9	135.5'	146.4'	147.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	1	0	0	339.6	135.5'	146.4'	147.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	0	82	4.6	11.51	0	2	0	328	118.6'	150'	147.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	0	86	4.6	13.41	0	1	0	229.3	118.6'	150'	147.7'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	263	66	4.6	11.29	0	0	1	383.5	118.4'	155.9'	147.7'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	263	65	4.6	14.65	0	0	1	1300.6	118.4'	155.9'	147.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	0	82	4.6	11.51	1	0	0	79.3	118.4'	165.4'	147.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	0	86	4.6	13.41	1	0	0	335.4	118.4'	165.4'	147.7'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

RF Emissions Simulation For: Clinton Meadow Rd



% of FCC Public Exposure Limit
Spatial average 0' - 6'

>= 5000	>= 500	>= 100	>= 5	< 5

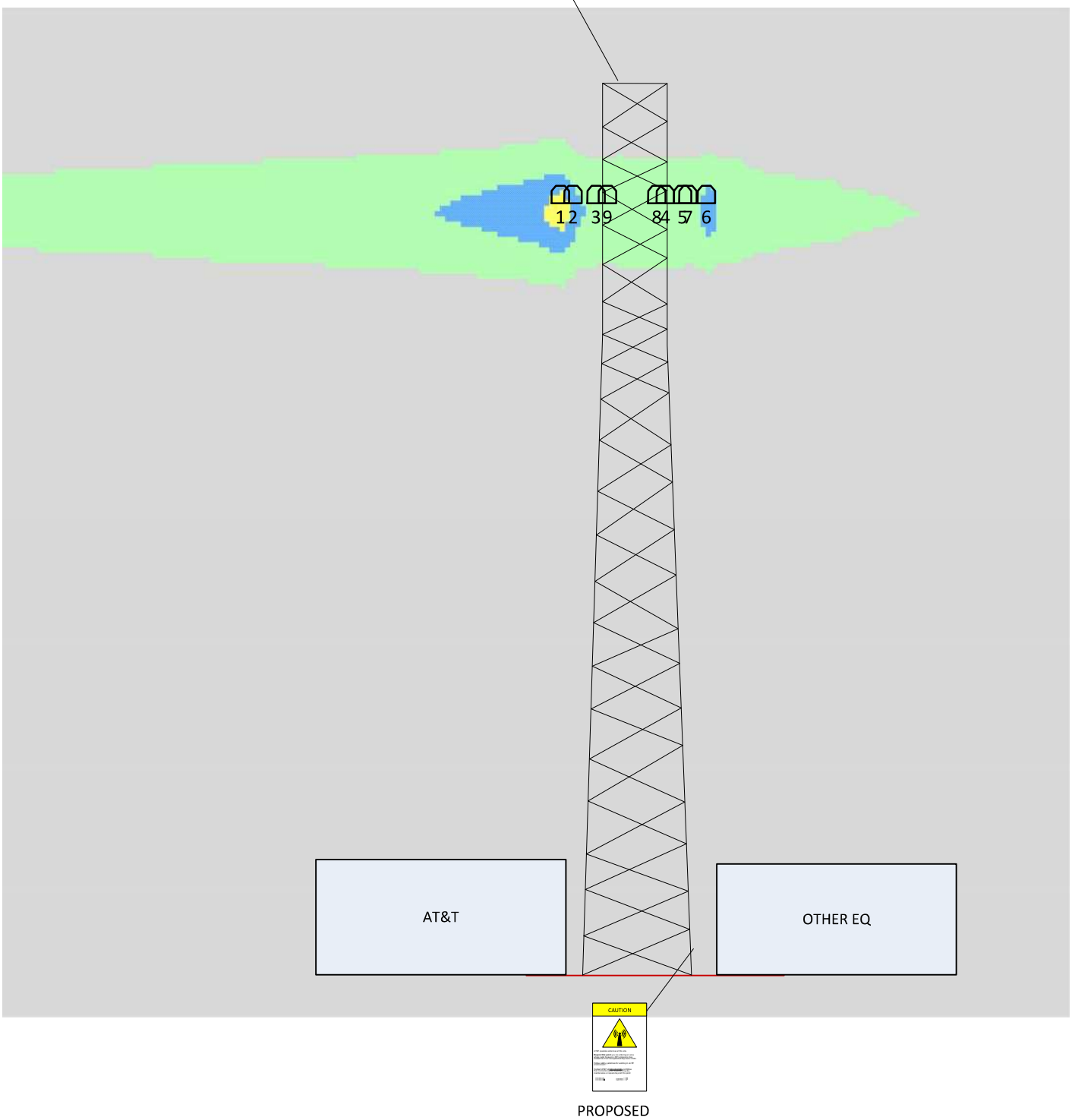
AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

(Feet)

0 11.2 22.5

www.sitesafe.com
Site Name:Clinton Meadow Rd

RF Emissions Simulation For: Clinton Meadow Rd



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)

0 14 28

www.sitesafe.com
Site Name:Clinton Meadow Rd

>= 5000	>= 500	>= 100	>= 5	< 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

The site will be made compliant if the following changes are implemented:

Site Access Location

Yellow caution 2 sign required.

AT&T Mobility, LLC Proposed Alpha Sector Location

No action required.

AT&T Mobility, LLC Proposed Beta Sector Location

No action required.

AT&T Mobility, LLC Proposed Gamma Sector Location

No action required.

6 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms that:

I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Kylie Davenport.

February 4, 2016

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

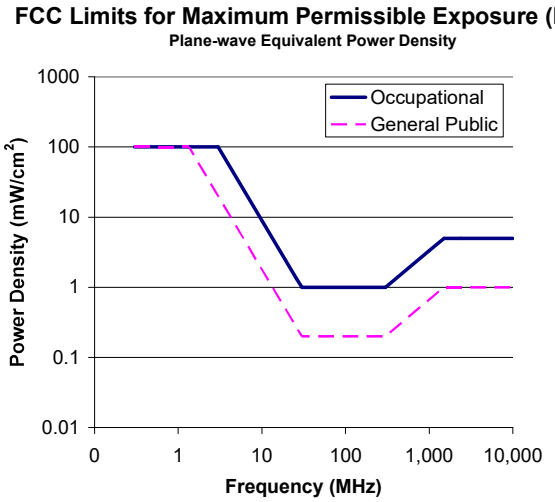
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

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

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit**.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels**.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a *worst-case* analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur, but are shown as a *worst-case* prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

StartAntennaData

It is advisable to provide an ID (ant 1) for all antennas

ID	Name	(MHz) Freq	Trans Power	Trans Count	Coax Len	Coax Type
1	AT&T MOBILITY LLC	850	11.508	2	0	
1	AT&T MOBILITY LLC	1900	10.35142	1	0	
2	AT&T MOBILITY LLC (Proposed)	737	28.57591	1	0	
2	AT&T MOBILITY LLC (Proposed)	1900	44.66836	1	0	
3	AT&T MOBILITY LLC	850	5.571857	1	0	
3	AT&T MOBILITY LLC	1900	15.13561	1	0	
4	AT&T MOBILITY LLC	850	11.6681	2	0	
4	AT&T MOBILITY LLC	1900	10.59254	1	0	
5	AT&T MOBILITY LLC (Proposed)	737	28.57591	1	0	
5	AT&T MOBILITY LLC (Proposed)	1900	44.66836	1	0	
6	AT&T MOBILITY LLC	850	5.662393	1	0	
6	AT&T MOBILITY LLC	1900	15.52387	1	0	
7	AT&T MOBILITY LLC	850	11.61449	2	0	
7	AT&T MOBILITY LLC	1900	10.49542	1	0	
8	AT&T MOBILITY LLC (Proposed)	737	28.57591	1	0	
8	AT&T MOBILITY LLC (Proposed)	1900	44.66836	1	0	
9	AT&T MOBILITY LLC	850	5.623413	1	0	
9	AT&T MOBILITY LLC	1900	15.34617	1	0	

StartSymbolData

Other Losses	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type
	23.01601		Powerwave	7770	131.17	174.47	147.7085	Panel
	10.35142		Powerwave	7770	131.17	174.47	147.7085	Panel
	28.57591		Andrew	SBNHH-1D(	135.56	172.02	147.7085	Panel
	44.66836		Andrew	SBNHH-1D(	135.56	172.02	147.7085	Panel
	5.571857		Powerwave	7770	144.19	167.59	147.7085	Panel
	15.13561		Powerwave	7770	144.19	167.59	147.7085	Panel
	23.33619		Powerwave	7770	148.04	154.3	147.7085	Panel
	10.59254		Powerwave	7770	148.04	154.3	147.7085	Panel
	28.57591		Andrew	SBNHH-1D(	143.28	150.99	147.7085	Panel
	44.66836		Andrew	SBNHH-1D(	143.28	150.99	147.7085	Panel
	5.662393		Powerwave	7770	135.48	146.41	147.7085	Panel
	15.52387		Powerwave	7770	135.48	146.41	147.7085	Panel
	23.22897		Powerwave	7770	118.61	149.95	147.7085	Panel
	10.49542		Powerwave	7770	118.61	149.95	147.7085	Panel
	28.57591		Andrew	SBNHH-1D(	118.41	155.93	147.7085	Panel
	44.66836		Andrew	SBNHH-1D(	118.41	155.93	147.7085	Panel
	5.623413		Powerwave	7770	118.43	165.41	147.7085	Panel
	15.34617		Powerwave	7770	118.43	165.41	147.7085	Panel

(ft) Aper	dBd Gain	BWdth Pt Dir	Uptime Profile	ON flag
4.583	11.51	82;90	100%	ON•
4.583	13.41	86;90	100%	ON•
4.583	11.29	66;0	100%	ON•
4.583	14.65	65;0	100%	ON•
4.583	11.51	82;90	100%	ON•
4.583	13.41	86;90	100%	ON•
4.583	11.51	82;263	100%	ON•
4.583	13.41	86;263	100%	ON•
4.583	11.29	66;90	100%	ON•
4.583	14.65	65;90	100%	ON•
4.583	11.51	82;263	100%	ON•
4.583	13.41	86;263	100%	ON•
4.583	11.51	82;0	100%	ON•
4.583	13.41	86;0	100%	ON•
4.583	11.29	66;263	100%	ON•
4.583	14.65	65;263	100%	ON•
4.583	11.51	82;0	100%	ON•
4.583	13.41	86;0	100%	ON•

PROJECT INFORMATION

SCOPE OF WORK:	ITEMS TO BE MOUNTED ON THE EXISTING TOWER: (3) LTE ANTENNAS, (3) RRH'S & (3) A2 MODULES ITEMS TO BE INSTALLED INSIDE THE EXISTING AT&T EQUIPMENT AREA: (1) ARGUS CONVERTER MODULE & (1) LTE DUS ITEMS TO REMAIN: (3) UMTS ANTENNAS, (3) GSM ANTENNAS, (3) RRH'S, (6) TMA'S, (1) SURGE ARRESTOR, (2) DC POWER, (1) FIBER LINE & (12) LINES 1-5/8" COAX ITEMS TO BE REMOVED: (3) LTE ANTENNAS PTN: 2051A03KA1
SITE ADDRESS:	46 MEADOW RD CLINTON, CT 06413
LATITUDE:	41.2751981, 41° 13' 30.71316"
LONGITUDE:	-72.4977069, -72° 29' 51.74484"
USID:	59449
PROPERTY OWNER:	SBA TOWERS
TYPE OF SITE:	SELF-SUPPORT TOWER
TOWER HEIGHT:	195'-0"
RAD CENTER:	150'-0"
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

FA NUMBER: 10049127
SITE NUMBER: CTL02230
SITE ADDRESS: 48 MEADOW ROAD
CLINTON, CT 06413
SITE NAME: CLINTON MEADOW RD
SBA SITE ID: CT01879

PROJECT: LTE 2C

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	1997 ANNAPOLIS EXCHANGE PARKWAY, SUITE 200
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RF ENGINEER

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CONTACT:	CAMERON SYME
PHONE:	(508) 596-7146
E-MAIL:	cs6970@att.com

SITE ACQUISITION

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ADDRESS:	33 BOSTON POST ROAD WEST SUITE 210
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PHONE:	(774) 369-3618
E-MAIL:	todd.oliver@smartlink.com

CONSTRUCTION MANAGER

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CITY, STATE, ZIP:	MARLBOROUGH, MA 01752
CONTACT:	ROBERT PICARD
PHONE:	(774) 369-3618
E-MAIL:	robert.picard@smartlinkllc.com

ENGINEERING

COMPANY:	HUDSON DESIGN GROUP, LLC.
ADDRESS:	1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090
CITY, STATE, ZIP:	NORTH ANDOVER, MA 01845
CONTACT:	DANIEL P. HAMM, PE
PHONE:	(978) 557-5553
E-MAIL:	info@hudsondesigngroupllc.com

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & SHELTER PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATIONS	1
A-3	DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1
G-1	GROUNDING DETAILS	1

VICINITY MAP

DIRECTIONS TO SITE:

TURN RIGHT ONTO BOSTON POST RD WEST 1.1MI. TURN RIGHT ONTO BOUNDARY ST 1.0MI. TURN LEFT ONTO HUDSON ST 0.4MI. TURN RIGHT ONTO SOLOMON POND RD 0.7MI. USE LEFT 2 LANES TO MERGE ONTO I-290W TOWARD WORCESTER 0.4MI. MERGE ONTO I-290W 18.1MI. CONTINUE ONTO I-395S (ENTERING CONNECTICUT) 66.3MI. MERGE ONTO I-95S 17.4MI. TAKE EXIT 64 FOR CT-145/HORSE HILL RD TOWARD CLINTON 0.2MI. TURN LEFT ONTO CT-145/HORSE HILL RD 0.2MI. TURN RIGHT ONTO CT-145S 0.5MI. TURN LEFT ONTO STATE HWY 625 1.0MI. TURN RIGHT ONTO MEADOW RD 0.3MI. DESTINATION WILL BE ON THE RIGHT.

GENERAL NOTES

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

APPROVALS

DISCIPLINE:	SIGNATURE:	DATE:
THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.		
SMARTLINK SITE ACQUISITION:		
SMARTLINK CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455

OR CALL 811

UNDERGROUND SERVICE ALERT

Hudson Design Groupllc
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BUILDING 20 NORTH, SUITE 3090
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smartlink
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ANNAPOLIS, MD 21401

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MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/01/16	ISSUED FOR PERMITTING	MC	HC	DPH
0	01/11/16	ISSUED FOR REVIEW	MC	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT — DANIEL P. HAMM — No. 24178 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE 2C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02230	T-1	1

GROUNDING NOTES

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SMARTLINK
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

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

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

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

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

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

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

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

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

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

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

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

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

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

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

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

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

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

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

20. APPLICABLE BUILDING CODES:
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
    BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

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

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

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

    MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

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

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

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

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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1997 ANNAPOLIS EXCHANGE PKWY
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SITE NUMBER: CTL02230
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at&t
550 COCHITUATE ROAD
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NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	01/11/16	ISSUED FOR REVIEW	MC	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

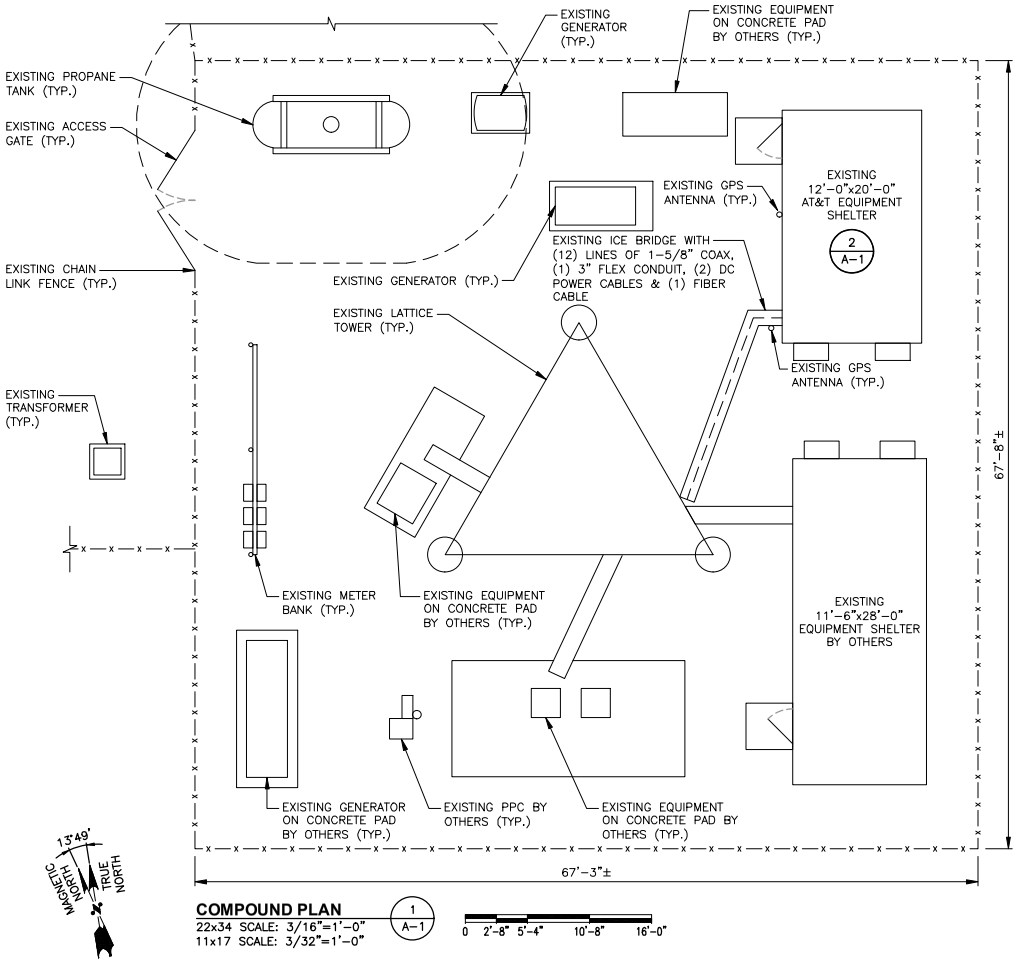
AT&T

GENERAL NOTES
(LTE 2C)

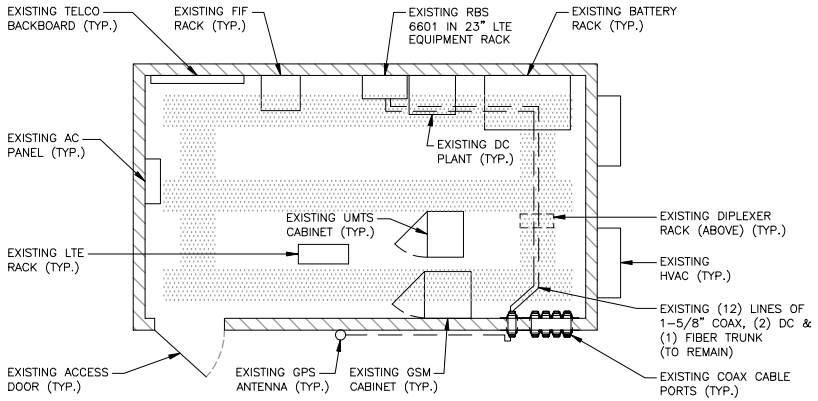
SITE NUMBER	DRAWING NUMBER	REV
CTL02230	GN-1	1

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS.

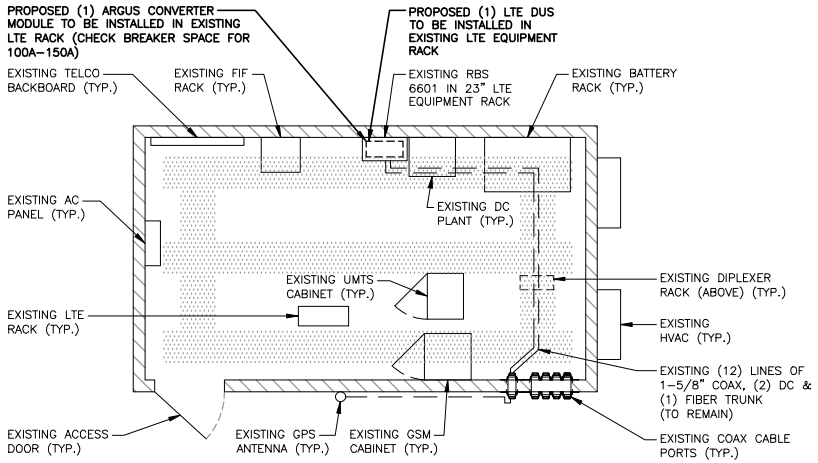
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



COMPOUND PLAN 1 A-1
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"



EXISTING EQUIPMENT PLAN 2 A-1
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"



PROPOSED EQUIPMENT PLAN 3 A-1
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

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SBA SITE ID: CT01879
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CLINTON, CT 06413
MIDDLESEX COUNTY

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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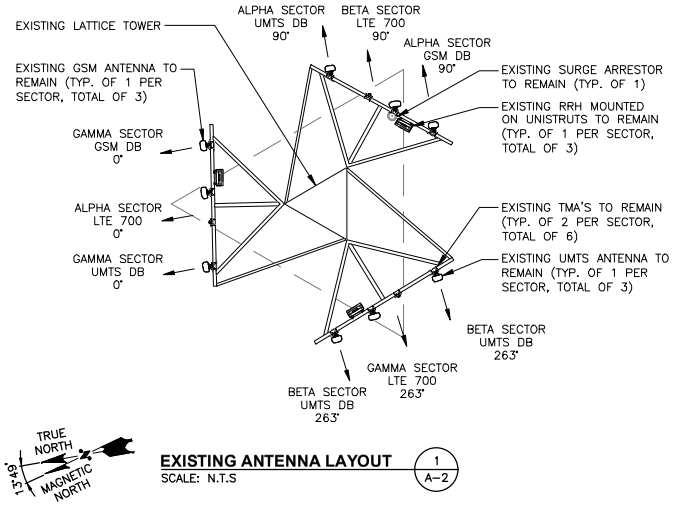
COMPOUND & SHELTER PLANS
(LTE 2C)

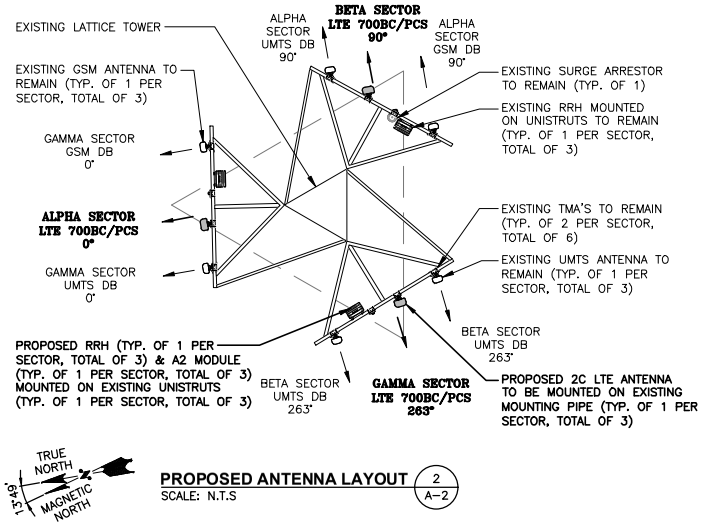
SITE NUMBER	DRAWING NUMBER	REV
CTL02230	A-1	1

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

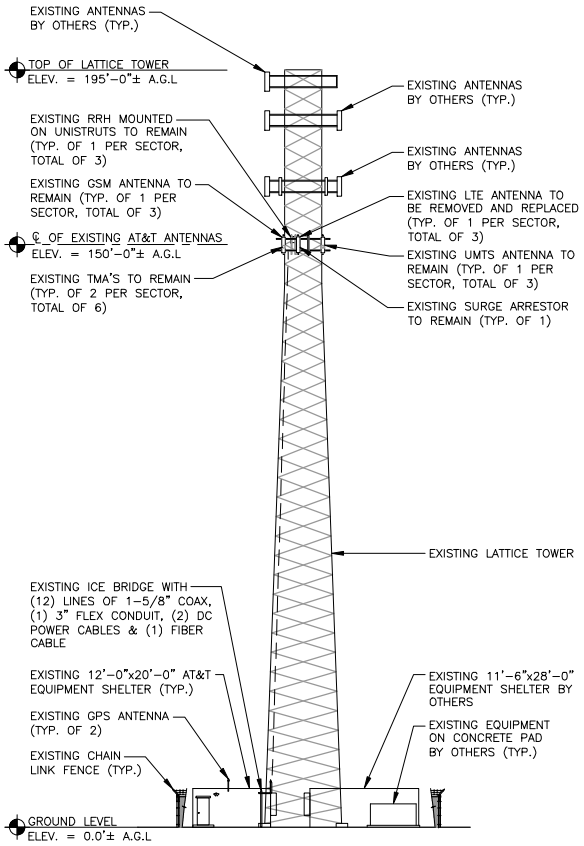
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS PROVIDED BY SBA TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS FOR TOWER TOP EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS.



EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S

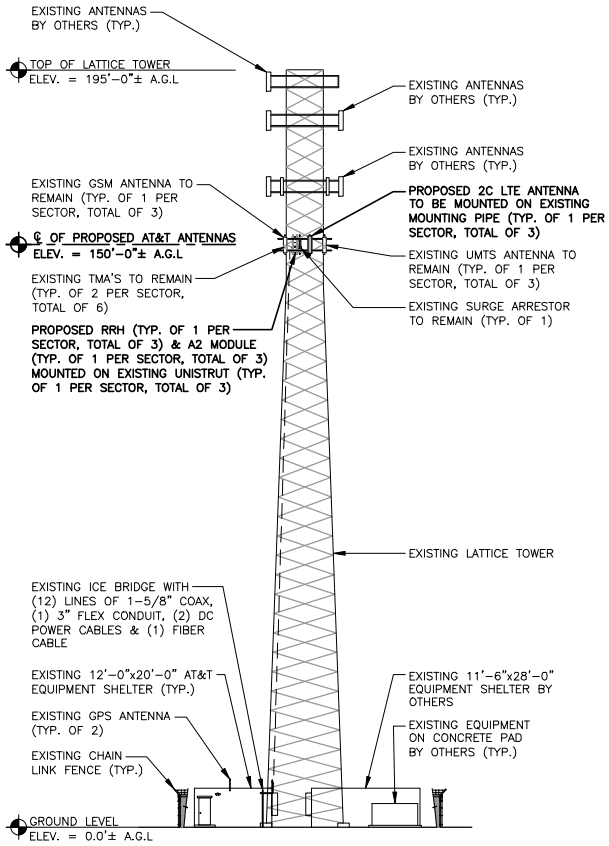


PROPOSED ANTENNA LAYOUT (2 / A-2)
SCALE: N.T.S



EXISTING WEST ELEVATION (3 / A-2)
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

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



PROPOSED WEST ELEVATION (4 / A-2)
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

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

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ANTENNA LAYOUTS & ELEVATIONS (LTE 2C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02230	A-2	1

STRUCTURAL NOTES:
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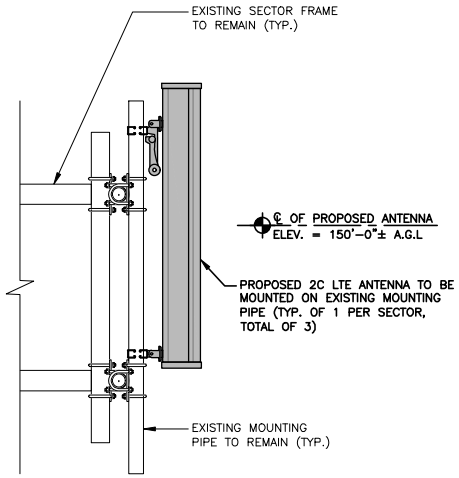
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

EXISTING & PROPOSED ANTENNA SCHEDULE

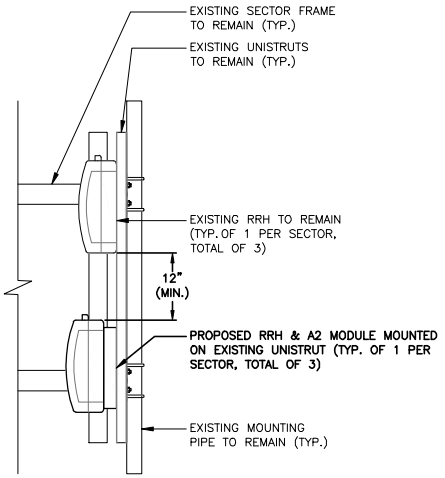
SECTOR	EXISTING/PROPOSED	RAD CENTER	AZIMUTH	MAKE	MODEL#	SIZE (INCHES)
ALPHA	EXISTING	150'-0"±	0°	POWERWAVE	7770	55.0x11.0x5.0
	PROPOSED	150'-0"±	0°	ANDREW	SBNHH-1D65A	55.0x11.9x7.1
	EXISTING	150'-0"±	0°	POWERWAVE	7770	55.0x11.0x5.0
BETA	EXISTING	150'-0"±	90°	POWERWAVE	7770	55.0x11.0x5.0
	PROPOSED	150'-0"±	90°	ANDREW	SBNHH-1D65A	55.0x11.9x7.1
	EXISTING	150'-0"±	90°	POWERWAVE	7770	55.0x11.0x5.0
GAMMA	EXISTING	150'-0"±	263°	POWERWAVE	7770	55.0x11.0x5.0
	PROPOSED	150'-0"±	263°	ANDREW	SBNHH-1D65A	55.0x11.9x7.1
	EXISTING	150'-0"±	263°	POWERWAVE	7770	55.0x11.0x5.0

EXISTING & PROPOSED RRU SCHEDULE

SECTOR	EXISTING/PROPOSED	MAKE	MODEL#	SIZE (INCHES)
ALPHA				
	EXISTING	ERICSSON	RRUS-11	19.7X17.0X7.2
	PROPOSED	ERICSSON	RRUS-11	19.7x17.0x7.2
	PROPOSED		RRUS-A2	16.4X15.2X3.4
BETA				
	EXISTING	ERICSSON	RRUS-11	19.7X17.0X7.2
	PROPOSED	ERICSSON	RRUS-11	19.7x17.0x7.2
	PROPOSED		RRUS-A2	16.4X15.2X3.4
GAMMA				
	EXISTING	ERICSSON	RRUS-11	19.7X17.0X7.2
	PROPOSED	ERICSSON	RRUS-11	19.7x17.0x7.2
	PROPOSED		RRUS-A2	16.4X15.2X3.4



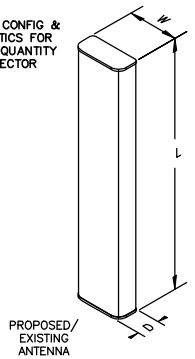
PROPOSED LTE ANTENNA MOUNTING DETAIL 1/A-3
SCALE: N.T.S



PROPOSED RRH MOUNTING DETAIL 2/A-3
SCALE: N.T.S

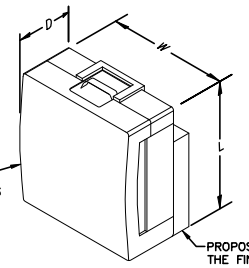
NOTES:

1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR MODEL, TYPE & QUANTITY REQUIRED PER SECTOR



PROPOSED ANTENNA DETAIL 3/A-3
SCALE: N.T.S

NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRH DETAIL 4/A-3
SCALE: N.T.S

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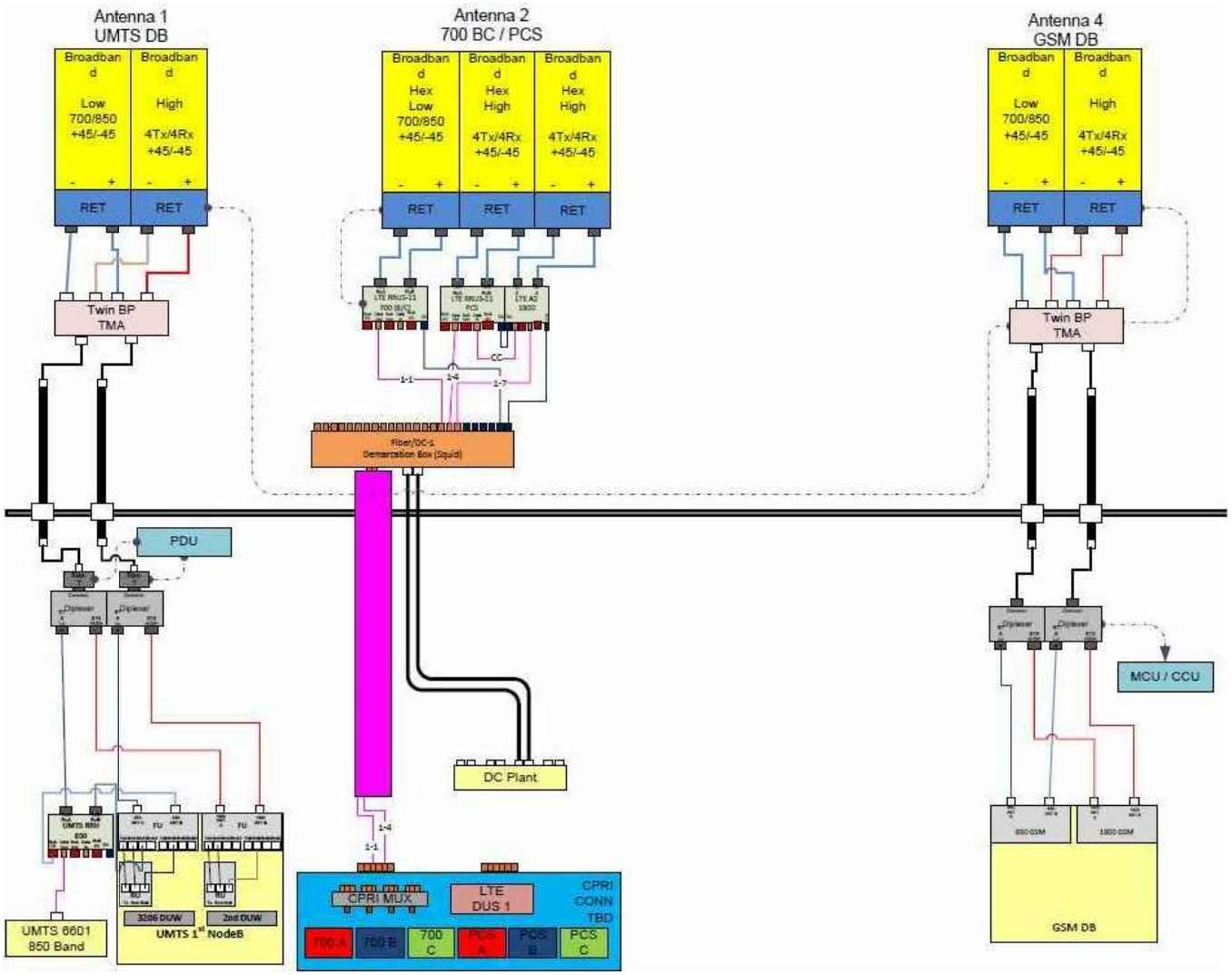
DETAILS
(LTE 2C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02230	A-4	1



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

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

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STATE OF CONNECTICUT

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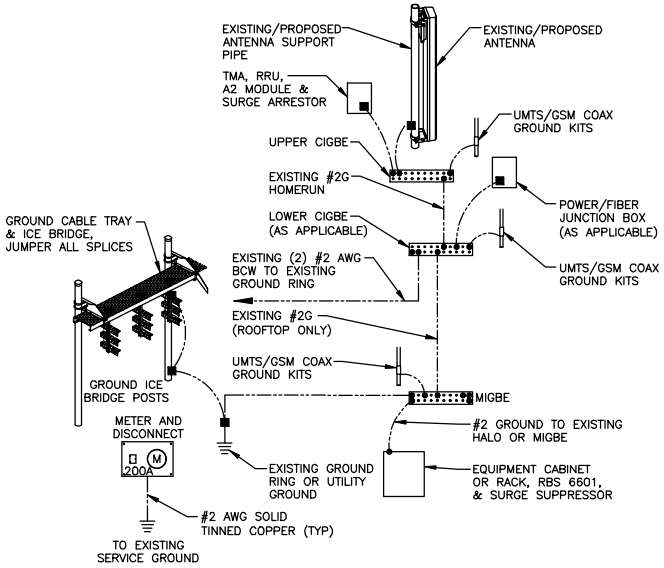
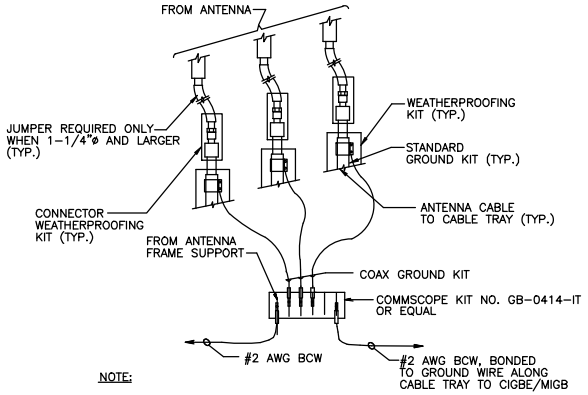
RF PLUMBING DIAGRAM
(LTE 2C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02230	RF–1	1

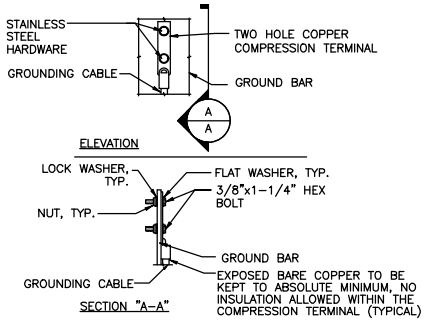


GROUNDING RISER DIAGRAM (1 / G-1)
SCALE: N.T.S



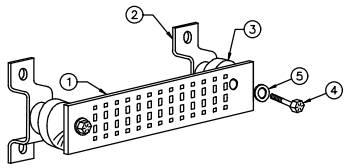
NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL (2 / G-1)
SCALE: N.T.S



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

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)
SCALE: N.T.S



GROUND BAR - DETAIL (4 / G-1)
SCALE: N.T.S

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

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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

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GROUNDING DETAILS
(LTE 2C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02230	G-1	1

FDH VELOCITEL
ENGINEERING INNOVATION

Structural Analysis for
SBA Network Services, Inc.

195.0' Self-Support (195.0' AGL)

SBA Site Name: Clinton 4 CT
SBA Site ID: CT01879-S-04
AT&T Site Name: Clinton-Meadow
AT&T Site ID: CTL02230
Site Address: 46 Meadow Road, Clinton, CT 06413-2212

FDH Velocitel Project Number 16BAOK1400

Analysis Results

Tower Components	99.8%	Sufficient
Foundation	58.7%	Sufficient

Prepared By:

Daniel Fling
Project Engineer I

Reviewed By:

Dennis D. Abel, PE
Director of Structural Engineering
CT License No. 23247

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive
Raleigh, NC, 27616
(919) 755-1012

STATE OF CONNECTICUT
DENNIS D. ABEL
No. 23247
LICENSED PROFESSIONAL ENGINEER

01-14-2016

January 14, 2016

Prepared pursuant to the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code

TABLE OF CONTENTS

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Velocitel performed a structural analysis of the existing Self-Support tower located in Clinton, CT to determine whether the tower is structurally adequate to support the antenna configuration in place per **Table 1** pursuant to the *TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code*. Information pertaining to the antenna loading, current tower geometry, member sizes, and below grade parameters was obtained from:

Source	Document Type	Reference	Date
Sabre Communications Corp.	Tower & Foundation Drawings	Job No. 00-10101	November 19, 1999
Jaworski Geotech, Inc.	Geotechnical Report	Job No. 99500G	December 13, 1999
FDH Engineering, Inc.	Modification Drawings	Project No. 1465YH1400	June 03, 2014
FDH Engineering, Inc.	Modification Inspection	Project No. 1466SS1400	February 13, 2015
FDH Engineering, Inc.	TIA Inspection	Project No. 1466SS1400	February 13, 2015
FDH Velocitel	Modification Drawings	Project No. 15BZTJ1400	September 24, 2015

The basic design wind speed per the TIA/EIA-222-F standards and the 2005 CSBC is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the antenna configuration in place per **Table 1** we have determined the tower stress level to be sufficient and the foundation(s) to be sufficient pursuant to the requirements stipulated by *TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code* provided the **Recommendations** listed below are satisfied. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Velocitel is accurate (i.e., the structure member information, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the current analysis standards are met with the antenna configuration in place per **Table 1**, we have the following recommendations:

1. Feed lines must be installed as shown in **Figure 1**.
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.
3. The proposed/existing TMAs should be installed directly behind the proposed/existing panel antennas.
4. The modification drawings listed in the FDH Velocitel Modification Drawings for a 195' Self-Support Tower (see FDH Velocitel Project No. 15BZTJ1400) dated September 24, 2015 must be installed correctly per the referenced drawings for this analysis to be valid.

APPURTENANCE LISTING

The antennas and equipment, with their corresponding feed lines, considered for this analysis are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Velocitel should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft.)	Description	Feed Lines	Carrier	Mount Elevation (ft.)	Mount Type
194	(3) Ericsson AIR B2A/B4P (3) Ericsson AIR B4A/B2P	(12) 1-5/8" (1) 1-5/8" Fiber	T-Mobile	192	(3) 13' T-Frames
193.5	(3) Ericsson KRY 112 144/1				
185	(1) Celwave PD1151	(1) 7/8"	Town of Clinton	178	Direct Mount
180	(3) RFS APXVTM14-C-I20 (3) Alcatel Lucent TD-RRH8x20-25 (3) RFS APXVSPP18-C-A20	(3) 1-1/4" Fiber	Sprint	178.5	(3) Pipe Mounts
177	(3) ALU 1900 MHZ RRUs			175	(3) 12' T-Frames
173.5	(3) ALU 800 MHZ RRUs (3) ALU 800 MHZ Filters (4) RFS ACU-A20-N				
162.5	(2) Antel LPA-80063/6CF	(10) 1-5/8" (2) 1-5/8" Fiber	Verizon	161	(3) 12' T-Frames
162	(4) Antel LPA-80063/4CF (6) Commscope SBNHH-1D65B (3) Alcatel Lucent RRH2X60-AWS (3) Alcatel Lucent RRH2X60-PCS (3) Alcatel Lucent RRH2x60-700 (6) RFS FD9R6004/2C-3L (2) RFS DB-T1-6Z-8AB-0Z				
151.5	(1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 1/2" Fiber* (2) 3/4" DC Power*	AT&T	150.5	(3) 12' T-Frames
150.5	(3) Powerwave 7770 (9) KMW AM-X-CD-14-65-00T (3) Andrew SBNHH-1D65A (6) Powerwave TT19-08BP111-001 (6) Ericsson RRUS-11			150	
141.5	(3) Sinclair SD312HL	(3) 7/8"	Town of Clinton	138	(3) 4' Standoffs
102	(1) Radiowaves RDH4518A	(2) CAT 5e		101	(1) Pipe Mount

Proposed Carrier Final Loading:

Antenna Elevation (ft.)	Description	Feed Lines	Carrier	Mount Elevation (ft.)	Mount Type
151.5	(1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 1/2" Fiber* (2) 3/4" DC Power*	AT&T	150.5	(3) 12' T-Frames
150.5	(6) Powerwave 7770 (3) KMW AMXCD1465 (3) Andrew SBNHH-1D65A (6) Powerwave TT19-08BP111-001 TMA (12) Powerwave 7020.00 RET (6) Ericsson RRUS 11 (3) Ericsson RRU A2			150	

*Located inside of 3" Conduit

RESULTS

The following material grades for individual members were used for analysis:

Table 2 - Material Grade

Member Type	Material Grade
Tower Legs	A572-50
Tower Bracing	A36

Table 3 and **Table 4** display the summary of capacities for the analyzed structure and its additional components. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 5** displays the maximum dish rotations at service winds speeds.

If the assumptions outlined in this report differ from actual field conditions, FDH Velocitel should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 - Structure Member Capacities

Section No.	Elevation (ft.)	Component Type	Size	% Capacity	Pass / Fail
T1	195 - 180	Leg	P2x.154 (2.38 OD)	28.9	Pass
T2	180 - 160	Leg	P3x.216 (3.5 OD)	48.0	Pass
T3	160 - 140	Leg	P3x.300 (3.50 OD)	78.2	Pass
T4	140 - 120	Leg	P4x.337 (4.50 OD)	80.7	Pass
T5	120 - 113.333	Leg	P5x.375 (5.5625 OD)	62.9	Pass
T6	113.333 - 106.667	Leg	P5x.375 (5.5625 OD)	68.4	Pass
T7	106.667 - 100	Leg	P5x.375 (5.5625 OD)	73.8	Pass
T8	100 - 80	Leg	P6x.28 (6.625 OD)	94.1	Pass
T9	80 - 70	Leg	P6x.432 (6.625 OD)	75.6	Pass
T10	70 - 60	Leg	P6x.432 (6.625 OD)	81.4	Pass
T11	60 - 50	Leg	P8x.322 (8.625 OD)	80.1	Pass
T12	50 - 40	Leg	P8x.322 (8.625 OD)	85.3	Pass
T13	40 - 20	Leg	P8x.322 (8.625 OD)	95.5	Pass
T14	20 - 10	Leg	P8x.5 (8.625 OD)	64.7	Pass
T15	10 - 0	Leg	P8x.5 (8.625 OD)	69.7	Pass
T1	195 - 180	Diagonal	L1 3/4x1 3/4x3/16	19.6 26.4 (b)	Pass
T2	180 - 160	Diagonal	L1 3/4x1 3/4x3/16	56.9	Pass
T3	160 - 140	Diagonal	L2x2x3/16	93.3	Pass
T4	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	79.1	Pass
T5	120 - 113.333	Diagonal	L2 1/2x2 1/2x3/16	84.6	Pass
T6	113.333 - 106.667	Diagonal	L2 1/2x2 1/2x3/16	93.8	Pass
T7	106.667 - 100	Diagonal	L2 1/2x2 1/2x1/4	80.6	Pass
T8	100 - 80	Diagonal	L3x3x3/16	79.3	Pass
T9	80 - 70	Diagonal	L3x3x1/4	93.4	Pass
T10	70 - 60	Diagonal	L3x3x3/8	72.7	Pass
T11	60 - 50	Diagonal	L3x3 1/2x1/4	91.9	Pass
T12	50 - 40	Diagonal	L3x3x3/8	91.1	Pass
T13	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	99.8	Pass
T14	20 - 10	Diagonal	L3 1/2x4x1/4	90.5	Pass
T15	10 - 0	Diagonal	L4x4x1/4	82.4	Pass
T1	195 - 180	Top Girt	L1 3/4x1 3/4x3/16	4.5	Pass
T2	180 - 160	Top Girt	L1 3/4x1 3/4x3/16	4.7	Pass

1. Capacities include 1/3 allowable stress increase for wind, per TIA/EIA-222-F standards.

Table 4 – Additional Structure Component Capacities

Elevation (ft.)	Component	% Capacity	Pass / Fail	Notes
0	Anchor Rods	66.7	Pass	1
0	Base Foundation (Soil Interaction)	56.6	Pass	1
0	Base Foundation (Structural)	27.8	Pass	1

Table 5 - Maximum Dish Rotations at Service Wind Speeds

Centerline Elevation (ft.)	Dish	Tilt (deg)*	Twist (deg)*
102	(1) RDH4518A	0.1766	0.0030

*Allowable tilt and twist to be reviewed by the carrier.

GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Velocitel should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Velocitel.

APPENDIX

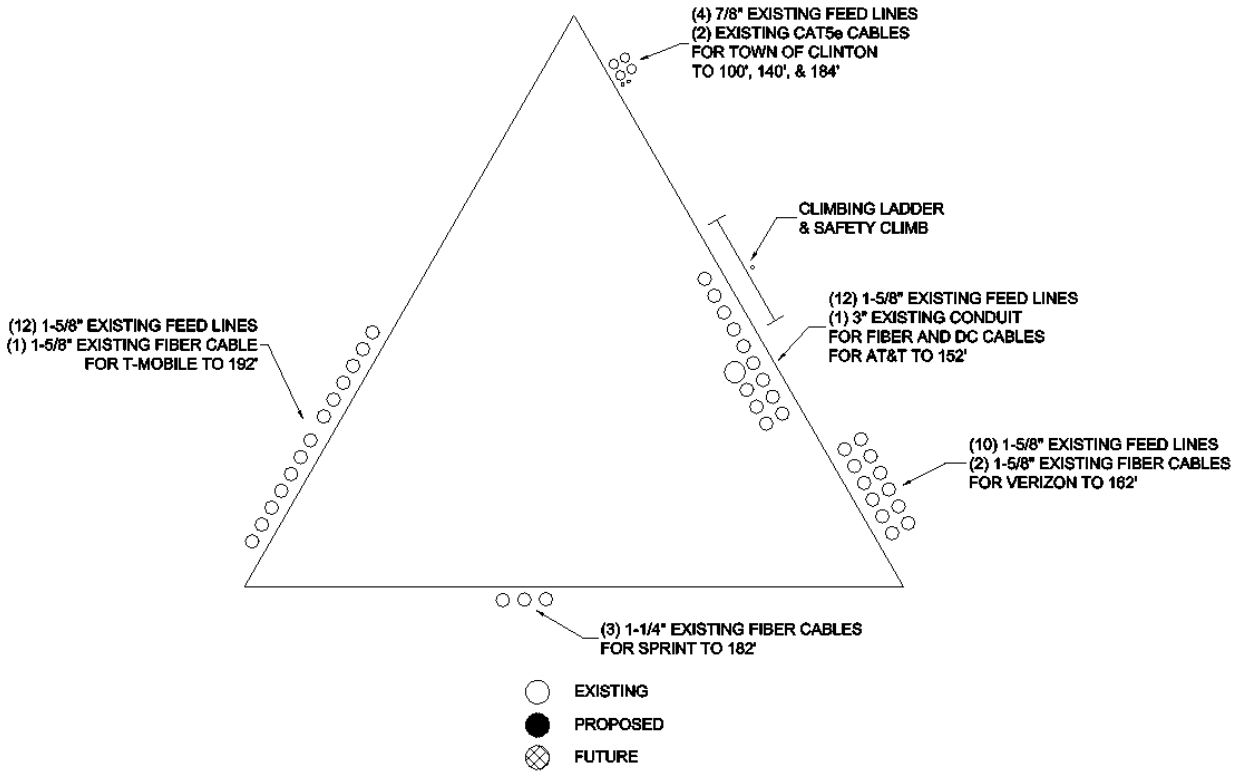
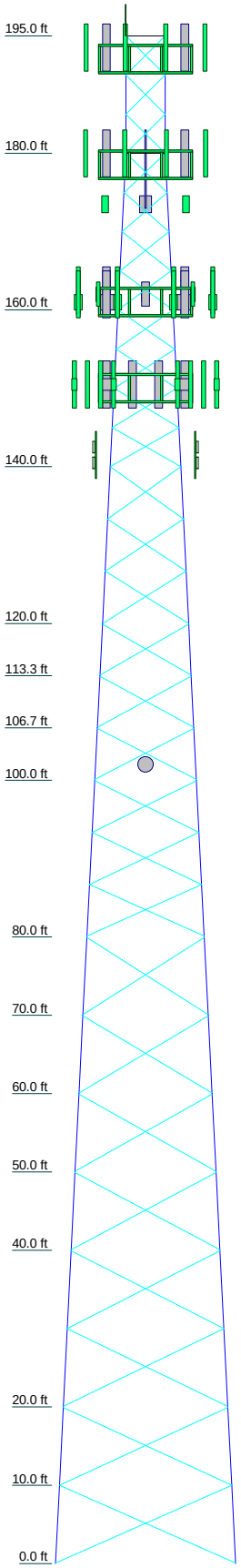


Figure 1 – Feedline Layout

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15		
Legs	P2x.154 (2.38 OD)	P3x.216 (3.5 OD)	P3x.300 (3.50 OD)	P4x.337 (4.50 OD)	P5x.375 (5.5625 OD)			P6x.28 (6.625 OD)	P6x.432 (6.625 OD)			P8x.322 (8.625 OD)			P8x.5 (8.625 OD)		
Leg Grade	A572-50																
Diagonals	L1 3/4x1 3/4x3/16		L2x2x3/16	L2 1/2x2 1/2x3/16			A	L3x3x3/16	L3x3x1/4	L3x3x3/8	L3x3 1/2x1/4	L3x3x3/8	L3 1/2x3 1/2x1/4	L3 1/2x4x1/4	L4x4x1/4		
Diagonal Grade	A36																
Top Girts	L1 3/4x1 3/4x3/16						N.A.										
Face Width (ft)	5		7	9	11	11.6667	12.3333	13	15	16	17	18	19	21	22	23	
# Panels @ (ft)	11 @ 5			3 @ 6.66667		3 @ 6.5		3 @ 6.61111	4 @ 9.83333					4 @ 9.91667			
Weight (K)	0.5	0.9	1.2	1.6	0.7	0.7	0.8	2.2	1.4	1.7	1.5	1.8	3.3	2.2	2.3	22.4	



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x1/4		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.8%

MAX. CORNER REACTIONS AT BASE:

DOWN: 303 K
SHEAR: 32 K

UPLIFT: -268 K
SHEAR: 28 K

AXIAL
80 K

SHEAR
15 K

MOMENT
1709 kip-ft

TORQUE 3 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL
40 K

SHEAR
51 K

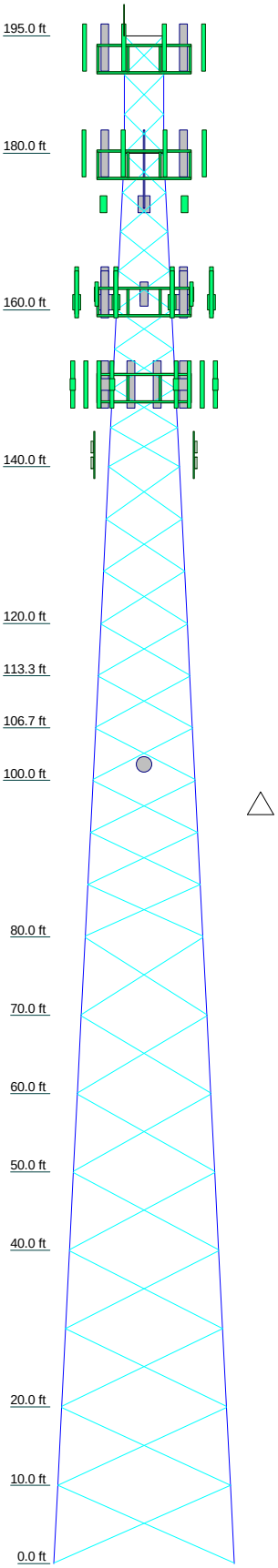
MOMENT
5762 kip-ft

TORQUE 9 kip-ft
REACTIONS - 85 mph WIND

FDH Velocitel
222 S. Central Ave., Suite 1110
St. Louis, MO 63105
Phone: 314.773.4000
FAX:
Tower Analysis

Job: **CT01879-S**			
Project: **16BAOK1400**			
Client: SBA Network Services, Inc.	Drawn by: DFling		App'd:
Code: TIA/EIA-222-F	Date: 01/14/16		Scale: NTS
Path:			Dwg No. E-1

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	P2x.154 (2.38 OD)		L1 3/4x1 3/4x3/16		L1 3/4x1 3/4x3/16	5	11 @ 5	0.5
T2	P3x.216 (3.5 OD)							0.9
T3	P3x.300 (3.50 OD)		L2x2x3/16			7		1.2
T4	P4x.337 (4.50 OD)		L2 1/2x2 1/2x3/16			9	3 @ 6.66667	1.6
T5	P5x.375 (5.5625 OD)					11		0.7
T6			A			11.6667	3 @ 6.5	0.7
T7		A572-50		A36	N.A.	12.3333		0.8
T8	P6x.28 (6.625 OD)		L3x3x3/16			13	3 @ 6.61111	2.2
T9	P6x.432 (6.625 OD)		L3x3x1/4			15	4 @ 9.83333	1.4
T10			L3x3x3/8			16		1.7
T11	P8x.322 (8.625 OD)		L3x3 1/2x1/4			17		1.5
T12			L3x3x3/8			18		1.8
T13			L3 1/2x3 1/2x1/4			19	4 @ 9.91667	3.3
T14	P8x.5 (8.625 OD)		L3 1/2x4x1/4			21		2.2
T15			L4x4x1/4			22		2.3
						23		22.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	195	(2) SBNHH-1D65B w/ Mount Pipe	161
AIR 21 B2A/B4P	192	(2) SBNHH-1D65B w/ Mount Pipe	161
AIR 21 B2A/B4P	192	RRH2X60-AWS	161
AIR 21 B2A/B4P	192	RRH2X60-AWS	161
AIR 21 B4A/B2P	192	RRH2X60-AWS	161
AIR 21 B4A/B2P	192	RRH2X60-PCS	161
AIR 21 B4A/B2P	192	RRH2X60-PCS	161
KRY 112 144/1	192	RRH2X60-PCS	161
KRY 112 144/1	192	RRH2x60-700	161
KRY 112 144/1	192	RRH2x60-700	161
(3) T-Frames	192	RRH2x60-700	161
APXVTM14-C-I20	178.5	(2) FD9R6004/2CL-3CL Diplexer	161
APXVTM14-C-I20	178.5	(2) FD9R6004/2CL-3CL Diplexer	161
APXVTM14-C-I20	178.5	(2) FD9R6004/2CL-3CL Diplexer	161
TD-RRH8x20-25	178.5	DC6-48-60-18-8F	150.5
TD-RRH8x20-25	178.5	AMXCD1465 w/ Mount Pipe	150
TD-RRH8x20-25	178.5	AMXCD1465 w/ Mount Pipe	150
APXVSPP18-C-A20	178.5	AMXCD1465 w/ Mount Pipe	150
APXVSPP18-C-A20	178.5	(2) 7722.00	150
APXVSPP18-C-A20	178.5	(2) 7722.00	150
(3) T-Frames	178.5	(2) 7722.00	150
PD1151	178	(2) TT19-08BP111-001 TMA	150
1900 MHz RRU	175	(2) TT19-08BP111-001 TMA	150
1900 MHz RRU	175	(2) TT19-08BP111-001 TMA	150
800 MHz RRU	175	(2) RRUS-11	150
800 MHz RRU	175	(2) RRUS-11	150
800 MHz RRU	175	(2) RRUS-11	150
800 MHz Filter	175	(3) T-Frames	150
800 MHz Filter	175	SBNHH-1D65A	150
800 MHz Filter	175	SBNHH-1D65A	150
(2) ACU-A20-N RET	175	SBNHH-1D65A	150
ACU-A20-N RET	175	(4) 7020.00	150
ACU-A20-N RET	175	(4) 7020.00	150
1900 MHz RRU	175	(4) 7020.00	150
(2) LPA-80063/4CF w/ Mount Pipe	161	RRU A2	150
LPA-80063/4CF w/ Mount Pipe	161	RRU A2	150
LPA-80063/4CF w/ Mount Pipe	161	RRU A2	150
LPA-80063/6CF w/ Mount Pipe	161	Sinclair SD312HL	138
LPA-80063/6CF w/ Mount Pipe	161	Sinclair SD312HL	138
(2) DB-T1-6Z-8AB-0Z	161	(3) Standoffs	138
(2) DB-T1-6Z-8AB-0Z	161	Sinclair SD312HL	138
(2) DB-T1-6Z-8AB-0Z	161	Pipe Mount	101
(3) T-Frames	161	RDH4518A	101
(2) SBNHH-1D65B w/ Mount Pipe	161		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x1/4		

FDH Velocitel
222 S. Central Ave., Suite 1110
St. Louis, MO 63105
Phone: 314.773.4000
FAX:

Tower Analysis

Job: CT01879-S			
Project: 16BAOK1400			
Client: SBA Network Services, Inc.	Drawn by: DFling	App'd:	
Code: TIA/EIA-222-F	Date: 01/14/16	Scale: NTS	
Path:		Dwg No. E-1	

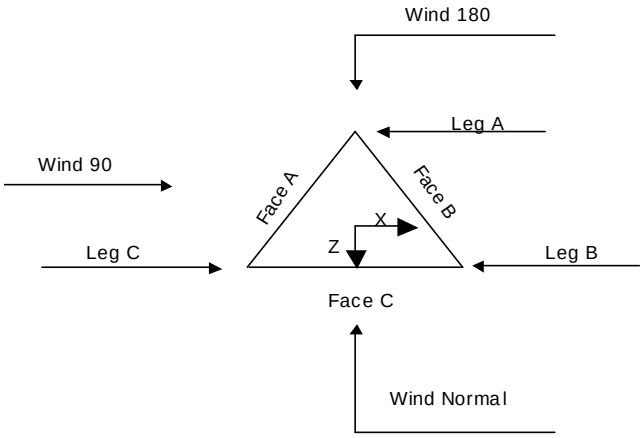
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 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 5.00 ft at the top and 23.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
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		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate	√	Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension	√	All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.	√	Include Angle Block Shear Check
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	195.00-180.00			5.00	1	15.00
T2	180.00-160.00			5.00	1	20.00
T3	160.00-140.00			7.00	1	20.00
T4	140.00-120.00			9.00	1	20.00
T5	120.00-113.33			11.00	1	6.67
T6	113.33-106.67			11.67	1	6.67
T7	106.67-100.00			12.33	1	6.67
T8	100.00-80.00			13.00	1	20.00
T9	80.00-70.00			15.00	1	10.00
T10	70.00-60.00			16.00	1	10.00
T11	60.00-50.00			17.00	1	10.00
T12	50.00-40.00			18.00	1	10.00
T13	40.00-20.00			19.00	1	20.00
T14	20.00-10.00			21.00	1	10.00
T15	10.00-0.00			22.00	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	195.00-180.00	5.00	X Brace	No	No	0.0000	0.0000
T2	180.00-160.00	5.00	X Brace	No	No	0.0000	0.0000
T3	160.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T5	120.00-113.33	6.50	X Brace	No	No	1.0000	1.0000
T6	113.33-106.67	6.50	X Brace	No	No	1.0000	1.0000
T7	106.67-100.00	6.50	X Brace	No	No	1.0000	1.0000
T8	100.00-80.00	6.61	X Brace	No	No	1.0000	1.0000
T9	80.00-70.00	9.83	X Brace	No	No	1.0000	1.0000
T10	70.00-60.00	9.83	X Brace	No	No	1.0000	1.0000
T11	60.00-50.00	9.83	X Brace	No	No	1.0000	1.0000
T12	50.00-40.00	9.83	X Brace	No	No	1.0000	1.0000
T13	40.00-20.00	9.92	X Brace	No	No	1.0000	1.0000
T14	20.00-10.00	9.92	X Brace	No	No	1.0000	0.0000
T15	10.00-0.00	9.92	X Brace	No	No	0.0000	1.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 195.00-180.00	Pipe	P2x.154 (2.38 OD)	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 180.00-160.00	Pipe	P3x.216 (3.5 OD)	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 160.00-140.00	Pipe	P3x.300 (3.50 OD)	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 140.00-120.00	Pipe	P4x.337 (4.50 OD)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 120.00-113.33	Pipe	P5x.375 (5.5625 OD)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 113.33-106.67	Pipe	P5x.375 (5.5625 OD)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 106.67-100.00	Pipe	P5x.375 (5.5625 OD)	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T8 100.00-80.00	Pipe	P6x.28 (6.625 OD)	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T9 80.00-70.00	Pipe	P6x.432 (6.625 OD)	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T10 70.00-60.00	Pipe	P6x.432 (6.625 OD)	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T11 60.00-50.00	Pipe	P8x.322 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L3x3 1/2x1/4	A36 (36 ksi)
T12 50.00-40.00	Pipe	P8x.322 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T13 40.00-20.00	Pipe	P8x.322 (8.625 OD)	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T14 20.00-10.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L3 1/2x4x1/4	A36 (36 ksi)
T15 10.00-0.00	Pipe	P8x.5 (8.625 OD)	A572-50 (50 ksi)	Single Angle	L4x4x1/4	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 195.00-180.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 195.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-113.33	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 113.33-106.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 106.67-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 80.00-70.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 70.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T12 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T13 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T14 20.00-10.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T15 10.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	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	No	1	1	1	1	1	1	1	1
195.00-180.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
120.00-113.33				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
113.33-106.67				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
106.67-100.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
80.00-70.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
70.00-60.00				1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1
60.00-50.00				1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1
50.00-40.00				1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1
20.00-10.00				1	1	1	1	1	1	1
T15	Yes	No	1	1	1	1	1	1	1	1
10.00-0.00				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	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
195.00-180.00														
T2	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
180.00-160.00														
T3	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
160.00-140.00														
T4	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
140.00-120.00														
T5	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
120.00-113.33														
T6	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
113.33-106.67														

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
T7 106.67-100.00	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
T8 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
T9 80.00-70.00	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
T10 70.00-60.00	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
T11 60.00-50.00	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
T12 50.00-40.00	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
T13 40.00-20.00	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
T14 20.00-10.00	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
T15 10.00-0.00	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 195.00-180.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-113.33	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 113.33-106.67	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 106.67-100.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 100.00-80.00	Flange	0.7500 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 80.00-70.00	Flange	0.7500 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 70.00-60.00	Flange	0.7500 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 60.00-50.00	Flange	0.7500 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 50.00-40.00	Flange	0.7500 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 40.00-20.00	Flange	0.7500 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 20.00-10.00	Flange	1.5000 A572-50	8	0.7500 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

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.
T15 10.00-0.00	Flange	1.5000 A572-50	8	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8")	A	Yes	Ar (CfAe)	192.00 - 10.00	0.0000	-0.15	7	7	0.5000	1.9800		0.82
LDF7-50A(1-5/8")	A	Yes	Ar (CfAe)	192.00 - 10.00	0.0000	-0.05	6	6	0.5000	1.9800		0.82
Feedline Ladder (Af) ***	A	Yes	Af (CfAe)	192.00 - 10.00	0.0000	-0.1	1	1	0.5000	1.0000	2.5000	4.20
AL5-50(7/8") ***	B	Yes	Ar (CfAe)	184.00 - 140.00	0.0000	-0.3	1	1	0.2500	1.1000		0.26
VXL6-50(1-1/4")	C	Yes	Ar (CfAe)	182.00 - 10.00	0.0000	0.1	4	4	0.5000	1.5500		0.50
Feedline Ladder (Af) ***	C	Yes	Af (CfAe)	182.00 - 10.00	0.0000	0.1	1	1	0.5000	1.0000	2.5000	4.20
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	152.00 - 10.00	-2.0000	0.2	12	9	0.5000	1.9800		0.82
3" Conduit	B	Yes	Ar (CfAe)	152.00 - 10.00	-4.0000	0.2	1	1	2.5000	2.7500		1.00
Feedline Ladder (Af)	B	Yes	Af (CfAe)	152.00 - 10.00	-2.0000	0.2	1	1	0.5000	1.0000	2.5000	4.20
ASU9328TYP01(3/4")	B	Yes	Ar (CfAe)	152.00 - 10.00	-4.0000	0.2	2	2	0.2500	0.7000		0.30
FSJ4-50B(1/2") ***	C	Yes	Ar (CfAe)	152.00 - 10.00	-4.0000	0.2	1	1	0.2500	0.5200		0.14
AL5-50(7/8")	B	Yes	Ar (CfAe)	140.00 - 10.00	0.0000	-0.3	4	2	0.2500	1.1000		0.26
CATEGORY 5e (1 WIRE) ***	B	Yes	Ar (CfAe)	100.00 - 10.00	0.0000	-0.29	2	1	0.2500	1.0000		0.21
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	162.00 - 10.00	0.0000	0.25	12	6	0.5000	1.9800		0.82
Feedline Ladder (Af) *	B	Yes	Af (CfAe)	162.00 - 10.00	0.0000	0.25	1	1	0.5000	1.0000	2.5000	4.20
Climbing Ladder	B	Yes	Af (CfAe)	195.00 - 10.00	0.0000	0	1	1	0.5000	1.0000	2.5000	4.20
Safety Line 3/8	B	Yes	Ar (CfAe)	195.00 - 10.00	0.0000	0	1	1	0.2500	0.3750		0.22

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	195.00-180.00	A	25.740	1.000	0.000	0.000	0.18
		B	0.835	1.250	0.000	0.000	0.07
		C	1.033	0.167	0.000	0.000	0.01
T2	180.00-160.00	A	42.900	1.667	0.000	0.000	0.30
		B	4.438	1.833	0.000	0.000	0.12
		C	10.333	1.667	0.000	0.000	0.12
T3	160.00-140.00	A	42.900	1.667	0.000	0.000	0.30
		B	44.228	4.333	0.000	0.000	0.56
		C	10.853	1.667	0.000	0.000	0.13
T4	140.00-120.00	A	42.900	1.667	0.000	0.000	0.30
		B	60.708	5.000	0.000	0.000	0.70
		C	11.200	1.667	0.000	0.000	0.13
T5	120.00-113.33	A	14.300	0.556	0.000	0.000	0.10
		B	20.236	1.667	0.000	0.000	0.23
		C	3.733	0.556	0.000	0.000	0.04
T6	113.33-106.67	A	14.300	0.556	0.000	0.000	0.10
		B	20.236	1.667	0.000	0.000	0.23
		C	3.733	0.556	0.000	0.000	0.04
T7	106.67-100.00	A	14.300	0.556	0.000	0.000	0.10
		B	20.236	1.667	0.000	0.000	0.23
		C	3.733	0.556	0.000	0.000	0.04
T8	100.00-80.00	A	42.900	1.667	0.000	0.000	0.30
		B	62.375	5.000	0.000	0.000	0.71
		C	11.200	1.667	0.000	0.000	0.13
T9	80.00-70.00	A	21.450	0.833	0.000	0.000	0.15
		B	31.188	2.500	0.000	0.000	0.36
		C	5.600	0.833	0.000	0.000	0.06
T10	70.00-60.00	A	21.450	0.833	0.000	0.000	0.15
		B	31.188	2.500	0.000	0.000	0.36
		C	5.600	0.833	0.000	0.000	0.06
T11	60.00-50.00	A	21.450	0.833	0.000	0.000	0.15
		B	31.188	2.500	0.000	0.000	0.36
		C	5.600	0.833	0.000	0.000	0.06
T12	50.00-40.00	A	21.450	0.833	0.000	0.000	0.15
		B	31.188	2.500	0.000	0.000	0.36
		C	5.600	0.833	0.000	0.000	0.06
T13	40.00-20.00	A	42.900	1.667	0.000	0.000	0.30
		B	62.375	5.000	0.000	0.000	0.71
		C	11.200	1.667	0.000	0.000	0.13
T14	20.00-10.00	A	21.450	0.833	0.000	0.000	0.15
		B	31.187	2.500	0.000	0.000	0.36
		C	5.600	0.833	0.000	0.000	0.06
T15	10.00-0.00	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

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	195.00-180.00	A	0.924	7.655	29.512	0.000	0.000	0.61
		B		3.761	2.790	0.000	0.000	0.13
		C		0.566	1.397	0.000	0.000	0.03
T2	180.00-160.00	A	0.913	12.687	49.162	0.000	0.000	1.01
		B		9.180	6.132	0.000	0.000	0.29
		C		5.627	13.946	0.000	0.000	0.34
T3	160.00-140.00	A	0.899	12.596	49.132	0.000	0.000	1.00

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
		B		25.579	50.987	0.000	0.000	1.62
		C		7.900	13.915	0.000	0.000	0.36
T4	140.00-120.00	A	0.884	12.494	49.098	0.000	0.000	0.99
		B		32.491	68.461	0.000	0.000	2.08
		C		9.344	13.881	0.000	0.000	0.36
T5	120.00-113.33	A	0.873	4.139	16.358	0.000	0.000	0.33
		B		10.754	22.795	0.000	0.000	0.69
		C		3.089	4.619	0.000	0.000	0.12
T6	113.33-106.67	A	0.867	4.126	16.353	0.000	0.000	0.33
		B		10.713	22.781	0.000	0.000	0.69
		C		3.076	4.614	0.000	0.000	0.12
T7	106.67-100.00	A	0.860	4.111	16.348	0.000	0.000	0.33
		B		10.670	22.767	0.000	0.000	0.68
		C		3.061	4.609	0.000	0.000	0.12
T8	100.00-80.00	A	0.846	12.240	49.013	0.000	0.000	0.97
		B		36.214	68.206	0.000	0.000	2.12
		C		9.090	13.797	0.000	0.000	0.35
T9	80.00-70.00	A	0.828	6.059	24.486	0.000	0.000	0.48
		B		17.893	34.042	0.000	0.000	1.05
		C		4.484	6.878	0.000	0.000	0.17
T10	70.00-60.00	A	0.814	6.012	24.471	0.000	0.000	0.47
		B		17.729	33.995	0.000	0.000	1.04
		C		4.437	6.862	0.000	0.000	0.17
T11	60.00-50.00	A	0.797	5.958	24.453	0.000	0.000	0.47
		B		17.541	33.941	0.000	0.000	1.02
		C		4.383	6.844	0.000	0.000	0.17
T12	50.00-40.00	A	0.778	5.895	24.432	0.000	0.000	0.46
		B		17.319	33.878	0.000	0.000	1.01
		C		4.320	6.823	0.000	0.000	0.17
T13	40.00-20.00	A	0.750	11.600	48.800	0.000	0.000	0.90
		B		33.975	67.567	0.000	0.000	1.98
		C		8.450	13.583	0.000	0.000	0.33
T14	20.00-10.00	A	0.750	5.800	24.400	0.000	0.000	0.45
		B		16.987	33.783	0.000	0.000	0.99
		C		4.225	6.792	0.000	0.000	0.16
T15	10.00-0.00	A	0.750	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

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	195.00-180.00	A	0.000	3.679	2.466	3.484
		B	0.000	0.713	0.192	0.675
		C	0.000	0.201	0.111	0.191
T2	180.00-160.00	A	0.000	5.482	3.724	5.254
		B	0.000	1.433	0.524	1.373
		C	0.000	1.795	1.003	1.720
T3	160.00-140.00	A	0.000	4.444	3.510	4.940
		B	0.000	5.608	3.825	6.235
		C	0.000	1.616	0.986	1.797
T4	140.00-120.00	A	0.000	3.328	3.352	4.706
		B	0.000	5.527	4.942	7.814
		C	0.000	1.288	0.968	1.821
T5	120.00-113.33	A	0.000	1.047	1.070	1.500

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		B	0.000	1.736	1.578	2.487
		C	0.000	0.404	0.309	0.579
T6	113.33-106.67	A	0.000	1.025	1.056	1.478
		B	0.000	1.698	1.557	2.449
		C	0.000	0.395	0.305	0.569
T7	106.67-100.00	A	0.000	1.004	1.044	1.460
		B	0.000	1.662	1.539	2.416
		C	0.000	0.386	0.301	0.561
T8	100.00-80.00	A	0.000	2.910	3.698	5.160
		B	0.000	5.018	5.590	8.898
		C	0.000	1.115	1.068	1.977
T9	80.00-70.00	A	0.000	1.013	1.319	1.836
		B	0.000	1.742	1.995	3.157
		C	0.000	0.386	0.381	0.700
T10	70.00-60.00	A	0.000	0.977	1.297	1.800
		B	0.000	1.676	1.961	3.089
		C	0.000	0.371	0.374	0.684
T11	60.00-50.00	A	0.000	0.941	1.278	1.769
		B	0.000	1.610	1.932	3.029
		C	0.000	0.356	0.369	0.669
T12	50.00-40.00	A	0.000	0.904	1.262	1.742
		B	0.000	1.543	1.907	2.972
		C	0.000	0.340	0.364	0.655
T13	40.00-20.00	A	0.000	1.709	2.902	3.988
		B	0.000	2.904	4.387	6.775
		C	0.000	0.638	0.838	1.489
T14	20.00-10.00	A	0.000	0.843	1.431	1.967
		B	0.000	1.432	2.164	3.342
		C	0.000	0.315	0.413	0.734
T15	10.00-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	195.00-180.00	-6.7780	-1.4341	-3.2728	-1.1173
T2	180.00-160.00	-7.3249	-0.0447	-3.8894	-0.6045
T3	160.00-140.00	1.0609	1.1789	1.3149	0.3762
T4	140.00-120.00	3.8148	1.1826	3.1680	1.2619
T5	120.00-113.33	4.0884	1.2525	3.4551	1.3590
T6	113.33-106.67	4.3054	1.3125	3.6380	1.4237
T7	106.67-100.00	4.5177	1.3711	3.8165	1.4868
T8	100.00-80.00	4.5491	0.9225	4.0178	0.7368
T9	80.00-70.00	5.4341	1.0946	4.9258	0.8936
T10	70.00-60.00	5.7432	1.1525	5.2073	0.9477
T11	60.00-50.00	5.5955	1.1192	5.1911	0.9490
T12	50.00-40.00	5.8726	1.1711	5.4482	1.0022
T13	40.00-20.00	5.9978	1.1915	5.6074	1.0450
T14	20.00-10.00	6.3598	1.2592	5.9422	1.1043
T15	10.00-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod	C	From Leg	0.00 0.00 2.00	0.0000	195.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.25 0.66 0.97 1.49 2.68	0.25 0.66 0.97 1.49 2.68	0.01 0.02 0.02 0.03 0.04
***									
AIR 21 B2A/B4P	A	From Leg	3.00 0.00 1.50	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.37 10.34	4.36 4.77 5.20 6.08 7.95	0.08 0.12 0.17 0.28 0.57
AIR 21 B2A/B4P	B	From Leg	3.00 0.00 1.50	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.37 10.34	4.36 4.77 5.20 6.08 7.95	0.08 0.12 0.17 0.28 0.57
AIR 21 B2A/B4P	C	From Leg	3.00 0.00 1.50	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.53 6.98 7.43 8.37 10.34	4.36 4.77 5.20 6.08 7.95	0.08 0.12 0.17 0.28 0.57
AIR 21 B4A/B2P	A	From Leg	3.00 0.00 1.50	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.59 7.03 7.49 8.42 10.40	4.30 4.70 5.13 6.01 7.87	0.09 0.13 0.18 0.29 0.58
AIR 21 B4A/B2P	B	From Leg	3.00 0.00 1.50	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.59 7.03 7.49 8.42 10.40	4.30 4.70 5.13 6.01 7.87	0.09 0.13 0.18 0.29 0.58
AIR 21 B4A/B2P	C	From Leg	3.00 0.00 1.50	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.59 7.03 7.49 8.42 10.40	4.30 4.70 5.13 6.01 7.87	0.09 0.13 0.18 0.29 0.58
KRY 112 144/1	A	From Leg	3.00 0.00 2.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	3.00 0.00 2.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	3.00 0.00 2.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
(3) T-Frames	C	None		0.0000	192.00	No Ice	30.27	30.27	1.42

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
						1/2" Ice	41.24	41.24	1.99
						1" Ice	52.21	52.21	2.56
						2" Ice	74.15	74.15	3.69
						4" Ice	118.03	118.03	5.96
***									
PD1151	A	From Leg	2.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.11 4.74 7.37 12.63 23.15	2.11 4.74 7.37 12.63 23.15	0.02 0.04 0.07 0.12 0.22
***									
APXVTM14-C-I20	A	From Leg	3.00 0.00 1.50	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
APXVTM14-C-I20	B	From Leg	3.00 0.00 1.50	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
APXVTM14-C-I20	C	From Leg	3.00 0.00 1.50	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.90 7.35 7.81 8.75 10.75	3.61 3.97 4.33 5.14 6.97	0.06 0.10 0.14 0.25 0.53
TD-RRH8x20-25	A	From Leg	3.00 0.00 -5.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	3.00 0.00 -5.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	3.00 0.00 -5.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.14 2.62 3.68	0.07 0.10 0.13 0.20 0.40
APXVSPP18-C-A20	A	From Leg	3.00 0.00 1.50	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	5.28 5.74 6.20 7.14 9.27	0.06 0.11 0.16 0.29 0.63
APXVSPP18-C-A20	B	From Leg	3.00 0.00 1.50	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	5.28 5.74 6.20 7.14 9.27	0.06 0.11 0.16 0.29 0.63
APXVSPP18-C-A20	C	From Leg	3.00 0.00 1.50	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.26 8.81 9.36 10.50 12.88	5.28 5.74 6.20 7.14 9.27	0.06 0.11 0.16 0.29 0.63
1900 MHz RRU	A	From Leg	1.00	0.0000	175.00	No Ice	2.70	2.77	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.94	3.01	0.08
			2.00			1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
1900 MHz RRU	B	From Leg	1.00	0.0000	175.00	No Ice	2.70	2.77	0.06
			0.00			1/2" Ice	2.94	3.01	0.08
			2.00			1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
1900 MHz RRU	C	From Leg	1.00	0.0000	175.00	No Ice	2.70	2.77	0.06
			0.00			1/2" Ice	2.94	3.01	0.08
			2.00			1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
800 MHz RRU	A	From Leg	1.00	0.0000	175.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			-1.50			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800 MHz RRU	B	From Leg	1.00	0.0000	175.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			-1.50			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800 MHz RRU	C	From Leg	1.00	0.0000	175.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			-1.50			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800 MHz Filter	A	From Leg	1.00	0.0000	175.00	No Ice	0.78	0.29	0.01
			0.00			1/2" Ice	0.90	0.38	0.01
			-1.50			1" Ice	1.03	0.48	0.02
						2" Ice	1.31	0.70	0.04
						4" Ice	1.99	1.24	0.10
800 MHz Filter	B	From Leg	1.00	0.0000	175.00	No Ice	0.78	0.29	0.01
			0.00			1/2" Ice	0.90	0.38	0.01
			-1.50			1" Ice	1.03	0.48	0.02
						2" Ice	1.31	0.70	0.04
						4" Ice	1.99	1.24	0.10
800 MHz Filter	C	From Leg	1.00	0.0000	175.00	No Ice	0.78	0.29	0.01
			0.00			1/2" Ice	0.90	0.38	0.01
			-1.50			1" Ice	1.03	0.48	0.02
						2" Ice	1.31	0.70	0.04
						4" Ice	1.99	1.24	0.10
(2) ACU-A20-N RET	A	From Leg	1.00	0.0000	175.00	No Ice	0.00	0.14	0.00
			렀 -1			1/2" Ice	0.00	0.19	0.00
			-1.50			1" Ice	0.00	0.25	0.00
						2" Ice	0.00	0.40	0.01
						4" Ice	0.00	0.80	0.04
ACU-A20-N RET	B	From Leg	1.00	0.0000	175.00	No Ice	0.00	0.14	0.00
			0.00			1/2" Ice	0.00	0.19	0.00
			-1.50			1" Ice	0.00	0.25	0.00
						2" Ice	0.00	0.40	0.01
						4" Ice	0.00	0.80	0.04
ACU-A20-N RET	C	From Leg	1.00	0.0000	175.00	No Ice	0.00	0.14	0.00
			0.00			1/2" Ice	0.00	0.19	0.00
			-1.50			1" Ice	0.00	0.25	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.00	0.40	0.01
						4" Ice	0.00	0.80	0.04
(3) T-Frames	C	None		0.0000	178.50	No Ice	30.27	30.27	1.42
						1/2" Ice	41.24	41.24	1.99
						1" Ice	52.21	52.21	2.56
						2" Ice	74.15	74.15	3.69
						4" Ice	118.03	118.03	5.96
***									
AMXCD1465 w/ Mount Pipe	A	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.04 0.04 0.05 0.05 0.07
AMXCD1465 w/ Mount Pipe	B	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.04 0.04 0.05 0.05 0.07
AMXCD1465 w/ Mount Pipe	C	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.74 6.20 6.66 7.62 9.67	4.02 4.63 5.28 6.68 9.74	0.04 0.04 0.05 0.05 0.07
(2) 7722.00	A	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.87 6.35 7.34 9.44	3.49 3.95 4.41 5.36 7.35	0.03 0.06 0.09 0.18 0.43
(2) 7722.00	B	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.87 6.35 7.34 9.44	3.49 3.95 4.41 5.36 7.35	0.03 0.06 0.09 0.18 0.43
(2) 7722.00	C	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.87 6.35 7.34 9.44	3.49 3.95 4.41 5.36 7.35	0.03 0.06 0.09 0.18 0.43
(2) TT19-08BP111-001 TMA	A	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.52 0.62 0.74 0.99 1.59	0.02 0.02 0.03 0.05 0.12
(2) TT19-08BP111-001 TMA	B	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.52 0.62 0.74 0.99 1.59	0.02 0.02 0.03 0.05 0.12
(2) TT19-08BP111-001 TMA	C	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.52 0.62 0.74 0.99 1.59	0.02 0.02 0.03 0.05 0.12
(2) RRUS-11	A	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.94 3.17 3.41 3.91	1.25 1.41 1.59 1.96	0.06 0.07 0.10 0.15

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
						4" Ice	5.02	2.82	0.30
(2) RRUS-11	B	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	C	From Leg	3.00 0.00 0.50	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
DC6-48-60-18-8F	A	From Leg	2.00 0.00 1.00	0.0000	150.50	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.28 1.40 1.51 1.75 2.21	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40
(3) T-Frames	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.73 27.19 35.65 52.57 86.41	18.73 27.19 35.65 52.57 86.41	0.63 0.69 0.75 0.88 1.13
SBNHH-1D65A	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.15 6.58 7.03 7.94 9.87	3.86 4.22 4.62 5.48 7.29	0.04 0.08 0.12 0.22 0.50
SBNHH-1D65A	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.15 6.58 7.03 7.94 9.87	3.86 4.22 4.62 5.48 7.29	0.04 0.08 0.12 0.22 0.50
SBNHH-1D65A	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.15 6.58 7.03 7.94 9.87	3.86 4.22 4.62 5.48 7.29	0.04 0.08 0.12 0.22 0.50
***									
(4) 7020.00	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
(4) 7020.00	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
(4) 7020.00	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.78	0.20 0.28 0.36 0.56 1.05	0.00 0.01 0.01 0.02 0.07
RRU A2	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.83 2.01 2.20 2.61 3.53	0.40 0.51 0.62 0.88 1.50	0.02 0.02 0.04 0.07 0.17

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
RRU A2	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.83 2.01 2.20 2.61 3.53	0.40 0.51 0.62 0.88 1.50	0.02 0.02 0.04 0.07 0.17
RRU A2	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.83 2.01 2.20 2.61 3.53	0.40 0.51 0.62 0.88 1.50	0.02 0.02 0.04 0.07 0.17
***									
Sinclair SD312HL	A	From Leg	2.00 0.00 3.50	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.24 2.64 3.06 3.91 5.72	2.24 2.64 3.06 3.91 5.72	0.01 0.03 0.05 0.11 0.28
Sinclair SD312HL	B	From Leg	2.00 0.00 3.50	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.24 2.64 3.06 3.91 5.72	2.24 2.64 3.06 3.91 5.72	0.01 0.03 0.05 0.11 0.28
Sinclair SD312HL	C	From Leg	2.00 0.00 3.50	0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.24 2.64 3.06 3.91 5.72	2.24 2.64 3.06 3.91 5.72	0.01 0.03 0.05 0.11 0.28
(3) Standoffs	C	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.64 4.10 5.56 8.48 14.32	2.64 4.10 5.56 8.48 14.32	0.07 0.08 0.09 0.11 0.14
***									
Pipe Mount	A	From Leg	0.00 0.00 0.00	0.0000	101.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.87 1.11 1.36 1.90 3.23	0.02 0.02 0.03 0.06 0.16
***									
(2) LPA-80063/4CF w/ Mount Pipe	A	From Leg	3.00 0.00 1.50	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.11 7.58 8.07 9.06 11.19	7.13 7.83 8.54 10.02 13.25	0.04 0.10 0.17 0.34 0.79
LPA-80063/4CF w/ Mount Pipe	B	From Leg	3.00 0.00 1.50	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.11 7.58 8.07 9.06 11.19	7.13 7.83 8.54 10.02 13.25	0.04 0.10 0.17 0.34 0.79
LPA-80063/4CF w/ Mount Pipe	C	From Leg	3.00 0.00 1.50	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.11 7.58 8.07 9.06 11.19	7.13 7.83 8.54 10.02 13.25	0.04 0.10 0.17 0.34 0.79
LPA-80063/6CF w/ Mount Pipe	B	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice	10.58 11.24 11.87 13.16	10.67 11.93 12.91 14.92	0.05 0.14 0.25 0.48

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
						4" Ice	15.87	19.16	1.09
LPA-80063/6CF w/ Mount Pipe	C	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.58 11.24 11.87 13.16 15.87	10.67 11.93 12.91 14.92 19.16	0.05 0.14 0.25 0.48 1.09
(2) DB-T1-6Z-8AB-0Z	A	From Leg	3.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
(2) DB-T1-6Z-8AB-0Z	B	From Leg	3.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
(2) DB-T1-6Z-8AB-0Z	C	From Leg	3.00 0.00 0.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
(3) T-Frames	C	None		0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	30.27 41.24 52.21 74.15 118.03	30.27 41.24 52.21 74.15 118.03	0.75 0.83 0.90 1.05 1.36
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.53 9.18 9.80 11.07 13.72	7.00 8.19 9.08 10.90 14.93	0.08 0.14 0.22 0.40 0.91
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.53 9.18 9.80 11.07 13.72	7.00 8.19 9.08 10.90 14.93	0.08 0.14 0.22 0.40 0.91
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.53 9.18 9.80 11.07 13.72	7.00 8.19 9.08 10.90 14.93	0.08 0.14 0.22 0.40 0.91
RRH2X60-AWS	A	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.19 2.40 2.61 3.07 4.09	1.43 1.61 1.80 2.21 3.13	0.04 0.06 0.08 0.13 0.26
RRH2X60-AWS	B	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.19 2.40 2.61 3.07 4.09	1.43 1.61 1.80 2.21 3.13	0.04 0.06 0.08 0.13 0.26
RRH2X60-AWS	C	From Leg	3.00 0.00 1.00	0.0000	161.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.19 2.40 2.61 3.07 4.09	1.43 1.61 1.80 2.21 3.13	0.04 0.06 0.08 0.13 0.26
RRH2X60-PCS	A	From Leg	3.00	0.0000	161.00	No Ice	2.57	1.93	0.05

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
			0.00			1/2" Ice	2.79	2.13	0.07
			1.00			1" Ice	3.02	2.34	0.09
						2" Ice	3.52	2.80	0.14
						4" Ice	4.61	3.81	0.30
RRH2X60-PCS	B	From Leg	3.00	0.0000	161.00	No Ice	2.57	1.93	0.05
			0.00			1/2" Ice	2.79	2.13	0.07
			1.00			1" Ice	3.02	2.34	0.09
						2" Ice	3.52	2.80	0.14
						4" Ice	4.61	3.81	0.30
RRH2X60-PCS	C	From Leg	3.00	0.0000	161.00	No Ice	2.57	1.93	0.05
			0.00			1/2" Ice	2.79	2.13	0.07
			1.00			1" Ice	3.02	2.34	0.09
						2" Ice	3.52	2.80	0.14
						4" Ice	4.61	3.81	0.30
RRH2x60-700	A	From Leg	3.00	0.0000	161.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	B	From Leg	3.00	0.0000	161.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
RRH2x60-700	C	From Leg	3.00	0.0000	161.00	No Ice	3.96	1.82	0.06
			0.00			1/2" Ice	4.27	2.08	0.08
			1.00			1" Ice	4.60	2.36	0.11
						2" Ice	5.27	2.96	0.17
						4" Ice	6.72	4.25	0.35
(2) FD9R6004/2CL-3CL Diplexer	A	From Leg	3.00	0.0000	161.00	No Ice	0.00	0.08	0.00
			0.00			1/2" Ice	0.00	0.14	0.01
			1.00			1" Ice	0.00	0.20	0.01
						2" Ice	0.00	0.34	0.02
						4" Ice	0.00	0.74	0.06
(2) FD9R6004/2CL-3CL Diplexer	B	From Leg	3.00	0.0000	161.00	No Ice	0.00	0.08	0.00
			0.00			1/2" Ice	0.00	0.14	0.01
			1.00			1" Ice	0.00	0.20	0.01
						2" Ice	0.00	0.34	0.02
						4" Ice	0.00	0.74	0.06
(2) FD9R6004/2CL-3CL Diplexer	C	From Leg	3.00	0.0000	161.00	No Ice	0.00	0.08	0.00
			0.00			1/2" Ice	0.00	0.14	0.01
			1.00			1" Ice	0.00	0.20	0.01
						2" Ice	0.00	0.34	0.02
						4" Ice	0.00	0.74	0.06
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
RDH4518A	A	Paraboloid w/o Radome	From Leg	0.00 0.00 1.00	0.0000		101.00	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	0.03 0.04 0.05 0.08 0.13

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	195 - 180	Leg	Max Tension	12	6.44	-0.11	-0.07
			Max. Compression	10	-8.17	0.17	-0.12
			Max. Mx	11	-0.68	-0.67	0.00
			Max. My	2	-0.44	-0.01	-0.67
			Max. Vy	5	0.53	-0.37	0.00
			Max. Vx	2	-0.54	-0.01	0.39
		Diagonal	Max Tension	3	1.72	0.00	0.00
			Max. Compression	3	-1.78	0.00	0.00
			Max. Mx	11	0.77	0.01	0.00
			Max. My	9	-1.61	-0.00	-0.00
			Max. Vy	24	-0.01	0.01	0.00
			Max. Vx	9	-0.00	0.00	0.00
		Top Girt	Max Tension	12	0.25	0.00	0.00
			Max. Compression	10	-0.22	0.00	0.00
			Max. Mx	14	0.02	-0.02	0.00
			Max. Vy	14	-0.01	0.00	0.00
T2	180 - 160	Leg	Max Tension	12	28.25	-0.85	0.02
			Max. Compression	10	-34.33	0.84	0.02
			Max. Mx	12	28.25	-0.85	0.02
			Max. My	7	-2.14	-0.02	1.03
			Max. Vy	4	1.61	-0.85	-0.02
			Max. Vx	7	1.54	-0.01	-0.50
		Diagonal	Max Tension	3	3.48	0.00	0.00
			Max. Compression	2	-3.55	0.00	0.00
			Max. Mx	9	0.63	0.02	-0.00
			Max. My	13	3.01	0.01	0.00
			Max. Vy	24	-0.01	0.01	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.24	0.00	0.00
			Max. Compression	4	-0.24	0.00	0.00
			Max. Mx	14	0.00	-0.02	0.00
			Max. My	14	0.00	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	14	-0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	12	65.99	-0.03	0.00
			Max. Compression	6	-75.07	0.32	0.00
			Max. Mx	12	36.72	-0.85	0.02
			Max. My	13	-3.04	-0.01	0.50
			Max. Vy	12	-1.15	-0.24	-0.01
			Max. Vx	9	1.00	0.00	-0.16
		Diagonal	Max Tension	3	6.17	0.00	0.00
			Max. Compression	9	-6.23	0.00	0.00
			Max. Mx	11	2.41	0.02	0.00
			Max. My	9	-5.35	-0.00	-0.01
			Max. Vy	25	0.02	0.02	-0.00
			Max. Vx	9	0.00	0.00	0.00
T4	140 - 120	Leg	Max Tension	4	100.80	-0.30	-0.01
			Max. Compression	6	-112.27	0.19	0.00
			Max. Mx	10	-86.36	0.32	0.00
			Max. My	3	-4.51	-0.01	-0.38
			Max. Vy	12	-0.11	-0.31	-0.00
			Max. Vx	3	0.11	-0.01	-0.38
		Diagonal	Max Tension	3	6.50	0.00	0.00
			Max. Compression	9	-6.56	0.00	0.00
			Max. Mx	6	5.45	0.04	0.00
			Max. My	24	1.68	0.04	-0.00
			Max. Vy	17	0.03	0.04	0.00
			Max. Vx	24	0.00	0.00	0.00
T5	120 - 113.333	Leg	Max Tension	4	117.77	0.20	-0.01
			Max. Compression	6	-130.65	0.49	-0.00
			Max. Mx	10	-118.71	0.90	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	3	-5.51	-0.00	-0.52
			Max. Vy	10	-8.40	0.90	0.01
			Max. Vx	13	-2.90	0.00	0.38
		Diagonal	Max Tension	9	6.50	0.00	0.00
			Max. Compression	9	-6.50	0.00	0.00
			Max. Mx	19	1.70	0.04	-0.00
			Max. My	24	1.77	0.04	-0.00
			Max. Vy	17	0.03	0.04	0.00
			Max. Vx	24	0.00	0.00	0.00
T6	113.333 - 106.667	Leg	Max Tension	4	128.15	0.10	-0.00
			Max. Compression	6	-142.00	0.61	0.02
			Max. Mx	10	-130.32	1.18	0.01
			Max. My	3	-5.80	0.00	-0.63
			Max. Vy	10	-8.77	0.61	-0.01
			Max. Vx	13	-2.90	0.00	0.62
		Diagonal	Max Tension	11	6.54	0.00	0.00
			Max. Compression	11	-6.58	0.00	0.00
			Max. Mx	17	1.50	0.04	-0.00
			Max. My	20	-1.92	0.03	0.01
			Max. Vy	17	0.03	0.04	-0.00
			Max. Vx	20	-0.00	0.00	0.00
T7	106.667 - 100	Leg	Max Tension	4	138.25	0.27	0.00
			Max. Compression	6	-153.17	0.46	0.02
			Max. Mx	10	-146.52	1.35	-0.01
			Max. My	9	-5.94	0.00	0.84
			Max. Vy	10	-8.95	0.46	-0.01
			Max. Vx	9	-2.99	0.01	0.48
		Diagonal	Max Tension	11	6.70	0.00	0.00
			Max. Compression	11	-6.72	0.00	0.00
			Max. Mx	17	1.51	0.05	-0.01
			Max. My	20	-1.97	0.04	0.01
			Max. Vy	17	0.04	0.05	-0.01
			Max. Vx	20	-0.00	0.00	0.00
T8	100 - 80	Leg	Max Tension	4	167.14	-0.34	-0.01
			Max. Compression	6	-185.31	1.08	0.01
			Max. Mx	10	-157.47	1.21	-0.01
			Max. My	9	-7.52	-0.03	1.04
			Max. Vy	10	-9.69	1.08	0.01
			Max. Vx	9	-3.43	-0.03	1.04
		Diagonal	Max Tension	13	7.05	0.00	0.00
			Max. Compression	13	-7.03	0.00	0.00
			Max. Mx	19	1.92	0.07	0.01
			Max. My	26	-1.86	0.05	-0.01
			Max. Vy	17	0.04	0.07	-0.01
			Max. Vx	26	0.00	0.00	0.00
T9	80 - 70	Leg	Max Tension	4	181.02	0.01	-0.02
			Max. Compression	6	-201.06	0.84	0.01
			Max. Mx	10	-184.65	1.89	0.02
			Max. My	9	-7.52	-0.03	1.32
			Max. Vy	10	-10.49	0.85	0.02
			Max. Vx	9	-3.44	-0.03	1.32
		Diagonal	Max Tension	13	7.95	0.00	0.00
			Max. Compression	13	-8.05	0.00	0.00
			Max. Mx	17	1.71	0.10	-0.01
			Max. My	20	-2.45	0.08	0.01
			Max. Vy	17	0.05	0.10	-0.01
			Max. Vx	20	-0.00	0.00	0.00
T10	70 - 60	Leg	Max Tension	4	194.40	-0.05	-0.01
			Max. Compression	6	-216.51	0.83	0.00
			Max. Mx	10	-200.32	1.72	0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	9	-8.26	0.01	1.27
			Max. Vy	10	-10.63	0.83	0.01
			Max. Vx	9	-3.67	-0.04	0.71
		Diagonal	Max Tension	13	8.20	0.00	0.00
			Max. Compression	13	-8.23	0.00	0.00
			Max. Mx	17	1.88	0.13	0.02
			Max. My	15	-2.23	0.10	-0.02
			Max. Vy	17	0.06	0.13	0.02
			Max. Vx	15	0.00	0.00	0.00
T11	60 - 50	Leg	Max Tension	4	207.33	-0.91	-0.02
			Max. Compression	6	-231.39	1.86	0.01
			Max. Mx	10	-230.47	1.87	0.02
			Max. My	3	-10.20	0.01	-1.83
			Max. Vy	10	-11.12	1.87	0.02
			Max. Vx	9	-3.75	0.01	1.83
		Diagonal	Max Tension	13	8.26	0.00	0.00
			Max. Compression	13	-8.28	0.00	0.00
			Max. Mx	17	1.62	0.13	-0.01
			Max. My	15	-2.56	0.11	-0.02
			Max. Vy	17	0.06	0.13	-0.01
			Max. Vx	15	0.00	0.00	0.00
T12	50 - 40	Leg	Max Tension	4	220.29	0.02	0.00
			Max. Compression	6	-246.50	0.86	0.00
			Max. Mx	10	-230.48	2.79	0.03
			Max. My	9	-10.02	0.02	2.14
			Max. Vy	10	-11.76	0.86	0.00
			Max. Vx	9	-3.76	-0.02	0.83
		Diagonal	Max Tension	13	8.70	0.00	0.00
			Max. Compression	13	-8.80	0.00	0.00
			Max. Mx	17	2.18	0.15	0.02
			Max. My	15	-2.25	0.12	-0.02
			Max. Vy	17	0.07	0.15	0.02
			Max. Vx	15	0.00	0.00	0.00
T13	40 - 20	Leg	Max Tension	4	245.10	-0.58	-0.01
			Max. Compression	6	-275.45	1.69	0.01
			Max. Mx	25	45.24	-3.46	-0.00
			Max. My	3	-11.63	-0.04	-1.85
			Max. Vy	10	-12.87	1.69	0.01
			Max. Vx	9	-3.76	-0.00	1.15
		Diagonal	Max Tension	13	8.95	0.00	0.00
			Max. Compression	13	-9.09	0.00	0.00
			Max. Mx	17	1.24	0.17	-0.02
			Max. My	15	2.95	0.15	-0.02
			Max. Vy	17	0.07	0.15	0.02
			Max. Vx	15	0.00	0.00	0.00
T14	20 - 10	Leg	Max Tension	4	250.65	-2.55	-0.03
			Max. Compression	6	-282.30	1.32	0.00
			Max. Mx	19	-103.95	4.57	-0.01
			Max. My	3	-13.39	-0.09	-2.51
			Max. Vy	10	-12.87	2.76	0.03
			Max. Vx	9	-3.75	0.06	1.06
		Diagonal	Max Tension	13	9.17	0.00	0.00
			Max. Compression	13	-9.11	0.00	0.00
			Max. Mx	17	0.04	0.23	-0.02
			Max. My	15	-3.94	0.21	-0.02
			Max. Vy	17	0.08	0.23	-0.02
			Max. Vx	15	0.00	0.00	0.00
T15	10 - 0	Leg	Max Tension	4	268.91	1.06	0.01
			Max. Compression	6	-303.90	0.00	0.00
			Max. Mx	19	-111.69	4.57	-0.01
			Max. My	3	-13.67	-0.09	-2.51

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	10	-14.07	0.00	0.00
			Max. Vx	9	-3.40	0.00	-0.00
		Diagonal	Max Tension	13	9.47	0.00	0.00
			Max. Compression	13	-9.66	0.00	0.00
			Max. Mx	6	7.61	0.17	0.02
			Max. My	16	4.98	0.13	-0.03
			Max. Vy	18	0.08	0.14	0.03
			Max. Vx	16	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	301.39	27.35	-15.62
	Max. H_x	10	301.39	27.35	-15.62
	Max. H_z	4	-267.73	-24.47	13.98
	Min. Vert	4	-267.73	-24.47	13.98
	Min. H_x	4	-267.73	-24.47	13.98
	Min. H_z	10	301.39	27.35	-15.62
Leg B	Max. Vert	6	302.58	-27.26	-15.83
	Max. H_x	12	-266.54	24.36	14.14
	Max. H_z	12	-266.54	24.36	14.14
	Min. Vert	12	-266.54	24.36	14.14
	Min. H_x	6	302.58	-27.26	-15.83
	Min. H_z	6	302.58	-27.26	-15.83
Leg A	Max. Vert	2	301.17	0.24	31.45
	Max. H_x	11	13.20	3.15	1.09
	Max. H_z	2	301.17	0.24	31.45
	Min. Vert	8	-267.06	-0.20	-28.17
	Min. H_x	5	13.20	-3.13	1.09
	Min. H_z	8	-267.06	-0.20	-28.17

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	39.90	0.00	0.00	2.20	-13.71	0.00
Dead+Wind 0 deg - No Ice	39.90	0.00	-50.52	-5733.98	-13.71	8.89
Dead+Wind 30 deg - No Ice	39.90	24.57	-42.46	-4861.26	-2829.88	8.02
Dead+Wind 60 deg - No Ice	39.90	42.11	-24.27	-2786.00	-4855.14	5.46
Dead+Wind 90 deg - No Ice	39.90	49.10	-0.00	2.09	-5642.05	1.65
Dead+Wind 120 deg - No Ice	39.90	43.80	25.36	2880.51	-4990.43	-2.85
Dead+Wind 150 deg - No Ice	39.90	24.53	42.53	4872.78	-2826.03	-6.36
Dead+Wind 180 deg - No Ice	39.90	-0.00	48.59	5584.41	-13.71	-8.34
Dead+Wind 210 deg - No Ice	39.90	-24.53	42.53	4872.78	2798.60	-8.32
Dead+Wind 240 deg - No Ice	39.90	-43.80	25.36	2880.51	4963.01	-6.05
Dead+Wind 270 deg - No Ice	39.90	-49.10	-0.00	2.09	5614.63	-1.65
Dead+Wind 300 deg - No Ice	39.90	-42.11	-24.27	-2786.00	4827.71	2.88
Dead+Wind 330 deg - No Ice	39.90	-24.57	-42.46	-4861.26	2802.45	6.67
Dead+Ice+Temp	80.38	0.00	0.00	3.46	-34.68	-0.00
Dead+Wind 0 deg+Ice+Temp	80.38	-0.00	-14.74	-1670.60	-34.68	2.70

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 30 deg+Ice+Temp	80.38	6.86	-11.87	-1360.35	-823.76	2.21
Dead+Wind 60 deg+Ice+Temp	80.38	11.58	-6.68	-767.47	-1372.39	1.35
Dead+Wind 90 deg+Ice+Temp	80.38	13.72	-0.00	3.43	-1611.94	0.25
Dead+Wind 120 deg+Ice+Temp	80.38	12.77	7.39	842.78	-1486.20	-1.07
Dead+Wind 150 deg+Ice+Temp	80.38	6.85	11.88	1368.87	-822.90	-1.96
Dead+Wind 180 deg+Ice+Temp	80.38	0.00	13.37	1546.61	-34.68	-2.36
Dead+Wind 210 deg+Ice+Temp	80.38	-6.85	11.88	1368.87	753.53	-2.28
Dead+Wind 240 deg+Ice+Temp	80.38	-12.77	7.39	842.78	1416.83	-1.63
Dead+Wind 270 deg+Ice+Temp	80.38	-13.72	-0.00	3.43	1542.57	-0.25
Dead+Wind 300 deg+Ice+Temp	80.38	-11.58	-6.68	-767.47	1303.03	1.01
Dead+Wind 330 deg+Ice+Temp	80.38	-6.86	-11.87	-1360.35	754.39	2.03
Dead+Wind 0 deg - Service	39.90	0.00	-17.48	-1982.64	-13.71	3.08
Dead+Wind 30 deg - Service	39.90	8.50	-14.69	-1680.66	-988.17	2.77
Dead+Wind 60 deg - Service	39.90	14.57	-8.40	-962.58	-1688.95	1.89
Dead+Wind 90 deg - Service	39.90	16.99	-0.00	2.16	-1961.24	0.57
Dead+Wind 120 deg - Service	39.90	15.16	8.78	998.16	-1735.76	-0.98
Dead+Wind 150 deg - Service	39.90	8.49	14.72	1687.52	-986.83	-2.20
Dead+Wind 180 deg - Service	39.90	0.00	16.81	1933.76	-13.71	-2.89
Dead+Wind 210 deg - Service	39.90	-8.49	14.72	1687.52	959.41	-2.88
Dead+Wind 240 deg - Service	39.90	-15.16	8.78	998.16	1708.34	-2.09
Dead+Wind 270 deg - Service	39.90	-16.99	-0.00	2.16	1933.81	-0.57
Dead+Wind 300 deg - Service	39.90	-14.57	-8.40	-962.58	1661.52	1.00
Dead+Wind 330 deg - Service	39.90	-8.50	-14.69	-1680.66	960.74	2.31

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	-39.90	0.00	0.00	39.90	0.00	0.000%
2	0.00	-39.90	-50.52	0.00	39.90	50.52	0.000%
3	24.57	-39.90	-42.46	-24.57	39.90	42.46	0.000%
4	42.11	-39.90	-24.27	-42.11	39.90	24.27	0.000%
5	49.10	-39.90	-0.00	-49.10	39.90	0.00	0.000%
6	43.80	-39.90	25.36	-43.80	39.90	-25.36	0.000%
7	24.53	-39.90	42.53	-24.53	39.90	-42.53	0.000%
8	0.00	-39.90	48.59	0.00	39.90	-48.59	0.000%
9	-24.53	-39.90	42.53	24.53	39.90	-42.53	0.000%
10	-43.80	-39.90	25.36	43.80	39.90	-25.36	0.000%
11	-49.10	-39.90	-0.00	49.10	39.90	0.00	0.000%
12	-42.11	-39.90	-24.27	42.11	39.90	24.27	0.000%
13	-24.57	-39.90	-42.46	24.57	39.90	42.46	0.000%
14	0.00	-80.38	0.00	0.00	80.38	0.00	0.000%
15	0.00	-80.38	-14.74	0.00	80.38	14.74	0.000%
16	6.86	-80.38	-11.87	-6.86	80.38	11.87	0.000%
17	11.58	-80.38	-6.68	-11.58	80.38	6.68	0.000%
18	13.72	-80.38	-0.00	-13.72	80.38	0.00	0.000%
19	12.77	-80.38	7.39	-12.77	80.38	-7.39	0.000%
20	6.85	-80.38	11.88	-6.85	80.38	-11.88	0.000%
21	0.00	-80.38	13.37	0.00	80.38	-13.37	0.000%
22	-6.85	-80.38	11.88	6.85	80.38	-11.88	0.000%
23	-12.77	-80.38	7.39	12.77	80.38	-7.39	0.000%
24	-13.72	-80.38	-0.00	13.72	80.38	0.00	0.000%
25	-11.58	-80.38	-6.68	11.58	80.38	6.68	0.000%
26	-6.86	-80.38	-11.87	6.86	80.38	11.87	0.000%
27	0.00	-39.90	-17.48	0.00	39.90	17.48	0.000%
28	8.50	-39.90	-14.69	-8.50	39.90	14.69	0.000%
29	14.57	-39.90	-8.40	-14.57	39.90	8.40	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
30	16.99	-39.90	-0.00	-16.99	39.90	0.00	0.000%
31	15.16	-39.90	8.78	-15.16	39.90	-8.78	0.000%
32	8.49	-39.90	14.72	-8.49	39.90	-14.72	0.000%
33	0.00	-39.90	16.81	0.00	39.90	-16.81	0.000%
34	-8.49	-39.90	14.72	8.49	39.90	-14.72	0.000%
35	-15.16	-39.90	8.78	15.16	39.90	-8.78	0.000%
36	-16.99	-39.90	-0.00	16.99	39.90	0.00	0.000%
37	-14.57	-39.90	-8.40	14.57	39.90	8.40	0.000%
38	-8.50	-39.90	-14.69	8.50	39.90	14.69	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 180	7.481	31	0.3591	0.0107
T2	180 - 160	6.355	31	0.3473	0.0088
T3	160 - 140	4.937	31	0.3127	0.0030
T4	140 - 120	3.675	31	0.2617	0.0013
T5	120 - 113.333	2.634	31	0.2126	0.0027
T6	113.333 - 106.667	2.331	31	0.1997	0.0029
T7	106.667 - 100	2.044	31	0.1862	0.0030
T8	100 - 80	1.781	31	0.1723	0.0030
T9	80 - 70	1.111	31	0.1244	0.0026
T10	70 - 60	0.850	31	0.1080	0.0024
T11	60 - 50	0.629	31	0.0912	0.0022
T12	50 - 40	0.438	31	0.0743	0.0018
T13	40 - 20	0.286	31	0.0571	0.0015
T14	20 - 10	0.083	31	0.0226	0.0008
T15	10 - 0	0.028	35	0.0113	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	Lightning Rod	31	7.481	0.3591	0.0107	137349
192.00	AIR 21 B2A/B4P	31	7.254	0.3572	0.0105	137349
178.50	APXVTM14-C-I20	31	6.245	0.3455	0.0085	44969
178.00	PD1151	31	6.208	0.3449	0.0084	44305
175.00	1900 MHz RRU	31	5.989	0.3408	0.0075	41469
161.00	(2) LPA-80063/4CF w/ Mount Pipe	31	5.005	0.3149	0.0033	32540
150.50	DC6-48-60-18-8F	31	4.313	0.2895	0.0015	24425
150.00	AMXCD1465 w/ Mount Pipe	31	4.281	0.2882	0.0014	24115
138.00	Sinclair SD312HL	31	3.560	0.2563	0.0014	19837
102.00	RDH4518A	31	1.858	0.1766	0.0030	25554
101.00	Pipe Mount	31	1.819	0.1745	0.0030	26412

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 180	21.556	6	1.0365	0.0310
T2	180 - 160	18.307	6	1.0019	0.0255
T3	160 - 140	14.217	6	0.9011	0.0087
T4	140 - 120	10.580	6	0.7534	0.0038
T5	120 - 113.333	7.584	6	0.6119	0.0079
T6	113.333 - 106.667	6.710	6	0.5746	0.0085
T7	106.667 - 100	5.886	6	0.5359	0.0088
T8	100 - 80	5.127	6	0.4956	0.0088
T9	80 - 70	3.200	6	0.3579	0.0076
T10	70 - 60	2.447	6	0.3107	0.0069
T11	60 - 50	1.811	6	0.2623	0.0063
T12	50 - 40	1.262	6	0.2137	0.0053
T13	40 - 20	0.825	6	0.1643	0.0045
T14	20 - 10	0.240	6	0.0651	0.0022
T15	10 - 0	0.082	10	0.0325	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	Lightning Rod	6	21.556	1.0365	0.0310	48070
192.00	AIR 21 B2A/B4P	6	20.901	1.0310	0.0303	48070
178.50	APXVTM14-C-I20	6	17.988	0.9968	0.0245	15726
178.00	PD1151	6	17.882	0.9949	0.0241	15492
175.00	1900 MHz RRU	6	17.252	0.9831	0.0217	14485
161.00	(2) LPA-80063/4CF w/ Mount Pipe	6	14.413	0.9076	0.0094	11320
150.50	DC6-48-60-18-8F	6	12.419	0.8339	0.0042	8467
150.00	AMXCD1465 w/ Mount Pipe	6	12.327	0.8302	0.0041	8358
138.00	Sinclair SD312HL	6	10.251	0.7380	0.0042	6872
102.00	RDH4518A	6	5.348	0.5082	0.0088	8876
101.00	Pipe Mount	6	5.237	0.5020	0.0088	9177

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	195	Diagonal	A325X	0.6250	1	1.72	4.89	0.351 ✔	1.333	Member Block Shear
		Top Girt	A325X	0.6250	1	0.25	4.89	0.051 ✔	1.333	Member Block Shear
T2	180	Diagonal	A325X	0.6250	1	3.48	4.89	0.710 ✔	1.333	Member Block Shear
		Top Girt	A325X	0.6250	1	0.24	4.89	0.049 ✔	1.333	Member Block Shear
T3	160	Diagonal	A325X	0.6250	1	6.17	5.57	1.108 ✔	1.333	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T4	140	Diagonal	A325X	0.6250	1	6.50	6.80	0.956 ✔	1.333	Member Bearing
T5	120	Diagonal	A325X	0.6250	1	6.50	6.80	0.957 ✔	1.333	Member Bearing
T6	113.333	Diagonal	A325X	0.6250	1	6.54	6.80	0.962 ✔	1.333	Member Bearing
T7	106.667	Diagonal	A325X	0.6250	1	6.70	9.06	0.740 ✔	1.333	Member Bearing
T8	100	Diagonal	A325X	0.7500	1	7.05	6.80	1.037 ✔	1.333	Member Bearing
T9	80	Diagonal	A325X	0.7500	1	7.95	9.06	0.878 ✔	1.333	Member Bearing
T10	70	Diagonal	A325X	0.7500	1	8.23	13.25	0.621 ✔	1.333	Bolt Shear
T11	60	Diagonal	A325X	0.7500	1	8.26	9.06	0.911 ✔	1.333	Member Bearing
T12	50	Diagonal	A325X	0.7500	1	8.80	13.25	0.664 ✔	1.333	Bolt Shear
T13	40	Diagonal	A325X	0.7500	1	8.95	9.06	0.988 ✔	1.333	Member Bearing
T14	20	Leg	A572-50	1.5000	8	31.33	37.91	0.827 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	9.17	9.06	1.012 ✔	1.333	Member Bearing
T15	10	Leg	A572-50	1.5000	8	33.61	37.91	0.887 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	9.47	9.06	1.045 ✔	1.333	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	195 - 180	P2x.154 (2.38 OD)	15.00	5.00	76.2 K=1.00	19.756	1.0745	-8.17	21.23	0.385 ✔
T2	180 - 160	P3x.216 (3.5 OD)	20.03	5.01	51.7 K=1.00	24.091	2.2285	-34.33	53.69	0.640 ✔
T3	160 - 140	P3x.300 (3.50 OD)	20.03	5.01	52.9 K=1.00	23.894	3.0159	-75.07	72.06	1.042 ✔
T4	140 - 120	P4x.337 (4.50 OD)	20.03	6.68	54.3 K=1.00	23.672	4.4074	-112.27	104.33	1.076 ✔
T5	120 - 113.333	P5x.375 (5.5625 OD)	6.68	6.51	42.5 K=1.00	25.478	6.1114	-130.65	155.71	0.839 ✔
T6	113.333 - 106.667	P5x.375 (5.5625 OD)	6.68	6.51	42.5 K=1.00	25.478	6.1114	-142.00	155.71	0.912 ✔
T7	106.667 - 100	P5x.375 (5.5625 OD)	6.68	6.51	42.5 K=1.00	25.478	6.1114	-153.17	155.71	0.984 ✔
T8	100 - 80	P6x.28 (6.625 OD)	20.03	6.62	35.4 K=1.00	26.462	5.5813	-185.31	147.69	1.255 ✔
T9	80 - 70	P6x.432 (6.625 OD)	10.02	9.85	53.9 K=1.00	23.739	8.4049	-201.06	199.53	1.008 ✔
T10	70 - 60	P6x.432 (6.625 OD)	10.02	9.85	53.9 K=1.00	23.739	8.4049	-216.51	199.53	1.085 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	60 - 50	P8x.322 (8.625 OD)	10.02	9.85	40.2 K=1.00	25.799	8.3993	-231.39	216.69	1.068 ✔
T12	50 - 40	P8x.322 (8.625 OD)	10.02	9.85	40.2 K=1.00	25.799	8.3993	-246.50	216.69	1.138 ✔
T13	40 - 20	P8x.322 (8.625 OD)	20.03	9.93	40.6 K=1.00	25.751	8.3993	-275.45	216.29	1.274 ✔
T14	20 - 10	P8x.5 (8.625 OD)	10.02	9.93	41.4 K=1.00	25.632	12.7627	-282.30	327.13	0.863 ✔
T15	10 - 0	P8x.5 (8.625 OD)	10.02	9.93	41.4 K=1.00	25.632	12.7627	-303.90	327.13	0.929 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 180	L1 3/4x1 3/4x3/16	7.07	3.25	115.2 K=1.01	10.966	0.6211	-1.78	6.81	0.261 ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	8.40	4.03	140.8 K=1.00	7.536	0.6211	-3.55	4.68	0.758 ✔
T3	160 - 140	L2x2x3/16	10.08	4.87	148.3 K=1.00	6.789	0.7150	-6.04	4.85	1.244 ✔
T4	140 - 120	L2 1/2x2 1/2x3/16	12.58	6.12	148.4 K=1.00	6.785	0.9020	-6.45	6.12	1.054 ✔
T5	120 - 113.333	L2 1/2x2 1/2x3/16	13.07	6.31	152.9 K=1.00	6.387	0.9020	-6.50	5.76	1.128 ✔
T6	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.65	6.60	160.0 K=1.00	5.834	0.9020	-6.58	5.26	1.250 ✔
T7	106.667 - 100	L2 1/2x2 1/2x1/4	14.24	6.90	168.5 K=1.00	5.258	1.1900	-6.72	6.26	1.075 ✔
T8	100 - 80	L3x3x3/16	16.08	7.77	156.5 K=1.00	6.094	1.0900	-7.03	6.64	1.058 ✔
T9	80 - 70	L3x3x1/4	18.36	9.00	182.4 K=1.00	4.489	1.4400	-8.05	6.46	1.245 ✔
T10	70 - 60	L3x3x3/8	19.21	9.42	192.7 K=1.00	4.023	2.1100	-8.23	8.49	0.970 ✔
T11	60 - 50	L3x3 1/2x1/4	20.08	9.76	185.6 K=1.00	4.333	1.5600	-8.28	6.76	1.224 ✔
T12	50 - 40	L3x3x3/8	20.95	10.20	208.6 K=1.00	3.433	2.1100	-8.80	7.24	1.215 ✔
T13	40 - 20	KL/R > 200 (C) - 184 L3 1/2x3 1/2x1/4	22.77	11.12	192.2 K=1.00	4.042	1.6900	-9.09	6.83	1.331 ✔
T14	20 - 10	L3 1/2x4x1/4	23.68	11.57	189.2 K=1.00	4.172	1.8100	-9.11	7.55	1.206 ✔
T15	10 - 0	L4x4x1/4	24.59	12.03	181.5 K=1.00	4.532	1.9400	-9.66	8.79	1.099 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 180	L1 3/4x1 3/4x3/16	5.00	4.51	157.6 K=1.00	6.013	0.6211	-0.22	3.73	0.060 ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	5.00	4.51	157.6 K=1.00	6.013	0.6211	-0.24	3.73	0.063 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 180	P2x.154 (2.38 OD)	15.00	5.00	76.2	30.000	1.0745	6.44	32.24	0.200 ✔
T2	180 - 160	P3x.216 (3.5 OD)	20.03	5.01	51.7	30.000	2.2285	28.25	66.85	0.423 ✔
T3	160 - 140	P3x.300 (3.50 OD)	20.03	5.01	52.9	30.000	3.0159	65.99	90.48	0.729 ✔
T4	140 - 120	P4x.337 (4.50 OD)	20.03	6.68	54.3	30.000	4.4074	100.80	132.22	0.762 ✔
T5	120 - 113.333	P5x.375 (5.5625 OD)	6.68	6.51	42.5	30.000	6.1114	117.77	183.34	0.642 ✔
T6	113.333 - 106.667	P5x.375 (5.5625 OD)	6.68	6.51	42.5	30.000	6.1114	128.15	183.34	0.699 ✔
T7	106.667 - 100	P5x.375 (5.5625 OD)	6.68	6.51	42.5	30.000	6.1114	138.25	183.34	0.754 ✔
T8	100 - 80	P6x.28 (6.625 OD)	20.03	6.62	35.4	30.000	5.5813	167.14	167.44	0.998 ✔
T9	80 - 70	P6x.432 (6.625 OD)	10.02	9.85	53.9	30.000	8.4049	181.02	252.15	0.718 ✔
T10	70 - 60	P6x.432 (6.625 OD)	10.02	9.85	53.9	30.000	8.4049	194.40	252.15	0.771 ✔
T11	60 - 50	P8x.322 (8.625 OD)	10.02	9.85	40.2	30.000	8.3993	207.33	251.98	0.823 ✔
T12	50 - 40	P8x.322 (8.625 OD)	10.02	9.85	40.2	30.000	8.3993	220.29	251.98	0.874 ✔
T13	40 - 20	P8x.322 (8.625 OD)	20.03	9.93	40.6	30.000	8.3993	245.10	251.98	0.973 ✔
T14	20 - 10	P8x.5 (8.625 OD)	10.02	9.93	41.4	30.000	12.7627	250.65	382.88	0.655 ✔
T15	10 - 0	P8x.5 (8.625 OD)	10.02	9.93	41.4	30.000	12.7627	268.91	382.88	0.702 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 180	L1 3/4x1 3/4x3/16	7.07	3.25	75.9	29.000	0.3604	1.72	10.45	0.165 ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	8.40	4.03	93.3	29.000	0.3604	3.48	10.45	0.333 ✔
T3	160 - 140	L2x2x3/16	9.65	4.66	93.4	29.000	0.4308	6.17	12.49	0.494 ✔
T4	140 - 120	L2 1/2x2 1/2x3/16	11.47	5.57	88.2	29.000	0.5710	6.50	16.56	0.392 ✔
T5	120 - 113.333	L2 1/2x2 1/2x3/16	13.07	6.31	99.5	29.000	0.5710	6.50	16.56	0.393 ✔
T6	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.65	6.60	104.0	29.000	0.5710	6.54	16.56	0.395 ✔
T7	106.667 - 100	L2 1/2x2 1/2x1/4	14.24	6.90	109.9	29.000	0.7519	6.70	21.80	0.307 ✔
T8	100 - 80	L3x3x3/16	16.08	7.77	101.2	29.000	0.6945	7.05	20.14	0.350 ✔
T9	80 - 70	L3x3x1/4	18.36	9.00	118.0	29.000	0.9159	7.95	26.56	0.299 ✔
T10	70 - 60	L3x3x3/8	19.21	9.42	125.8	29.000	1.3364	8.20	38.76	0.212 ✔
T11	60 - 50	L3x3 1/2x1/4	20.08	9.76	130.2	29.000	1.0059	8.26	29.17	0.283 ✔
T12	50 - 40	L3x3x3/8	20.95	10.20	136.0	29.000	1.3364	8.70	38.76	0.225 ✔
T13	40 - 20	L3 1/2x3 1/2x1/4	22.77	11.12	124.0	29.000	1.1034	8.95	32.00	0.280 ✔
T14	20 - 10	L3 1/2x4x1/4	23.68	11.57	130.9	29.000	1.1934	9.17	34.61	0.265 ✔
T15	10 - 0	L4x4x1/4	24.59	12.03	116.8	29.000	1.2909	9.47	37.44	0.253 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	195 - 180	L1 3/4x1 3/4x3/16	5.00	4.51	107.3	29.000	0.3604	0.25	10.45	0.024 ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	5.00	4.51	107.3	29.000	0.3604	0.24	10.45	0.023 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	195 - 180	Leg	P2x.154 (2.38 OD)	1	-8.17	28.30	28.9	Pass
T2	180 - 160	Leg	P3x.216 (3.5 OD)	25	-34.33	71.56	48.0	Pass
T3	160 - 140	Leg	P3x.300 (3.50 OD)	56	-75.07	96.06	78.2	Pass
T4	140 - 120	Leg	P4x.337 (4.50 OD)	83	-112.27	139.08	80.7	Pass
T5	120 - 113.333	Leg	P5x.375 (5.5625 OD)	104	-130.65	207.56	62.9	Pass
T6	113.333 - 106.667	Leg	P5x.375 (5.5625 OD)	113	-142.00	207.56	68.4	Pass
T7	106.667 - 100	Leg	P5x.375 (5.5625 OD)	122	-153.17	207.56	73.8	Pass
T8	100 - 80	Leg	P6x.28 (6.625 OD)	131	-185.31	196.87	94.1	Pass
T9	80 - 70	Leg	P6x.432 (6.625 OD)	152	-201.06	265.97	75.6	Pass
T10	70 - 60	Leg	P6x.432 (6.625 OD)	161	-216.51	265.97	81.4	Pass
T11	60 - 50	Leg	P8x.322 (8.625 OD)	170	-231.39	288.85	80.1	Pass
T12	50 - 40	Leg	P8x.322 (8.625 OD)	179	-246.50	288.85	85.3	Pass
T13	40 - 20	Leg	P8x.322 (8.625 OD)	188	-275.45	288.32	95.5	Pass
T14	20 - 10	Leg	P8x.5 (8.625 OD)	203	-282.30	436.07	64.7	Pass
T15	10 - 0	Leg	P8x.5 (8.625 OD)	212	-303.90	436.07	69.7	Pass
T1	195 - 180	Diagonal	L1 3/4x1 3/4x3/16	11	-1.78	9.08	19.6 26.4 (b)	Pass
T2	180 - 160	Diagonal	L1 3/4x1 3/4x3/16	35	-3.55	6.24	56.9	Pass
T3	160 - 140	Diagonal	L2x2x3/16	62	-6.04	6.47	93.3	Pass
T4	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	90	-6.45	8.16	79.1	Pass
T5	120 - 113.333	Diagonal	L2 1/2x2 1/2x3/16	111	-6.50	7.68	84.6	Pass
T6	113.333 - 106.667	Diagonal	L2 1/2x2 1/2x3/16	115	-6.58	7.01	93.8	Pass
T7	106.667 - 100	Diagonal	L2 1/2x2 1/2x1/4	124	-6.72	8.34	80.6	Pass
T8	100 - 80	Diagonal	L3x3x3/16	136	-7.03	8.85	79.3	Pass
T9	80 - 70	Diagonal	L3x3x1/4	157	-8.05	8.62	93.4	Pass
T10	70 - 60	Diagonal	L3x3x3/8	166	-8.23	11.32	72.7	Pass
T11	60 - 50	Diagonal	L3x3 1/2x1/4	175	-8.28	9.01	91.9	Pass
T12	50 - 40	Diagonal	L3x3x3/8	184	-8.80	9.66	91.1	Pass
T13	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	193	-9.09	9.11	99.8	Pass
T14	20 - 10	Diagonal	L3 1/2x4x1/4	208	-9.11	10.07	90.5	Pass
T15	10 - 0	Diagonal	L4x4x1/4	217	-9.66	11.72	82.4	Pass
T1	195 - 180	Top Girt	L1 3/4x1 3/4x3/16	5	-0.22	4.98	4.5	Pass
T2	180 - 160	Top Girt	L1 3/4x1 3/4x3/16	29	-0.24	4.98	4.7	Pass
							Summary	
						Leg (T13)	95.5	Pass
						Diagonal (T13)	99.8	Pass
						Top Girt (T2)	4.7	Pass
						Bolt Checks	83.1	Pass
						RATING =	**99.8**	**Pass**

Self Support Tower Caisson Foundation Analysis

Code (F or G)	F

Reactions	
Uplift (Per Leg) (k)	268
Comp. (Per Leg) (k)	303

Legend	
	Input
	Output
	Input Error
	Notes

Caisson Properties	
Diameter (ft)	6.0
Overall Length (ft)	51.5
Height Above Grade (ft)	0.5
γ Unit Weight of Conc. (kcf)	0.150
Foundation Modified?	No

Soil Properties	
Type of Soil Parameter Input	Caisson Capacities Per FDH Geo
Frost Depth (ft)	3.33
Water Table Level (ft)	5
Number of Soil Layers Below Grade	0
Ult. Tip Bearing Pressure (ksf)	12.55
Net or Gross Bearing?	Net

Normal Soils Inputs
Normal Soils
Determine Per County
100
0
8 ksf (F)/7ksf (G)
Net

FDH Geo Inputs
Caisson Capacities Per FDH Geo
Determine Per County
Per FDH Geo
0
Per FDH Geo
Net

FDH Geo Skin Friction Resistance	
Ult. Uplift Resistance (k)	727.00
Ult. Comp. Skin Friction Resistance (k)	969.00
γ Recommended Unit Weight of Soil (kcf)	0.105

Soil Profile

Soil Layers	Clay or Sand (C or S)	Depth to Bottom of Soil Layer (ft)	Soil Unit Weight (pcf)	Friction Angle (Φ)	Cohesion (ksf)	Ult. Comp. Skin Friction (ksf)	Ult. Uplift Skin Friction (ksf)
Grade	---	0	0	0	0.00	0.00	0.00
Layer 1	S						
Layer 2	S						
Layer 3	S						
Layer 4	S						
Layer 5	S						
Layer 6	S						
Layer 7	S						
Layer 8	S						
Layer 9	S						
Layer 10	S						

Input Parameter Checks	
Last Soil Layer Depth @ Caisson Tip	OK
Moist Soil Unit Weights Used	OK
Only Φ/Cu Input or Skin Friction Input	OK

Uplift Resistance		
Weight of Conc. (k)	137.3	
Soil Type in Neglected Layer	S	
Top Soil Neglected (ft)	3.33	
Ult. Skin Friction Resistance (k)	727.0	
Ult. Modification Resistance (k)		
Total Allowable Uplift Resistance (k)	**473.3**	
Capacity (%)	**56.6%**	**Sufficient**

Compression Resistance		
Weight of Conc. (k)	65.5	
Soil Type Neglected at Top (C or S)	S	
Top Soil Neglected (ft)	3.33	
Soil Type Neglected at Bottom (C or S)	Do Not Neglect	
Bottom Soil Neglected (ft)	0	
Ult. Skin Friction Resistance (k)	969.0	
Ult. Tip Bearing Resistance (k)	354.8	
Ult. Modification Resistance (k)		
Total Allow. Compressive Resistance (k)	**661.9**	
Capacity (%)	**55.7%**	**Sufficient**

Notes

1. The depth of the last soil layer entered must be the depth at which the caisson is bearing.

2. The soil unit weight should be the moist unit weight and is a necessary input to account for net bearing. All buoyant unit weights will be accounted for as necessary.

3. If the water table falls in between soil layers, break the soil layer up into two layers.

4. If the geotechnical report provides a skin friction value for each soil layer, make sure the friction angle and cohesion inputs are zero.

Project Title: Clinton 4 CT, CT1879-S-02
Project Notes: 15BYPZ1400

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
6.00	0.50	3.00	60.00

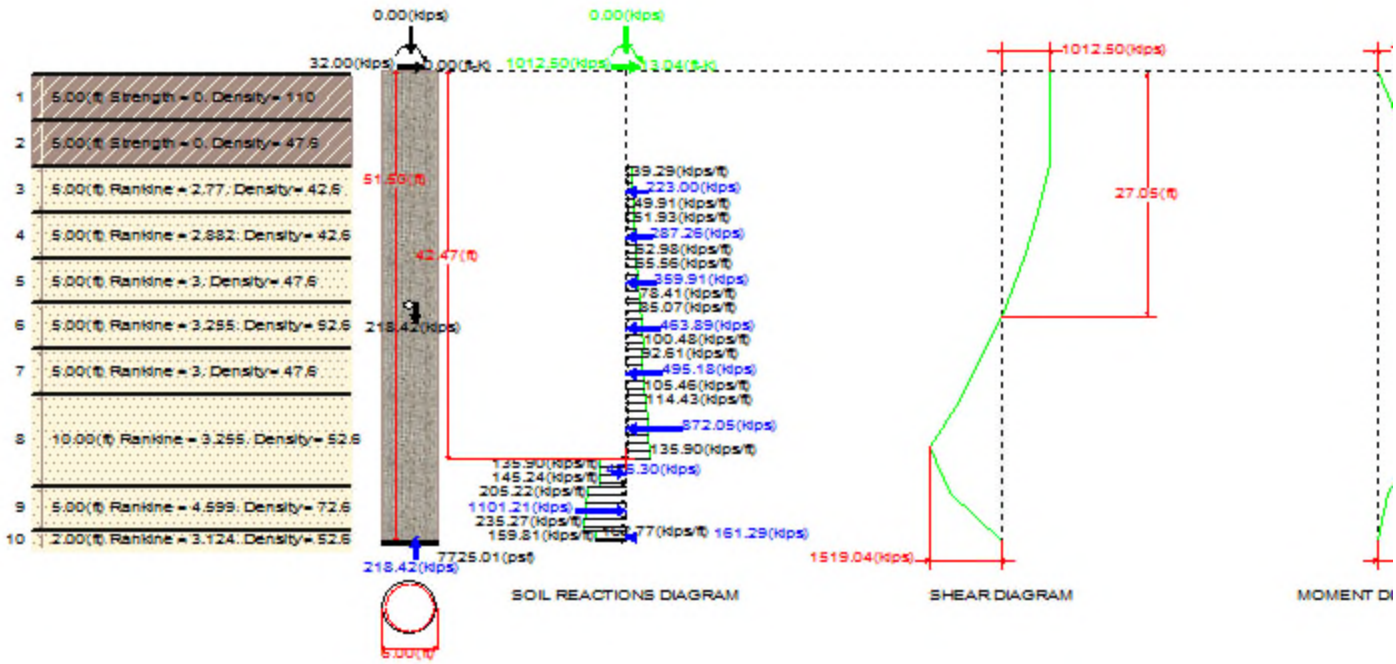
Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	5.00	0.00	110.0			
2	Clay	5.00	5.00	47.6			
3	Sand	5.00	10.00	42.6		2.770	28.00
4	Sand	5.00	15.00	42.6		2.882	29.00
5	Sand	5.00	20.00	47.6		3.000	30.00
6	Sand	5.00	25.00	52.6		3.255	32.00
7	Sand	5.00	30.00	47.6		3.000	30.00
8	Sand	10.00	35.00	52.6		3.255	32.00
9	Sand	5.00	45.00	72.6		4.599	40.00
10	Sand	2.00	50.00	52.6		3.124	31.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
0.0	0.0	32.00	31.64

******* R E S U L T S



Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
51.500	218.419	0.0	7725.0	7725.0

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	5.00	110.0			0.00	3.00
Clay	5.50	5.00	47.6			0.00	8.00
Sand	10.50	5.00	42.6		2.770	223.00	13.10
Sand	15.50	5.00	42.6		2.882	287.26	18.08
Sand	20.50	5.00	47.6		3.000	359.91	23.07
Sand	25.50	5.00	52.6		3.255	463.89	28.07
Sand	30.50	5.00	47.6		3.000	495.18	33.05
Sand	35.50	6.97	52.6		3.255	872.05	39.08
Sand	42.47	3.03	52.6		3.255	-426.30	44.00
Sand	45.50	5.00	72.6		4.599	-1101.21	48.06
Sand	50.50	1.00	52.6		3.124	-161.29	51.00

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	1012.5	13.0	32.0	0.4
5.15	1012.5	5227.4	32.0	165.2
10.30	1012.5	10441.7	32.0	330.0
15.45	792.0	15131.8	25.0	478.2
20.60	495.7	18473.6	15.7	583.9
25.75	121.0	20094.8	3.8	635.1
30.90	-358.8	19509.8	-11.3	616.6
36.05	-880.1	16360.3	-27.8	517.1
41.20	-1519.0	10217.5	-48.0	322.9
46.35	-1085.9	2704.6	-34.3	85.5
51.50	-0.0	0.0	-0.0	0.0

Reinforcement and Capacity

Total Reinforcement Percent	Reinforcement Area (in^2)	Usable Axial Capacity (kips)	Usable Moment Capacity (ft-k)
0.32	13.03	0.0	1708.9

US Standard Re-Bars (Select one of the following)

Quantity	Name	Area (in^2)	Diameter (in)	Spacing (in)
66	#4	0.20	0.500	2.95
43	#5	0.31	0.625	4.53
30	#6	0.44	0.750	6.49
22	#7	0.60	0.875	8.85
17	#8	0.79	1.000	11.46
14	#9	1.00	1.128	13.91
11	#10	1.27	1.270	17.71
9	#11	1.56	1.410	21.64
6	#14	2.25	1.693	32.46

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#:
Site Name:
App #:

Loads Already Factored		
For M (WL)	1.3	<----Disregard
For P (DL)	1.3	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	6.0	ft
Concrete Area =	4071.5	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	4	
Vert. Cage Diameter =	5.33	ft
Vert. Cage Diameter =	64.00	in
Vertical Bar Size =	8	
Bar Diameter =	1.00	in
Bar Area =	0.79	in^2
Number of Bars =	28	
As Total=	22.12	in^2
A s/ Aconc, Rho:	0.0054	0.54%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.54%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	6059.63	kips
at Mu=(ϕ=0.65)Mn=	3162.85	ft-kips
Max Tu, (φ=0.9) Tn =	1194.48	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	635.1	ft-kips **(* Note)**
Max. Factored Shaft Pu:	303	kips
Max Axial Force Type:	Tension	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.00	Mu:	635.1	ft-kips
1.00	Pu:	303	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code=	2005	

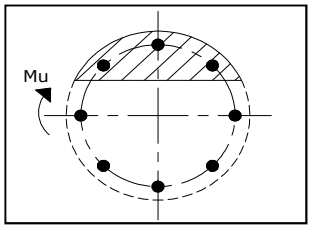
Seismic Properties

Seismic Design Category =	B	
Seismic Risk =	**Low**	

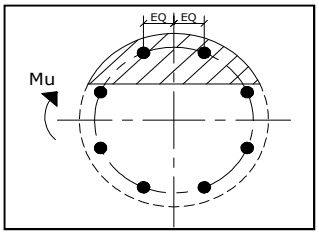
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**8.81**	in
Extreme Steel Strain, ϵt:	**0.0201**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	-303.00	kips
Drilled Shaft Moment Capacity, φMn:	**2285.16**	ft-kips
Drilled Shaft Superimposed Mu:	**635.10**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**27.8%**

Town of Clinton
Planning and Zoning Commission
54 East Main Street
Clinton, Connecticut 06413

November 19, 1999

Richards Farms
PO Box 932
Clinton, CT 06413

Re: SP 99-450: 46 Meadow Road, SBA, Inc.: Communications tower. Map 85, Block 69, Lot 1. Zone I-1.

CAM 99-450: 46 Meadow Road, SBA, Inc.: Communications tower. Map 85, Block 69, Lot 1. Zone I-1.

Dear Richards Farms:

Please be advised that that at its Regular Monthly Meeting held on November 8, 1999 the Clinton Planning and Zoning Commission approved CAM 99-450 and Site Plan Application 99-450 with the following conditions:

1. If the tower is abandoned, it is to be removed within one year by the owner, otherwise the town will remove it at the expense of the property owner;
2. Should the existing fence fall into disrepair on the southwest corner of the property, the applicant (SBA, Inc) shall replace the fence.

If you have any concerns regarding these conditions, please contact the Zoning Enforcement Officer at (860) 669-6133.

Clinton Planning and Zoning Commission

Nancy Taubman

Nancy Taubman, Secretary

Cc: Nathan L. Jacobson & Associates, Inc
Street file: Meadow Road