smartlink

July 5, 2017

EM-AT&T-047-170712

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

ORIGINAL

Re:	**Notice of Exempt Modification – Antenna Swap**
Property Address:	**232 South Main St East Windsor, Ct 06088**
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 168-feet on an existing 188 – self-support lattice tower, owned by BALCH BRIDGE STREET CORPORATION D/B/A BALCH COMMUNICATIONS

AT&T now intends to install three (3) new RRU-12 units one per sector all on position Three.

This facility approved the Application by the Town of East Windsor-Planning & Zoning Commission on August 13, 1996 –Public Hearing # 1721 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. SEE ATTACHED FOR CONDITIIONS OF APPROVAL.

The following is a list of subsequent decisions:

EM-AT&T-047-020513 - AT&T Wireless notice of intent to modify an existing telecommunications facility located at 232 South Main Street, **East Windsor,** Connecticut.

EM-CING-023-131-047-155-056-061130 New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 14 Canton Spring Road, Canton; Shuttle Meadow Road, Southington; 232 South Main Street, **East Windsor**; 3114 Albany Avenue, West Hartford; and 15 North Granby Road, Granby, Connecticut.

EM-CING-047-052-131-142-164-071004 – New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 232 South Main Street, **East Windsor**; 319-321 New Britain Avenue, Farmington; 250 Meriden-Waterbury Turnpike, Southington; 5 Barbara Road, Tolland; and 750 Rainbow Road, Windsor, Connecticut.

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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. § 16-5l0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent Robert Maynard First Selectman and Laurie P. Whitten, CZEO, AICP Town Planner Town of East Windsor, Ct 06088.A copy pf this letter is also being sent to owner, James Balch, 250 South Main Street East Windsor, Ct 06088.

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 168-foot level of the 188-lattice tower.
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:
Robert Maynard First Selectman and Laurie P. Whitten, CZEO, AICP
Owner - American Tower Corporation

TOWN OF EAST WINDSOR - PLANNING & ZONING COMMISSION
AUGUST 13, 1996 - PUBLIC HEARING #1271

CONDITIONS OF APPROVAL

BALCH BRIDGE STREET CORPORATION
SPECIAL USE PERMIT - TELECOMMUNICATIONS TOWER
232 SOUTH MAIN STREET
EAST WINDSOR, CONNECTICUT

Motion by: Ed Filipone

Seconded by: Susan Kiss

TO APPROVE the application of Balch Bridge Street Corporation for a Special Use Permit to allow the construction of a 200 foot tall telecommunications tower on property located at 232 South Main Street which is presently zoned B-2 and shown on Assessors Map 33, Block 5, Lot 84-1. This approval is subject to conformance with the reference plans and the following conditions:

Referenced plans:

- "Key Map, Balch Bridge Street Corporation, South Main Street - U.S. Route 5 East Windsor, Connecticut" Sheet 1 of 3, Scale 1'=200' BY J.R. Russo & Associates dated 7-2-96.
- "Balch Bridge Street Corporation, South Main Street - U.S. Route 5 East Windsor, Connecticut" Sheet 2 of 3, Scale 1'=100' BY J.R. Russo & Associates dated 7-2-96.
- "Site Plan, Balch Bridge Street Corporation, South Main Street - U.S. Route 5 East Windsor, Connecticut" Sheet 1 of 3, Scale 1'=200' BY J.R. Russo & Associates dated 7-2-96, revised to 7-30-96.

Conditions to be met prior to signing mylars:

1. The applicant shall submit an agreement for review and approval of the town attorney, to indemnify and hold harmless the Town of East Windsor against any claims that may be made should the proposed tower fall and cause damages to property or individuals. The hold harmless agreement shall be recorded on the land records of the subject property and of the property to the immediate south which is also under the applicant's control.

2. A copy of this approval Motion shall be recorded on the land records.

Conditions to be met prior to the issuance of a Zoning Permit:

3. Two sets of mylars shall be submitted for the signature of the Commission Chairman and Secretary. One set of mylars shall be filed on the land records and another shall be filed in the East Windsor Planning and Zoning Commission office.

Conditions to be met Prior to Certificate of Compliance:

4. All conditions of this approval motion shall be complied with.

BALCH BRIDGE STREET CORPORATION
SPECIAL USE PERMIT - TELECOMMUNICATIONS TOWER
232 SOUTH MAIN STREET
EAST WINDSOR, CONNECTICUT

General Conditions:

5. No work may begin until a Zoning and Building Permit have been issued.

6. Construction of improvements as approved by this special use/site plan approval must commence by August 13, 1997 and all improvements must be completed within 1 year from the start of construction, otherwise approval shall become null and void unless an extension is granted by the Commission.

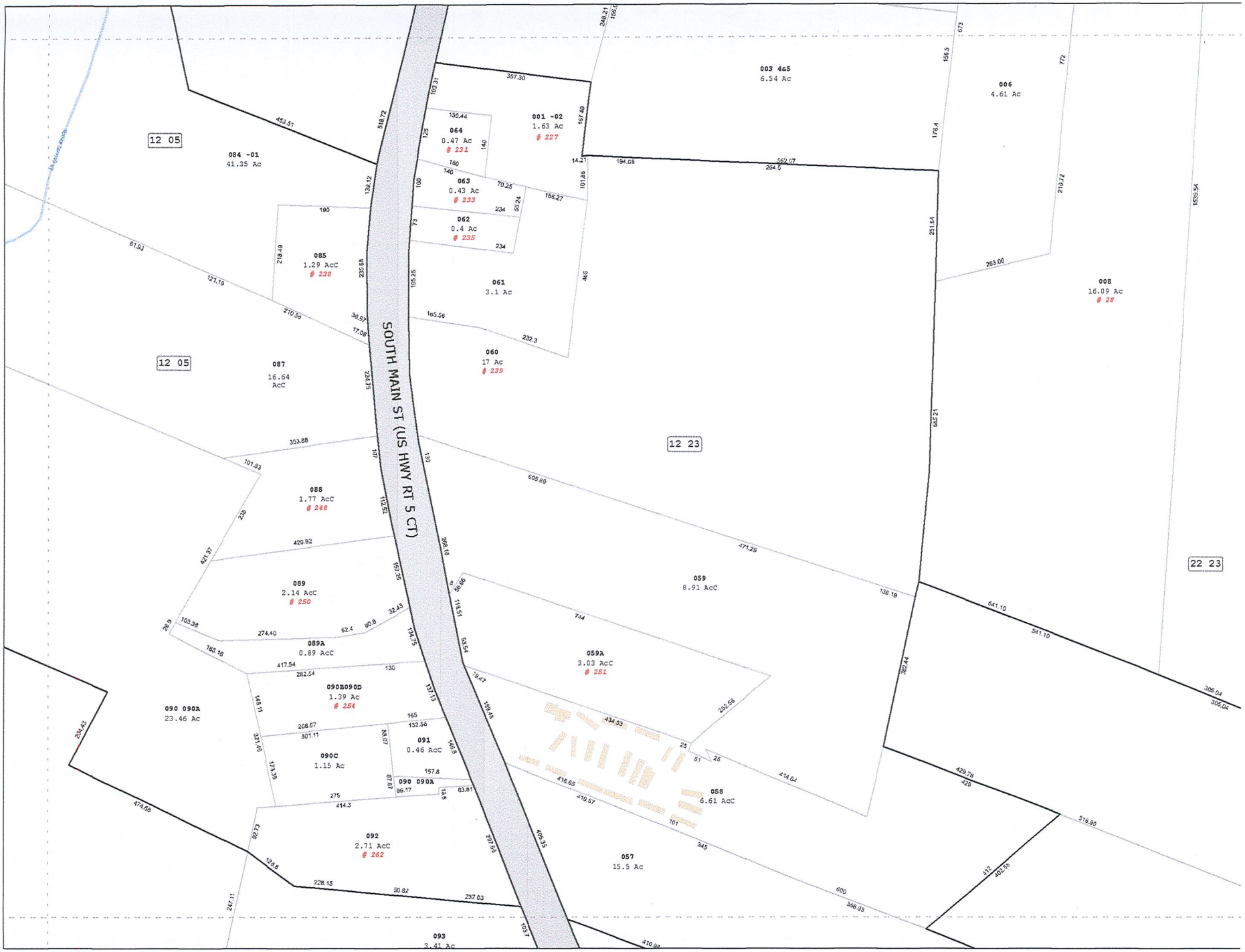
7. This Special Use Permit approval is for the specific use identified in the application. Any changes in use or tenancy require a new zoning permit and may require additional Commission approvals.

8. No structures or buildings other than the tower shall be erected without further Site Plan Review by the Commission.

9. This project shall be constructed and maintained in accordance with the referenced plans. Minor modifications to the approved plans which result in lesser impacts may be allowed subject to staff review and approval.

10. By acceptance of this permit and conditions, the applicant and owner acknowledge the right of Town staff to periodically enter upon the subject property for the purpose of determining compliance with the terms of this approval.

VOTE: In Favor: Unanimous



Map: 012

Map Printed: January, 2016

This map is for informational purposes only.
All information is subject to verification by any user.
The Town of East Windsor and its mapping contractors assume no legal responsibility for the information contained herein.

TOWN OF EAST WINDSOR, CONNECTICUT

Property Assessment Maps

Revised: October 1, 2015

1 : 100

0 50 100 200 300 400

From: TrackingUpdates@fedex.com
To: David Barbagallo
Subject: FedEx Shipment 779578824687 Delivered
Date: Wednesday, July 12, 2017 11:02:30 AM

FedEx®

Your package has been delivered

Tracking # 779578824687

Ship date:
Fri, 7/7/2017

Dave Barbagallo
Smartlink LLC
KENSINGTON, CT 06037
US

Delivered

Delivery date:
Wed, 7/12/2017 10:59 am

James Balch
Balch Communications Inc.
250 South Main St
EAST WINDSOR, CT 06088
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	779578824687
Status:	Delivered: 07/12/2017 10:59 AM Signed for By: J.BALCH
Signed for by:	J.BALCH
Delivery location:	EAST WINDSOR, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Express Saver
Packaging type:	FedEx Pak
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	7/12/2017 by 4:30 pm

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 10:02 AM CDT on 07/12/2017.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

Thank you for your business.

From: TrackingUpdates@fedex.com
To: David Barbagallo
Subject: FedEx Shipment 779578713974 Delivered
Date: Wednesday, July 12, 2017 12:09:40 PM

FedEx®

Your package has been delivered

Tracking # 779578713974

Ship date:
Fri, 7/7/2017

Dave Barbagallo
Smartlink LLC
KENSINGTON, CT 06037
US

Delivered

Delivery date:
Wed, 7/12/2017 12:07 pm

Robert Maynard First Selectman
Town of East Windsor
East Windsor
EAST WINDSOR, CT 06088
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	779578713974
Status:	Delivered: 07/12/2017 12:07 PM Signed for By: A.T
Signed for by:	A.T
Delivery location:	EAST WINDSOR, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Express Saver
Packaging type:	FedEx Pak
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	7/12/2017 by 4:30 pm

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 11:09 AM CDT on 07/12/2017.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

Thank you for your business.

From: TrackingUpdates@fedex.com
To: David Barbagallo
Subject: FedEx Shipment 779578765342 Delivered
Date: Wednesday, July 12, 2017 12:09:31 PM

FedEx®

Your package has been delivered

Tracking # 779578765342

Ship date:
Fri, 7/7/2017

Dave Barbagallo
Smartlink LLC
KENSINGTON, CT 06037
US

Delivered

Delivery date:
Wed, 7/12/2017 12:07 pm

Laurie P. Whitten, CZEO, AICP Town
Town of East Windsor
11 Rye St, Broad Brook
EAST WINDSOR, CT 06016
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	779578765342
Status:	Delivered: 07/12/2017 12:07 PM Signed for By: A.T
Signed for by:	A.T
Delivery location:	EAST WINDSOR, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Express Saver
Packaging type:	FedEx Pak
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	7/12/2017 by 4:30 pm

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 11:09 AM CDT on 07/12/2017.

All weights are estimated.

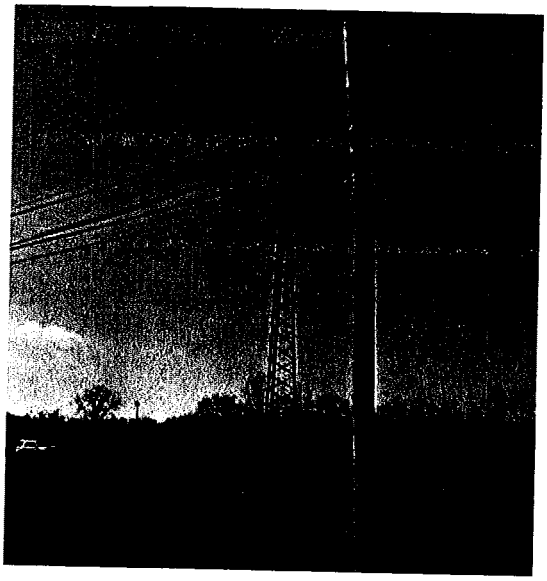
To track the latest status of your shipment, click on the tracking number above.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

Thank you for your business.

SITESAFE®
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728
703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com



SmartLink, LLC on behalf of AT&T Mobility, LLC
Site FA – 10035100
Site ID – CTL01194 (2C)
USID – 59398
Site Name – East Windsor
Site Compliance Report

232 South Main Street
East Windsor, CT 06088

Latitude: N41-52-37.77
Longitude: W72-36-38.77
Structure Type: Tower

Report generated date: July 5, 2017
Report by: Kevin Bernstetter II, EI
Customer Contact: David Barbagallo

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	Unknown
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit at Ground Level
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_CTV1194_2016-LTE-Next-Carrier_LTE-2C_om636a_2051A066H4_10035100_59398_03-09-2016_As-Built-RF-Approval_v4.00

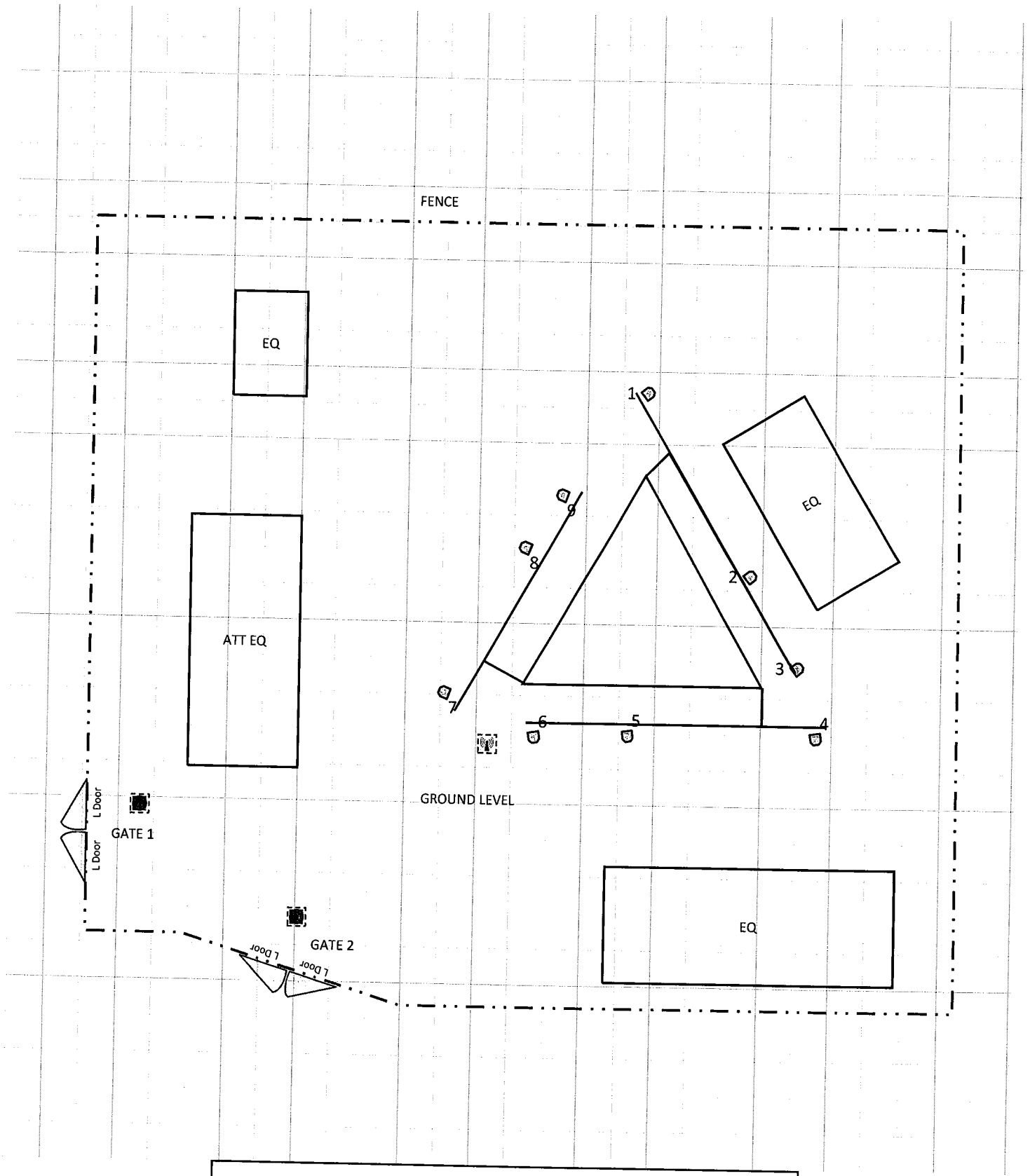
CD's: 10035100_AE201_170619_CTL01194_REV2

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

Site Scale Map For: East Windsor



Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Info 1 | Info 2

Barrier

Proposed Barriers/ Signs

(Feet)

0 7 14

www.sitesafe.com
Site Name:East Windsor
7/5/2017 8:15:31 AM

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
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	23	87.6	4.5	11.35	0	1	0	247.2	72.9'	87'	169.7'
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	23	85.7	4.5	14.32	0	1	0	455	72.9'	87'	169.7'
2	AT&T MOBILITY LLC	Powerwave P65-17-XLH-RR	Panel	737	23	70	8	13.41	0	0	1	1475.7	83.9'	68.1'	168'
2	AT&T MOBILITY LLC (Proposed)	Powerwave P65-17-XLH-RR	Panel	1900	23	63	8	14.51	0	0	2	4842.1	83.9'	68.1'	168'
3	AT&T MOBILITY LLC (Decommissioned)	Kathrein-Scala 800-10121	Panel	850	23	87.6	4.5	11.35	0	0	0	0	89.1'	58.6'	169.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	143	87.6	4.5	11.35	0	1	0	241.6	91.1'	51.4'	169.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	143	85.7	4.5	14.32	0	1	0	455	91.1'	51.4'	169.7'
5	AT&T MOBILITY LLC	Powerwave P65-17-XLH-RR	Panel	737	143	70	8	13.41	0	0	1	1475.7	71.2'	51.4'	168'
5	AT&T MOBILITY LLC (Proposed)	Powerwave P65-17-XLH-RR	Panel	1900	143	63	8	14.51	0	0	2	4842.1	71.2'	51.4'	168'
6	AT&T MOBILITY LLC (Decommissioned)	Kathrein-Scala 800-10121	Panel	850	143	87.6	4.5	11.35	0	0	0	0	61.4'	51.1'	169.7'
7	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	263	87.6	4.5	11.35	0	1	0	247.2	51.9'	55.6'	169.7'
7	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	263	85.7	4.5	14.32	0	1	0	455	51.9'	55.6'	169.7'
8	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	263	71	8	13.733	0	0	1	1475.7	60.1'	70.8'	168'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNH-1D6565C	Panel	1900	263	57	8	15.504	0	0	2	4842.1	60.1'	70.8'	168'
9	AT&T MOBILITY LLC (Decommissioned)	Kathrein-Scala 800-10121	Panel	850	263	87.6	4.5	11.35	0	0	0	0	63.9'	76.3'	169.7'

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.

Note: The 1900 MHz LTE technology is being added to an existing antenna.

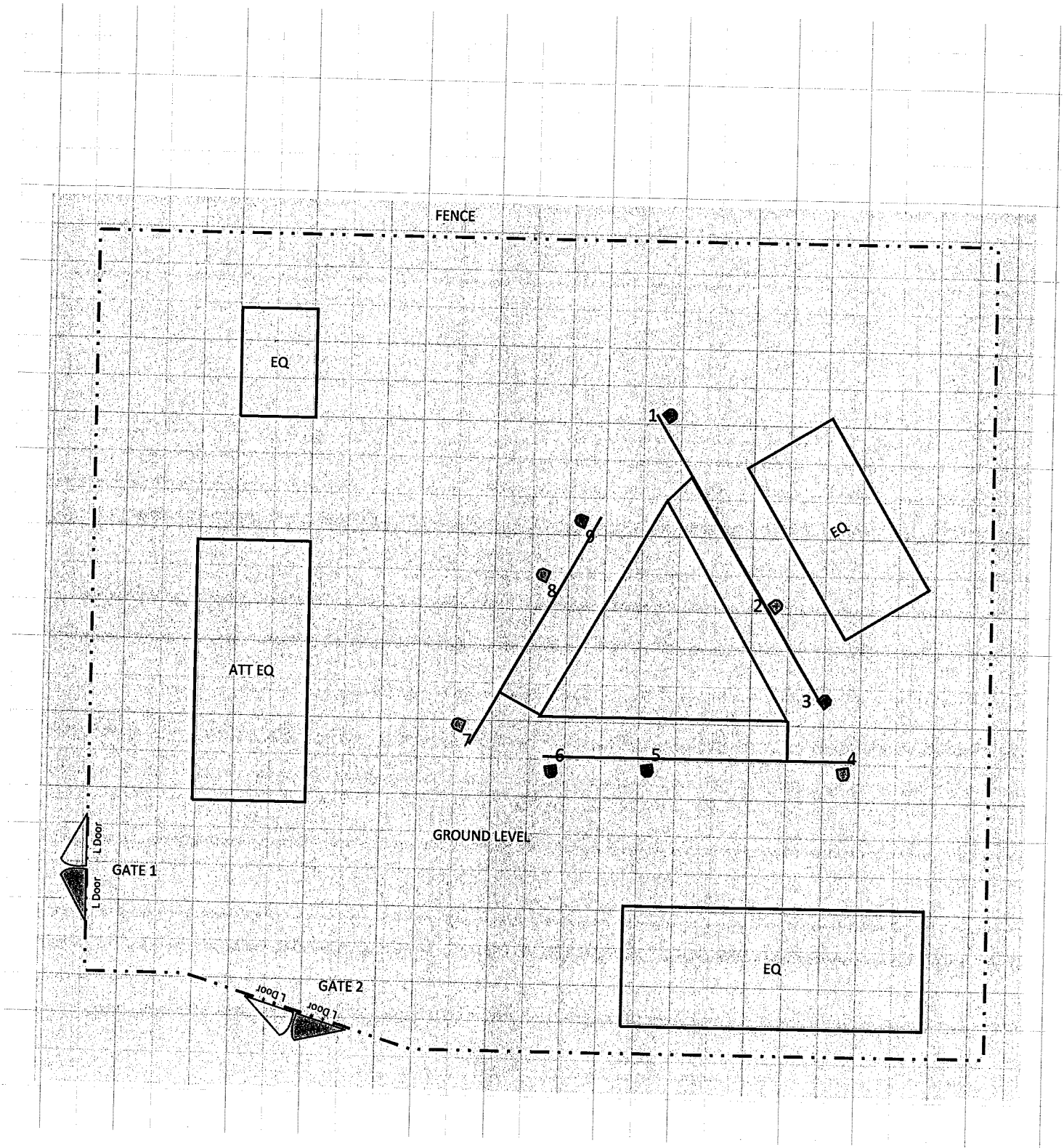
Note: Other operators exist on site but were not considered for this modeling as Sitesafe had no information on them.

4 Emission Predictions

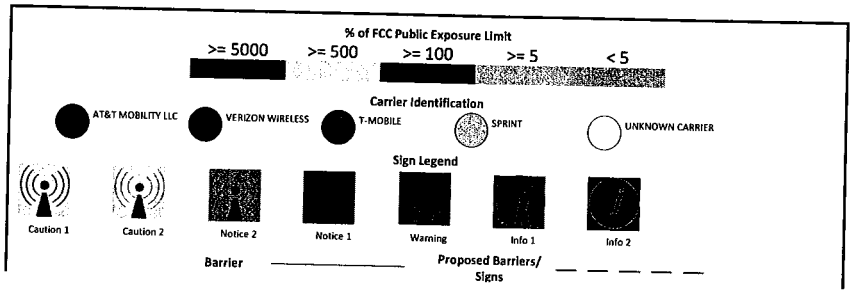
In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main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

RF Exposure Simulation For: East Windsor



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

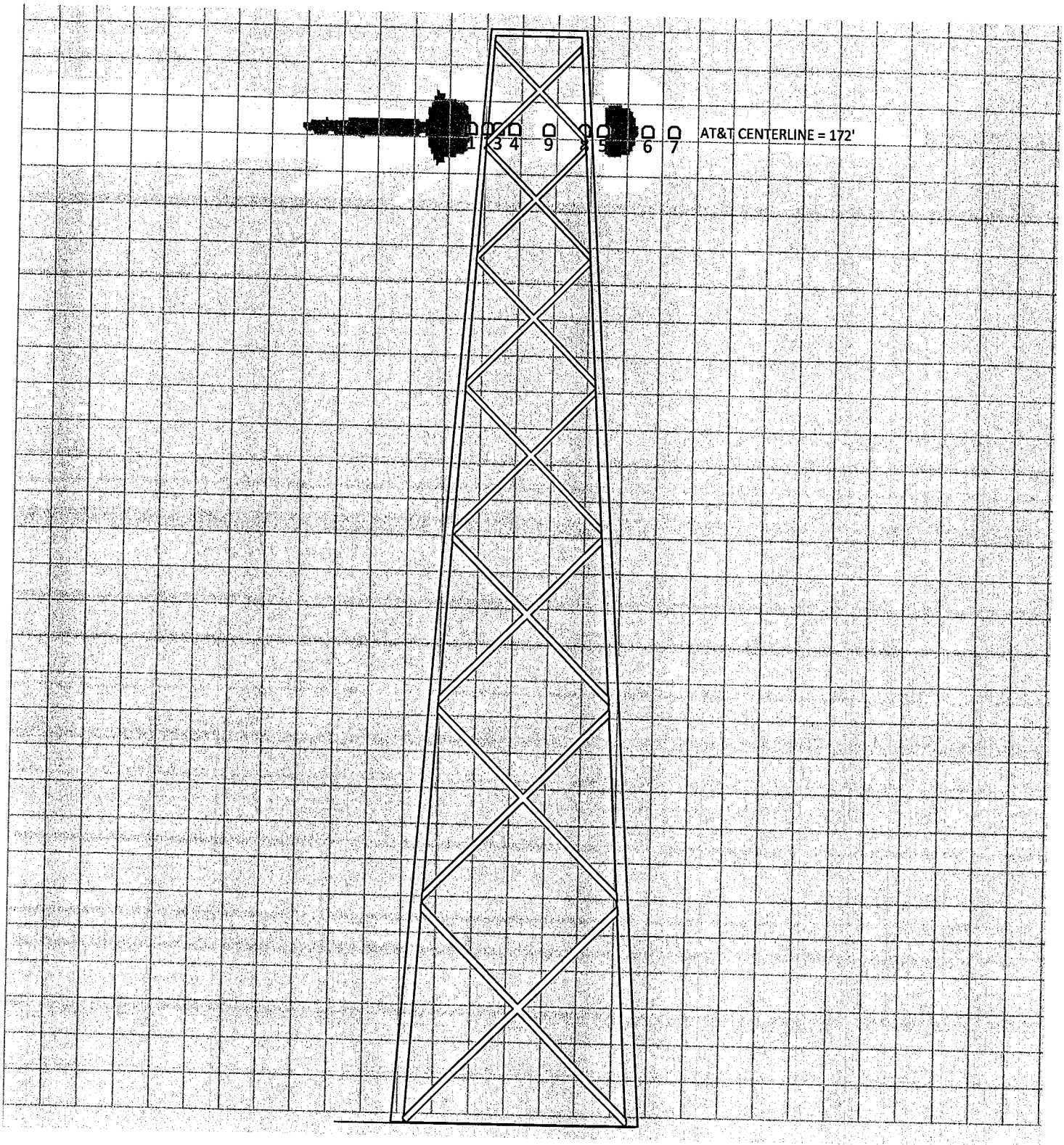


(Feet)
0 7 14

www.sitesafe.com
Site Name:East Windsor
7/5/2017 8:13:46 AM

SitesafeTC Version:1.0.0.0 - 0.0.0.264
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: East Windsor
Elevation View



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

% of FCC Public Exposure Limit

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

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Info 1 | Info 2

Barrier

Proposed Barriers/ Signs

(Feet)

0 12.9 25.8

www.sitesafe.com
Site Name:East Windsor
7/5/2017 8:19:41 AM

SitesafeTC Version:1.0.0.0 - 0.0.0.264
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Single Level (0)

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.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Site Access Location

Yellow caution 2 sign required at base of tower.

Gate Location 1

Information 1 sign required on the Gate.

Gate Location 2

Information 1 sign required on the Gate.

Notes:

- Signage may already exist on site. Sitesafe is recommending as a worst case scenario.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

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 Kevin Bernstetter II, EI.

July 5, 2017

Eddie Santoro

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.

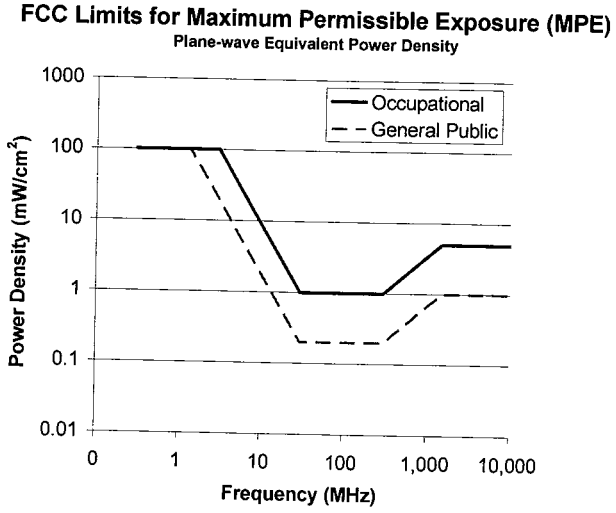
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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 modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

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

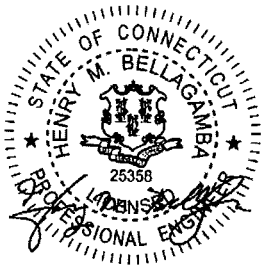
STRUCTURAL ANALYSIS REPORT

Prepared for: Smartlink / AT&T LTE 2C

New Equipment Installation on Existing Self-Support Tower

Site No.: CTL01194
FA Number: 10035100
PTN No.: 2051A066H4
PACE No.: MRCTB018196
Site Name: EAST WINDSOR
232 South Main Street
East Windsor, CT 06088

June 6, 2017



Henry M. Bellagamba, P.E.

FULLERTON
ENGINEERING · DESIGN

Fullerton Engineering Consultants, Inc.
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Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com
Project Number: 2016.0200.0010

Summary

A rigorous structural analysis was performed by Fullerton, as requested by the client, to determine the conformance of existing structure with the governing building code, the 2016 Connecticut State Building code, the 2012 International Building Code with amendments, and the industry standard, ANSI/TIA-222-G (Structural Standard for Steel Antenna Towers and Antenna Supporting Structures). The analysis considers the tower properties, existing and proposed appurtenances and the required loading criteria.

Conclusion

- **The tower members are in conformance for the loading considered.**
- **The tower foundation is in conformance for the loading considered.**

Analysis Data

The following is based on information provided by the client, field investigation, and other determination by Fullerton Engineering Consultants or third parties.

Configuration	188'-0" Rohn Self-Support Tower (File#: 34769PH) with a top face width of 6'-7.5" and bottom face width of 25'-0
References	Original Tower and Foundation Design by Rohn (File#: 34769PH) dated 10/16/1996. Tower Mapping Form by Northeast Towers, Inc. dated 05/04/2017. Geotechnical Study by Welti Geotechnical, P.C. dated 05/23/2017. Geotechnical Assessment of Foundation for Proposed Communications Tower by Dr. Clarence Welti, P.E., P.C. dated 11/05/1996. Site Visit Pictures dated 05/04/2017. Construction Drawings by Fullerton Engineering Consultants, Inc. dated 11/15/2016. Structural Analysis Report by All-Points Technology Corporation dated 03/31/2017.

Appurtenance Loading Schedule

ELEV. (FT.=AGL)	APPURTENANCE	TRANSMISSION LINES
	Proposed	
172'-0" (AT&T)	(3) Ericsson RRUS-12 Units Mounted on existing (3) sector frames	
	Existing (To Remain)	
195'-0"	(1) Antel BCD-87010N Omni Antenna Mounted on (1) rotatable platform	(1) 1-1/4" Coaxial Cable
172'-0" (AT&T)	(6) KMW AM-X-CD-16-65-000 Antennas (3) Kathrein 800-10121 Antennas (3) Ericsson RRUS-11 Units (3) Powerwave TT19-08BP111-001 TMA Units (3) CCI DTMABP7819VG12A TMA Units (1) Raycap DC6-48-60-18-8F Unit Mounted on existing (3) sector frames	(12) 1-1/4" Coaxial Cables (2) 5/8" DC Cables (1) 3/8" Fiber Cable
157'-0"	(6) Andrew RR90-17-02DP Antennas (3) RFS APX16DWV-DWVS Antennas (6) TMA Units Mounted on existing (3) sector frames	(18) 1-1/4" Coaxial Cables
145'-6"	(9) Commscope SBNHH-1D85B Antennas (3) Amphenol BXA-70063/6CF Antennas (3) Alcatel-Lucent B66A RRH4x45 RRH Units (3) Alcatel-Lucent B13 RRH4x30-4R RRH Units (3) Alcatel-Lucent PCS B25 RRH2x60 RRH Units (2) Raycap DB-61-6C-12AB-0Z Distribution Boxes Mounted on proposed (3) sector frames	(15) 1-5/8" Coaxial Cables (2) 1-5/8" Hybrid Cables
126'-0"	(3) RFS APXVSPP18-C-A20 Antennas (3) Alcatel-Lucent RRH 1900-4x45 Units (3) Alcatel-Lucent RRH2x50-800 Units Mounted on existing (3) sector frames	(3) 1-1/4" Hybrid Cables

Results

The results of the structural analysis are summarized as follows:

Tower	The tower legs are **adequate** for new loads, with a maximum stress ratio of 61.6% @ Elev. 60'-80' AGL.
	The tower bolts are **adequate** for new loads, with a maximum stress ratio of 80.7%.
	The tower diagonals are **adequate** for new loads, with a maximum stress ratio of 84.9% @ Elev. 0'-20' AGL.
Anchor Rods	The anchor rods are **adequate** for new loads, with a maximum stress ratio of 63.8%.
Foundation	The foundation is **adequate** for new loads. Please see attached foundation analysis.

Assumptions

This analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. The analysis is based solely on the information supplied, and the results, in turn, are only as accurate as data extracted from this information. Fullerton has been instructed by the client to assume the information supplied is accurate, and Fullerton has made no independent determination of its accuracy. The exception to the previous statement is if Fullerton has been contracted by the client to provide an independent structural mapping report of the tower and related appurtenances, in which case Fullerton has made an independent determination of the accuracy of the information resulting from the mapping report.

- The tower member sizes and geometry are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and stated in the materials section.
- The existing tower is assumed to have been properly maintained in accordance with the TIA/EIA standard and/or its original manufacturer's recommendations. The existing tower is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The antenna configuration is as supplied and/or stated in the analysis section. It is assumed to be complete and accurate. All antennas, mounts, remote radios, cables and cable supports are assumed to be properly installed and supported as per the manufacturer's requirements.
- The antennas, mounts, remote radios, cables and cable supports and lines stated in the appurtenance loading schedule represent Fullerton's understanding of the overall antenna configuration. If the actual configuration is different than above, then this analysis is invalid. Please refer to this report for the projected wind areas used in the calculations for antennas and mounts. If variations or discrepancies are identified, please inform Fullerton.
- Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
- The existing foundation is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The soil parameters are as per data supplied, or as assumed, and stated in the calculations.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.

Scope and Limitations

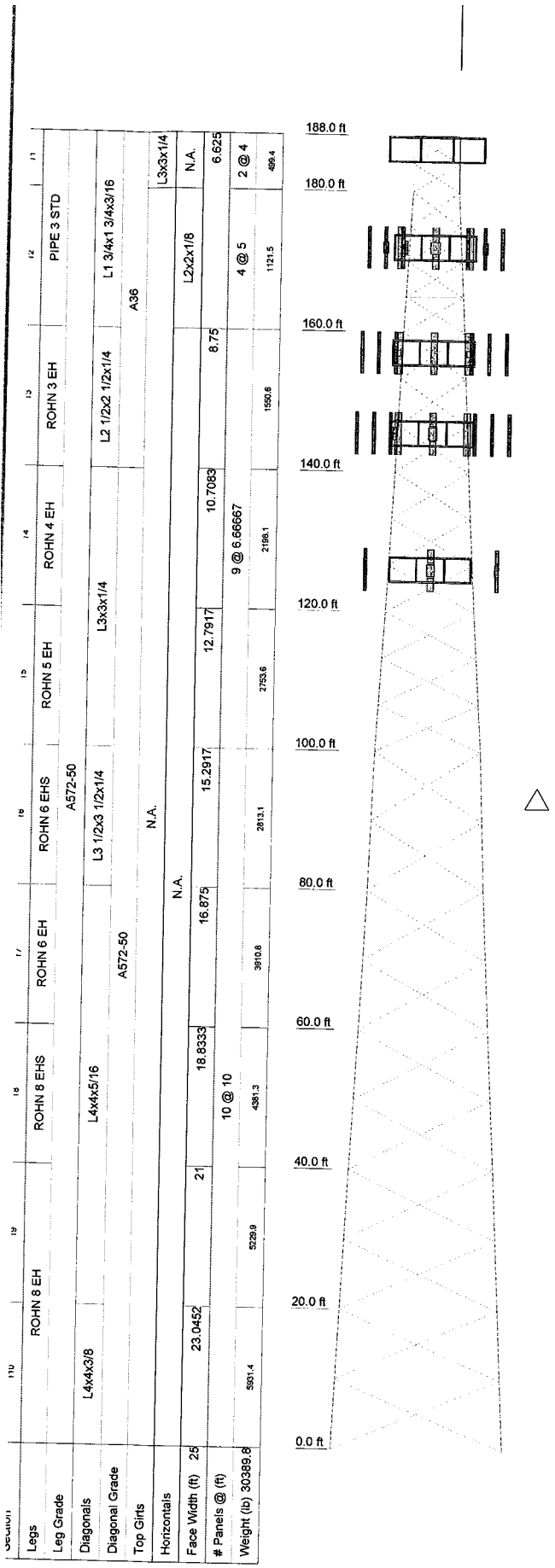
The engineering services rendered by Fullerton Engineering Consultants, Inc. (Fullerton) in connection with this structural analysis are limited to an analysis of the structure, size and capacity of its members. Fullerton does not analyze the fabrication, including welding and connection capacities, except as included in this report.

The information and conclusions contained in this report were determined by application of the current engineering standards and analysis procedures and formulae, and Fullerton assumes no obligation to revise any of the information or conclusions contained in this report in the event such engineering and analysis procedures and formulae are hereafter modified or revised.

Fullerton makes no warranties, expressed or implied in connection with this report and disclaims any liability arising from original design, material, fabrication and erection deficiencies or the "as-built" condition of this tower. Fullerton will not be responsible whatsoever for or on account of consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report.

Installation procedures are not within the scope of this report and should be performed and evaluated by a competent tower erection contractor.

Structural Calculations



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
BCD87010	195	(2) RR90-17-02DP	157
Rohn 14' Rotatable Platform	186	(2) RR90-17-02DP	157
(2) KMW AM-X-CD-16-65-00T	172	Amphenol Antel BXA-70063/6CF	145.5
(2) KMW AM-X-CD-16-65-00T	172	Amphenol Antel BXA-70063/6CF	145.5
(2) KMW AM-X-CD-16-65-00T	172	Amphenol Antel BXA-70063/6CF	145.5
Kathrein 800 10121	172	ALU B66A RRH4x45-4R	145.5
Kathrein 800 10121	172	ALU B66A RRH4x45-4R	145.5
Kathrein 800 10121	172	ALU B66A RRH4x45-4R	145.5
RRUS-11	172	ALU B25 RRH4x30-4R	145.5
RRUS-11	172	ALU B25 RRH4x30-4R	145.5
RRUS-11	172	ALU B25 RRH4x30-4R	145.5
Powerwave TT19-08BP111-001 TMA	172	ALU PCS B25 RRH2x60	145.5
Powerwave TT19-08BP111-001 TMA	172	ALU PCS B25 RRH2x60	145.5
Powerwave TT19-08BP111-001 TMA	172	ALU PCS B25 RRH2x60	145.5
CCI DTMABP7819VG12A TMA	172	Raycap DB-B1-6C-12AB-0Z	145.5
CCI DTMABP7819VG12A TMA	172	Raycap DB-B1-6C-12AB-0Z	145.5
CCI DTMABP7819VG12A TMA	172	SitePro1 VFA10-RRU	145.5
Raycap DC6-48-60-18-8F	172	SitePro1 VFA10-RRU	145.5
SM502-1	172	SitePro1 VFA10-RRU	145.5
SM502-1	172	(3) Commscope SBNHH-1D85B	145.5
SM502-1	172	(3) Commscope SBNHH-1D85B	145.5
RRUS-12	172	(3) Commscope SBNHH-1D85B	145.5
RRUS-12	172	ALU B66A RRH4x45-4R	126
RRUS-12	172	ALU B66A RRH4x45-4R	126
RFS APX16DWV-DWVS	157	ALU B66A RRH4x45-4R	126
RFS APX16DWV-DWVS	157	ALU FD-RRH2x50-800	126
RFS APX16DWV-DWVS	157	ALU FD-RRH2x50-800	126
(2) TMA (10"x6"x3.5")	157	ALU FD-RRH2x50-800	126
(2) TMA (10"x6"x3.5")	157	SM502-1	126
(2) TMA (10"x6"x3.5")	157	SM502-1	126
13' Sector Mount	157	SM502-1	126
13' Sector Mount	157	RFS APXVSPP18-C-A20	126
13' Sector Mount	157	RFS APXVSPP18-C-A20	126
(2) RR90-17-02DP	157	RFS APXVSPP18-C-A20	126

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 Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

Fullerton Engineering Consultants
1100 E. Woodfield Road Suite 500
Scahaumburg, IL 60173
Phone: 847-908-8400
FAX:

Job: *EAST WINDSOR - CTL01194*			
Project: *LTE 2C*			
Client: Smartlink / AT&T	Drawn by: JM	App'd:	
Code: TIA-222-G	Date:	Scale: N	
Path: P:\Dept 400\SMI\NX-ATT-NEWEN\CTL01194\Structural\Structural Analysis\Analysis\TNX\CTL01194 - TNX.eri		Dwg No.	

DESIGNED APPURTENANCE LOADING

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RRUS-11	172	ALU B25 RRH4x30-4R	145.5
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CCI DTMABP7819VG12A TMA	172	Raycap DB-B1-6C-12AB-0Z	145.5
CCI DTMABP7819VG12A TMA	172	SitePro1 VFA10-RRU	145.5
Raycap DC6-48-60-18-8F	172	SitePro1 VFA10-RRU	145.5
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(2) TMA (10"x6"x3.5")	157	SM502-1	126
(2) TMA (10"x6"x3.5")	157	SM502-1	126
13' Sector Mount	157	SM502-1	126
13' Sector Mount	157	RFS APXVSPP18-C-A20	126
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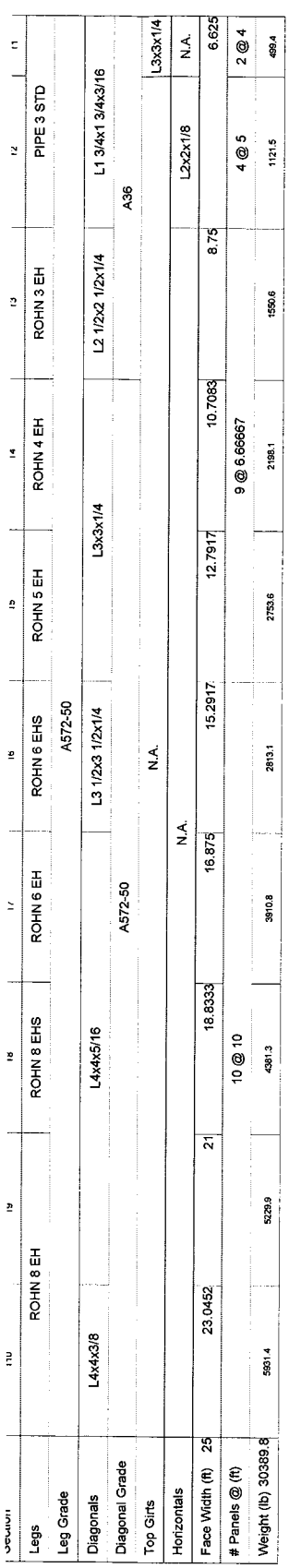
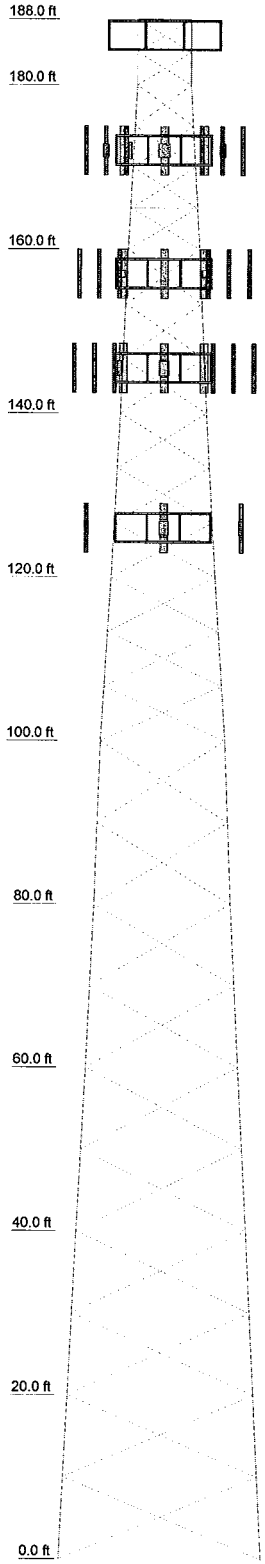
(2) RR90-17-02DP	157	RFS APXVSPP18-C-A20	126





△

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 303306 lb
SHEAR: 36296 lb

UPLIFT: -254492 lb
SHEAR: 31260 lb

AXIAL
186654 lb

SHEAR
16312 lb

MOMENT
1988614 lb-ft

TORQUE 7526 lb-ft
50 mph WIND - 1.0000 in ICE

AXIAL
58279 lb

SHEAR
60201 lb

MOMENT
6238346 lb-ft

TORQUE 32357 lb-ft
REACTIONS - 105 mph WIND

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Job: *EAST WINDSOR - CTL01194*			
Project: *LTE 2C*			
Client: Smartlink / AT&T	Drawn by: JM	App'd:	
Code: TIA-222-G	Date: 08/06/21	Scale: N	
Path:		Dwg No.	

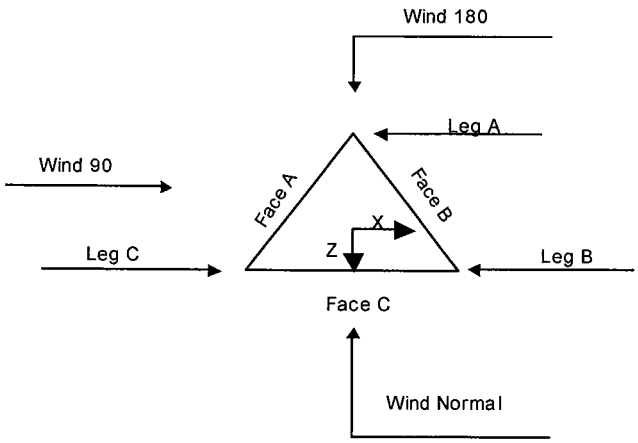
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 188.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.63 ft at the top and 25.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	188.00-180.00			6.63	1	8.00
T2	180.00-160.00			6.63	1	20.00
T3	160.00-140.00			8.75	1	20.00
T4	140.00-120.00			10.71	1	20.00
T5	120.00-100.00			12.79	1	20.00
T6	100.00-80.00			15.29	1	20.00
T7	80.00-60.00			16.88	1	20.00
T8	60.00-40.00			18.83	1	20.00
T9	40.00-20.00			21.00	1	20.00
T10	20.00-0.00			23.05	1	20.00

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
T1	188.00-180.00	4.00	X Brace	No	No	0.0000	0.0000
T2	180.00-160.00	5.00	X Brace	No	Yes	0.0000	0.0000
T3	160.00-140.00	6.67	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T5	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000

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
T6	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T7	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T8	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 188.00-180.00	Pipe	PIPE 3 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 180.00-160.00	Pipe	PIPE 3 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 140.00-120.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T5 120.00-100.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T6 100.00-80.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T7 80.00-60.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T8 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A572-50 (50 ksi)
T10 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 188.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
ft				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 188.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 188.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 120.00-100.00	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
T6 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
T7 80.00-60.00	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
T8 60.00-40.00	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
T9 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
T10 20.00-0.00	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 188.00-180.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	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	1.0000 A325N	4	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.00-80.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-0.00	Flange	1.0000 A354-BC	10	0.7500 A325N	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
LDF6-50A (1-1/4 FOAM)	B	No	Ar (CaAa)	188.00 - 8.00	1.0000	0.38	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	C	No	Ar (CaAa)	172.00 - 8.00	1.0000	0.38	12	12	0.7000 1.5500	1.5500		0.66
5/8 DC Cable	C	No	Ar (CaAa)	172.00 - 8.00	1.0000	0.31	2	2	1.6250 0.6250	0.6250		0.30
3/8" Fiber	C	No	Ar (CaAa)	172.00 - 8.00	1.0000	0.3	1	1	1.7370 0.4000	0.4000		0.08
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	157.00 - 8.00	1.0000	-0.4	12	12	0.7000 1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	157.00 - 8.00	2.0000	-0.38	6	6	0.7000 1.5500	1.5500		0.66
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	145.50 - 8.00	1.0000	-0.4	15	15	0.2700 1.9800	1.9800		0.82
1-5/8" Hybrid Cable	C	No	Ar (CaAa)	145.50 - 8.00	2.0000	0.49	2	2	0.7000 1.6250	1.6250		0.82
LDF6-50A (1-1/4 FOAM)	A	No	Ar (CaAa)	126.00 - 8.00	1.0000	0.48	3	3	0.7000 1.5500	1.5500		0.66
Safety Line 3/8	C	No	Ar (CaAa)	188.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.22

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Feedline Ladder (Af)	C	No	CaAa (In Face)	188.00 - 0.00	1	No Ice	0.50	8.40
						1/2" Ice	0.61	13.50
						1" Ice	0.72	18.60
Step Rungs 5/8	C	No	CaAa (Out Of Face)	188.00 - 0.00	1	No Ice	0.06	0.34
						1/2" Ice	0.16	1.03
						1" Ice	0.26	2.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	188.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	1.240	0.000	5.28
		C	0.000	0.000	4.300	0.500	71.68
T2	180.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	35.050	1.250	282.40
T3	160.00-140.00	A	0.000	0.000	47.430	0.000	201.96
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	69.373	1.250	427.87
T4	140.00-120.00	A	0.000	0.000	58.590	0.000	249.48
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	117.150	1.250	630.00
T5	120.00-100.00	A	0.000	0.000	65.100	0.000	277.20
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	117.150	1.250	630.00

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
T6	100.00-80.00	A	0.000	0.000	65.100	0.000	277.20
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	117.150	1.250	630.00
T7	80.00-60.00	A	0.000	0.000	65.100	0.000	277.20
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	117.150	1.250	630.00
T8	60.00-40.00	A	0.000	0.000	65.100	0.000	277.20
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	117.150	1.250	630.00
T9	40.00-20.00	A	0.000	0.000	65.100	0.000	277.20
		B	0.000	0.000	3.100	0.000	13.20
		C	0.000	0.000	117.150	1.250	630.00
T10	20.00-0.00	A	0.000	0.000	39.060	0.000	166.32
		B	0.000	0.000	1.860	0.000	7.92
		C	0.000	0.000	74.590	1.250	449.68

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
T1	188.00-180.00	A	2.375	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	5.040	0.000	96.39
		C		0.000	0.000	12.322	4.300	404.91
T2	180.00-160.00	A	2.356	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	12.525	0.000	238.10
		C		0.000	0.000	98.155	10.675	2120.49
T3	160.00-140.00	A	2.327	0.000	0.000	106.448	0.000	1853.64
		B		0.000	0.000	12.408	0.000	233.64
		C		0.000	0.000	176.353	10.558	3414.23
T4	140.00-120.00	A	2.294	0.000	0.000	134.039	0.000	2284.42
		B		0.000	0.000	12.276	0.000	228.65
		C		0.000	0.000	264.556	10.426	4891.63
T5	120.00-100.00	A	2.256	0.000	0.000	154.806	0.000	2551.85
		B		0.000	0.000	12.124	0.000	222.99
		C		0.000	0.000	263.111	10.274	4810.34
T6	100.00-80.00	A	2.211	0.000	0.000	153.952	0.000	2503.85
		B		0.000	0.000	11.944	0.000	216.40
		C		0.000	0.000	261.407	10.094	4715.00
T7	80.00-60.00	A	2.156	0.000	0.000	152.908	0.000	2445.48
		B		0.000	0.000	11.725	0.000	208.46
		C		0.000	0.000	259.322	9.875	4599.08
T8	60.00-40.00	A	2.085	0.000	0.000	151.553	0.000	2370.25
		B		0.000	0.000	11.439	0.000	198.37
		C		0.000	0.000	256.614	9.589	4449.69
T9	40.00-20.00	A	1.981	0.000	0.000	149.585	0.000	2262.09
		B		0.000	0.000	11.024	0.000	184.12
		C		0.000	0.000	252.677	9.174	4236.34
T10	20.00-0.00	A	1.775	0.000	0.000	87.419	0.000	1231.25
		B		0.000	0.000	6.120	0.000	94.44
		C		0.000	0.000	157.223	8.350	2597.86

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	188.00-180.00	0.1552	1.7234	-0.5926	1.8450
T2	180.00-160.00	-2.8864	3.7911	-2.1118	3.0000
T3	160.00-140.00	-5.8505	5.9529	-4.4429	4.6603
T4	140.00-120.00	-3.1320	7.1201	-3.0495	5.5090
T5	120.00-100.00	-3.5146	7.3268	-3.4379	5.8542
T6	100.00-80.00	-3.9609	8.2714	-3.9809	6.7782
T7	80.00-60.00	-4.2720	8.9316	-4.3578	7.4156
T8	60.00-40.00	-4.5474	9.5182	-4.7576	8.0881
T9	40.00-20.00	-4.9575	10.3863	-5.2429	8.8973
T10	20.00-0.00	-4.4321	9.5207	-5.2047	8.7714

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF6-50A (1-1/4 FOAM)	180.00 - 188.00	0.6000	0.4680
T1	10	Feedline Ladder (Af)	180.00 - 188.00	0.6000	0.4680
T1	11	Safety Line 3/8	180.00 - 188.00	0.6000	0.4680
T2	1	LDF6-50A (1-1/4 FOAM)	160.00 - 180.00	0.6000	0.5138
T2	2	LDF6-50A (1-1/4 FOAM)	160.00 - 172.00	0.6000	0.5138
T2	3	5/8 DC Cable	160.00 - 172.00	0.6000	0.5138
T2	4	3/8" Fiber	160.00 - 172.00	0.6000	0.5138
T2	10	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.5138
T2	11	Safety Line 3/8	160.00 - 180.00	0.6000	0.5138
T3	1	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	2	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	3	5/8 DC Cable	140.00 - 160.00	0.6000	0.6000
T3	4	3/8" Fiber	140.00 - 160.00	0.6000	0.6000
T3	5	LDF6-50A (1-1/4 FOAM)	140.00 - 157.00	0.6000	0.6000
T3	6	LDF6-50A (1-1/4 FOAM)	140.00 - 157.00	0.6000	0.6000
T3	7	LDF7-50A (1-5/8 FOAM)	140.00 - 145.50	0.6000	0.6000
T3	8	1-5/8" Hybrid Cable	140.00 - 145.50	0.6000	0.6000
T3	10	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	11	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T4	1	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	2	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	3	5/8 DC Cable	120.00 - 140.00	0.6000	0.6000
T4	4	3/8" Fiber	120.00 - 140.00	0.6000	0.6000
T4	5	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	6	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	7	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	8	1-5/8" Hybrid Cable	120.00 - 140.00	0.6000	0.6000
T4	9	LDF6-50A (1-1/4 FOAM)	120.00 - 126.00	0.6000	0.6000
T4	10	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	11	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T5	1	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	2	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	3	5/8 DC Cable	100.00 - 120.00	0.6000	0.6000
T5	4	3/8" Fiber	100.00 - 120.00	0.6000	0.6000
T5	5	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	6	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	7	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	8	1-5/8" Hybrid Cable	100.00 - 120.00	0.6000	0.6000
T5	9	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	10	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	11	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T6	1	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T6	2	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T6	3	5/8 DC Cable	80.00 - 100.00	0.6000	0.6000
T6	4	3/8" Fiber	80.00 - 100.00	0.6000	0.6000
T6	5	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T6	6	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T6	7	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T6	8	1-5/8" Hybrid Cable	80.00 - 100.00	0.6000	0.6000
T6	9	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T6	10	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	11	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T7	1	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	2	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	3	5/8 DC Cable	60.00 - 80.00	0.6000	0.6000
T7	4	3/8" Fiber	60.00 - 80.00	0.6000	0.6000
T7	5	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	6	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	7	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.6000
T7	8	1-5/8" Hybrid Cable	60.00 - 80.00	0.6000	0.6000
T7	9	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	10	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	11	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T8	1	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	2	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	3	5/8 DC Cable	40.00 - 60.00	0.6000	0.6000
T8	4	3/8" Fiber	40.00 - 60.00	0.6000	0.6000
T8	5	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	6	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	7	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	8	1-5/8" Hybrid Cable	40.00 - 60.00	0.6000	0.6000
T8	9	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	10	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	11	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T9	1	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	2	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	3	5/8 DC Cable	20.00 - 40.00	0.6000	0.6000
T9	4	3/8" Fiber	20.00 - 40.00	0.6000	0.6000
T9	5	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	6	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	7	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	8	1-5/8" Hybrid Cable	20.00 - 40.00	0.6000	0.6000
T9	9	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	10	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	11	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T10	1	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T10	2	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T10	3	5/8 DC Cable	8.00 - 20.00	0.6000	0.6000
T10	4	3/8" Fiber	8.00 - 20.00	0.6000	0.6000
T10	5	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T10	6	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T10	7	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.6000
T10	8	1-5/8" Hybrid Cable	8.00 - 20.00	0.6000	0.6000
T10	9	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.6000
T10	10	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	11	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
BCD87010	B	From Leg	0.00 0.00 7.50	0.0000	195.00	No Ice 1/2" Ice 1" Ice	2.98 4.12 5.26	2.98 4.12 5.26	27.00 37.00 47.00
Rohn 14' Rotatable Platform	C	None		0.0000	186.00	No Ice 1/2" Ice 1" Ice	41.00 56.00 71.00	41.00 56.00 71.00	2500.00 3000.00 3500.00
(2) KMW AM-X-CD-16-65-00T	A	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	6.40 6.89 7.35	5.54 6.38 7.09	54.90 112.27 176.34
(2) KMW	B	From Leg	4.00	0.0000	172.00	No Ice	6.40	5.54	54.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
AM-X-CD-16-65-00T			0.00				1/2" Ice	6.89	6.38	112.27
			0.00				1" Ice	7.35	7.09	176.34
(2) KMW	C	From Leg	4.00	0.0000	172.00		No Ice	6.40	5.54	54.90
AM-X-CD-16-65-00T			0.00				1/2" Ice	6.89	6.38	112.27
			0.00				1" Ice	7.35	7.09	176.34
Kathrein 800 10121	A	From Leg	4.00	0.0000	172.00		No Ice	5.91	5.27	85.45
			0.00				1/2" Ice	6.35	6.00	139.05
			0.00				1" Ice	6.80	6.74	200.14
Kathrein 800 10121	B	From Leg	4.00	0.0000	172.00		No Ice	5.91	5.27	85.45
			0.00				1/2" Ice	6.35	6.00	139.05
			0.00				1" Ice	6.80	6.74	200.14
Kathrein 800 10121	C	From Leg	4.00	0.0000	172.00		No Ice	5.91	5.27	85.45
			0.00				1/2" Ice	6.35	6.00	139.05
			0.00				1" Ice	6.80	6.74	200.14
RRUS-11	A	From Leg	4.00	0.0000	172.00		No Ice	2.52	1.07	55.00
			0.00				1/2" Ice	2.72	1.21	74.32
			0.00				1" Ice	2.92	1.36	96.56
RRUS-11	B	From Leg	4.00	0.0000	172.00		No Ice	2.52	1.07	55.00
			0.00				1/2" Ice	2.72	1.21	74.32
			0.00				1" Ice	2.92	1.36	96.56
RRUS-11	C	From Leg	4.00	0.0000	172.00		No Ice	2.52	1.07	55.00
			0.00				1/2" Ice	2.72	1.21	74.32
			0.00				1" Ice	2.92	1.36	96.56
Powerwave TT19-08BP111-001 TMA	A	From Leg	4.00	0.0000	172.00		No Ice	0.55	0.45	16.00
			0.00				1/2" Ice	0.65	0.53	21.80
			0.00				1" Ice	0.75	0.63	29.22
Powerwave TT19-08BP111-001 TMA	B	From Leg	4.00	0.0000	172.00		No Ice	0.55	0.45	16.00
			0.00				1/2" Ice	0.65	0.53	21.80
			0.00				1" Ice	0.75	0.63	29.22
Powerwave TT19-08BP111-001 TMA	C	From Leg	4.00	0.0000	172.00		No Ice	0.55	0.45	16.00
			0.00				1/2" Ice	0.65	0.53	21.80
			0.00				1" Ice	0.75	0.63	29.22
CCI DTMABP7819VG12A TMA	A	From Leg	4.00	0.0000	172.00		No Ice	0.98	0.34	19.20
			0.00				1/2" Ice	1.10	0.42	26.50
			0.00				1" Ice	1.23	0.51	35.65
CCI DTMABP7819VG12A TMA	B	From Leg	4.00	0.0000	172.00		No Ice	0.98	0.34	19.20
			0.00				1/2" Ice	1.10	0.42	26.50
			0.00				1" Ice	1.23	0.51	35.65
CCI DTMABP7819VG12A TMA	C	From Leg	4.00	0.0000	172.00		No Ice	0.98	0.34	19.20
			0.00				1/2" Ice	1.10	0.42	26.50
			0.00				1" Ice	1.23	0.51	35.65
Raycap DC6-48-60-18-8F	C	From Leg	0.50	0.0000	172.00		No Ice	0.83	0.83	22.00
			0.00				1/2" Ice	1.34	1.34	37.91
			0.00				1" Ice	1.52	1.52	56.21
SM502-1	A	None		0.0000	172.00		No Ice	15.35	14.00	557.70
							1/2" Ice	21.29	20.81	741.30
							1" Ice	27.23	27.62	924.90
SM502-1	B	None		0.0000	172.00		No Ice	15.35	14.00	557.70
							1/2" Ice	21.29	20.81	741.30
							1" Ice	27.23	27.62	924.90
SM502-1	C	None		0.0000	172.00		No Ice	15.35	14.00	557.70
							1/2" Ice	21.29	20.81	741.30
							1" Ice	27.23	27.62	924.90
(2) RR90-17-02DP	A	From Leg	4.00	0.0000	157.00		No Ice	4.36	1.97	18.00
			0.00				1/2" Ice	4.70	2.31	40.42
			0.00				1" Ice	5.06	2.66	67.36
(2) RR90-17-02DP	B	From Leg	4.00	0.0000	157.00		No Ice	4.36	1.97	18.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1/2" Ice	4.70	2.31	40.42
			0.00				1" Ice	5.06	2.66	67.36
(2) RR90-17-02DP	C	From Leg	4.00		0.0000	157.00	No Ice	4.36	1.97	18.00
			0.00				1/2" Ice	4.70	2.31	40.42
			0.00				1" Ice	5.06	2.66	67.36
RFS APX16DWV-DWVS	A	From Leg	4.00		0.0000	157.00	No Ice	6.59	2.15	40.70
			0.00				1/2" Ice	6.96	2.49	74.24
			0.00				1" Ice	7.34	2.84	112.65
RFS APX16DWV-DWVS	B	From Leg	4.00		0.0000	157.00	No Ice	6.59	2.15	40.70
			0.00				1/2" Ice	6.96	2.49	74.24
			0.00				1" Ice	7.34	2.84	112.65
RFS APX16DWV-DWVS	C	From Leg	4.00		0.0000	157.00	No Ice	6.59	2.15	40.70
			0.00				1/2" Ice	6.96	2.49	74.24
			0.00				1" Ice	7.34	2.84	112.65
(2) TMA (10"x6"x3.5")	A	From Leg	4.00		0.0000	157.00	No Ice	0.50	0.30	15.00
			0.00				1/2" Ice	0.59	0.37	19.42
			0.00				1" Ice	0.69	0.46	25.31
(2) TMA (10"x6"x3.5")	B	From Leg	4.00		0.0000	157.00	No Ice	0.50	0.30	15.00
			0.00				1/2" Ice	0.59	0.37	19.42
			0.00				1" Ice	0.69	0.46	25.31
(2) TMA (10"x6"x3.5")	C	From Leg	4.00		0.0000	157.00	No Ice	0.50	0.30	15.00
			0.00				1/2" Ice	0.59	0.37	19.42
			0.00				1" Ice	0.69	0.46	25.31
13' Sector Mount	A	None			0.0000	157.00	No Ice	9.80	4.90	330.00
							1/2" Ice	14.70	7.35	420.00
							1" Ice	19.60	9.80	510.00
13' Sector Mount	B	None			0.0000	157.00	No Ice	9.80	4.90	330.00
							1/2" Ice	14.70	7.35	420.00
							1" Ice	19.60	9.80	510.00
13' Sector Mount	C	None			0.0000	157.00	No Ice	9.80	4.90	330.00
							1/2" Ice	14.70	7.35	420.00
							1" Ice	19.60	9.80	510.00
(3) Commscope SBNHH-1D85B	A	From Leg	4.00		0.0000	145.50	No Ice	8.32	7.00	74.95
			0.00				1/2" Ice	8.88	8.19	143.50
			0.00				1" Ice	9.40	9.08	220.01
(3) Commscope SBNHH-1D85B	B	From Leg	4.00		0.0000	145.50	No Ice	8.32	7.00	74.95
			0.00				1/2" Ice	8.88	8.19	143.50
			0.00				1" Ice	9.40	9.08	220.01
(3) Commscope SBNHH-1D85B	C	From Leg	4.00		0.0000	145.50	No Ice	8.32	7.00	74.95
			0.00				1/2" Ice	8.88	8.19	143.50
			0.00				1" Ice	9.40	9.08	220.01
Amphenol Antel BXA-70063/6CF	A	From Leg	4.00		0.0000	145.50	No Ice	7.61	6.10	38.90
			0.00				1/2" Ice	8.06	7.04	99.80
			0.00				1" Ice	8.52	7.86	168.30
Amphenol Antel BXA-70063/6CF	B	From Leg	4.00		0.0000	145.50	No Ice	7.61	6.10	38.90
			0.00				1/2" Ice	8.06	7.04	99.80
			0.00				1" Ice	8.52	7.86	168.30
Amphenol Antel BXA-70063/6CF	C	From Leg	4.00		0.0000	145.50	No Ice	7.61	6.10	38.90
			0.00				1/2" Ice	8.06	7.04	99.80
			0.00				1" Ice	8.52	7.86	168.30
ALU B66A RRH4x45-4R	A	From Leg	4.00		0.0000	145.50	No Ice	2.54	1.61	56.80
			0.00				1/2" Ice	2.75	1.79	76.92
			0.00				1" Ice	2.97	1.98	100.15
ALU B66A RRH4x45-4R	B	From Leg	4.00		0.0000	145.50	No Ice	2.54	1.61	56.80
			0.00				1/2" Ice	2.75	1.79	76.92
			0.00				1" Ice	2.97	1.98	100.15
ALU B66A RRH4x45-4R	C	From Leg	4.00		0.0000	145.50	No Ice	2.54	1.61	56.80

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00					1/2" Ice	2.75	1.79	76.92
			0.00					1" Ice	2.97	1.98	100.15
ALU B25 RRH4x30-4R	A	From Leg	4.00			0.0000	145.50	No Ice	2.16	1.62	57.20
			0.00					1/2" Ice	2.35	1.79	76.81
			0.00					1" Ice	2.55	1.97	99.38
ALU B25 RRH4x30-4R	B	From Leg	4.00			0.0000	145.50	No Ice	2.16	1.62	57.20
			0.00					1/2" Ice	2.35	1.79	76.81
			0.00					1" Ice	2.55	1.97	99.38
ALU B25 RRH4x30-4R	C	From Leg	4.00			0.0000	145.50	No Ice	2.16	1.62	57.20
			0.00					1/2" Ice	2.35	1.79	76.81
			0.00					1" Ice	2.55	1.97	99.38
ALU PCS B25 RRH2x60	A	From Leg	4.00			0.0000	145.50	No Ice	2.20	1.56	60.00
			0.00					1/2" Ice	2.39	1.73	79.33
			0.00					1" Ice	2.59	1.91	101.61
ALU PCS B25 RRH2x60	B	From Leg	4.00			0.0000	145.50	No Ice	2.20	1.56	60.00
			0.00					1/2" Ice	2.39	1.73	79.33
			0.00					1" Ice	2.59	1.91	101.61
ALU PCS B25 RRH2x60	C	From Leg	4.00			0.0000	145.50	No Ice	2.20	1.56	60.00
			0.00					1/2" Ice	2.39	1.73	79.33
			0.00					1" Ice	2.59	1.91	101.61
Raycap DB-B1-6C-12AB-0Z	A	From Leg	0.50			0.0000	145.50	No Ice	2.82	1.85	32.00
			0.00					1/2" Ice	3.04	2.03	57.02
			0.00					1" Ice	3.25	2.22	85.31
Raycap DB-B1-6C-12AB-0Z	C	From Leg	0.50			0.0000	145.50	No Ice	2.82	1.85	32.00
			0.00					1/2" Ice	3.04	2.03	57.02
			0.00					1" Ice	3.25	2.22	85.31
SitePro1 VFA10-RRU	A	None				0.0000	145.50	No Ice	7.53	3.80	310.00
								1/2" Ice	10.77	5.38	370.00
								1" Ice	13.91	6.97	450.00
SitePro1 VFA10-RRU	B	None				0.0000	145.50	No Ice	7.53	3.80	310.00
								1/2" Ice	10.77	5.38	370.00
								1" Ice	13.91	6.97	450.00
SitePro1 VFA10-RRU	C	None				0.0000	145.50	No Ice	7.53	3.80	310.00
								1/2" Ice	10.77	5.38	370.00
								1" Ice	13.91	6.97	450.00
RFS APXVSPP18-C-A20	A	From Leg	4.00			0.0000	126.00	No Ice	8.02	5.28	64.50
			0.00					1/2" Ice	8.48	5.74	114.02
			0.00					1" Ice	8.94	6.20	169.62
RFS APXVSPP18-C-A20	B	From Leg	4.00			0.0000	126.00	No Ice	8.02	5.28	64.50
			0.00					1/2" Ice	8.48	5.74	114.02
			0.00					1" Ice	8.94	6.20	169.62
RFS APXVSPP18-C-A20	C	From Leg	4.00			0.0000	126.00	No Ice	8.02	5.28	64.50
			0.00					1/2" Ice	8.48	5.74	114.02
			0.00					1" Ice	8.94	6.20	169.62
ALU B66A RRH4x45-4R	A	From Leg	4.00			0.0000	126.00	No Ice	2.54	1.61	56.80
			0.00					1/2" Ice	2.75	1.79	76.92
			0.00					1" Ice	2.97	1.98	100.15
ALU B66A RRH4x45-4R	B	From Leg	4.00			0.0000	126.00	No Ice	2.54	1.61	56.80
			0.00					1/2" Ice	2.75	1.79	76.92
			0.00					1" Ice	2.97	1.98	100.15
ALU B66A RRH4x45-4R	C	From Leg	4.00			0.0000	126.00	No Ice	2.54	1.61	56.80
			0.00					1/2" Ice	2.75	1.79	76.92
			0.00					1" Ice	2.97	1.98	100.15
ALU FD-RRH2x50-800	A	From Leg	4.00			0.0000	126.00	No Ice	2.13	1.41	53.00
			0.00					1/2" Ice	2.32	1.57	71.78
			0.00					1" Ice	2.51	1.74	93.44
ALU FD-RRH2x50-800	B	From Leg	4.00			0.0000	126.00	No Ice	2.13	1.41	53.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1/2" Ice	2.32	1.57	71.78
			0.00				1" Ice	2.51	1.74	93.44
ALU FD-RRH2x50-800	C	From Leg	4.00	0.0000		126.00	No Ice	2.13	1.41	53.00
			0.00				1/2" Ice	2.32	1.57	71.78
			0.00				1" Ice	2.51	1.74	93.44
SM502-1	A	None		0.0000		126.00	No Ice	15.35	14.00	557.70
							1/2" Ice	21.29	20.81	741.30
							1" Ice	27.23	27.62	924.90
SM502-1	B	None		0.0000		126.00	No Ice	15.35	14.00	557.70
							1/2" Ice	21.29	20.81	741.30
							1" Ice	27.23	27.62	924.90
SM502-1	C	None		0.0000		126.00	No Ice	15.35	14.00	557.70
							1/2" Ice	21.29	20.81	741.30
							1" Ice	27.23	27.62	924.90
RRUS-12	A	From Leg	4.00	0.0000		172.00	No Ice	3.15	1.29	50.00
			0.00				1/2" Ice	3.36	1.44	73.22
			0.00				1" Ice	3.59	1.60	99.64
RRUS-12	B	From Leg	4.00	0.0000		172.00	No Ice	3.15	1.29	50.00
			0.00				1/2" Ice	3.36	1.44	73.22
			0.00				1" Ice	3.59	1.60	99.64
RRUS-12	C	From Leg	4.00	0.0000		172.00	No Ice	3.15	1.29	50.00
			0.00				1/2" Ice	3.36	1.44	73.22
			0.00				1" Ice	3.59	1.60	99.64

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	184.00	1.176	28	55.333	A	5.899	4.667	4.667	44.17	0.000	0.000
188.00-180.00					B	5.899	4.667		44.17	1.240	0.000
					C	5.899	4.667		44.17	4.300	0.500
T2	170.00	1.15	28	159.592	A	15.054	11.689	11.689	43.71	0.000	0.000
180.00-160.00					B	15.054	11.689		43.71	3.100	0.000
					C	15.054	11.689		43.71	35.050	1.250
T3	150.00	1.11	27	200.424	A	14.307	11.685	11.685	44.96	47.430	0.000
160.00-140.00					B	14.307	11.685		44.96	3.100	0.000
					C	14.307	11.685		44.96	69.373	1.250
T4	130.00	1.065	26	242.510	A	19.648	15.027	15.027	43.34	58.590	0.000
140.00-120.00					B	19.648	15.027		43.34	3.100	0.000
					C	19.648	15.027		43.34	117.150	1.250
T5	110.00	1.016	24	290.123	A	22.577	18.592	18.592	45.16	65.100	0.000
120.00-100.00					B	22.577	18.592		45.16	3.100	0.000
					C	22.577	18.592		45.16	117.150	1.250
T6	90.00	0.959	23	332.717	A	21.370	22.106	22.106	50.85	65.100	0.000
100.00-80.00					B	21.370	22.106		50.85	3.100	0.000
					C	21.370	22.106		50.85	117.150	1.250

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T7 80.00-60.00	70.00	0.892	21	368.138	A	26.446	22.119	22.119	45.54	65.100	0.000
					B	26.446	22.119		45.54	3.100	0.000
					C	26.446	22.119		45.54	117.150	1.250
T8 60.00-40.00	50.00	0.811	19	412.729	A	28.710	28.806	28.806	50.08	65.100	0.000
					B	28.710	28.806		50.08	3.100	0.000
					C	28.710	28.806		50.08	117.150	1.250
T9 40.00-20.00	30.00	0.701	17	454.846	A	31.200	28.800	28.800	48.00	65.100	0.000
					B	31.200	28.800		48.00	3.100	0.000
					C	31.200	28.800		48.00	117.150	1.250
T10 20.00-0.00	10.00	0.7	17	494.844	A	33.659	28.796	28.796	46.11	39.060	0.000
					B	33.659	28.796		46.11	1.860	0.000
					C	33.659	28.796		46.11	74.590	1.250

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1 188.00-180.00	184.00	1.176	6	2.3750	58.500	A	5.899	25.221	11.000	35.35	0.000	0.000
						B	5.899	25.221		35.35	5.040	0.000
						C	5.899	25.221		35.35	12.322	4.300
T2 180.00-160.00	170.00	1.15	6	2.3563	167.457	A	15.054	66.364	27.427	33.69	0.000	0.000
						B	15.054	66.364		33.69	12.525	0.000
						C	15.054	66.364		33.69	98.155	10.675
T3 160.00-140.00	150.00	1.11	6	2.3270	208.189	A	14.307	53.856	27.223	39.94	106.448	0.000
						B	14.307	53.856		39.94	12.408	0.000
						C	14.307	53.856		39.94	176.353	10.558
T4 140.00-120.00	130.00	1.065	6	2.2939	250.167	A	19.648	60.394	30.347	37.91	134.039	0.000
						B	19.648	60.394		37.91	12.276	0.000
						C	19.648	60.394		37.91	264.556	10.426
T5 120.00-100.00	110.00	1.016	6	2.2559	297.657	A	22.577	67.625	33.670	37.33	154.806	0.000
						B	22.577	67.625		37.33	12.124	0.000
						C	22.577	67.625		37.33	263.111	10.274
T6 100.00-80.00	90.00	0.959	5	2.2111	340.093	A	21.370	63.863	36.862	43.25	153.952	0.000
						B	21.370	63.863		43.25	11.944	0.000
						C	21.370	63.863		43.25	261.407	10.094
T7 80.00-60.00	70.00	0.892	5	2.1562	375.334	A	26.446	65.027	36.516	39.92	152.908	0.000
						B	26.446	65.027		39.92	11.725	0.000
						C	26.446	65.027		39.92	259.322	9.875
T8 60.00-40.00	50.00	0.811	4	2.0849	419.689	A	28.710	72.660	42.732	42.16	151.553	0.000
						B	28.710	72.660		42.16	11.439	0.000
						C	28.710	72.660		42.16	256.614	9.589
T9 40.00-20.00	30.00	0.701	4	1.9810	461.458	A	31.200	72.934	42.030	40.36	149.585	0.000
						B	31.200	72.934		40.36	11.024	0.000
						C	31.200	72.934		40.36	252.677	9.174
T10 20.00-0.00	10.00	0.7	4	1.7749	500.768	A	33.659	70.519	40.647	39.02	87.419	0.000
						B	33.659	70.519		39.02	6.120	0.000
						C	33.659	70.519		39.02	157.223	8.350

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 188.00-180.00	184.00	1.176	9	55.333	A	5.899	4.667	4.667	44.17	0.000	0.000
					B	5.899	4.667		44.17	1.240	0.000
					C	5.899	4.667		44.17	4.300	0.500
T2 180.00-160.00	170.00	1.15	9	159.592	A	15.054	11.689	11.689	43.71	0.000	0.000
					B	15.054	11.689		43.71	3.100	0.000
					C	15.054	11.689		43.71	35.050	1.250
T3 160.00-140.00	150.00	1.11	9	200.424	A	14.307	11.685	11.685	44.96	47.430	0.000
					B	14.307	11.685		44.96	3.100	0.000
					C	14.307	11.685		44.96	69.373	1.250
T4 140.00-120.00	130.00	1.065	8	242.510	A	19.648	15.027	15.027	43.34	58.590	0.000
					B	19.648	15.027		43.34	3.100	0.000
					C	19.648	15.027		43.34	117.150	1.250
T5 120.00-100.00	110.00	1.016	8	290.123	A	22.577	18.592	18.592	45.16	65.100	0.000
					B	22.577	18.592		45.16	3.100	0.000
					C	22.577	18.592		45.16	117.150	1.250
T6 100.00-80.00	90.00	0.959	8	332.717	A	21.370	22.106	22.106	50.85	65.100	0.000
					B	21.370	22.106		50.85	3.100	0.000
					C	21.370	22.106		50.85	117.150	1.250
T7 80.00-60.00	70.00	0.892	7	368.138	A	26.446	22.119	22.119	45.54	65.100	0.000
					B	26.446	22.119		45.54	3.100	0.000
					C	26.446	22.119		45.54	117.150	1.250
T8 60.00-40.00	50.00	0.811	6	412.729	A	28.710	28.806	28.806	50.08	65.100	0.000
					B	28.710	28.806		50.08	3.100	0.000
					C	28.710	28.806		50.08	117.150	1.250
T9 40.00-20.00	30.00	0.701	5	454.846	A	31.200	28.800	28.800	48.00	65.100	0.000
					B	31.200	28.800		48.00	3.100	0.000
					C	31.200	28.800		48.00	117.150	1.250
T10 20.00-0.00	10.00	0.7	5	494.844	A	33.659	28.796	28.796	46.11	39.060	0.000
					B	33.659	28.796		46.11	1.860	0.000
					C	33.659	28.796		46.11	74.590	1.250

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 188.00-180.00	76.96	499.43	A	0.191	2.627	28	1	1	8.549	630.35	78.79	C
			B	0.191	2.627		1	1	8.549			
			C	0.191	2.627		1	1	8.549			
T2 180.00-160.00	295.60	1121.55	A	0.168	2.708	28	1	1	21.667	1942.04	97.10	C
			B	0.168	2.708		1	1	21.667			
			C	0.168	2.708		1	1	21.667			
T3 160.00-140.00	643.03	1550.61	A	0.13	2.848	27	1	1	20.903	2708.14	135.41	C
			B	0.13	2.848		1	1	20.903			
			C	0.13	2.848		1	1	20.903			
T4 140.00-120.00	892.68	2198.08	A	0.143	2.797	26	1	1	27.551	3688.74	184.44	C
			B	0.143	2.797		1	1	27.551			
			C	0.143	2.797		1	1	27.551			
T5 120.00-100.00	920.40	2753.62	A	0.142	2.802	24	1	1	31.607	3812.59	190.63	C
			B	0.142	2.802		1	1	31.607			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.142	2.802		1	1	31.607			
T6	920.40	2813.13	A	0.131	2.844	23	1	1	31.198	3603.57	180.18	C
100.00-80.00			B	0.131	2.844		1	1	31.198			
			C	0.131	2.844		1	1	31.198			
T7	920.40	3910.78	A	0.132	2.839	21	1	1	36.506	3625.47	181.27	C
80.00-60.00			B	0.132	2.839		1	1	36.506			
			C	0.132	2.839		1	1	36.506			
T8	920.40	4381.27	A	0.139	2.811	19	1	1	40.617	3467.26	173.36	C
60.00-40.00			B	0.139	2.811		1	1	40.617			
			C	0.139	2.811		1	1	40.617			
T9	920.40	5229.88	A	0.132	2.839	17	1	1	43.117	3114.13	155.71	C
40.00-20.00			B	0.132	2.839		1	1	43.117			
			C	0.132	2.839		1	1	43.117			
T10	623.92	5931.40	A	0.126	2.861	17	1	1	45.502	2720.62	136.03	C
20.00-0.00			B	0.126	2.861		1	1	45.502			
			C	0.126	2.861		1	1	45.502			
Sum Weight:	7134.19	30389.75						OTM	2623372.0 0 lb-ft	29312.92		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	76.96	499.43	A	0.191	2.627	28	0.8	1	7.369	556.02	69.50	C
188.00-180.00			B	0.191	2.627		0.8	1	7.369			
			C	0.191	2.627		0.8	1	7.369			
T2	295.60	1121.55	A	0.168	2.708	28	0.8	1	18.657	1750.85	87.54	A
180.00-160.00			B	0.168	2.708		0.8	1	18.657			
			C	0.168	2.708		0.8	1	18.657			
T3	643.03	1550.61	A	0.13	2.848	27	0.8	1	18.042	2523.78	126.19	A
160.00-140.00			B	0.13	2.848		0.8	1	18.042			
			C	0.13	2.848		0.8	1	18.042			
T4	892.68	2198.08	A	0.143	2.797	26	0.8	1	23.621	3449.96	172.50	A
140.00-120.00			B	0.143	2.797		0.8	1	23.621			
			C	0.143	2.797		0.8	1	23.621			
T5	920.40	2753.62	A	0.142	2.802	24	0.8	1	27.092	3550.63	177.53	A
120.00-100.00			B	0.142	2.802		0.8	1	27.092			
			C	0.142	2.802		0.8	1	27.092			
T6	920.40	2813.13	A	0.131	2.844	23	0.8	1	26.924	3365.89	168.29	A
100.00-80.00			B	0.131	2.844		0.8	1	26.924			
			C	0.131	2.844		0.8	1	26.924			
T7	920.40	3910.78	A	0.132	2.839	21	0.8	1	31.217	3352.17	167.61	A
80.00-60.00			B	0.132	2.839		0.8	1	31.217			
			C	0.132	2.839		0.8	1	31.217			
T8	920.40	4381.27	A	0.139	2.811	19	0.8	1	34.875	3200.43	160.02	A
60.00-40.00			B	0.139	2.811		0.8	1	34.875			
			C	0.139	2.811		0.8	1	34.875			
T9	920.40	5229.88	A	0.132	2.839	17	0.8	1	36.877	2861.03	143.05	A
40.00-20.00			B	0.132	2.839		0.8	1	36.877			
			C	0.132	2.839		0.8	1	36.877			
T10	623.92	5931.40	A	0.126	2.861	17	0.8	1	38.770	2445.71	122.29	A
20.00-0.00			B	0.126	2.861		0.8	1	38.770			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	7134.19	30389.75	C	0.126	2.861		0.8	1 OTM	38.770 2425475.8 3 lb-ft	27056.47		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 188.00-180.00	76.96	499.43	A	0.191	2.627	28	0.85	1	7.664	574.61	71.83	C
			B	0.191	2.627		0.85	1	7.664			
			C	0.191	2.627		0.85	1	7.664			
T2 180.00-160.00	295.60	1121.55	A	0.168	2.708	28	0.85	1	19.409	1798.65	89.93	B
			B	0.168	2.708		0.85	1	19.409			
			C	0.168	2.708		0.85	1	19.409			
T3 160.00-140.00	643.03	1550.61	A	0.13	2.848	27	0.85	1	18.757	2864.71	143.24	B
			B	0.13	2.848		0.85	1	18.757			
			C	0.13	2.848		0.85	1	18.757			
T4 140.00-120.00	892.68	2198.08	A	0.143	2.797	26	0.85	1	24.604	3852.85	192.64	B
			B	0.143	2.797		0.85	1	24.604			
			C	0.143	2.797		0.85	1	24.604			
T5 120.00-100.00	920.40	2753.62	A	0.142	2.802	24	0.85	1	28.221	3966.04	198.30	B
			B	0.142	2.802		0.85	1	28.221			
			C	0.142	2.802		0.85	1	28.221			
T6 100.00-80.00	920.40	2813.13	A	0.131	2.844	23	0.85	1	27.992	3755.73	187.79	B
			B	0.131	2.844		0.85	1	27.992			
			C	0.131	2.844		0.85	1	27.992			
T7 80.00-60.00	920.40	3910.78	A	0.132	2.839	21	0.85	1	32.539	3728.02	186.40	B
			B	0.132	2.839		0.85	1	32.539			
			C	0.132	2.839		0.85	1	32.539			
T8 60.00-40.00	920.40	4381.27	A	0.139	2.811	19	0.85	1	36.311	3546.48	177.32	B
			B	0.139	2.811		0.85	1	36.311			
			C	0.139	2.811		0.85	1	36.311			
T9 40.00-20.00	920.40	5229.88	A	0.132	2.839	17	0.85	1	38.437	3165.71	158.29	B
			B	0.132	2.839		0.85	1	38.437			
			C	0.132	2.839		0.85	1	38.437			
T10 20.00-0.00	623.92	5931.40	A	0.126	2.861	17	0.85	1	40.453	2659.16	132.96	B
			B	0.126	2.861		0.85	1	40.453			
			C	0.126	2.861		0.85	1	40.453			
Sum Weight:	7134.19	30389.75						OTM	2676201.9 6 lb-ft	29911.94		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 188.00-180.00	501.30	2597.03	A	0.532	1.862	6	1	1	23.623	306.83	38.35	C
			B	0.532	1.862		1	1	23.623			
			C	0.532	1.862		1	1	23.623			
T2 180.00-160.00	2358.59	6527.50	A	0.486	1.919	6	1	1	60.025	962.07	48.10	C
			B	0.486	1.919		1	1	60.025			
			C	0.486	1.919		1	1	60.025			
T3 160.00-140.00	5501.50	6085.94	A	0.327	2.226	6	1	1	47.048	1289.47	64.47	C
			B	0.327	2.226		1	1	47.048			
			C	0.327	2.226		1	1	47.048			
T4 140.00-120.00	7404.71	7798.59	A	0.32	2.244	6	1	1	56.210	1628.37	81.42	C
			B	0.32	2.244		1	1	56.210			
			C	0.32	2.244		1	1	56.210			
T5 120.00-100.00	7585.18	9062.63	A	0.303	2.288	6	1	1	63.143	1668.08	83.40	C
			B	0.303	2.288		1	1	63.143			
			C	0.303	2.288		1	1	63.143			
T6 100.00-80.00	7435.25	8643.51	A	0.251	2.436	5	1	1	58.739	1562.00	78.10	C
			B	0.251	2.436		1	1	58.739			
			C	0.251	2.436		1	1	58.739			
T7 80.00-60.00	7253.02	10355.98	A	0.244	2.457	5	1	1	64.388	1508.20	75.41	C
			B	0.244	2.457		1	1	64.388			
			C	0.244	2.457		1	1	64.388			
T8 60.00-40.00	7018.31	11295.64	A	0.242	2.463	4	1	1	71.069	1423.92	71.20	C
			B	0.242	2.463		1	1	71.069			
			C	0.242	2.463		1	1	71.069			
T9 40.00-20.00	6682.56	12138.68	A	0.226	2.513	4	1	1	73.461	1249.66	62.48	C
			B	0.226	2.513		1	1	73.461			
			C	0.226	2.513		1	1	73.461			
T10 20.00-0.00	3923.55	12319.20	A	0.208	2.569	4	1	1	74.273	1025.26	51.26	C
			B	0.208	2.569		1	1	74.273			
			C	0.208	2.569		1	1	74.273			
Sum Weight:	55663.96	86824.69						OTM	1173698.62 lb-ft	12623.86		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 188.00-180.00	501.30	2597.03	A	0.532	1.862	6	0.8	1	22.443	294.88	36.86	C
			B	0.532	1.862		0.8	1	22.443			
			C	0.532	1.862		0.8	1	22.443			
T2 180.00-160.00	2358.59	6527.50	A	0.486	1.919	6	0.8	1	57.014	931.36	46.57	A
			B	0.486	1.919		0.8	1	57.014			
			C	0.486	1.919		0.8	1	57.014			
T3 160.00-140.00	5501.50	6085.94	A	0.327	2.226	6	0.8	1	44.186	1256.79	62.84	A
			B	0.327	2.226		0.8	1	44.186			
			C	0.327	2.226		0.8	1	44.186			
T4 140.00-120.00	7404.71	7798.59	A	0.32	2.244	6	0.8	1	52.280	1584.93	79.25	A
			B	0.32	2.244		0.8	1	52.280			
			C	0.32	2.244		0.8	1	52.280			
T5 120.00-100.00	7585.18	9062.63	A	0.303	2.288	6	0.8	1	58.628	1619.57	80.98	A
			B	0.303	2.288		0.8	1	58.628			
			C	0.303	2.288		0.8	1	58.628			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6 100.00-80.00	7435.25	8643.51	A	0.251	2.436	5	0.8	1	54.465	1515.84	75.79	A
			B	0.251	2.436		0.8	1	54.465			
			C	0.251	2.436		0.8	1	54.465			
T7 80.00-60.00	7253.02	10355.98	A	0.244	2.457	5	0.8	1	59.099	1454.58	72.73	A
			B	0.244	2.457		0.8	1	59.099			
			C	0.244	2.457		0.8	1	59.099			
T8 60.00-40.00	7018.31	11295.64	A	0.242	2.463	4	0.8	1	65.327	1370.90	68.54	A
			B	0.242	2.463		0.8	1	65.327			
			C	0.242	2.463		0.8	1	65.327			
T9 40.00-20.00	6682.56	12138.68	A	0.226	2.513	4	0.8	1	67.221	1198.88	59.94	A
			B	0.226	2.513		0.8	1	67.221			
			C	0.226	2.513		0.8	1	67.221			
T10 20.00-0.00	3923.55	12319.20	A	0.208	2.569	4	0.8	1	67.542	969.27	48.46	A
			B	0.208	2.569		0.8	1	67.542			
			C	0.208	2.569		0.8	1	67.542			
Sum Weight:	55663.96	86824.69						OTM	1137751.89 lb-ft	12197.00		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 188.00-180.00	501.30	2597.03	A	0.532	1.862	6	0.85	1	22.738	297.87	37.23	C
			B	0.532	1.862		0.85	1	22.738			
			C	0.532	1.862		0.85	1	22.738			
T2 180.00-160.00	2358.59	6527.50	A	0.486	1.919	6	0.85	1	57.767	911.37	45.57	B
			B	0.486	1.919		0.85	1	57.767			
			C	0.486	1.919		0.85	1	57.767			
T3 160.00-140.00	5501.50	6085.94	A	0.327	2.226	6	0.85	1	44.902	1312.87	65.64	B
			B	0.327	2.226		0.85	1	44.902			
			C	0.327	2.226		0.85	1	44.902			
T4 140.00-120.00	7404.71	7798.59	A	0.32	2.244	6	0.85	1	53.263	1621.42	81.07	B
			B	0.32	2.244		0.85	1	53.263			
			C	0.32	2.244		0.85	1	53.263			
T5 120.00-100.00	7585.18	9062.63	A	0.303	2.288	6	0.85	1	59.757	1667.23	83.36	B
			B	0.303	2.288		0.85	1	59.757			
			C	0.303	2.288		0.85	1	59.757			
T6 100.00-80.00	7435.25	8643.51	A	0.251	2.436	5	0.85	1	55.534	1560.93	78.05	B
			B	0.251	2.436		0.85	1	55.534			
			C	0.251	2.436		0.85	1	55.534			
T7 80.00-60.00	7253.02	10355.98	A	0.244	2.457	5	0.85	1	60.421	1499.20	74.96	B
			B	0.244	2.457		0.85	1	60.421			
			C	0.244	2.457		0.85	1	60.421			
T8 60.00-40.00	7018.31	11295.64	A	0.242	2.463	4	0.85	1	66.762	1412.51	70.63	B
			B	0.242	2.463		0.85	1	66.762			
			C	0.242	2.463		0.85	1	66.762			
T9 40.00-20.00	6682.56	12138.68	A	0.226	2.513	4	0.85	1	68.781	1236.08	61.80	B
			B	0.226	2.513		0.85	1	68.781			
			C	0.226	2.513		0.85	1	68.781			
T10 20.00-0.00	3923.55	12319.20	A	0.208	2.569	4	0.85	1	69.224	997.96	49.90	B
			B	0.208	2.569		0.85	1	69.224			
			C	0.208	2.569		0.85	1	69.224			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	55663.96	86824.69						OTM	1163965.9 5 lb-ft	12517.44		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 188.00-180.00	76.96	499.43	A	0.191	2.627	9	1	1	8.549	205.83	25.73	C
			B	0.191	2.627		1	1	8.549			
			C	0.191	2.627		1	1	8.549			
T2 180.00-160.00	295.60	1121.55	A	0.168	2.708	9	1	1	21.667	634.14	31.71	C
			B	0.168	2.708		1	1	21.667			
			C	0.168	2.708		1	1	21.667			
T3 160.00-140.00	643.03	1550.61	A	0.13	2.848	9	1	1	20.903	884.29	44.21	C
			B	0.13	2.848		1	1	20.903			
			C	0.13	2.848		1	1	20.903			
T4 140.00-120.00	892.68	2198.08	A	0.143	2.797	8	1	1	27.551	1204.49	60.22	C
			B	0.143	2.797		1	1	27.551			
			C	0.143	2.797		1	1	27.551			
T5 120.00-100.00	920.40	2753.62	A	0.142	2.802	8	1	1	31.607	1244.93	62.25	C
			B	0.142	2.802		1	1	31.607			
			C	0.142	2.802		1	1	31.607			
T6 100.00-80.00	920.40	2813.13	A	0.131	2.844	8	1	1	31.198	1176.68	58.83	C
			B	0.131	2.844		1	1	31.198			
			C	0.131	2.844		1	1	31.198			
T7 80.00-60.00	920.40	3910.78	A	0.132	2.839	7	1	1	36.506	1183.83	59.19	C
			B	0.132	2.839		1	1	36.506			
			C	0.132	2.839		1	1	36.506			
T8 60.00-40.00	920.40	4381.27	A	0.139	2.811	6	1	1	40.617	1132.17	56.61	C
			B	0.139	2.811		1	1	40.617			
			C	0.139	2.811		1	1	40.617			
T9 40.00-20.00	920.40	5229.88	A	0.132	2.839	5	1	1	43.117	1016.86	50.84	C
			B	0.132	2.839		1	1	43.117			
			C	0.132	2.839		1	1	43.117			
T10 20.00-0.00	623.92	5931.40	A	0.126	2.861	5	1	1	45.502	888.37	44.42	C
			B	0.126	2.861		1	1	45.502			
			C	0.126	2.861		1	1	45.502			
Sum Weight:	7134.19	30389.75						OTM	856611.27 lb-ft	9571.57		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	76.96	499.43	A	0.191	2.627	9	0.8	1	7.369	181.56	22.69	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
188.00-180.00			B	0.191	2.627		0.8	1	7.369			
			C	0.191	2.627		0.8	1	7.369			
T2	295.60	1121.55	A	0.168	2.708	9	0.8	1	18.657	571.71	28.59	A
180.00-160.00			B	0.168	2.708		0.8	1	18.657			
			C	0.168	2.708		0.8	1	18.657			
T3	643.03	1550.61	A	0.13	2.848	9	0.8	1	18.042	824.09	41.20	A
160.00-140.00			B	0.13	2.848		0.8	1	18.042			
			C	0.13	2.848		0.8	1	18.042			
T4	892.68	2198.08	A	0.143	2.797	8	0.8	1	23.621	1126.52	56.33	A
140.00-120.00			B	0.143	2.797		0.8	1	23.621			
			C	0.143	2.797		0.8	1	23.621			
T5	920.40	2753.62	A	0.142	2.802	8	0.8	1	27.092	1159.39	57.97	A
120.00-100.00			B	0.142	2.802		0.8	1	27.092			
			C	0.142	2.802		0.8	1	27.092			
T6	920.40	2813.13	A	0.131	2.844	8	0.8	1	26.924	1099.07	54.95	A
100.00-80.00			B	0.131	2.844		0.8	1	26.924			
			C	0.131	2.844		0.8	1	26.924			
T7	920.40	3910.78	A	0.132	2.839	7	0.8	1	31.217	1094.59	54.73	A
80.00-60.00			B	0.132	2.839		0.8	1	31.217			
			C	0.132	2.839		0.8	1	31.217			
T8	920.40	4381.27	A	0.139	2.811	6	0.8	1	34.875	1045.04	52.25	A
60.00-40.00			B	0.139	2.811		0.8	1	34.875			
			C	0.139	2.811		0.8	1	34.875			
T9	920.40	5229.88	A	0.132	2.839	5	0.8	1	36.877	934.21	46.71	A
40.00-20.00			B	0.132	2.839		0.8	1	36.877			
			C	0.132	2.839		0.8	1	36.877			
T10	623.92	5931.40	A	0.126	2.861	5	0.8	1	38.770	798.60	39.93	A
20.00-0.00			B	0.126	2.861		0.8	1	38.770			
			C	0.126	2.861		0.8	1	38.770			
Sum Weight:	7134.19	30389.75						OTM	791992.11 lb-ft	8834.77		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	76.96	499.43	A	0.191	2.627	9	0.85	1	7.664	187.63	23.45	C
188.00-180.00			B	0.191	2.627		0.85	1	7.664			
			C	0.191	2.627		0.85	1	7.664			
T2	295.60	1121.55	A	0.168	2.708	9	0.85	1	19.409	587.31	29.37	B
180.00-160.00			B	0.168	2.708		0.85	1	19.409			
			C	0.168	2.708		0.85	1	19.409			
T3	643.03	1550.61	A	0.13	2.848	9	0.85	1	18.757	935.42	46.77	B
160.00-140.00			B	0.13	2.848		0.85	1	18.757			
			C	0.13	2.848		0.85	1	18.757			
T4	892.68	2198.08	A	0.143	2.797	8	0.85	1	24.604	1258.07	62.90	B
140.00-120.00			B	0.143	2.797		0.85	1	24.604			
			C	0.143	2.797		0.85	1	24.604			
T5	920.40	2753.62	A	0.142	2.802	8	0.85	1	28.221	1295.03	64.75	B
120.00-100.00			B	0.142	2.802		0.85	1	28.221			
			C	0.142	2.802		0.85	1	28.221			
T6	920.40	2813.13	A	0.131	2.844	8	0.85	1	27.992	1226.36	61.32	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
100.00-80.00			B	0.131	2.844		0.85	1	27.992			
			C	0.131	2.844		0.85	1	27.992			
T7	920.40	3910.78	A	0.132	2.839	7	0.85	1	32.539	1217.31	60.87	B
80.00-60.00			B	0.132	2.839		0.85	1	32.539			
			C	0.132	2.839		0.85	1	32.539			
T8	920.40	4381.27	A	0.139	2.811	6	0.85	1	36.311	1158.03	57.90	B
60.00-40.00			B	0.139	2.811		0.85	1	36.311			
			C	0.139	2.811		0.85	1	36.311			
T9	920.40	5229.88	A	0.132	2.839	5	0.85	1	38.437	1033.70	51.68	B
40.00-20.00			B	0.132	2.839		0.85	1	38.437			
			C	0.132	2.839		0.85	1	38.437			
T10	623.92	5931.40	A	0.126	2.861	5	0.85	1	40.453	868.30	43.41	B
20.00-0.00			B	0.126	2.861		0.85	1	40.453			
			C	0.126	2.861		0.85	1	40.453			
Sum Weight:	7134.19	30389.75						OTM	873861.86 lb-ft	9767.16		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	14391.68					
Bracing Weight	15998.07					
Total Member Self-Weight	30389.75			27665.55	12023.11	
Total Weight	48565.74			27665.55	12023.11	
Wind 0 deg - No Ice		5.67	-37023.17	-3795515.24	11197.78	-9887.34
Wind 30 deg - No Ice		16642.12	-28824.99	-2999702.94	-1735828.90	1022.75
Wind 60 deg - No Ice		26319.72	-15202.25	-1592300.75	-2792190.16	9175.81
Wind 90 deg - No Ice		30109.85	-5.67	26840.22	-3193976.55	14828.46
Wind 120 deg - No Ice		30252.56	17466.32	1845776.46	-3137037.35	20223.15
Wind 150 deg - No Ice		18802.90	32578.93	3383976.65	-1924791.00	18723.07
Wind 180 deg - No Ice		-5.67	34766.72	3652950.17	12848.44	9130.42
Wind 210 deg - No Ice		-16642.12	28824.99	3055034.04	1759875.13	-1022.75
Wind 240 deg - No Ice		-28273.86	16330.47	1746579.93	2987619.49	-10079.26
Wind 270 deg - No Ice		-30109.85	5.67	28490.88	3218022.78	-14828.46
Wind 300 deg - No Ice		-28298.42	-16338.10	-1691497.27	2989700.47	-18562.78
Wind 330 deg - No Ice		-18802.90	-32578.93	-3328645.55	1948837.22	-18723.07
Member Ice	56434.94					
Total Weight Ice	176940.53			199872.06	134115.93	
Wind 0 deg - Ice		1.47	-16311.83	-1552144.48	133901.91	-4088.74
Wind 30 deg - Ice		7405.90	-12827.39	-1203329.34	-676022.78	-77.62
Wind 60 deg - Ice		11896.04	-6869.88	-562059.23	-1185159.76	3107.12
Wind 90 deg - Ice		14055.95	-1.47	199658.05	-1415342.92	5630.37
Wind 120 deg - Ice		13471.88	7778.00	1040471.05	-1321844.23	7525.79
Wind 150 deg - Ice		8100.58	14033.56	1708627.16	-736717.11	6928.29
Wind 180 deg - Ice		-1.47	15884.97	1915941.88	134329.94	3943.43
Wind 210 deg - Ice		-7405.90	12827.39	1603073.46	944254.63	77.62
Wind 240 deg - Ice		-12265.71	7083.31	979776.72	1484522.39	-3241.74
Wind 270 deg - Ice		-14055.95	1.47	200086.07	1683574.77	-5630.37
Wind 300 deg - Ice		-13102.21	-7564.57	-622753.56	1558945.31	-7245.87
Wind 330 deg - Ice		-8100.58	-14033.56	-1308883.03	1004948.97	-6928.29
Total Weight	48565.74			27665.55	12023.11	

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 0 deg - Service		1.85	-12089.20	-1248382.90	-90.61	-3228.52
Wind 30 deg - Service		5434.16	-9412.24	-988525.82	-570548.30	333.96
Wind 60 deg - Service		8594.20	-4964.00	-528965.92	-915482.59	2996.18
Wind 90 deg - Service		9831.79	-1.85	-266.83	-1046678.15	4841.95
Wind 120 deg - Service		9878.39	5703.29	593671.53	-1028085.75	6603.48
Wind 150 deg - Service		6139.72	10638.02	1095940.98	-632250.21	6113.66
Wind 180 deg - Service		-1.85	11352.40	1183769.07	448.38	2981.36
Wind 210 deg - Service		-5434.16	9412.24	988531.15	570906.07	-333.96
Wind 240 deg - Service		-9232.28	5332.40	561280.83	971802.19	-3291.19
Wind 270 deg - Service		-9831.79	1.85	272.16	1047035.92	-4841.95
Wind 300 deg - Service		-9240.30	-5334.89	-561356.62	972481.70	-6061.31
Wind 330 deg - Service		-6139.72	-10638.02	-1095935.65	632607.98	-6113.66

Load Combinations

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

Comb. No.	Description
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	188 - 180	Leg	Max Tension	15	691.71	-1.79	-202.29
			Max. Compression	31	-3413.69	8.27	7.87
			Max. Mx	20	-1103.28	-337.26	-5.96
			Max. My	3	-594.90	-19.15	-337.87
			Max. Vy	8	276.05	-195.49	16.95
			Max. Vx	3	-278.13	1.77	196.43
		Diagonal	Max Tension	21	885.19	0.00	0.00
			Max. Compression	8	-914.43	0.00	0.00
			Max. Mx	28	244.62	27.91	-0.12
			Max. My	18	736.13	4.67	0.48
			Max. Vy	28	-34.93	27.91	-0.12
			Max. Vx	18	0.13	0.00	0.00
		Top Girt	Max Tension	19	7.08	0.00	0.00
			Max. Compression	33	-91.78	0.00	0.00
			Max. Mx	26	-80.31	-139.22	0.00
			Max. Vy	26	-84.06	0.00	0.00
T2	180 - 160	Leg	Max Tension	15	12122.60	198.38	-2.10
			Max. Compression	18	-17744.39	495.70	6.20
			Max. Mx	6	2879.33	964.15	-3.49
			Max. My	24	-2556.03	-32.67	-940.98
			Max. Vy	6	775.19	-559.70	-3.49
			Max. Vx	12	744.62	-32.64	-514.74
		Diagonal	Max Tension	9	2724.92	0.00	0.00
			Max. Compression	8	-2917.62	0.00	0.00
			Max. Mx	33	582.69	44.34	-6.16
			Max. My	30	341.89	43.82	-6.26
			Max. Vy	33	44.96	44.34	-6.16
			Max. Vx	30	2.52	0.00	0.00
		Horizontal	Max Tension	14	541.60	0.00	0.00
			Max. Compression	19	-363.91	0.00	0.00
			Max. Mx	26	298.09	-143.49	0.00
			Max. My	26	319.01	0.00	4.40
			Max. Vy	26	-69.83	0.00	0.00
			Max. Vx	26	2.14	0.00	0.00
T3	160 - 140	Leg	Max Tension	15	33054.21	-529.35	-26.53
			Max. Compression	18	-43091.20	476.14	5.88
			Max. Mx	6	31578.71	780.66	-0.75
			Max. My	8	-4747.03	-23.37	-804.54
			Max. Vy	6	-1137.32	-537.82	-0.75
			Max. Vx	12	-1101.39	-19.57	-471.42
		Diagonal	Max Tension	8	5742.26	0.00	0.00
			Max. Compression	8	-5816.49	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	35	1287.43	96.27	-11.25
			Max. My	36	-1865.39	77.59	12.27
			Max. Vy	33	72.49	90.61	11.24
			Max. Vx	36	-3.89	0.00	0.00
T4	140 - 120	Leg	Max Tension	15	63141.55	-366.66	-13.65
			Max. Compression	18	-78072.27	413.53	16.63
			Max. Mx	6	40947.98	-521.79	-5.61
			Max. My	12	-5695.98	-28.02	-617.65
			Max. Vy	6	-730.98	-382.93	-14.54
			Max. Vx	12	-735.32	-49.59	-477.35
		Diagonal	Max Tension	9	7581.76	0.00	0.00
			Max. Compression	8	-7737.79	0.00	0.00
			Max. Mx	35	1597.89	155.67	-18.40
			Max. My	31	1183.41	143.80	-18.98
			Max. Vy	33	98.65	147.77	18.41
			Max. Vx	31	5.29	0.00	0.00
T5	120 - 100	Leg	Max Tension	15	93601.78	-335.12	-7.84
			Max. Compression	18	-113316.23	405.19	19.66
			Max. Mx	6	90104.99	-474.89	-21.70
			Max. My	12	-9423.97	-51.24	-708.50
			Max. Vy	29	134.21	-386.66	-14.98
			Max. Vx	12	203.22	-51.24	-708.50
		Diagonal	Max Tension	8	8053.67	0.00	0.00
			Max. Compression	8	-7973.41	0.00	0.00
			Max. Mx	34	826.49	185.34	-28.07
			Max. My	36	-2120.55	167.72	30.62
			Max. Vy	34	114.13	185.34	-28.07
			Max. Vx	36	-7.31	0.00	0.00
T6	100 - 80	Leg	Max Tension	15	124758.73	-517.55	-24.31
			Max. Compression	18	-148295.31	1037.71	38.27
			Max. Mx	2	-146446.46	1041.97	37.59
			Max. My	12	-10238.21	-27.90	-803.26
			Max. Vy	2	-166.71	1041.97	37.59
			Max. Vx	12	-154.68	-27.90	-803.26
		Diagonal	Max Tension	9	11409.47	0.00	0.00
			Max. Compression	8	-11642.31	0.00	0.00
			Max. Mx	35	2402.42	285.19	-28.68
			Max. My	32	2358.39	279.56	-29.73
			Max. Vy	33	140.59	280.76	28.64
			Max. Vx	32	6.02	0.00	0.00
T7	80 - 60	Leg	Max Tension	15	158228.50	-484.86	-22.56
			Max. Compression	18	-187066.33	1067.32	26.43
			Max. Mx	2	-184871.30	1070.32	24.84
			Max. My	12	-11938.08	-74.71	-962.78
			Max. Vy	2	-174.49	1070.32	24.84
			Max. Vx	12	-169.35	-74.71	-962.78
		Diagonal	Max Tension	8	11552.16	0.00	0.00
			Max. Compression	8	-11630.21	0.00	0.00
			Max. Mx	35	2787.79	397.24	-48.00
			Max. My	32	2439.30	390.44	-49.39
			Max. Vy	33	181.88	392.40	47.95
			Max. Vx	32	9.29	0.00	0.00
T8	60 - 40	Leg	Max Tension	15	188604.10	-1159.66	-21.18
			Max. Compression	18	-223065.81	1113.49	16.74
			Max. Mx	29	1344.89	-1930.16	-25.15
			Max. My	12	-14708.01	-84.50	-1509.20
			Max. Vy	29	307.47	-1930.16	-25.15
			Max. Vx	12	231.44	-84.50	-1509.20
		Diagonal	Max Tension	8	11779.34	0.00	0.00
			Max. Compression	8	-11835.05	0.00	0.00
			Max. Mx	33	2354.48	449.39	60.21

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	31	-2930.31	408.13	-61.75
			Max. Vy	33	195.92	449.39	60.21
			Max. Vx	31	10.77	0.00	0.00
T9	40 - 20	Leg	Max Tension	15	218199.47	-1101.51	-14.45
			Max. Compression	18	-258782.06	1593.80	29.96
			Max. Mx	33	21508.01	-4833.21	-20.03
			Max. My	12	-17111.78	-90.13	-1201.53
			Max. Vy	29	813.73	-4823.28	-15.70
			Max. Vx	12	-160.58	-90.13	-1201.53
		Diagonal	Max Tension	8	12760.92	0.00	0.00
			Max. Compression	8	-12945.45	0.00	0.00
			Max. Mx	33	1093.53	511.30	59.37
			Max. My	37	-1635.36	452.20	65.58
			Max. Vy	33	203.62	477.89	63.77
			Max. Vx	37	-10.56	0.00	0.00
T10	20 - 0	Leg	Max Tension	15	247327.64	-1187.89	-14.14
			Max. Compression	18	-294472.52	0.00	-0.03
			Max. Mx	35	-141061.48	5168.99	-41.31
			Max. My	12	-19180.60	-153.81	-2471.27
			Max. Vy	29	-991.75	-4823.28	-15.70
			Max. Vx	12	-366.53	-153.81	-2471.27
		Diagonal	Max Tension	8	13778.04	0.00	0.00
			Max. Compression	8	-14041.03	0.00	0.00
			Max. Mx	33	-517.71	644.69	-64.60
			Max. My	32	5749.35	473.38	-72.96
			Max. Vy	33	219.76	644.69	-64.60
			Max. Vx	32	10.82	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	303306.38	31626.09	-17809.31
	Max. H_x	18	303306.38	31626.09	-17809.31
	Max. H_z	5	-232517.64	-23981.17	16711.51
	Min. Vert	7	-252334.02	-27199.54	15328.08
	Min. H_x	7	-252334.02	-27199.54	15328.08
	Min. H_z	16	268865.30	26606.51	-18191.36
Leg B	Max. Vert	10	302046.52	-31793.38	-17458.90
	Max. H_x	23	-253094.03	27373.65	15037.93
	Max. H_z	25	-233261.31	24307.34	16154.98
	Min. Vert	23	-253094.03	27373.65	15037.93
	Min. H_x	10	302046.52	-31793.38	-17458.90
	Min. H_z	12	267589.10	-26911.87	-17598.79
Leg A	Max. Vert	2	300429.20	-377.63	36242.29
	Max. H_x	21	13358.70	4455.42	1247.37
	Max. H_z	2	300429.20	-377.63	36242.29
	Min. Vert	15	-254491.90	328.85	-31258.05
	Min. H_x	8	17953.91	-4476.23	1676.28
	Min. H_z	15	-254491.90	328.85	-31258.05

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	48565.74	-0.00	0.00	27665.54	12023.07	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	58278.89	9.08	-59237.07	-6083891.28	13107.16	-15819.70
0.9 Dead+1.6 Wind 0 deg - No Ice	43709.17	9.08	-59237.07	-6092190.94	9500.24	-15819.70
1.2 Dead+1.6 Wind 30 deg - No Ice	58278.89	30100.37	-52135.37	-5338220.22	-3086762.45	1636.44
0.9 Dead+1.6 Wind 30 deg - No Ice	43709.17	30100.37	-52135.37	-5346519.89	-3090369.37	1636.44
1.2 Dead+1.6 Wind 60 deg - No Ice	58278.89	48169.65	-27821.24	-2868172.97	-5008254.32	14681.31
0.9 Dead+1.6 Wind 60 deg - No Ice	43709.17	48169.65	-27821.24	-2876472.63	-5011861.24	14681.31
1.2 Dead+1.6 Wind 90 deg - No Ice	58278.89	60185.02	-9.08	31878.12	-6185665.36	23725.53
0.9 Dead+1.6 Wind 90 deg - No Ice	43709.17	60185.02	-9.08	23578.46	-6189272.28	23725.53
1.2 Dead+1.6 Wind 120 deg - No Ice	58278.89	51287.20	29610.68	3090600.01	-5281146.80	32357.02
0.9 Dead+1.6 Wind 120 deg - No Ice	43709.17	51287.20	29610.68	3082300.34	-5284753.72	32357.02
1.2 Dead+1.6 Wind 150 deg - No Ice	58278.89	30084.65	52126.29	5403297.00	-3084475.23	29956.87
0.9 Dead+1.6 Wind 150 deg - No Ice	43709.17	30084.65	52126.29	5394997.34	-3088082.15	29956.87
1.2 Dead+1.6 Wind 180 deg - No Ice	58278.89	-9.08	55626.76	5833654.68	15748.21	14608.62
0.9 Dead+1.6 Wind 180 deg - No Ice	43709.17	-9.08	55626.76	5825355.02	12141.29	14608.62
1.2 Dead+1.6 Wind 210 deg - No Ice	58278.89	-30100.37	52135.37	5404617.53	3115617.82	-1636.44
0.9 Dead+1.6 Wind 210 deg - No Ice	43709.17	-30100.37	52135.37	5396317.87	3112010.90	-1636.44
1.2 Dead+1.6 Wind 240 deg - No Ice	58278.89	-51296.27	29626.40	3092887.23	5311322.69	-16126.84
0.9 Dead+1.6 Wind 240 deg - No Ice	43709.17	-51296.27	29626.40	3084587.56	5307715.77	-16126.84
1.2 Dead+1.6 Wind 270 deg - No Ice	58278.89	-60185.02	9.08	34519.18	6214520.73	-23725.53
0.9 Dead+1.6 Wind 270 deg - No Ice	43709.17	-60185.02	9.08	26219.52	6210913.81	-23725.53
1.2 Dead+1.6 Wind 300 deg - No Ice	58278.89	-48160.57	-27805.52	-2865885.75	5035789.16	-29700.42
0.9 Dead+1.6 Wind 300 deg - No Ice	43709.17	-48160.57	-27805.52	-2874185.41	5032182.24	-29700.42
1.2 Dead+1.6 Wind 330 deg - No Ice	58278.89	-30084.65	-52126.29	-5336899.70	3113330.60	-29956.87
0.9 Dead+1.6 Wind 330 deg - No Ice	43709.17	-30084.65	-52126.29	-5345199.36	3109723.68	-29956.87
1.2 Dead+1.0 Ice+1.0 Temp	186653.68	-0.00	0.00	205405.15	136520.31	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	186653.68	1.47	-16311.83	-1546611.59	136306.30	-4088.73
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	186653.68	8103.13	-14035.04	-1303564.12	-734683.51	-77.61
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	186653.68	13756.06	-7943.76	-652815.19	-1349532.91	3107.13
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	186653.68	16203.72	-1.47	205191.14	-1605516.64	5630.37
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	186653.68	14124.26	8154.64	1081228.18	-1380449.68	7525.79

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	186653.68	8100.58	14033.57	1714160.41	-734312.83	6928.27
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	186653.68	-1.47	15884.97	1921475.16	136734.32	3943.42
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	186653.68	-8103.13	14035.04	1714374.42	1007724.12	77.61
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	186653.68	-14125.73	8157.19	1081598.86	1653704.30	-3241.74
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	186653.68	-16203.72	1.47	205619.16	1878557.26	-5630.37
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	186653.68	-13754.59	-7941.21	-652444.51	1622359.51	-7245.86
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	186653.68	-8100.58	-14033.57	-1303350.11	1007353.44	-6928.27
Dead+Wind 0 deg - Service	48565.74	1.85	-12089.20	-1220720.16	11753.57	-3228.51
Dead+Wind 30 deg - Service	48565.74	6142.93	-10639.87	-1068542.39	-620872.88	333.97
Dead+Wind 60 deg - Service	48565.74	9830.54	-5677.80	-564451.11	-1013014.07	2996.19
Dead+Wind 90 deg - Service	48565.74	12282.66	-1.85	27396.05	-1253302.04	4841.94
Dead+Wind 120 deg - Service	48565.74	10466.78	6043.00	651625.00	-1068706.42	6603.47
Dead+Wind 150 deg - Service	48565.74	6139.72	10638.02	1123603.98	-620406.09	6113.65
Dead+Wind 180 deg - Service	48565.74	-1.85	11352.40	1211432.08	12292.57	2981.35
Dead+Wind 210 deg - Service	48565.74	-6142.93	10639.87	1123873.48	644919.02	-333.97
Dead+Wind 240 deg - Service	48565.74	-10468.63	6046.20	652091.78	1093022.05	-3291.19
Dead+Wind 270 deg - Service	48565.74	-12282.66	1.85	27935.04	1277348.18	-4841.94
Dead+Wind 300 deg - Service	48565.74	-9828.69	-5674.60	-563984.34	1036790.72	-6061.31
Dead+Wind 330 deg - Service	48565.74	-6139.72	-10638.02	-1068272.90	644452.23	-6113.65

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-48565.74	0.00	0.00	48565.74	-0.00	0.000%
2	9.08	-58278.89	-59237.07	-9.08	58278.89	59237.07	0.000%
3	9.08	-43709.17	-59237.07	-9.08	43709.17	59237.07	0.000%
4	30100.37	-58278.89	-52135.36	-30100.37	58278.89	52135.37	0.000%
5	30100.37	-43709.17	-52135.36	-30100.37	43709.17	52135.37	0.000%
6	48169.64	-58278.89	-27821.24	-48169.65	58278.89	27821.24	0.000%
7	48169.64	-43709.17	-27821.24	-48169.65	43709.17	27821.24	0.000%
8	60185.01	-58278.89	-9.08	-60185.02	58278.89	9.08	0.000%
9	60185.01	-43709.17	-9.08	-60185.02	43709.17	9.08	0.000%
10	51287.19	-58278.89	29610.67	-51287.20	58278.89	-29610.68	0.000%
11	51287.19	-43709.17	29610.67	-51287.20	43709.17	-29610.68	0.000%
12	30084.65	-58278.89	52126.29	-30084.65	58278.89	-52126.29	0.000%
13	30084.65	-43709.17	52126.29	-30084.65	43709.17	-52126.29	0.000%
14	-9.08	-58278.89	55626.75	9.08	58278.89	-55626.76	0.000%
15	-9.08	-43709.17	55626.75	9.08	43709.17	-55626.76	0.000%
16	-30100.37	-58278.89	52135.36	30100.37	58278.89	-52135.37	0.000%
17	-30100.37	-43709.17	52135.36	30100.37	43709.17	-52135.37	0.000%
18	-51296.27	-58278.89	29626.39	51296.27	58278.89	-29626.40	0.000%
19	-51296.27	-43709.17	29626.39	51296.27	43709.17	-29626.40	0.000%
20	-60185.01	-58278.89	9.08	60185.02	58278.89	-9.08	0.000%
21	-60185.01	-43709.17	9.08	60185.02	43709.17	-9.08	0.000%
22	-48160.57	-58278.89	-27805.52	48160.57	58278.89	27805.52	0.000%
23	-48160.57	-43709.17	-27805.52	48160.57	43709.17	27805.52	0.000%
24	-30084.65	-58278.89	-52126.29	30084.65	58278.89	52126.29	0.000%
25	-30084.65	-43709.17	-52126.29	30084.65	43709.17	52126.29	0.000%
26	0.00	-186653.68	0.00	0.00	186653.68	-0.00	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
27	1.47	-186653.68	-16311.83	-1.47	186653.68	16311.83	0.000%
28	8103.13	-186653.68	-14035.04	-8103.13	186653.68	14035.04	0.000%
29	13756.05	-186653.68	-7943.76	-13756.06	186653.68	7943.76	0.000%
30	16203.72	-186653.68	-1.47	-16203.72	186653.68	1.47	0.000%
31	14124.25	-186653.68	8154.64	-14124.26	186653.68	-8154.64	0.000%
32	8100.58	-186653.68	14033.56	-8100.58	186653.68	-14033.57	0.000%
33	-1.47	-186653.68	15884.97	1.47	186653.68	-15884.97	0.000%
34	-8103.13	-186653.68	14035.04	8103.13	186653.68	-14035.04	0.000%
35	-14125.73	-186653.68	8157.19	14125.73	186653.68	-8157.19	0.000%
36	-16203.72	-186653.68	1.47	16203.72	186653.68	-1.47	0.000%
37	-13754.58	-186653.68	-7941.21	13754.59	186653.68	7941.21	0.000%
38	-8100.58	-186653.68	-14033.56	8100.58	186653.68	14033.57	0.000%
39	1.85	-48565.74	-12089.20	-1.85	48565.74	12089.20	0.000%
40	6142.93	-48565.74	-10639.87	-6142.93	48565.74	10639.87	0.000%
41	9830.54	-48565.74	-5677.80	-9830.54	48565.74	5677.80	0.000%
42	12282.66	-48565.74	-1.85	-12282.66	48565.74	1.85	0.000%
43	10466.77	-48565.74	6042.99	-10466.78	48565.74	-6043.00	0.000%
44	6139.72	-48565.74	10638.02	-6139.72	48565.74	-10638.02	0.000%
45	-1.85	-48565.74	11352.40	1.85	48565.74	-11352.40	0.000%
46	-6142.93	-48565.74	10639.87	6142.93	48565.74	-10639.87	0.000%
47	-10468.63	-48565.74	6046.20	10468.63	48565.74	-6046.20	0.000%
48	-12282.66	-48565.74	1.85	12282.66	48565.74	-1.85	0.000%
49	-9828.69	-48565.74	-5674.60	9828.69	48565.74	5674.60	0.000%
50	-6139.72	-48565.74	-10638.02	6139.72	48565.74	10638.02	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	188 - 180	2.717	46	0.1203	0.0098
T2	180 - 160	2.514	46	0.1199	0.0098
T3	160 - 140	2.009	46	0.1139	0.0091
T4	140 - 120	1.543	46	0.1007	0.0081
T5	120 - 100	1.135	46	0.0851	0.0068
T6	100 - 80	0.786	46	0.0704	0.0053
T7	80 - 60	0.502	46	0.0538	0.0040
T8	60 - 40	0.291	46	0.0383	0.0030
T9	40 - 20	0.143	46	0.0238	0.0020
T10	20 - 0	0.046	46	0.0122	0.0009

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	BCD87010	46	2.717	0.1203	0.0098	633528
186.00	Rohn 14' Rotatable Platform	46	2.666	0.1203	0.0098	633528
172.00	(2) KMW AM-X-CD-16-65-00T	46	2.310	0.1185	0.0096	403473
157.00	(2) RR90-17-02DP	46	1.936	0.1123	0.0089	98526
145.50	(3) Commscope SBNHH-1D85B	46	1.666	0.1048	0.0084	82340
126.00	RFS APXVSPP18-C-A20	46	1.251	0.0897	0.0072	80750

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	188 - 180	13.041	16	0.5760	0.0482
T2	180 - 160	12.071	16	0.5741	0.0481
T3	160 - 140	9.657	16	0.5451	0.0444
T4	140 - 120	7.424	16	0.4821	0.0396
T5	120 - 100	5.466	16	0.4077	0.0335
T6	100 - 80	3.789	16	0.3375	0.0260
T7	80 - 60	2.423	16	0.2582	0.0197
T8	60 - 40	1.409	16	0.1838	0.0148
T9	40 - 20	0.692	16	0.1142	0.0097
T10	20 - 0	0.222	16	0.0587	0.0045

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	BCD87010	16	13.041	0.5760	0.0482	137639
186.00	Rohn 14' Rotatable Platform	16	12.799	0.5757	0.0483	137639
172.00	(2) KMW AM-X-CD-16-65-00T	16	11.097	0.5671	0.0471	87362
157.00	(2) RR90-17-02DP	16	9.307	0.5375	0.0437	20632
145.50	(3) Commscope SBNHH-1D85B	16	8.013	0.5017	0.0410	17288
126.00	RFS APXVSPP18-C-A20	16	6.024	0.4297	0.0355	16957

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	188	Leg	A325N	0.8750	4	284.47	40589.10	0.007 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	885.19	5811.33	0.152 ✔	1	Member Block Shear
T2	180	Leg	A325N	0.8750	4	3030.65	40589.10	0.075 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2724.92	5811.33	0.469 ✔	1	Member Block Shear
T3	160	Leg	A325N	0.8750	4	8263.55	40589.10	0.204 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5742.26	10440.00	0.550 ✔	1	Member Bearing
T4	140	Leg	A325N	1.0000	4	15785.40	53014.40	0.298 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	7581.76	14137.50	0.536 ✔	1	Member Bearing
T5	120	Leg	A325N	1.0000	6	15600.30	53014.40	0.294 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8053.67	14137.50	0.570 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T6	100	Leg	A325N	1.0000	6	20793.10	53014.40	0.392 ✓	1	Bolt Tension
		Diagonal	A325N	0.7500	1	11409.50	14137.50	0.807 ✓	1	Member Bearing
T7	80	Leg	A325N	1.0000	8	19778.60	53014.40	0.373 ✓	1	Bolt Tension
		Diagonal	A325N	0.7500	1	11552.20	17671.90	0.654 ✓	1	Member Bearing
T8	60	Leg	A325N	1.0000	8	23575.50	53014.40	0.445 ✓	1	Bolt Tension
		Diagonal	A325N	0.7500	1	11779.30	17671.90	0.667 ✓	1	Member Bearing
T9	40	Leg	A325N	1.0000	8	27274.90	53014.40	0.514 ✓	1	Bolt Tension
		Diagonal	A325N	0.7500	1	12945.40	17892.40	0.724 ✓	1	Bolt Shear
T10	20	Leg	A354-BC	1.0000	10	24732.80	55223.30	0.448 ✓	1	Bolt Tension
		Diagonal	A325N	0.7500	1	14041.00	17892.40	0.785 ✓	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $P_u / \phi P_n$
T1	188 - 180	PIPE 3 STD	8.00	4.00	41.3 K=1.00	2.2285	-3413.69	88548.60	0.039 [1] ✓
T2	180 - 160	PIPE 3 STD	20.04	5.01	51.7 K=1.00	2.2285	-17744.40	82502.60	0.215 [1] ✓
T3	160 - 140	ROHN 3 EH	20.03	6.68	70.5 K=1.00	3.0159	-43091.20	94350.00	0.457 [1] ✓
T4	140 - 120	ROHN 4 EH	20.04	6.68	54.3 K=1.00	4.4074	-78072.30	159904.00	0.488 [1] ✓
T5	120 - 100	ROHN 5 EH	20.05	6.68	43.6 K=1.00	6.1120	-113316.00	239326.00	0.473 [1] ✓
T6	100 - 80	ROHN 6 EHS	20.02	10.01	54.0 K=1.00	6.7133	-148295.00	244127.00	0.607 [1] ✓
T7	80 - 60	ROHN 6 EH	20.03	10.02	54.8 K=1.00	8.4049	-187066.00	303757.00	0.616 [1] ✓
T8	60 - 40	ROHN 8 EHS	20.04	10.02	41.2 K=1.00	9.7193	-223066.00	386369.00	0.577 [1] ✓
T9	40 - 20	ROHN 8 EH	20.03	10.02	41.8 K=1.00	12.7627	-258782.00	505545.00	0.512 [1] ✓
T10	20 - 0	ROHN 8 EH	20.03	10.02	41.8 K=1.00	12.7627	-294473.00	505564.00	0.582 [1] ✓

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	188 - 180	L1 3/4x1 3/4x3/16	7.74	3.58	125.1 K=1.00	0.6211	-914.43	8833.29	0.104 [1] ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	9.40	4.57	159.5 K=1.00	0.6211	-2917.62	5513.95	0.529 [1] ✔
T3	160 - 140	L2 1/2x2 1/2x1/4	12.34	6.07	148.4 K=1.00	1.1900	-5816.49	12212.80	0.476 [1] ✔
T4	140 - 120	L3x3x1/4	14.12	6.91	140.0 K=1.00	1.4400	-7737.79	16589.30	0.466 [1] ✔
T5	120 - 100	L3x3x1/4	16.30	7.99	162.0 K=1.00	1.4400	-7973.41	12401.60	0.643 [1] ✔
T6	100 - 80	L3 1/2x3 1/2x1/4	19.28	9.41	162.7 K=1.00	1.6900	-11642.30	14415.50	0.808 [1] ✔
T7	80 - 60	L4x4x5/16	20.89	10.28	155.9 K=1.00	2.4000	-11630.20	22308.90	0.521 [1] ✔
T8	60 - 40	L4x4x5/16	22.77	11.15	169.2 K=1.00	2.4000	-11835.00	18939.30	0.625 [1] ✔
T9	40 - 20	L4x4x5/16	24.65	12.08	183.2 K=1.00	2.4000	-12945.40	16147.70	0.802 [1] ✔
T10	20 - 0	L4x4x3/8	26.47	12.98	197.6 K=1.00	2.8600	-14041.00	16543.00	0.849 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/8	8.22	7.93	193.4 K=0.81	0.4844	-363.91	2926.80	0.124 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	188 - 180	L3x3x1/4	6.63	6.33	125.2 K=0.97	1.4400	-91.78	20454.90	0.004 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	188 - 180	PIPE 3 STD	8.00	4.00	41.3	2.2285	691.71	100281.00	0.007 [1] ✔
T2	180 - 160	PIPE 3 STD	20.04	5.01	51.7	2.2285	12122.60	100281.00	0.121 [1] ✔
T3	160 - 140	ROHN 3 EH	20.03	6.68	70.5	3.0159	33054.20	135717.00	0.244 [1] ✔
T4	140 - 120	ROHN 4 EH	20.04	6.68	54.3	4.4074	63141.60	198335.00	0.318 [1] ✔
T5	120 - 100	ROHN 5 EH	20.05	6.68	43.6	6.1120	93601.80	275039.00	0.340 [1] ✔
T6	100 - 80	ROHN 6 EHS	20.02	10.01	54.0	6.7133	124759.00	302097.00	0.413 [1] ✔
T7	80 - 60	ROHN 6 EH	20.03	10.02	54.8	8.4049	158229.00	378222.00	0.418 [1] ✔
T8	60 - 40	ROHN 8 EHS	20.04	10.02	41.2	9.7193	188604.00	437369.00	0.431 [1] ✔
T9	40 - 20	ROHN 8 EH	20.03	10.02	41.8	12.7627	218199.00	574322.00	0.380 [1] ✔
T10	20 - 0	ROHN 8 EH	20.03	10.02	41.8	12.7627	247328.00	574322.00	0.431 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	188 - 180	L1 3/4x1 3/4x3/16	7.74	3.58	82.7	0.3604	885.19	15675.30	0.056 [1] ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	9.40	4.57	104.7	0.3604	2724.92	15675.30	0.174 [1] ✔
T3	160 - 140	L2 1/2x2 1/2x1/4	12.34	6.07	96.6	0.7519	5742.26	32706.60	0.176 [1] ✔
T4	140 - 120	L3x3x1/4	14.12	6.91	90.9	0.9159	7581.76	44652.00	0.170 [1] ✔
T5	120 - 100	L3x3x1/4	16.30	7.99	104.8	0.9159	8053.67	44652.00	0.180 [1] ✔
T6	100 - 80	L3 1/2x3 1/2x1/4	19.28	9.41	105.1	1.1034	11409.50	53792.60	0.212 [1] ✔
T7	80 - 60	L4x4x5/16	20.89	10.28	100.8	1.5949	11552.20	77752.40	0.149 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	60 - 40	L4x4x5/16	22.77	11.15	109.2	1.5949	11779.30	77752.40	0.151 [1] ✔
T9	40 - 20	L4x4x5/16	24.65	12.08	118.2	1.5949	12760.90	77752.40	0.164 [1] ✔
T10	20 - 0	L4x4x3/8	26.47	12.98	127.9	1.8989	13778.00	92571.70	0.149 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/8	8.22	7.93	151.9	0.4844	541.60	15693.80	0.035 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	188 - 180	L3x3x1/4	6.63	6.33	81.7	1.4400	7.08	46656.00	0.000 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	188 - 180	Leg	PIPE 3 STD	2	-3413.69	88548.60	3.9	Pass
T2	180 - 160	Leg	PIPE 3 STD	19	-17744.40	82502.60	21.5	Pass
T3	160 - 140	Leg	ROHN 3 EH	58	-43091.20	94350.00	45.7	Pass
T4	140 - 120	Leg	ROHN 4 EH	79	-78072.30	159904.00	48.8	Pass
T5	120 - 100	Leg	ROHN 5 EH	100	-113316.00	239326.00	47.3	Pass
T6	100 - 80	Leg	ROHN 6 EHS	121	-148295.00	244127.00	60.7	Pass
T7	80 - 60	Leg	ROHN 6 EH	136	-187066.00	303757.00	61.6	Pass
T8	60 - 40	Leg	ROHN 8 EHS	151	-223066.00	386369.00	57.7	Pass
T9	40 - 20	Leg	ROHN 8 EH	166	-258782.00	505545.00	51.2	Pass
T10	20 - 0	Leg	ROHN 8 EH	181	-294473.00	505564.00	58.2	Pass
T1	188 - 180	Diagonal	L1 3/4x1 3/4x3/16	7	-914.43	8833.29	10.4	Pass
T2	180 - 160	Diagonal	L1 3/4x1 3/4x3/16	35	-2917.62	5513.95	52.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T3	160 - 140	Diagonal	L2 1/2x2 1/2x1/4	62	-5816.49	12212.80	47.6	Pass
T4	140 - 120	Diagonal	L3x3x1/4	83	-7737.79	16589.30	46.6	Pass
T5	120 - 100	Diagonal	L3x3x1/4	104	-7973.41	12401.60	64.3	Pass
T6	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	125	-11642.30	14415.50	80.8	Pass
T7	80 - 60	Diagonal	L4x4x5/16	140	-11630.20	22308.90	52.1	Pass
T8	60 - 40	Diagonal	L4x4x5/16	155	-11835.00	18939.30	62.5	Pass
T9	40 - 20	Diagonal	L4x4x5/16	170	-12945.40	16147.70	80.2	Pass
T10	20 - 0	Diagonal	L4x4x3/8	185	-14041.00	16543.00	84.9	Pass
T2	180 - 160	Horizontal	L2x2x1/8	32	-363.91	2926.80	12.4	Pass
T1	188 - 180	Top Girt	L3x3x1/4	4	-91.78	20454.90	0.6	Pass
							Summary	
						Leg (T7)	61.6	Pass
						Diagonal (T10)	84.9	Pass
						Horizontal (T2)	12.4	Pass
						Top Girt (T1)	0.6	Pass
						Bolt Checks	80.7	Pass
						RATING =	**84.9**	**Pass**

Program Version 7.0.5.1 - 2/1/2016 File:P:/Dept 400/SMLINK-ATT-NEWEN 2/CTL01194/Structural/Structural Analysis/Analysis/TNX/CTL01194 - TNX.eri

Site Name:	East Windsor
Site No.:	CTL01194
Prepared By:	JM
Checked By:	BTK

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 06/06/2017

Self Support Tower Anchor Rod Check

Anchor Rods are (10) 1" Diam. ASTM A354 Grade BC Bolts

$Pu := 303.3kip$ — *Max Tension force for Detail type A,B, or C Connections*

$Vu := 36.3kip$ — *Shear force Corresponfing to Max Tension or Compression Force*

$Fub := 125ksi$ — *Steel Grade of Anchor Bolts*

$Dbolt := 1.0in$ — *Diameter of Anchor Bolt*

$Nbolt := 10$ — *Number of Anchor Bolts*

$\eta := 0.5$ — *η is dependent on Anchor Rod Detail Type per Figure 4-4 TIA Rev. G*

$Anet := 0.75\left(\frac{\pi}{4}\right)\cdot(Dbolt)^2$ — *Net Area of Bolt taken as 0.75 x unthreaded Area*

$Anet = 0.59\,in^2$

$Rnt := Fub\cdot Anet$

$Rnt = 73.6\,kip$ — *Nominal Tensile Strength of Anchor Rod per Section 4.9.6.1*

$$StressRatio := \frac{\left(Pu+\frac{Vu}{\eta}\right)}{0.8\cdot Rnt}$$

Interaction Equation

$StressRatio = 63.8\,\%$ *if Ratio<1.0, okay*

This check assumes the clear dist. from the top of the concrete foundation to bottom leveling nut does not exceed the diameter of the anchor rod.

Site Name:	East Windsor
Site No.:	CTL01194
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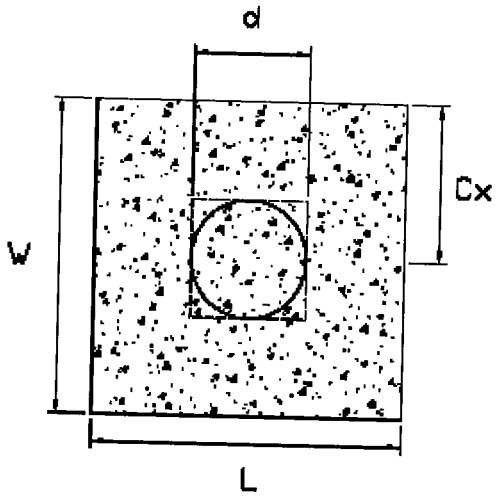
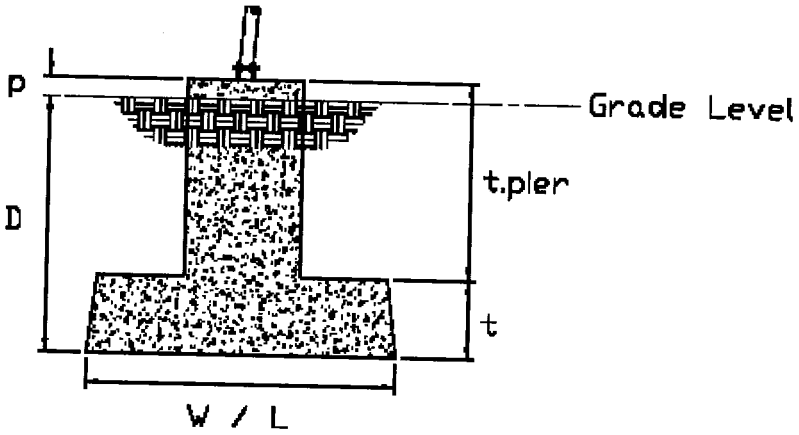
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 06/06/2017

Self Support Tower Foundation - Pad & Pier



Plan



Elevation

Pad & Pier Dimensions

$W := 11.1\,ft$ — *Width of Pad*

$L := 11.1\,ft$ — *Length of Pad*

$d := 4.5\,ft$ — *Diameter of Pier*

$Cx := 5.5\,ft$ — *Minimum distance to center of gravity of tower from outer edge (based on foundation drawings)*

$p := 6\,in$ — *Projection of Pier above grade*

$D := 14\,ft$ — *Depth from grade to the bottom of foundation*

$t := 2.5\,ft$ — *Thickness of Pad*

$t_{pier} := D + p - t$ $\quad t_{pier} = 12\,ft$ — *Length of Pier*

Pier Shape :=

○ "Circular"

◉ "Square"

Tower Reactions

$P_u := 303306lbf$ — *Factored download reaction*

$T_u := 254492lbf$ — *Factored uplift reaction*

$V_u := 36296lbf$ — *Factored shear reaction*

Soil Properties

$Bearing := 6ksf$ — *Allowable bearing pressure*

Bearing_Type :=
- ○ "Gross"
- ◉ "Net"

$SF_{Bearing} := 2$ — *Safety factor for allowable bearing*

$Bearing_{Ult} := Bearing \cdot SF_{Bearing}$ $\quad Bearing_{Ult} = 12 \cdot ksf$ — *Ultimate bearing pressure*

$\phi_{soil} := 34deg$ — *Angle of internal friction*

$H_{water} := 6ft$ — *Depth of water table*

$H_{frost} := 3.5ft$ — *Frost depth*

$\gamma_{conc} := 150pcf$

$\gamma_{soil} := 125pcf$

$\gamma_{H20} := 62.4pcf$

$\phi_b := 0.75$ — *Resistance factor for bearing per TIA-222-G Section 9.4.1*

$\phi_u := 0.75$ — *Resistance factor for uplift per TIA-222-G Section 9.4.1*

Soil Bearing Calculations

$A_{pad} := W \cdot L$ $\quad A_{pad} = 123.21\,ft^2$ *Area of pad*

$A_{pier} := \begin{cases} \pi \frac{d^2}{4} & \text{if Pier Shape = "Circular"} \\ d^2 & \text{if Pier Shape = "Square"} \end{cases}$ $\quad A_{pier} = 20.25\,ft^2$ *Area of pier*

$S := \frac{A_{pad} \cdot \min(W, L)}{6}$ $\quad S = 227.94 \cdot ft^3$ *Section modulus of base*

$D_{tpad} := t_{pier} - p$ $\quad D_{tpad} = 11.5\,ft$ *Depth of soil to top of pad*

$V_{soil} := D_{tpad} \cdot W \cdot L - D_{tpad} \cdot A_{pier}$ $\quad V_{soil} = 1184.04 \cdot ft^3$ *Volume of soil above concrete*

$Wt_{soil} := V_{soil} \cdot \gamma_{soil}$ $\quad Wt_{soil} = 148 \cdot kip$ *Weight of soil acting downwards*

$Wt_{pad} = 7.7 \cdot kip$ *Weight of concrete pad*

$Wt_{pier} = 7.34 \cdot kip$ *Weight of concrete pier*

$Wt_{soils} = 0 \cdot kip$ *Weight of soil is ignored if Net Bearing Pressure is given*

$Wt_{total} := 1.2Wt_{pad} + 1.2Wt_{pier} + 1.2Wt_{soils}$ $\quad Wt_{total} = 18.05 \cdot kip$ *Total factored weight of foundation*

$K_p := \frac{1 + \sin(\phi_{soil})}{1 - \sin(\phi_{soil})}$ $\quad K_p = 3.54$ *Rankine passive earth pressure coefficient*

$A := H_{water} - H_{frost}$ $\quad A = 2.5\,ft$ *Depth of soil layer between end of frost depth and start of water table*

$B := D - H_{water}$ $\quad B = 8\,ft$ *Depth of soil layer between start of water table and end of foundation*

$$M_{v\ passive\ pressure} := \begin{cases} d \cdot \left[\gamma_{soil} \cdot K_p \cdot H_{frost} \cdot (D - H_{frost}) \left(\frac{D - H_{frost}}{2} \right) + 0.5 \gamma_{soil} \cdot K_p \cdot (D - H_{frost})^2 \left(\frac{D - H_{frost}}{3} \right) \right] & \text{if } H_{water} > D \\ d \cdot \left[\gamma_{soil} \cdot K_p \cdot H_{frost} \cdot A \left(B + \frac{A}{2} \right) + 0.5 \gamma_{soil} \cdot K_p \cdot (A)^2 \left(B + \frac{A}{3} \right) \ldots \right. & \text{if } H_{water} < D \\ \left. + \gamma_{soil} \cdot K_p \cdot H_{water} \cdot B \left(\frac{B}{2} \right) + 0.5 \gamma_{soil\_sub} \cdot K_p \cdot (B)^2 \left(\frac{B}{3} \right) \right] & \end{cases}$$

$M_{v\ passive\ pressure} = 683 \cdot kip \cdot ft$

$M_{v\ resist} := \min\left[M_{v\ passive\ pressure}, V_u \cdot (D + p) \right]$ $\quad M_{v\ resist} = 526.29 \cdot kip \cdot ft$

$M_v := V_u \cdot (D + p) - M_{v\ resist}$ $\quad M_v = 0 \cdot kip \cdot ft$ *Moment due to shear, including passive resistance from soil*

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Check soil bearing capacity

$\phi R_s := \phi_b \cdot Bearing_{Ult}$ $\quad \phi R_s = 9 \cdot ksf$

$$R_u := \frac{(P_u + Wt_{total})}{A_{pad}} + \frac{M_v + \left[P_u \cdot \left(\frac{\min(L, W)}{2} - Cx\right)\right]}{S} \qquad R_u = 2.67 \cdot ksf$$

$$\frac{R_u}{\phi R_s} = 0.3$$

BearingCheck = "Bearing of soil is adequate."

Uplift Calculations

$Wt_{pad} := \gamma_{conc} \cdot t \cdot A_{pad}$ $\quad Wt_{pad} = 46.2 \cdot kip$ *Unfactored weight of concrete pad*

$Wt_{pier} := \gamma_{conc} \cdot t_{pier} \cdot A_{pier}$ $\quad Wt_{pier} = 36.45 \cdot kip$ *Unfactored weight of concrete pier*

$D_{tpad} := t_{pier} - p$ $\quad D_{tpad} = 11.5\,ft$ *Depth of soil to top of pad*

$V_{soil\_AC} := D_{tpad} \cdot W \cdot L - D_{tpad} \cdot A_{pier}$ $\quad V_{soil\_AC} = 1184.04 \cdot ft^3$ *Volume of soil above concrete*

$y := \tan(\phi_{soil}) \cdot D_{tpad}$ $\quad y = 7.76\,ft$

$V_{cone} := y \cdot D_{tpad} \cdot (L + W) + \pi \cdot y^2 \cdot \frac{1}{3} \cdot D_{tpad}$ $\quad V_{cone} = 2704.92 \cdot ft^3$ *Volume of soil cone*

$V_{soil} := V_{soil\_AC} + V_{cone}$

$V_{soil} = 3888.96 \cdot ft^3$ *Total volume of soil acting in uplift*

$Wt_{soil} := V_{soil} \cdot \gamma_{soil}$ $\quad Wt_{soil} = 486.12 \cdot kip$ *Unfactored weight of soil*

Check Uplift Capacity

$\phi R_s := \phi_u \cdot (0.9Wt_{pad} + 0.9Wt_{pier} + 0.9Wt_{soil})$ $\quad \phi R_s = 383.92 \cdot kip$ *Total Factored Uplift Resistance*

$R_u := T_u$ $\quad R_u = 254.49 \cdot kip$ *Factored Uplift Force*

$$\frac{R_u}{\phi R_s} = 0.66$$

UpliftCheck = "Uplift capacity is adequate."

at&t

PROJECT:	LTE 2C
SITE NUMBER:	CTL01194
FA NUMBER:	10035100
PTN NUMBER:	2051A066H4
PACE NUMBER:	MRCTB018196
SITE NAME:	EAST WINDSOR
SITE ADDRESS:	232 SOUTH MAIN STREET EAST WINDSOR, CT 06088

PROJECT INFORMATION

SITE NAME:	EAST WINDSOR
SITE NUMBER:	CTL01194
SITE ADDRESS:	232 SOUTH MAIN STREET EAST WINDSOR, CT 06088
FA NUMBER:	10035100
PTN NUMBER:	2051A066H4
PACE NUMBER:	MRCTB018196
USID NUMBER:	59398
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
OWNER:	BALCH BRIDGE STREET CORPORATION D/B/A BALCH COMMUNICATIONS
JURISDICTION:	HARTFORD COUNTY
COUNTY:	HARTFORD
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.877159°
LONGITUDE:	-72.61077°
GROUND ELEV.:	59'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	DEEPAK RATHORE
PHONE:	(860) 965-3068
EMAIL:	dr701e@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
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CONTACT:	RYAN BURGDORFER (508) 665-8005
EMAIL:	Ryan.Burgdorfer@Smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@Smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@fullertonengineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

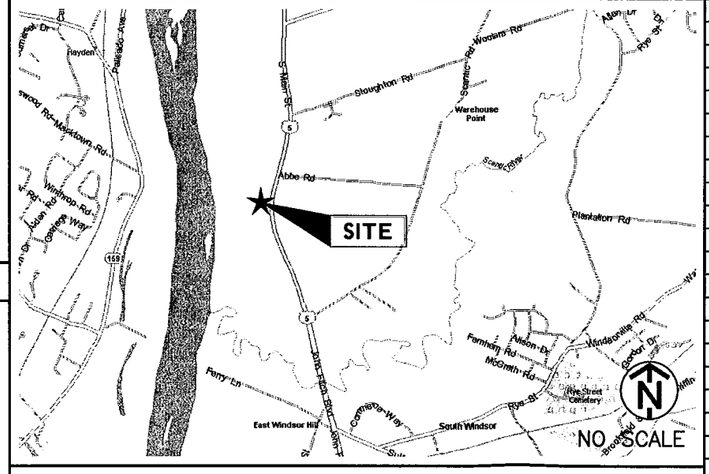
SCOPE OF WORK

LTE 1900 WILL BE 2C AT THE SITE, Q&D.
PROPOSED 2C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1111511, VERSION 4.00 LAST UPDATED 06/15/2017.

- (3) NEW RRUS-12 UNITS
- (3) NEW 25 AMP BREAKERS
- (1) NEW ARGUS CONVERTOR MODULE
- (1) NEW LTE DUS

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP



DIRECTIONS

SCAN QR CODE FOR LINK
TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE:	2012 INTERNATIONAL BUILDING CODE 2016 CONNECTICUT STATE BUILDING CODE SUPPLEMENT
ELECTRICAL CODE:	2014 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

T1	TITLE SHEET
SP1	NOTES AND SPECIFICATIONS
SP2	NOTES AND SPECIFICATIONS
A1	COMPOUND PLAN
A2	EQUIPMENT PLAN
A3	ELEVATIONS
A4	ANTENNA PLANS
A5	EQUIPMENT DETAILS
A6	ANTENNA & CABLE CONFIGURATION
A7	CABLE NOTES AND COLOR CODING
A8	GROUNDING DETAILS

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON
ENGINEERING DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	06/23/16	90% REVIEW	VV
1	11/15/16	FOR PERMIT	KC
2	06/19/17	FOR CONSTRUCTION	MD

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

STATE OF CONNECTICUT
HENRY M. BELLAGAMBA
25358
LICENSED PROFESSIONAL ENGINEER

SITE NAME
EAST WINDSOR

SITE NUMBER:
CTL01194

SITE ADDRESS
232 SOUTH MAIN STREET
EAST WINDSOR, CT 06088

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

FEC# 2016.020000010

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.
41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.
48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
    A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
    B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".
66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.
67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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STATE OF CONNECTICUT
HENRY M. BELTAGAMBA
25358
LICENSED PROFESSIONAL ENGINEER

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EAST WINDSOR

SITE NUMBER:
CTL01194

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232 SOUTH MAIN STREET
EAST WINDSOR, CT 06088

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

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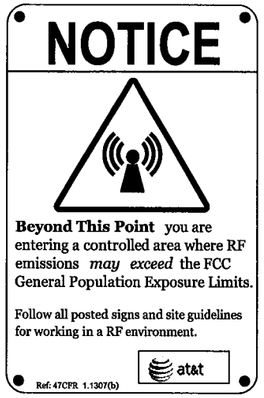
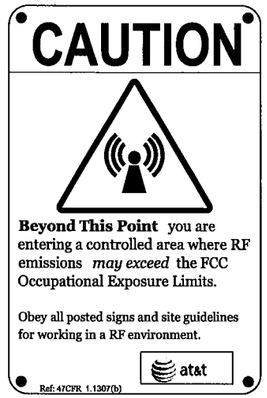
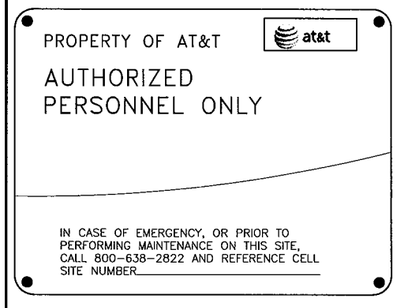




ALERTING SIGNS

ALERTING SIGN



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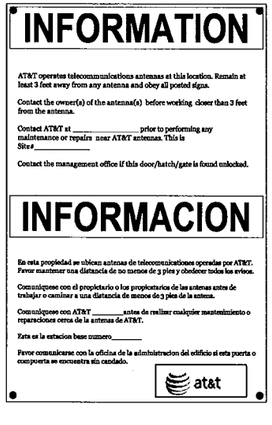

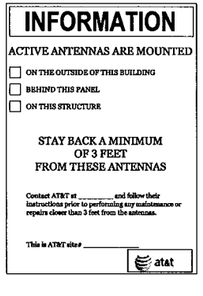

INFO SIGN #1 | INFO SIGN #2

INFO SIGN #3

ALERTING SIGN
(FOR CELL SITE BATTERIES)

ALERTING SIGN
(FOR DIESEL FUEL)

ALERTING SIGN
(FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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CTL01194

SITE ADDRESS
232 SOUTH MAIN STREET
EAST WINDSOR, CT 06088

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP2

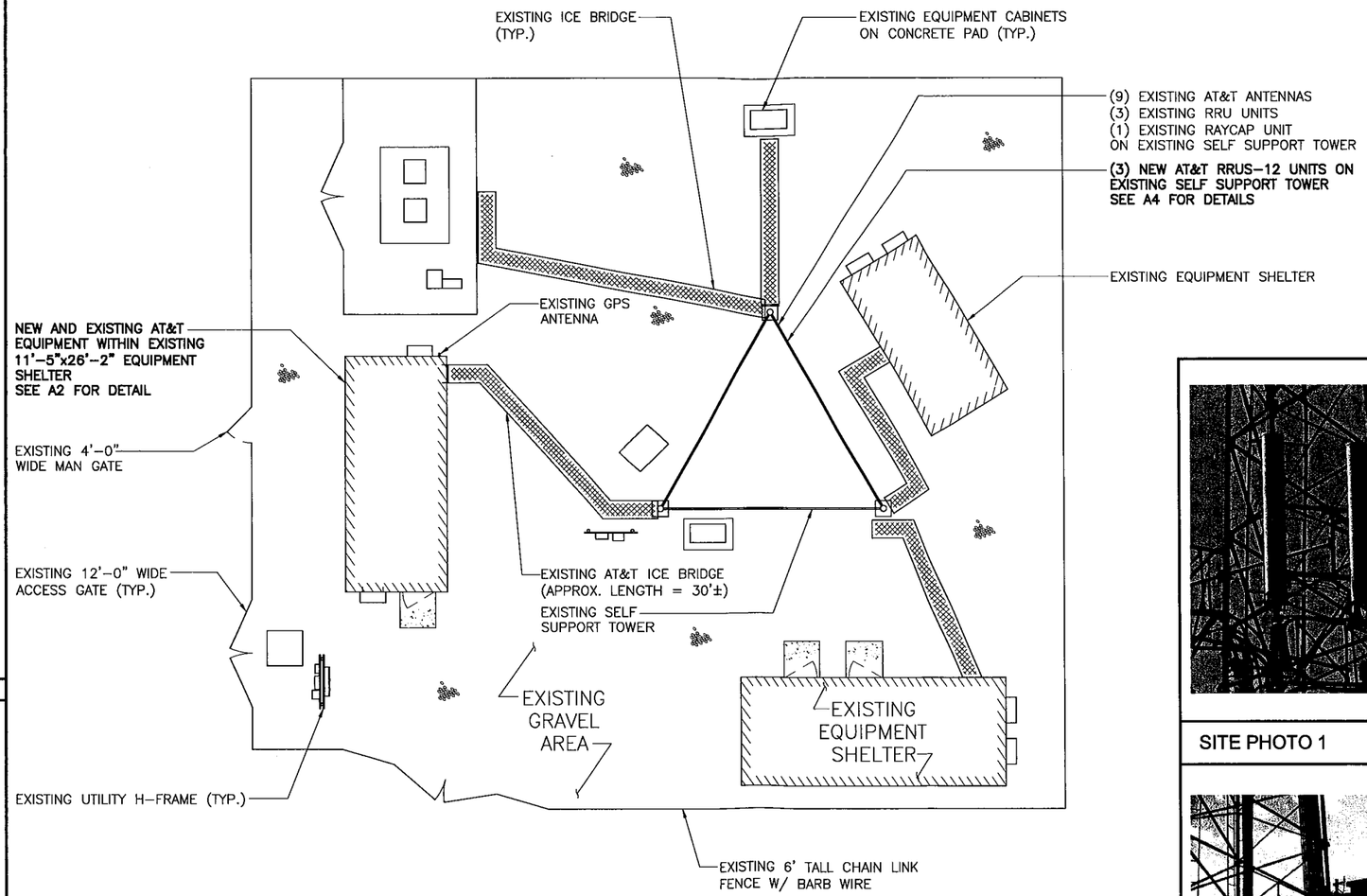
FEC# 2016.0200.0010

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE



COMPOUND PLAN — SCALE: 1/16" = 1'-0" | 1

SITE PHOTO 1 — SCALE: N.T.S. | 2

SITE PHOTO 2 — SCALE: N.T.S. | 3

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

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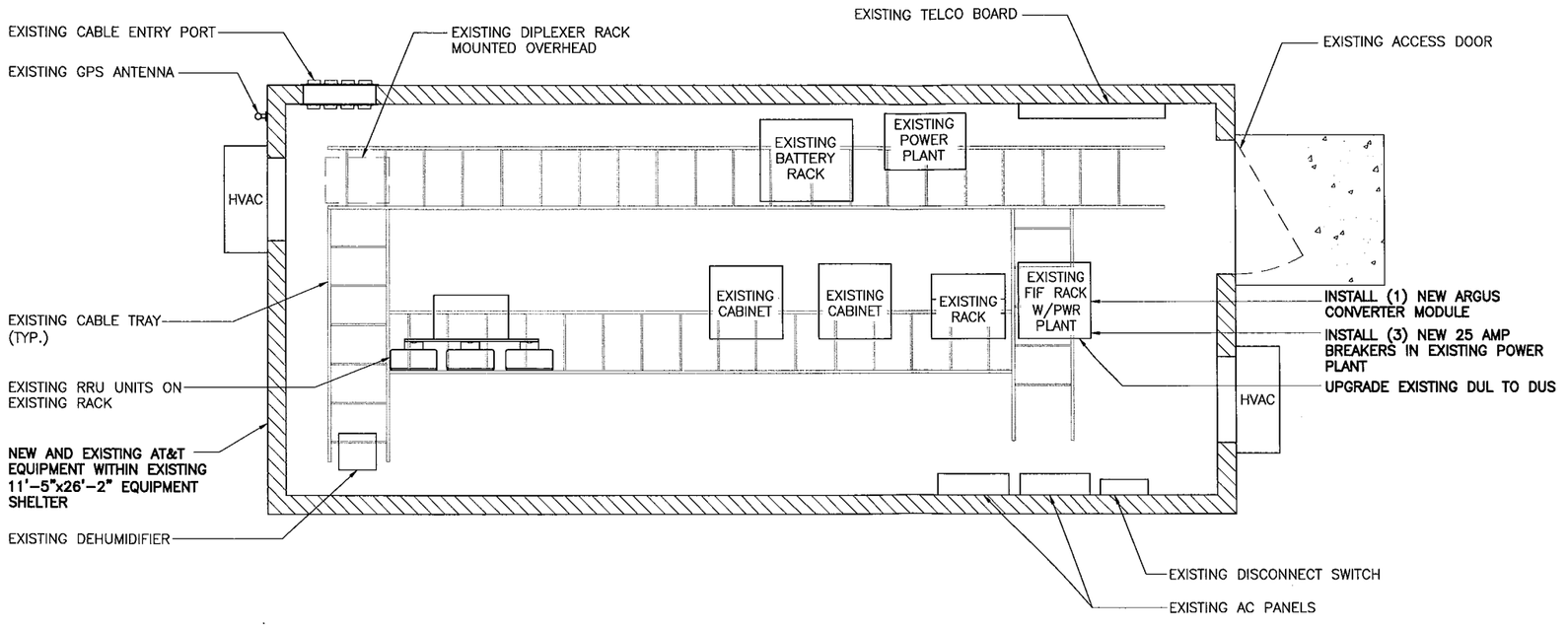
SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

FEC# 2016.02000010



EQUIPMENT PLAN

SCALE: 1/4" = 1'-0" | 1

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SHEET NAME
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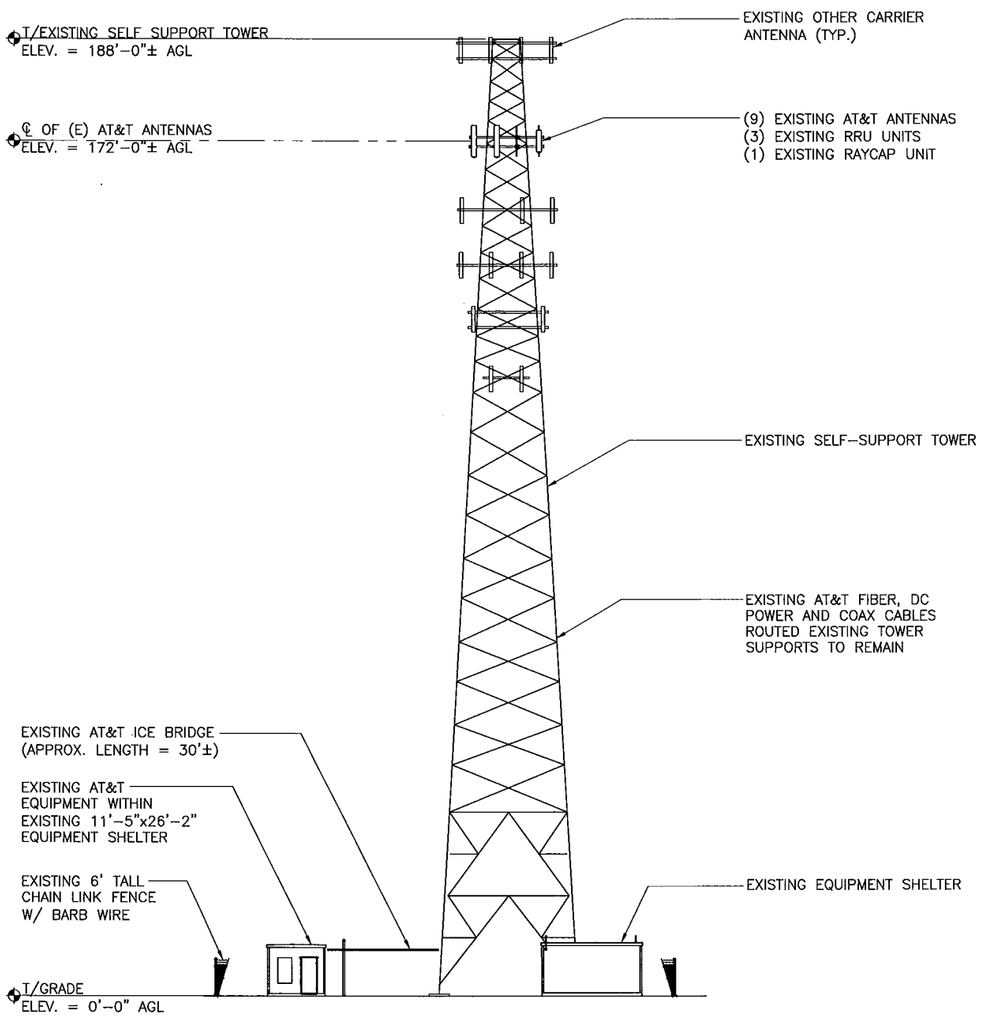
SHEET NUMBER
A2

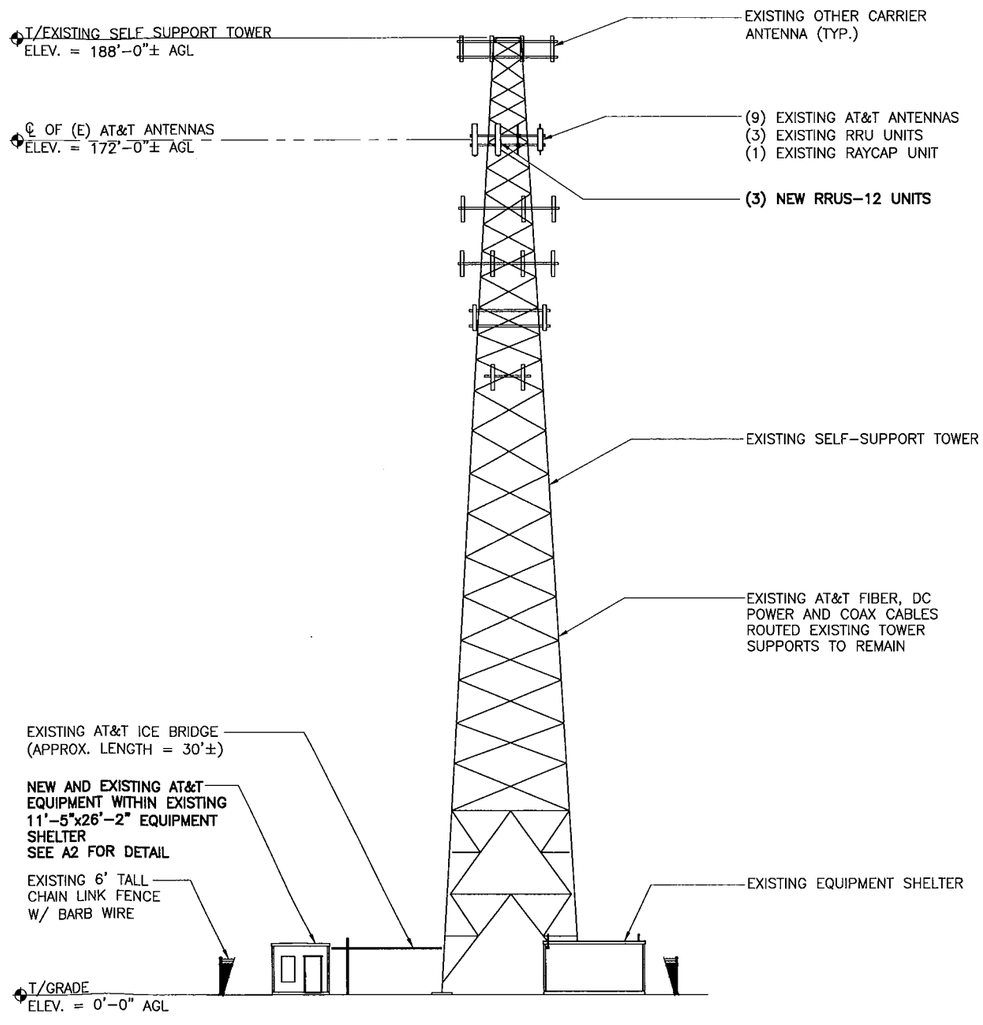
FEC# 2016.020000010

NOTES:

1. CALCULATIONS FOR THE STRUCTURE AND ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION SCALE: 1" = 30'-0" 1



NEW ELEVATION SCALE: 1" = 30'-0" 2

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STATE OF CONNECTICUT
HENRY M. BELLAGAMBA
25358
LICENSED PROFESSIONAL ENGINEER

SITE NAME
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SITE NUMBER:
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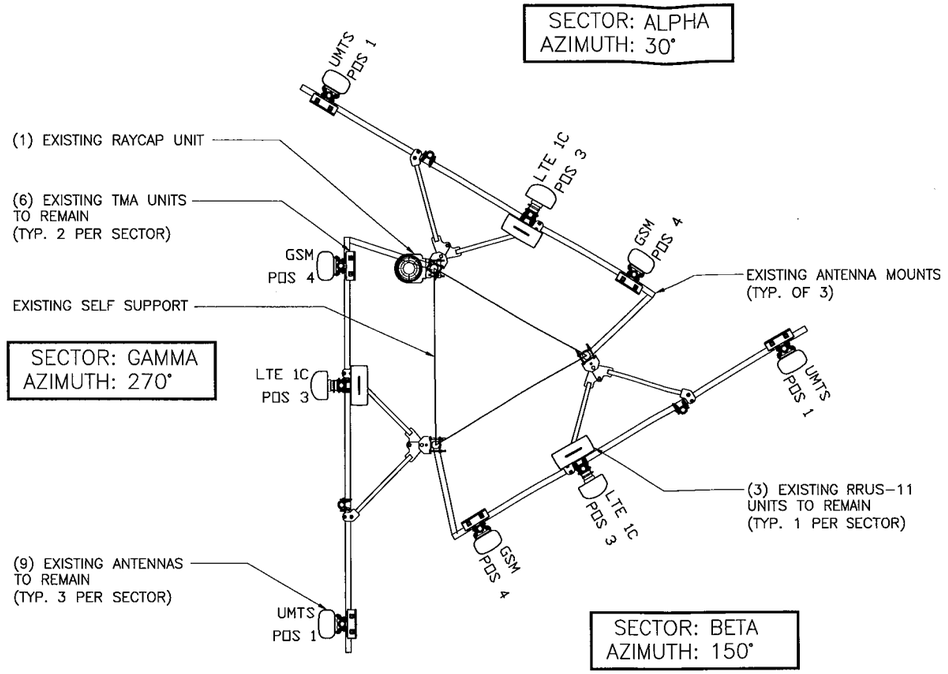
SITE ADDRESS
232 SOUTH MAIN STREET
EAST WINDSOR, CT 06088

SHEET NAME
ELEVATIONS

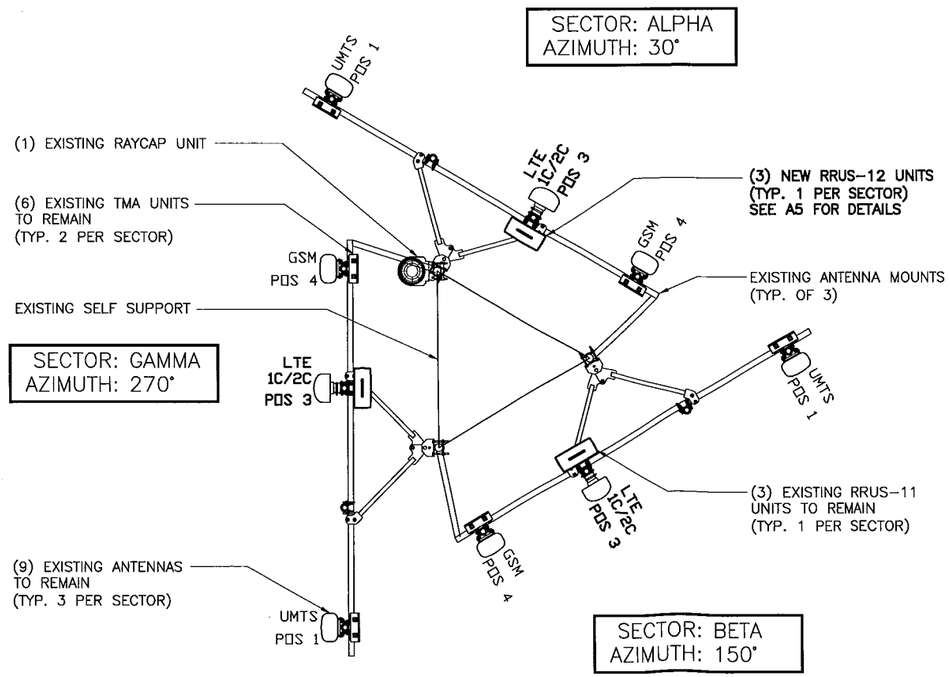
SHEET NUMBER
A3

FEC# 2016.0200010



EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 1



FINAL ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 2

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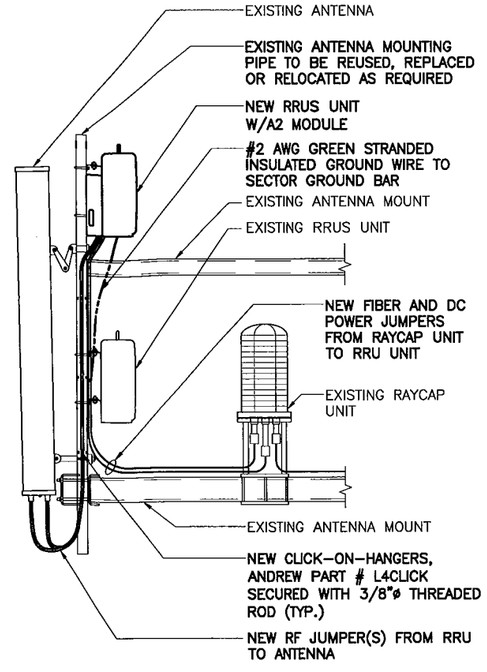
SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

FEC# 2016.020000010

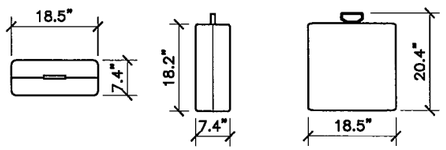
NOT USED — SCALE: N.T.S. — 1

NOT USED — SCALE: N.T.S. — 2



ANTENNA SCHEMATIC — SCALE: N.T.S. — 3

NOT USED — SCALE: N.T.S. — 4



ERICSSON – RRUS 12
WITH SOLAR SHIELD
UNIT WEIGHT 52.2 Lbs

RRU SPEC — SCALE: N.T.S. — 5

NOT USED — SCALE: N.T.S. — 6

NOT USED — SCALE: N.T.S. — 7

NOT USED — SCALE: N.T.S. — 8

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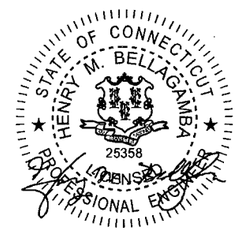

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SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5

FEC# 2016.020000010

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (06/15/17)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A–1	(E) UMTS ANTENNA	800–10121	KATHREIN	(1) EXISTING TMA UNIT(S)	30°	172'–0"	1–1/4"ø LDF6–50A	210'–0"	(1) (E) DC6–48–60–18–8F UNIT
								1–1/4"ø LDF6–50A	210'–0"	
	A–2	–	–	–	–	–	–	–		
	A–3	**(N) LTE1C/2C ANTENNA**	P65–17–XLH–RR	POWERWAVE	(1) EXISTING RRUS–11 UNIT **AND (1) NEW RRUS–12 UNIT**	30°	172'–0"	(1) EXISTING FIBER CABLE	210'–0"	
								(2) EXISTING DC POWER CABLES	210'–0"	
	A–4	(E) GSM/UMTS ANTENNA	P65–17–XLH–RR	POWERWAVE	(1) EXISTING TMA UNIT(S)	30°	172'–0"	1–1/4"ø LDF6–50A	210'–0"	
								1–1/4"ø LDF6–50A	210'–0"	
BETA	B–1	(E) UMTS ANTENNA	800–10121	KATHREIN	(1) EXISTING TMA UNIT(S)	150°	172'–0"	1–1/4"ø LDF6–50A	210'–0"	
								1–1/4"ø LDF6–50A	210'–0"	
	B–2	–	–	–	–	–	–	–		
	B–3	**(N) LTE1C/2C ANTENNA**	P65–17–XLH–RR	POWERWAVE	(1) EXISTING RRUS–11 UNIT **AND (1) NEW RRUS–12 UNIT**	150°	172'–0"	SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH		
	B–4	(E) GSM/UMTS ANTENNA	P65–17–XLH–RR	POWERWAVE	(1) EXISTING TMA UNIT(S)	150°	172'–0"	1–1/4"ø LDF6–50A	210'–0"	
								1–1/4"ø LDF6–50A	210'–0"	
GAMMA	C–1	(E) UMTS ANTENNA	800–10121	KATHREIN	(1) EXISTING TMA UNIT(S)	270°	172'–0"	1–1/4"ø LDF6–50A	210'–0"	
								1–1/4"ø LDF6–50A	210'–0"	
	C–2	–	–	–	–	–	–	–		
	C–3	**(N) LTE1C/2C ANTENNA**	SBNH–1D6565C	COMMSCOPE	(1) EXISTING RRUS–11 UNIT **AND (1) NEW RRUS–12 UNIT**	270°	172'–0"	SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH		
	C–4	(E) GSM/UMTS ANTENNA	SBNH–1D6565C	COMMSCOPE	(1) EXISTING TMA UNIT(S)	270°	172'–0"	1–1/4"ø LDF6–50A	210'–0"	
								1–1/4"ø LDF6–50A	210'–0"	

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S. | 1

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

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SITE NUMBER:
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EAST WINDSOR, CT 06088

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

FEC# 2016.0200010

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

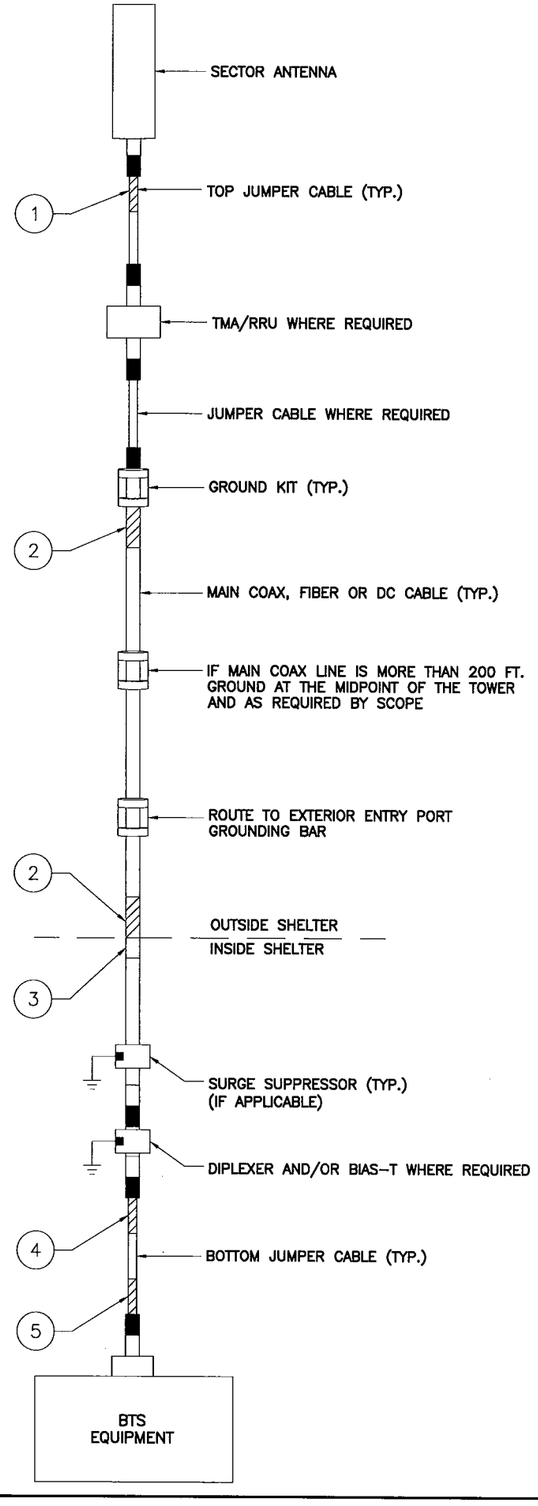
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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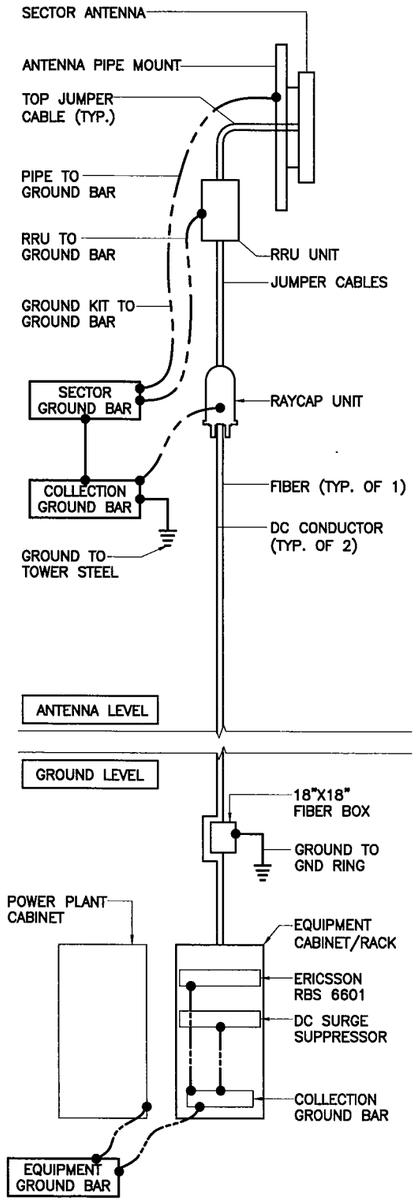
EAST WINDSOR, CT 06088

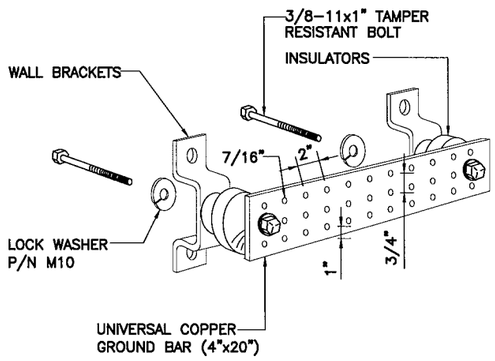
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

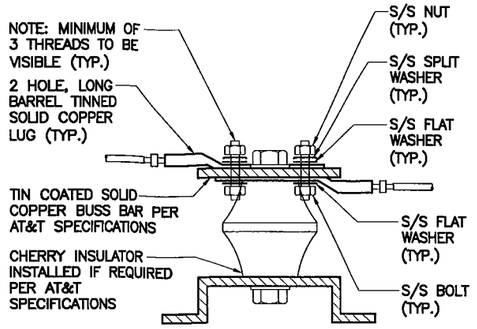
FEC# 2016.0200D0010



GROUNDING SCHEMATIC SCALE: N.T.S. 1



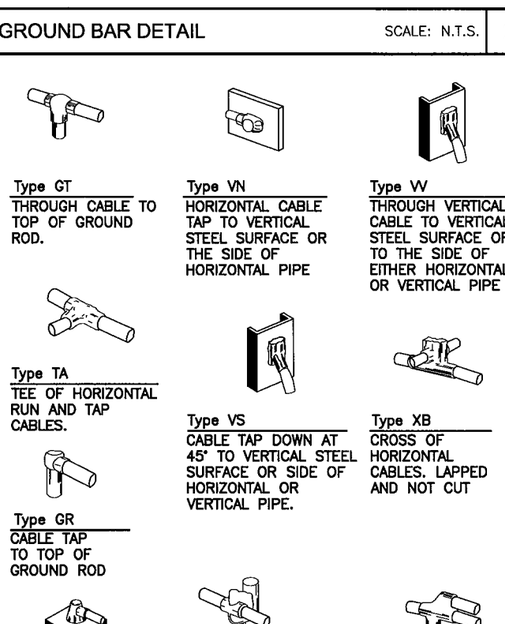
GROUND BAR DETAIL SCALE: N.T.S. 2



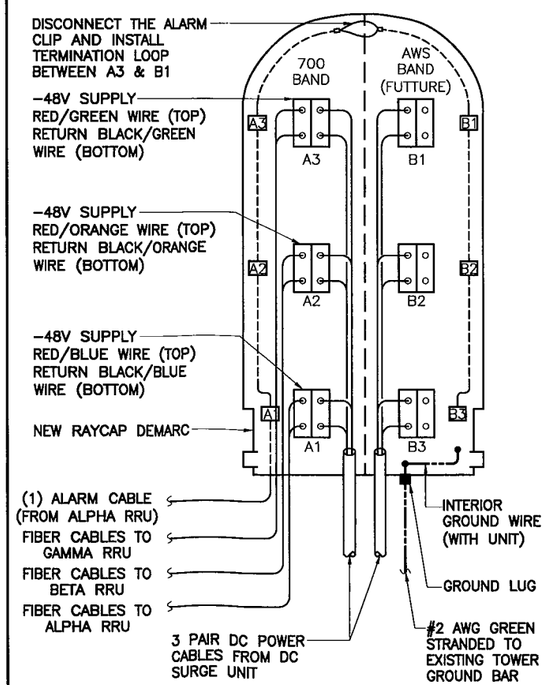
NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

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SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

FEC# 2016.02000010