May 15, 2018

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

Re:	**Notice of Exempt Modification – Antenna Add**
Property Address:	**2108 MAIN STREET GLASTONBURY, CT 06033**
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 166-feet on an existing 170 –self-support tower, owned by The Town of Glastonbury. AT&T now intends to install (3) NEW ANTENNAS, (3) NEW RRUS-32 82 UNITS, (3) NEW RRUS-32 B66 UNITS, (3) NEW RRUS-12 UNITS, (3) NEW RRUS-Bl 4 4478 UNITS (1) NEW RAYCAP UNIJ, (2) DC POWER CABLES, ADD 2ND 5216 & ADD 2ND XMU.

This facility was approved by The Glastonbury Town Plan and Zoning Commission with Section12 Special Permit with Design Review on January 3rd, 1989 for a certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of telecommunications antennas, associated equipment, and building to provide Domestic Public Cellular Radio Telecommunication service in the Connecticut- New England area. This approval is for removal of old and replacement with a new 170' free-standing radio antenna. SEE ATTACHED.

The following is a subsequent decision by the Connecticut Siting Council:

EM-CING-054-054-077-134-164-070911 – New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 2108 Main Street, **Glastonbury**; 577 Bell Street, **Glastonbury**; 60 Adams Street, Manchester; 46 Brendon Street, Stafford; and 419 Broad Street, Windsor, Connecticut.

EM-AT&T-054-120518A – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 2108 Main Street, **Glastonbury**, Connecticut.

EM-AT&T-054-141224 - AT&T notice of intent to modify an existing telecommunications facility located at 2108 Main Street, **Glastonbury**, Connecticut. Decision. Completion Letter.

EM-AT&T-054-170123b - AT&T notice of intent to modify an existing telecommunications facility located at 2108 Main Street, **Glastonbury**, Connecticut. Decision Completion Letter

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to The Honorable Stewart "Chip" Beckett III, Chairman of the Glastonbury Town Council, Richard J. Johnson, Glastonbury Town Manager, as the property owner and the tower owner Peter R. Carey, Glastonbury Building Official and Zoning Enforcement Officer at the Glastonbury Town Hall 2155 Main Street Glastonbury, CT 06033.

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 166-foot level of the 170-utility monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

David Barbagallo

Enclosures
CC w/enclosures:

The Honorable Stewart "Chip" Beckett III, Chairman of the Glastonbury Town Council Richard J. Johnson, Glastonbury Town Manager, as the property owner and the tower owner Peter R. Carey, Glastonbury Building Official and Zoning Enforcement Officer.

Town of Glastonbury

2155 MAIN STREET • GLASTONBURY, CONNECTICUT 06033 • (203) 659-2711

TOWN PLAN AND
ZONING COMMISSION

SECTION 12 SPECIAL PERMIT WITH DESIGN REVIEW

APPLICANT: TOWN OF GLASTONBURY
POLICE DEPARTMENT
2108 MAIN STREET
GLASTONBURY, CT 06033

OWNER: TOWN OF GLASTONBURY
2155 MAIN STREET
GLASTONBURY, CT 06033

FOR: INSTALLATION OF A NEW RADIO ANTENNA

MOVED, that the Town Plan and Zoning Commission approve the application of the Town of Glastonbury Police Department for a Section 12 Special Permit with Design Review for installation of a new 170' free-standing radio antenna - removal of old - 2108 Main Street, Reserved Land Zone.

APPROVED: TOWN PLAN AND ZONING COMMISSION
JANUARY 3, 1989

B. W. ERK, III, CHAIRMAN

bsw

2108 MAIN ST

Location	2108 MAIN ST	**M/B/L/U**	D6/ 4140/ E0064/ /
Acct#	41402108	**Owner**	GLASTONBURY TOWN
Assessment	$5,567,790	**Appraisal**	$7,953,930
PID	12840	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	
2017	$4,408,130	$3,545,800	
Assessment			
Valuation Year	**Improvements**	**Land**	
2017	$3,085,690	$2,482,100	

Owner of Record

Owner	GLASTONBURY TOWN OF
Co-Owner	POLICE/AMBULANCE FACILITY

Sale Price	$0
Certificate	
Book & Page	0098/0515
Sale Date	11/15/1956
Instrument	76

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**
GLASTONBURY TOWN OF	$0		0098/0515	76

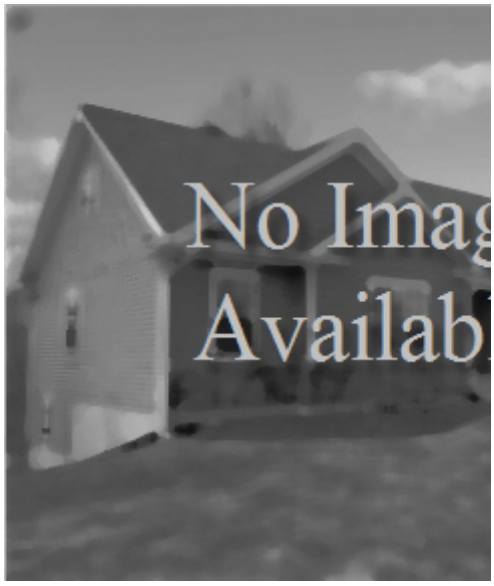
Building Information

Building 1 : Section 1

Year Built: 0
Living Area: 0
Replacement Cost: $0
Building Percent Good: 30
Replacement Cost Less Depreciation: $0

Building Attributes	
Field	**Description**
STYLE	Town Owned
MODEL	Comm/Ind
Stories:	1
Occupancy	1
Exterior Wall 1	Average
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Type	None
Bldg Use	922
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	922
Heat/AC	HEAT/AC SPLIT
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS

Building Photo



(http://images.vgsi.com/photos2/Glas

Building Layout

Building Sub-Areas (sq
No Data for Building Su

Rooms/Prtns	AVERAGE
Wall Height	9
% Comn Wall	

Extra Features

Extra Features
No Data for Extra Features

Land

Land Use

Use Code	901
Description	Town MDL-94
Zone	A

Land Line Valuation

Size (Acres)	12.6
Assessed Value	$2,482,100
Appraised Value	$3,545,800

Outbuildings

Outbuildings
No Data for Outbuildings

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	
2016	$4,408,130	$2,281,800	
2015	$4,408,130	$2,281,800	
2014	$4,408,130	$2,281,800	

Assessment			
Valuation Year	**Improvements**	**Land**	
2016	$3,085,690	$1,597,300	
2015	$3,085,690	$1,597,300	

2014	$3,085,690	$1,597,300	

SITESAFE
RF COMPLIANCE EXPERTS

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 – 10035111
Site ID – CT1083 (MRCTB025618-MRCTB025635-MRCTB022337-MRCTB026600)
USID – 59372
Site Name – Glastonbury PD
Site Compliance Report

Glastonbury Police Department
Glastonbury, CT 06033

Latitude: N41-42-22.37
Longitude: W72-36-24.90
Structure Type: Self-Support

Report generated date: December 27, 2017
Report by: Young Kim
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?	No
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Rooftop	<1% General Public Limit
Max simulated RFE level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTL01083_2018-LTE-Next-Carrier_LTE_mm093q_2051A0...

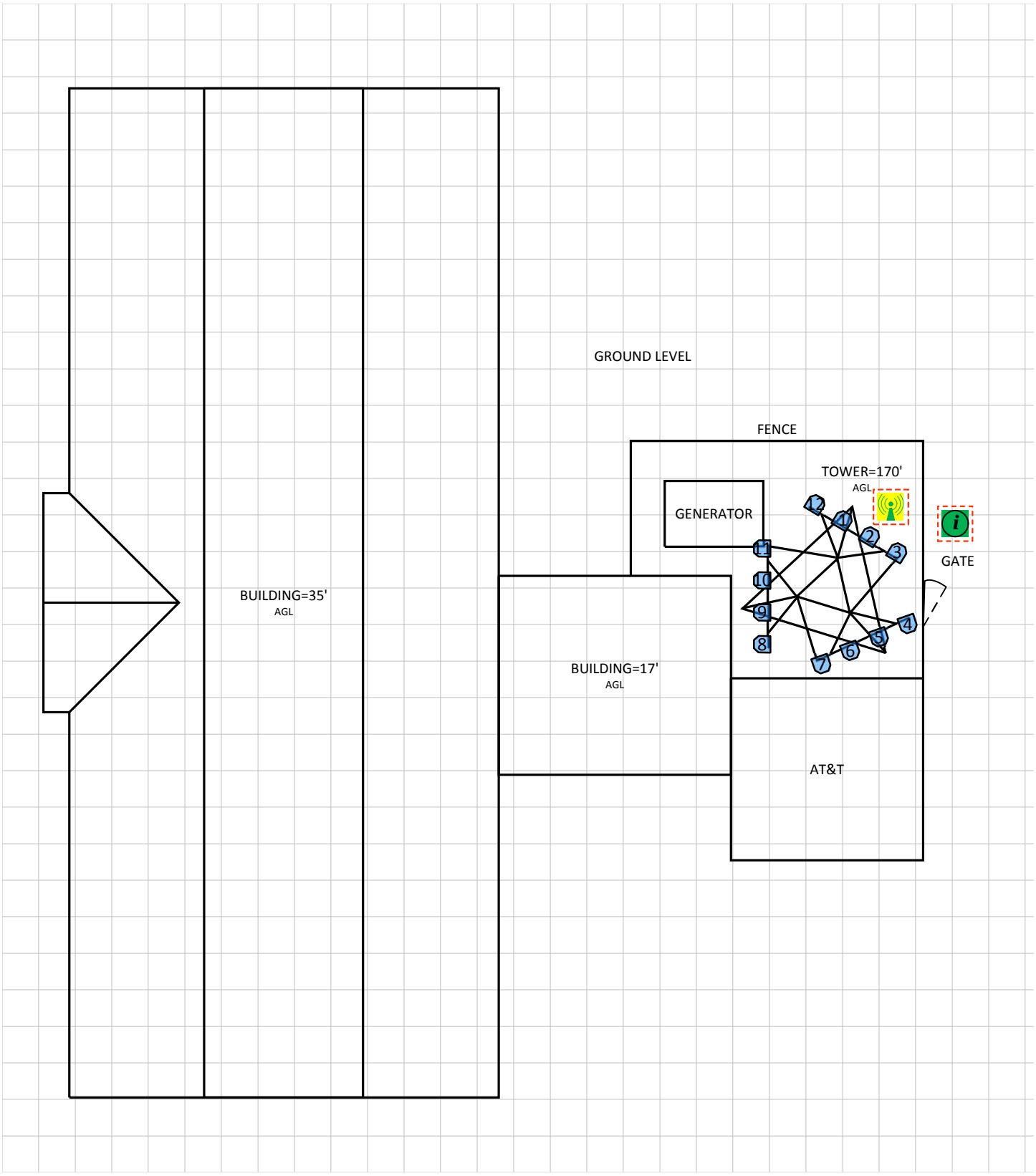
CD's: 10035111_AE201_171102_CTL01083_REV0 JMRL (2) (00000002)

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View – South

Site Scale Map For: Glastonbury PD



(Feet)

0 9.4 18.8

www.sitesafe.com
Site Name:Glastonbury PD
12/27/2017 1:46:38 PM

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

3 Antenna Inventory

The following antenna inventory was obtained by the customer and utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	737	30	66	6	11.66	0	0	1	1475.7	141.9'	129.1'	163'
1	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	1900	30	60	6	14.86	0	0	2	4842.1	141.9'	129.1'	163'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	737	30	63.9	6.6	12.5	0	0	1	1285.3	145.6'	126.9'	162.7'
2	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	2100	30	65.2	6.6	16.48	0	0	1	5070.3	145.6'	126.9'	162.7'
3	AT&T MOBILITY LLC (Proposed)	CCI Antennas OPA-65R-LCUU-H6	Panel	850	30	61	6	12.46	0	0	1	1000	149.3'	124.7'	163'
3	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	2300	30	60	6	15.46	0	0	1	1285.3	149.3'	124.7'	163'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	160	87.6	4.5	11.35	0	1	0	236.1	150.8'	114.9'	163.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	160	85.7	4.5	14.32	0	1	0	392.6	150.8'	114.9'	163.7'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	737	160	66	6	11.66	0	0	1	1475.7	146.9'	113.1'	163'
5	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	1900	160	60	6	14.86	0	0	2	4842.1	146.9'	113.1'	163'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	737	160	63.9	6.6	12.5	0	0	1	1285.3	142.9'	111.2'	162.7'
6	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10965	Panel	2100	160	65.2	6.6	16.48	0	0	1	5070.3	142.9'	111.2'	162.7'
7	AT&T MOBILITY LLC (Proposed)	CCI Antennas OPA-65R-LCUU-H6	Panel	850	160	61	6	12.46	0	0	1	1000	139'	109.4'	163'
7	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H6	Panel	2300	160	60	6	15.46	0	0	1	1285.3	139'	109.4'	163'
8	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	270	87.6	4.5	11.35	0	1	0	229.6	130.8'	112.2'	163.7'
8	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	270	85.7	4.5	14.32	0	1	0	401.8	130.8'	112.2'	163.7'
9	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H8	Panel	737	270	63.9	7.7	12.26	0	0	1	1475.7	130.8'	116.5'	162.1'
9	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H8	Panel	1900	270	64.3	7.7	14.76	0	0	2	4842.1	130.8'	116.5'	162.1'
10	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	737	270	67.9	8	13.55	0	0	1	1285.3	130.8'	120.9'	162'
10	AT&T MOBILITY LLC (Proposed)	Kathrein-Scala 800-10966	Panel	2100	270	64.4	8	16.15	0	0	1	5070.3	130.8'	120.9'	162'
11	AT&T MOBILITY LLC (Proposed)	CCI Antennas OPA-65R-LCUU-H8	Panel	850	270	59.2	7.7	13.86	0	0	1	1000	130.8'	125.3'	162.1'
11	AT&T MOBILITY LLC	CCI Antennas OPA-65R-LCUU-H8	Panel	2300	270	63.7	7.7	14.66	0	0	1	1285.3	130.8'	125.3'	162.1'
12	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	30	87.6	4.5	11.35	0	1	0	229.6	138.1'	131.3'	163.7'
12	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	30	85.7	4.5	14.32	0	1	0	401.8	138.1'	131.3'	163.7'

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 850MHz LTE technology is being added to an existing antenna.

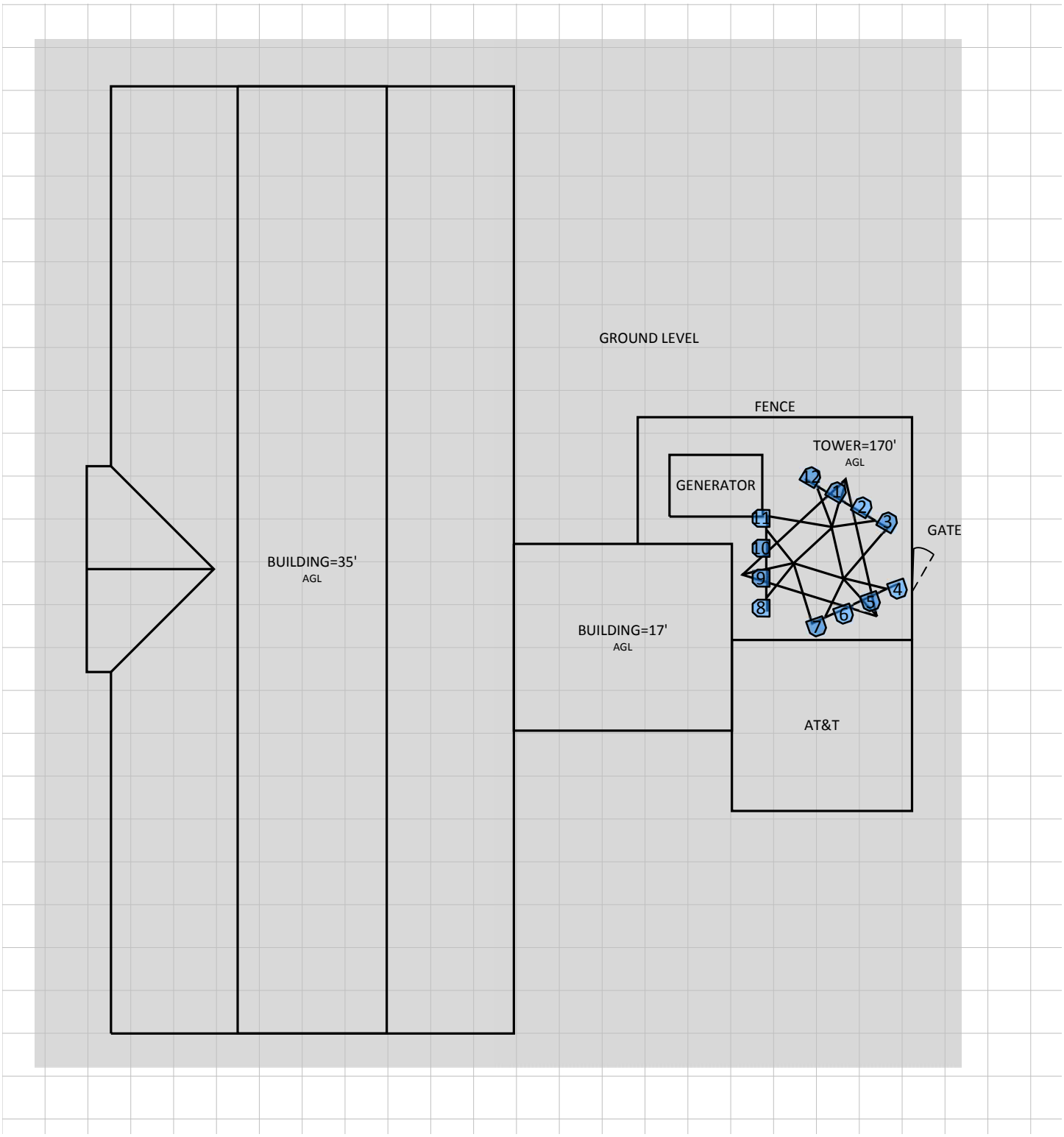
Note: An RRH swap is being proposed for the 1900MHz LTE technology.

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: Glastonbury PD



% 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

(Feet)

0 10.9 21.9

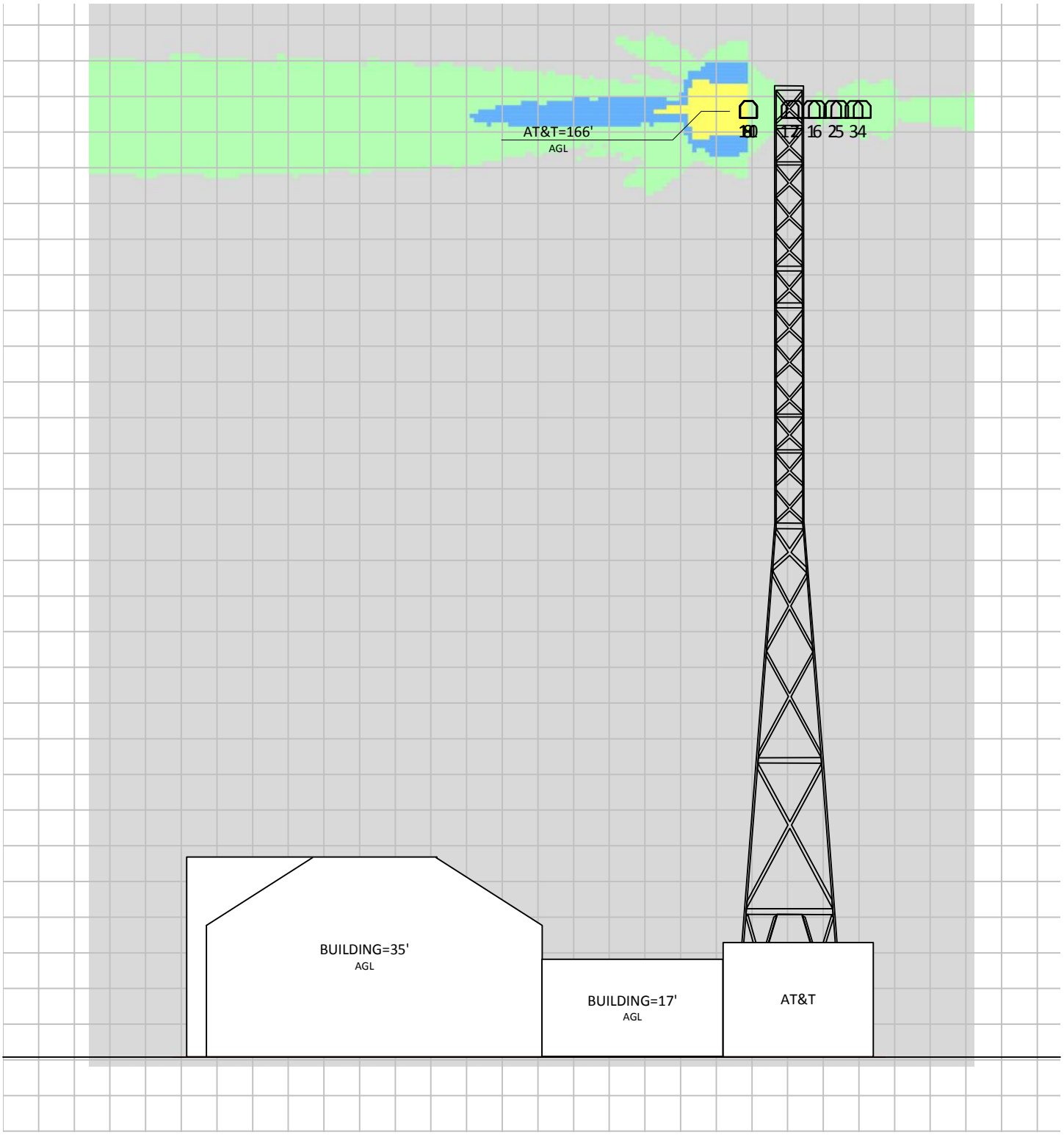
Barrier

Proposed Barriers

www.sitesafe.com
Site Name:Glastonbury PD
12/27/2017 1:47:24 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.266
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Glastonbury PD
Elevation View – South



% 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

(Feet)

0 13.1 26.2

Barrier

Proposed Barriers

www.sitesafe.com
Site Name:Glastonbury PD
12/27/2017 2:09:14 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.266
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:

All Tower Access Points

Yellow caution 2 sign required.

Gate

Information 1 sign required.

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 Young Kim.

December 27, 2017

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 Communications 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.

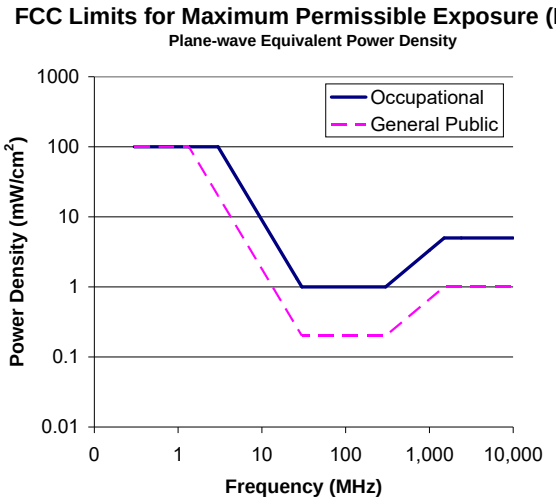
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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 CALCULATIONS

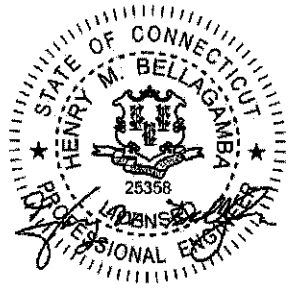
Prepared for: Smartlink / AT&T LTE 4C/5C/6C/RETROFIT

Antenna and Equipment on Existing Self-Support Tower

Site No.: CTL01083
FA No.: 10035111
PTN No.: 2051A0ACL6/2051A0DAXS/2051A0DB1A
Pace No.: MRCTB022337/MRCTB025618/MRCTB025635
Site Name: GLASTONBURY PD
2108 Main Street
Glastonbury, CT 06033

April 24, 2018

Revision 1:
Tower Modification Included



Henry M. Bellagamba, P.E.

FULLERTON
ENGINEERING · DESIGN

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Project Number: 2017.0278.0008

Summary

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

Conclusion

- The tower member stresses are in conformance for the loading considered, provided that tower modification described on page 6 is installed.
- The tower base 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	170 ft., self-support tower with a 4.56’ face width at top and 20.86’ face width at bottom.
References	RF Design Sheet by AT&T, dated 09/19/2017.
	Structural Analysis Report by Tectonic, dated 10/06/2017.
	Structural Analysis Report by Centek, job No.16071.83, dated 01/09/2017.

Appurtenance Loading Schedule

ELEV. (FT.=AGL)	APPURTENANCE	TRANSMISSION LINES
	Proposed AT&T	
166’	(2) Kathrein 800-10965 antennas (1) Kathrein 800-10966 antennas (3) RRUS-32 B2 units (3) RRUS-32 B66 units (3) RRUS-4478 B14 units (1) Raycap DC6-48-60-0-8F unit Mounted on existing (3) Sector Frames	(2) 3/4" DC Power
	Existing AT&T (to be Remain / Relocated)	
166’	(3) Kathrein 800-10121 antennas (6) CCI OPA-65R-LCUU-H6 antennas (3) RRUS-11 units (3) RRUS-32 units (6) CCI TPX-070821 triplexers (3) Powerwave TT19-08-BP111-001 TMA units (1) Raycap DC6-48-60-18-8F unit Mounted on existing (3) Sector Frames	(1) 3/8” Fiber (2) 3/4" DC Power (12) 1-5/8” Coax
	Existing AT&T (to Removed)	
166’	(3) RRUS-12 units (3) RRUS-A2 modules	
	Existing (to Remain)	
173’	(1) 10’ Omni antenna	(1) 7/8” Coax
173’	(2) 8’ Omni antenna	(2) 7/8” Coax
152’	(1) Kathrein PR-950 grid dish (1) 3’ Standoff Mount	(1) 7/8” Coax
143’ 140’	(1) 5’ Omni antenna (2) 3’ Standoff Mount	(2) 7/8” Coax
134’ 129’	(1) 10’ Omni antenna (1) 3’ Standoff Mount	(1) 1/2” Coax
130’ 124’	(1) 12’ Omni antenna (1) 3’ Standoff Mount	(1) 7/8” Coax
129’ 124’	(1) 10’ Omni antenna (1) 3’ Standoff Mount	(1) 1/2” Coax
118’	(1) Commscope VHPL3-11W-SE1 dish	(1) CAT5
115’	(1) 6’Ø dish w/Radome	(1) 7/8” Coax
112’	(1) 10’ DiPole antenna	(1) 7/8” Coaxial
105’ 100’	(2) 10’ Omni antenna (2) 3’ Standoff Mount	(2) 7/8” Coaxial
110’ 100’	(1) 20’ Omni antenna (1) 3’ Standoff Mount	(1) 7/8” Coaxial
89’	(1) 10’ Omni antenna	(1) 7/8” Coaxial

84’	(1) 3’ Standoff Mount	
76’ 70’	(1) 12’ Omni antenna (1) 3’ Standoff Mount	(1) 7/8” Coaxial
71’ 67’	(1) 8’ Omni antenna (1) 3’ Standoff Mount	(1) 7/8” Coaxial
60’ 50’	(1) 20’ Omni antenna (1) 3’ Standoff Mount	(1) 7/8” Coaxial
55’ 50’	(1) 10’ Omni antenna (1) 3’ Standoff Mount	(1) 7/8” Coaxial
50’	(1) Ground Plane (1) 3’ Standoff Mount	(1) 1/2” Coaxial
40’ 30’	(1) 20’ Omni antenna (1) 20’ Omni antenna (2) 3’ Standoff Mount	(2) 7/8” Coaxial
35’ 30’	(1) Celwave PD1150 antenna (1) 3’ Standoff Mount	(1) 1/2” Coaxial

Results

The results of the structural analysis are summarized as follows:

Tower mast

The tower leg members are **adequate** for new loads, with a maximum stress ratio of 99.6% @ Elev. 0’-20’ AGL.

The tower leg bolts are **adequate** for new loads, with a maximum stress ratio of 79.7% @ Elev. 80’ AGL.

The tower main diagonal members are **adequate** for new loads, with a maximum stress ratio of 95.2% @ Elev. 20’-40’ AGL.

The tower diagonal bolts are **adequate** for new loads, with a maximum stress ratio of 98.1% @ Elev. 60’-80’ AGL.

The tower secondary horizontal members are **adequate** for new loads, with a maximum stress ratio of 57.5% @ Elev. 0’-20’ AGL.

The tower top girt members are **adequate** for new loads, with a maximum stress ratio of 21.6% @ Elev. 170’ AGL.

Foundation

The tower foundation is **adequate** for new loads.

Tower Modification

General Notes: Prior of installing new reinforcement remove clamps, climbing pegs and etc. all obstacles that stand in the way of new leg reinforcement. Remove/Replace/Add only one member at the time. All faces and sides of the tower shall be reinforced identically.

Install /modify the following members before adding proposed loading:

Secondary Horizontal to Legs & Diagonals

- From Elev. 60’ to 80’ AGL:
  Install additional RSH-SST Sub-horizontal Bracing Kit (Structural Components P/N: RSH-5113-15 & RSH-5035-45) to existing tower leg. New sub-horizontals shall be connected together with diagonals at mid-span with new Bolt 1/2”Ø .

- From Elev. 40’ to 60’ AGL:
  Install additional RSH-SST Sub-horizontal Bracing Kit (Structural Components P/N: RSH-5115-17 & RSH-5045-67) to existing tower leg. New sub-horizontals shall be connected together with diagonals at mid-span with new Bolt 5/8”Ø .

- From Elev. 0’ to 20’ AGL:
  Install additional RSH-SST Sub-horizontal Bracing Kit (Structural Components P/N: RSH-5119-21 & RSH-5067-86) to existing tower leg. New sub-horizontals shall be connected together with diagonals at mid-span with new Bolt 5/8”Ø

Diagonals

- From Elev. 60’ to 80’ AGL:
  Replace existing main diagonals with (1) L2-1/2x2-1/2x3/8. Attach new diagonals to existing gusset plates with new Bolt 1/2”Ø at each end. New diagonals shall be connected at mid-span with new Bolt 1/2”Ø and spacer plate as required.

- From Elev. 20’ to 60’ AGL:
  Replace existing main diagonals with (1) L3x3x3/8. Attach new diagonals to existing gusset plates with Bolt 5/8”Ø at each end. New diagonals shall be connected at mid-span with new Bolt 5/8”Ø and spacer plate as required.

- From Elev. 0’ to 20’ AGL:
  Replace existing main diagonals with (1) L3-1/2x3-1/2x3/8. Attach new diagonals to existing gusset plates with Bolt 5/8”Ø at each end. New diagonals shall be connected at mid-span with new Bolt 5/8”Ø and spacer plate as required.

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.

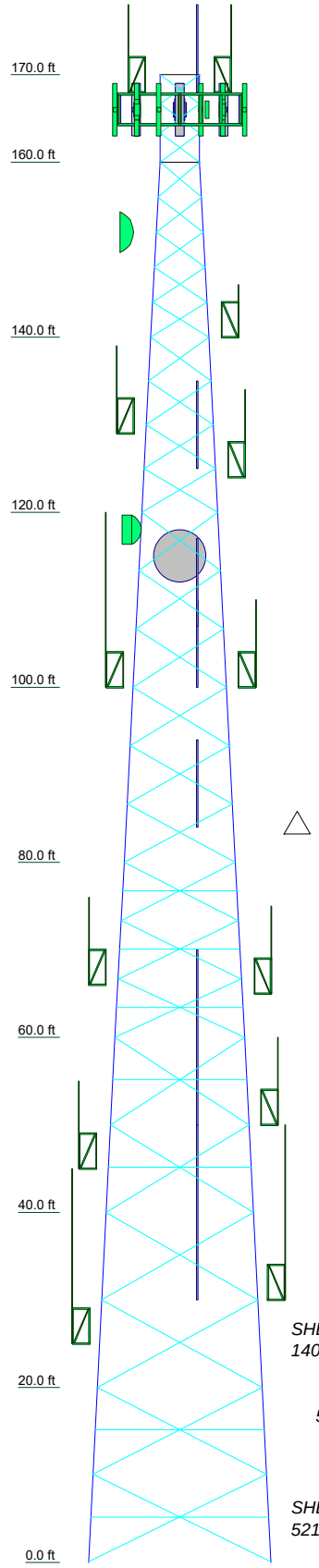
Fullerton makes no warranties, expressed or implied in connection with this report and disclaims any liability arising from original design, material, fabrication and erection deficiencies or the “as-built” condition of this tower. Fullerton will not be responsible whatsoever for or on account of consequential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

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

Section 1

Tower Analysis

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9
Legs		ROHN 2.5 STD		ROHN 3 STD	ROHN 3 1/2 X-STR	ROHN 4 X-STR		ROHN 5 X-STR	ROHN 6 EHS	
Leg Grade		A572-50								
Diagonals		A	L1 1/2x1 1/2x3/16	L1 3/4x1 3/4x3/16	L2 1/2x2 1/2x3/16		L2 1/2x2 1/2x3/8	L3x3x3/8		L3 1/2x3 1/2x3/8
Diagonal Grade		A572-50								
Top Girts		A	L1 1/2x1 1/2x3/16				N.A.			
Sec. Horizontals				N.A.			L2 1/2x2 1/2x1/4	L3x3x1/4	N.A.	L3 1/2x3 1/2x1/4
Face Width (ft)	20.86	4.56		6.6	8.64	10.68	12.68	14.77	16.85	18.85
# Panels @ (ft)		3 @ 3.33333	5 @ 4	4 @ 5		9 @ 6.66667		4 @ 10		2 @ 9.95833
Weight (lb)	19793.6	330.8	780.3	964.3	1514.0	1726.8	3169.5	3492.9	3292.8	4522.1



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x1/8		

MATERIAL STRENGTH

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

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 283178 lb
SHEAR: 32586 lb

UPLIFT: -247064 lb
SHEAR: 28345 lb

AXIAL 144431 lb
SHEAR 14026 lb *MOMENT 1410452 lb-ft*
TORQUE 8235 lb-ft
50 mph WIND - 1.0000 in ICE

AXIAL 34353 lb
SHEAR 52181 lb *MOMENT 4911785 lb-ft*
TORQUE 32689 lb-ft
REACTIONS - 105 mph WIND

Fullerton Engineering Consultants
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Phone: (847) 908-8400
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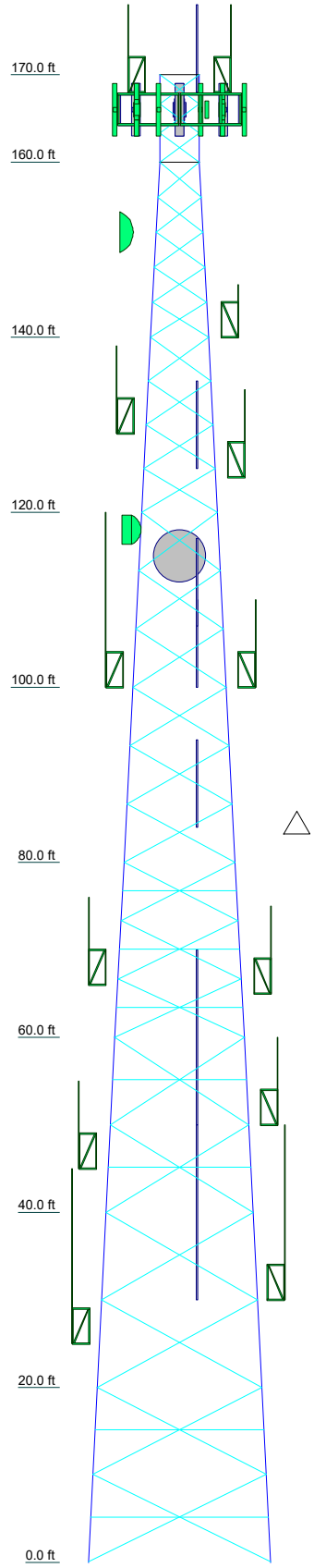
Job: ***CTL01083***			
Project: ***170 ft. Self-Support Tower***			
Client: Smartlink / AT&T	Drawn by: VY		App'd:
Code: TIA-222-G	Date: 04/24/18		Scale: NTS
Path:			Dwg No. E-1

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9
Legs		ROHN 2.5 STD		ROHN 3 STD	ROHN 3 1/2 X-STR	ROHN 4 X-STR		ROHN 5 X-STR	ROHN 6 EHS	
Leg Grade		A572-50								
Diagonals		L1 1/2x1 1/2x3/16		L1 3/4x1 3/4x3/16	L2 1/2x2 1/2x3/16		L2 1/2x2 1/2x3/8		L3x3x3/8	L3 1/2x3 1/2x3/8
Diagonal Grade		A572-50								
Top Girts		A					N.A.			
Sec. Horizontals		L1 1/2x1 1/2x3/16		N.A.			L2 1/2x2 1/2x1/4	L3x3x1/4	N.A.	L3 1/2x3 1/2x1/4
Face Width (ft)	20.86	4.56		6.6	8.64	10.68	12.68	14.77	16.85	18.85
# Panels @ (ft)		3 @ 3.33333	5 @ 4	4 @ 5	9 @ 6.66667			4 @ 10		2 @ 9.95833
Weight (lb)	19793.6	330.8	780.3	964.3	1514.0	1726.8	3169.5	3492.9	3292.8	4522.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' Omni	173	SO311-1	152
8' Omni	173	Kathrein PR-950	152
8' Omni	173	5' Omni	143
SM303-1	166	SO311-1	140
SM303-1	166	SO311-1	140
SM303-1	166	10' Omni	134
Kathrein 800-10121	166	12' Omni	130
Kathrein 800-10121	166	10' Omni	129
Kathrein 800-10121	166	SO311-1	129
(2) CCI OPA-65R-LCUU-H6	166	SO311-1	124
(2) CCI OPA-65R-LCUU-H6	166	SO311-1	124
(2) CCI OPA-65R-LCUU-H6	166	Commscope VHPL3-11W-SE1	118
RRUS-11	166	6' Dish w/ Radome	115
RRUS-11	166	10' DiPole	112
RRUS-11	166	20' Omni	110
RRUS-32	166	10' Omni	105
RRUS-32	166	10' Omni	105
RRUS-32	166	SO311-1	100
Powerwave TT19-08BP111-001 TMA	166	SO311-1	100
Powerwave TT19-08BP111-001 TMA	166	SO311-1	100
Powerwave TT19-08BP111-001 TMA	166	10' Omni	89
(2) CCI TPX-070821 triplexer	166	SO311-1	84
(2) CCI TPX-070821 triplexer	166	SO311-1	76
(2) CCI TPX-070821 triplexer	166	12' Omni	71
Raycap DC6-48-60-18-8F	166	12' Omni	70
Kathrein 800-10965	166	SO311-1	67
Kathrein 800-10965	166	20' Omni	60
Kathrein 800-10966	166	10' Omni	55
RRUS-32 B2	166	Ground Plane	50
RRUS-32 B2	166	SO311-1	50
RRUS-32 B2	166	SO311-1	50
RRUS-32 B66	166	SO311-1	50
RRUS-32 B66	166	20' Omni	40
RRUS-32 B66	166	20' Omni	40
RRUS-4478 B14	166	Celwave PD1150	35
RRUS-4478 B14	166	SO311-1	30
RRUS-4478 B14	166	SO311-1	30
Raycap DC6-48-60-0-8F	166	SO311-1	30

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x1/8		

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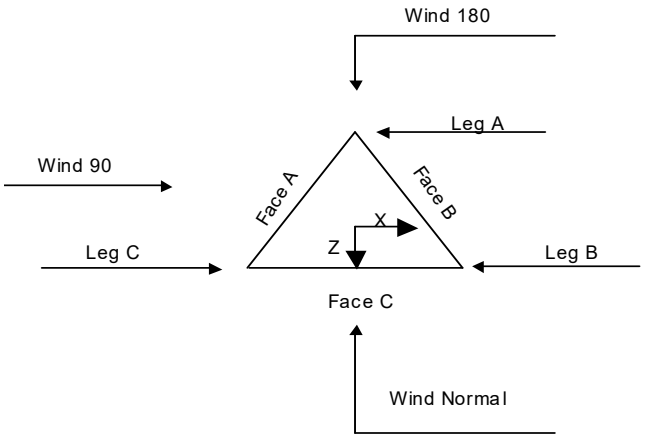
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Phone: (847) 908-8400
FAX: fax@fullertonengineering.com

Job: ***CTL01083***			
Project: ***170 ft. Self-Support Tower***			
Client: Smartlink / AT&T	Drawn by: VY		App'd:
Code: TIA-222-G	Date: 04/24/18		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 170.00 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 4.56 ft at the top and 20.86 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 III.
Exposure Category C.
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.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	170.00-160.00			4.56	1	10.00
T2	160.00-140.00			4.56	1	20.00
T3	140.00-120.00			6.60	1	20.00
T4	120.00-100.00			8.64	1	20.00
T5	100.00-80.00			10.68	1	20.00
T6	80.00-60.00			12.68	1	20.00
T7	60.00-40.00			14.77	1	20.00
T8	40.00-20.00			16.85	1	20.00
T9	20.00-0.00			18.85	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	170.00-160.00	3.33	X Brace	No	No	0.0000	0.0000
T2	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	5.00	X Brace	No	No	0.0000	0.0000
T4	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T5	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T6	80.00-60.00	6.67	X Brace	No	Yes	0.0000	0.0000
T7	60.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T9	20.00-0.00	9.96	X Brace	No	Yes	0.0000	1.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 170.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A572-50 (50 ksi)
T2 160.00-140.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A572-50 (50 ksi)
T3 140.00-120.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A572-50 (50 ksi)
T4 120.00-100.00	Pipe	ROHN 3 1/2 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T5 100.00-80.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T6 80.00-60.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T7 60.00-40.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A572-50 (50 ksi)
T8 40.00-20.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A572-50 (50 ksi)
T9 20.00-0.00	Pipe	ROHN 6 EHS	A572-50	Equal Angle	L3 1/2x3 1/2x3/8	A572-50

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(50 ksi)			(50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 170.00-160.00	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T6 80.00-60.00	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T7 60.00-40.00	Equal Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T9 20.00-0.00	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 170.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 40.00-20.00	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T9 20.00-0.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
170.00-160.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T9 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	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
170.00-160.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-140.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
140.00-120.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
120.00-100.00														

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T5 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
T6 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
T7 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
T8 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
T9 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 170.00-160.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-80.00	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 80.00-60.00	Flange	1.0000 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T7 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T8 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 20.00-0.00	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

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
LDF4-50A (1/2 FOAM)	A	No	Ar (CaAa)	28.00 - 20.00	0.0000	-0.44	4	4	0.5000	0.6300		0.15
LDF4-50A (1/2 FOAM)	A	No	Ar (CaAa)	48.00 - 28.00	0.0000	-0.44	3	3	0.5000	0.6300		0.15
LDF4-50A (1/2 FOAM) ***	A	No	Ar (CaAa)	122.00 - 48.00	0.0000	-0.44	2	2	0.5000	0.6300		0.15
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	100.00 - 20.00	0.0000	-0.4	6	6	0.5000	1.0900		0.33
LDF5-50A	A	No	Ar (CaAa)	124.00 - 100.00	0.0000	-0.4	5	5	0.5000	1.0900		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(7/8 FOAM)												
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	140.00 - 124.00	0.0000	-0.4	4	4	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	149.00 - 140.00	0.0000	-0.4	3	3	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	152.00 - 149.00	0.0000	-0.4	2	2	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM) ***	A	No	Ar (CaAa)	165.00 - 152.00	0.0000	-0.4	1	1	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	30.00 - 20.00	0.0000	-0.42	13	13	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	50.00 - 30.00	0.0000	-0.42	11	11	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	70.00 - 50.00	0.0000	-0.42	9	9	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	84.00 - 70.00	0.0000	-0.42	7	7	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	100.00 - 84.00	0.0000	-0.42	6	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	107.00 - 100.00	0.0000	-0.42	4	4	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	Ar (CaAa)	115.00 - 107.00	0.0000	-0.42	3	3	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM) ***	C	No	Ar (CaAa)	165.00 - 115.00	0.0000	-0.42	2	2	0.5000	1.0900		0.33
CAT5-E ***	C	No	Ar (CaAa)	118.00 - 5.00	0.0000	-0.5	1	1	0.2500	0.2500		0.10
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.28	12	6	0.5000	1.9800		0.82
3/8" Fiber	B	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.38	1	1	0.4000	0.4000		0.08
3/8" DC power cable ***Proposed***	B	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.39	2	2	0.3750	0.3750		0.30
3/8" DC power cable	B	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.39	2	2	0.3750	0.3750		0.30

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	170.00-160.00	A	0.000	0.000	0.545	0.000	1.65
		B	0.000	0.000	5.132	0.000	22.24
		C	0.000	0.000	1.090	0.000	3.30
T2	160.00-140.00	A	0.000	0.000	4.469	0.000	13.53
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	4.360	0.000	13.20
T3	140.00-120.00	A	0.000	0.000	9.408	0.000	28.32
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	4.360	0.000	13.20
T4	120.00-100.00	A	0.000	0.000	13.420	0.000	39.00
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	7.208	0.000	22.26
T5	100.00-80.00	A	0.000	0.000	15.600	0.000	45.60

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
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	14.016	0.000	42.92
T6	80.00-60.00	A	0.000	0.000	15.600	0.000	45.60
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	17.940	0.000	54.80
T7	60.00-40.00	A	0.000	0.000	16.104	0.000	46.80
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	22.300	0.000	68.00
T8	40.00-20.00	A	0.000	0.000	17.364	0.000	49.80
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	26.660	0.000	81.20
T9	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	51.320	0.000	222.40
		C	0.000	0.000	0.375	0.000	1.50

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	170.00-160.00	A	2.937	0.000	0.000	3.369	0.000	73.88
		B		0.000	0.000	11.630	0.000	224.56
		C		0.000	0.000	6.893	0.000	95.24
T2	160.00-140.00	A	2.909	0.000	0.000	23.225	0.000	379.80
		B		0.000	0.000	115.603	0.000	2220.47
		C		0.000	0.000	27.377	0.000	375.56
T3	140.00-120.00	A	2.867	0.000	0.000	36.790	0.000	582.29
		B		0.000	0.000	114.577	0.000	2183.44
		C		0.000	0.000	27.086	0.000	367.61
T4	120.00-100.00	A	2.820	0.000	0.000	61.043	0.000	902.65
		B		0.000	0.000	113.397	0.000	2141.30
		C		0.000	0.000	40.927	0.000	641.56
T5	100.00-80.00	A	2.764	0.000	0.000	63.853	0.000	959.66
		B		0.000	0.000	112.006	0.000	2092.17
		C		0.000	0.000	52.286	0.000	894.54
T6	80.00-60.00	A	2.695	0.000	0.000	62.916	0.000	928.79
		B		0.000	0.000	110.303	0.000	2032.85
		C		0.000	0.000	58.214	0.000	1008.24
T7	60.00-40.00	A	2.606	0.000	0.000	62.591	0.000	910.11
		B		0.000	0.000	108.090	0.000	1957.10
		C		0.000	0.000	64.822	0.000	1121.34
T8	40.00-20.00	A	2.476	0.000	0.000	63.111	0.000	902.82
		B		0.000	0.000	104.871	0.000	1849.64
		C		0.000	0.000	71.153	0.000	1204.10
T9	20.00-0.00	A	2.219	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	98.487	0.000	1646.06
		C		0.000	0.000	7.031	0.000	101.87

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	170.00-160.00	7.0583	-12.9444	4.7792	-6.7962

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T2	160.00-140.00	6.4433	-19.8870	4.7946	-16.4770
T3	140.00-120.00	4.3523	-22.0141	4.1975	-19.4262
T4	120.00-100.00	4.3414	-22.9344	4.1619	-14.9714
T5	100.00-80.00	11.6267	-25.2058	9.0946	-16.8558
T6	80.00-60.00	18.0873	-29.4988	13.3253	-19.7962
T7	60.00-40.00	24.9268	-33.1095	18.3532	-22.4569
T8	40.00-20.00	31.1086	-35.2522	23.8093	-24.3963
T9	20.00-0.00	27.2395	-93.8762	29.9228	-88.9935

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	10	LDF5-50A (7/8 FOAM)	160.00 - 165.00	0.6000	0.3011
T1	19	LDF5-50A (7/8 FOAM)	160.00 - 165.00	0.6000	0.3011
T1	23	LDF7-50A (1-5/8 FOAM)	160.00 - 162.00	0.6000	0.3011
T1	24	3/8" Fiber	160.00 - 162.00	0.6000	0.3011
T1	25	3/8" DC power cable	160.00 - 162.00	0.6000	0.3011
T1	27	3/8" DC power cable	160.00 - 162.00	0.6000	0.3011
T2	8	LDF5-50A (7/8 FOAM)	140.00 - 149.00	0.6000	0.4308
T2	9	LDF5-50A (7/8 FOAM)	149.00 - 152.00	0.6000	0.4308
T2	10	LDF5-50A (7/8 FOAM)	152.00 - 160.00	0.6000	0.4308
T2	19	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.4308
T2	23	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.4308
T2	24	3/8" Fiber	140.00 - 160.00	0.6000	0.4308
T2	25	3/8" DC power cable	140.00 - 160.00	0.6000	0.4308
T2	27	3/8" DC power cable	140.00 - 160.00	0.6000	0.4308
T3	3	LDF4-50A (1/2 FOAM)	120.00 - 122.00	0.6000	0.5552
T3	6	LDF5-50A (7/8 FOAM)	120.00 - 124.00	0.6000	0.5552
T3	7	LDF5-50A (7/8 FOAM)	124.00 - 140.00	0.6000	0.5552
T3	19	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.5552
T3	23	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.5552
T3	24	3/8" Fiber	120.00 - 140.00	0.6000	0.5552
T3	25	3/8" DC power cable	120.00 - 140.00	0.6000	0.5552

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	27	3/8" DC power cable	120.00 - 140.00	0.6000	0.5552
T4	3	LDF4-50A (1/2 FOAM)	100.00 - 120.00	0.6000	0.6000
T4	6	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T4	17	LDF5-50A (7/8 FOAM)	100.00 - 107.00	0.6000	0.6000
T4	18	LDF5-50A (7/8 FOAM)	107.00 - 115.00	0.6000	0.6000
T4	19	LDF5-50A (7/8 FOAM)	115.00 - 120.00	0.6000	0.6000
T4	21	CAT5-E	100.00 - 118.00	0.6000	0.6000
T4	23	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T4	24	3/8" Fiber	100.00 - 120.00	0.6000	0.6000
T4	25	3/8" DC power cable	100.00 - 120.00	0.6000	0.6000
T4	27	3/8" DC power cable	100.00 - 120.00	0.6000	0.6000
T5	3	LDF4-50A (1/2 FOAM)	80.00 - 100.00	0.6000	0.6000
T5	5	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T5	15	LDF5-50A (7/8 FOAM)	80.00 - 84.00	0.6000	0.6000
T5	16	LDF5-50A (7/8 FOAM)	84.00 - 100.00	0.6000	0.6000
T5	21	CAT5-E	80.00 - 100.00	0.6000	0.6000
T5	23	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.6000
T5	24	3/8" Fiber	80.00 - 100.00	0.6000	0.6000
T5	25	3/8" DC power cable	80.00 - 100.00	0.6000	0.6000
T5	27	3/8" DC power cable	80.00 - 100.00	0.6000	0.6000
T6	3	LDF4-50A (1/2 FOAM)	60.00 - 80.00	0.6000	0.5948
T6	5	LDF5-50A (7/8 FOAM)	60.00 - 80.00	0.6000	0.5948
T6	14	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.6000	0.5948
T6	15	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.6000	0.5948
T6	21	CAT5-E	60.00 - 80.00	0.6000	0.5948
T6	23	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.5948
T6	24	3/8" Fiber	60.00 - 80.00	0.6000	0.5948
T6	25	3/8" DC power cable	60.00 - 80.00	0.6000	0.5948
T6	27	3/8" DC power cable	60.00 - 80.00	0.6000	0.5948
T7	2	LDF4-50A (1/2 FOAM)	40.00 - 48.00	0.6000	0.6000
T7	3	LDF4-50A (1/2 FOAM)	48.00 - 60.00	0.6000	0.6000
T7	5	LDF5-50A (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T7	13	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.6000	0.6000
T7	14	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.6000	0.6000
T7	21	CAT5-E	40.00 - 60.00	0.6000	0.6000
T7	23	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T7	24	3/8" Fiber	40.00 - 60.00	0.6000	0.6000
T7	25	3/8" DC power cable	40.00 - 60.00	0.6000	0.6000
T7	27	3/8" DC power cable	40.00 - 60.00	0.6000	0.6000
T8	1	LDF4-50A (1/2 FOAM)	20.00 - 28.00	0.6000	0.6000
T8	2	LDF4-50A (1/2 FOAM)	28.00 - 40.00	0.6000	0.6000
T8	5	LDF5-50A (7/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T8	12	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.6000	0.6000
T8	13	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.6000	0.6000
T8	21	CAT5-E	20.00 - 40.00	0.6000	0.6000
T8	23	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.6000
T8	24	3/8" Fiber	20.00 - 40.00	0.6000	0.6000
T8	25	3/8" DC power cable	20.00 - 40.00	0.6000	0.6000
T8	27	3/8" DC power cable	20.00 - 40.00	0.6000	0.6000
T9	21	CAT5-E	5.00 - 20.00	0.6000	0.6000
T9	23	LDF7-50A (1-5/8 FOAM)	0.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	24	3/8" Fiber	0.00 - 20.00	0.6000	0.6000
T9	25	3/8" DC power cable	0.00 - 20.00	0.6000	0.6000
T9	27	3/8" DC power cable	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
10' Omni	A	From Leg	3.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice	3.19 4.52 5.87	3.19 4.52 5.87	53.25 82.03 118.76
8' Omni	B	From Leg	3.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice	1.60 2.42 3.24	1.60 2.42 3.24	15.00 27.45 45.14
8' Omni	C	From Leg	3.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice	1.60 2.42 3.24	1.60 2.42 3.24	15.00 27.45 45.14
SO311-1	A	From Leg	1.50 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	62.00 94.35 126.70
SO311-1	A	From Leg	1.50 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	62.00 94.35 126.70
SO311-1	B	From Leg	1.50 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	62.00 94.35 126.70
5' Omni	B	From Leg	3.00 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice 1" Ice	0.75 1.26 1.56	0.75 1.26 1.56	15.00 21.27 30.90
SO311-1	C	From Leg	1.50 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	62.00 94.35 126.70
10' Omni	C	From Leg	3.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice	3.19 4.52 5.87	3.19 4.52 5.87	53.25 82.03 118.76
SO311-1	A	From Leg	1.50 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	62.00 94.35 126.70
12' Omni	A	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	3.45 4.68 5.93	3.45 4.68 5.93	35.00 60.12 93.02
SO311-1	B	From Leg	1.50 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice 1" Ice	2.97 4.39 5.81	3.51 5.33 7.15	62.00 94.35 126.70
10' Omni	B	From Leg	3.00 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	3.19 4.52 5.87	3.19 4.52 5.87	53.25 82.03 118.76
10' DiPole	A	From Leg	1.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice	4.50 5.24 5.85	4.50 5.24 5.85	25.00 57.00 89.00

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
SO311-1	A	From Leg	1.50	0.0000	100.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
10' Omni	A	From Leg	3.00	0.0000	105.00	No Ice	3.19	3.19	53.25
			0.00			1/2" Ice	4.52	4.52	82.03
			0.00			1" Ice	5.87	5.87	118.76
SO311-1	B	From Leg	1.50	0.0000	100.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
10' Omni	B	From Leg	3.00	0.0000	105.00	No Ice	3.19	3.19	53.25
			0.00			1/2" Ice	4.52	4.52	82.03
			0.00			1" Ice	5.87	5.87	118.76
SO311-1	C	From Leg	1.50	0.0000	100.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
20' Omni	C	From Leg	3.00	0.0000	110.00	No Ice	4.00	4.00	40.00
			0.00			1/2" Ice	6.03	6.03	70.77
			0.00			1" Ice	8.07	8.07	114.12
SO311-1	A	From Leg	1.50	0.0000	84.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
10' Omni	A	From Leg	3.00	0.0000	89.00	No Ice	3.19	3.19	53.25
			0.00			1/2" Ice	4.52	4.52	82.03
			0.00			1" Ice	5.87	5.87	118.76
SO311-1	B	From Leg	1.50	0.0000	76.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
12' Omni	B	From Leg	3.00	0.0000	70.00	No Ice	3.45	3.45	35.00
			0.00			1/2" Ice	4.68	4.68	60.12
			0.00			1" Ice	5.93	5.93	93.02
SO311-1	C	From Leg	1.50	0.0000	67.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
12' Omni	C	From Leg	3.00	0.0000	71.00	No Ice	3.45	3.45	35.00
			0.00			1/2" Ice	4.68	4.68	60.12
			0.00			1" Ice	5.93	5.93	93.02
SO311-1	A	From Leg	1.50	0.0000	50.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
20' Omni	A	From Leg	3.00	0.0000	60.00	No Ice	4.00	4.00	40.00
			0.00			1/2" Ice	6.03	6.03	70.77
			0.00			1" Ice	8.07	8.07	114.12
SO311-1	B	From Leg	1.50	0.0000	50.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
10' Omni	B	From Leg	3.00	0.0000	55.00	No Ice	3.19	3.19	53.25
			0.00			1/2" Ice	4.52	4.52	82.03
			0.00			1" Ice	5.87	5.87	118.76
SO311-1	C	From Leg	1.50	0.0000	50.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
Ground Plane	C	From Leg	3.00	0.0000	50.00	No Ice	3.33	3.33	41.90
			0.00			1/2" Ice	9.34	9.34	62.85
			0.00			1" Ice	15.35	15.35	83.80
SO311-1	A	From Leg	1.50	0.0000	30.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
20' Omni	A	From Leg	3.00	0.0000	40.00	No Ice	4.00	4.00	40.00
			0.00			1/2" Ice	6.03	6.03	70.77
			0.00			1" Ice	8.07	8.07	114.12
SO311-1	B	From Leg	1.50	0.0000	30.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
20' Omni	B	From Leg	3.00	0.0000	40.00	No Ice	4.00	4.00	40.00
			0.00			1/2" Ice	6.03	6.03	70.77
			0.00			1" Ice	8.07	8.07	114.12
SO311-1	C	From Leg	1.50	0.0000	30.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
Celwave PD1150	C	From Leg	3.00	0.0000	35.00	No Ice	1.22	1.22	10.00
			0.00			1/2" Ice	2.24	2.24	20.63
			0.00			1" Ice	3.27	3.27	37.65
***									
SM303-1	A	From Leg	1.50	0.0000	166.00	No Ice	18.56	20.17	626.50
			0.00			1/2" Ice	26.00	28.95	901.48
			0.00			1" Ice	33.44	37.73	1176.46
SM303-1	B	From Leg	1.50	0.0000	166.00	No Ice	18.56	20.17	626.50
			0.00			1/2" Ice	26.00	28.95	901.48
			0.00			1" Ice	33.44	37.73	1176.46
SM303-1	C	From Leg	1.50	0.0000	166.00	No Ice	18.56	20.17	626.50
			0.00			1/2" Ice	26.00	28.95	901.48
			0.00			1" Ice	33.44	37.73	1176.46
Kathrein 800-10121	A	From Leg	3.00	0.0000	166.00	No Ice	5.27	4.48	68.95
			0.00			1/2" Ice	5.65	5.14	115.14
			0.00			1" Ice	6.04	5.80	167.58
Kathrein 800-10121	B	From Leg	3.00	0.0000	166.00	No Ice	5.27	4.48	68.95
			0.00			1/2" Ice	5.65	5.14	115.14
			0.00			1" Ice	6.04	5.80	167.58
Kathrein 800-10121	C	From Leg	3.00	0.0000	166.00	No Ice	5.27	4.48	68.95
			0.00			1/2" Ice	5.65	5.14	115.14
			0.00			1" Ice	6.04	5.80	167.58
(2) CCI OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	166.00	No Ice	9.90	8.11	92.55
			0.00			1/2" Ice	10.47	9.30	174.03
			0.00			1" Ice	11.01	10.21	263.79
(2) CCI OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	166.00	No Ice	9.90	8.11	92.55
			0.00			1/2" Ice	10.47	9.30	174.03
			0.00			1" Ice	11.01	10.21	263.79
(2) CCI OPA-65R-LCUU-H6	C	From Leg	3.00	0.0000	166.00	No Ice	9.90	8.11	92.55
			0.00			1/2" Ice	10.47	9.30	174.03
			0.00			1" Ice	11.01	10.21	263.79
RRUS-11	A	From Leg	3.00	0.0000	166.00	No Ice	2.79	1.19	50.00
			0.00			1/2" Ice	3.00	1.34	70.87
			0.00			1" Ice	3.21	1.50	94.78
RRUS-11	B	From Leg	3.00	0.0000	166.00	No Ice	2.79	1.19	50.00
			0.00			1/2" Ice	3.00	1.34	70.87
			0.00			1" Ice	3.21	1.50	94.78
RRUS-11	C	From Leg	3.00	0.0000	166.00	No Ice	2.79	1.19	50.00
			0.00			1/2" Ice	3.00	1.34	70.87
			0.00			1" Ice	3.21	1.50	94.78
RRUS-32	A	From Leg	3.00	0.0000	166.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
RRUS-32	B	From Leg	3.00	0.0000	166.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93

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Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft²	C_AA_A *Side* ft²	*Weight* lb
			0.00			1" Ice	3.81	2.86	136.47
RRUS-32	C	From Leg	3.00	0.0000	166.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
Powerwave	A	From Leg	3.00	0.0000	166.00	No Ice	0.55	0.45	16.00
TT19-08BP111-001 TMA			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
Powerwave	A	From Leg	3.00	0.0000	166.00	No Ice	0.55	0.45	16.00
TT19-08BP111-001 TMA			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
Powerwave	A	From Leg	3.00	0.0000	166.00	No Ice	0.55	0.45	16.00
TT19-08BP111-001 TMA			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
(2) CCI TPX-070821	A	From Leg	3.00	0.0000	166.00	No Ice	0.47	0.10	7.50
triplexer			0.00			1/2" Ice	0.56	0.15	10.95
			0.00			1" Ice	0.65	0.20	15.72
(2) CCI TPX-070821	B	From Leg	3.00	0.0000	166.00	No Ice	0.47	0.10	7.50
triplexer			0.00			1/2" Ice	0.56	0.15	10.95
			0.00			1" Ice	0.65	0.20	15.72
(2) CCI TPX-070821	C	From Leg	3.00	0.0000	166.00	No Ice	0.47	0.10	7.50
triplexer			0.00			1/2" Ice	0.56	0.15	10.95
			0.00			1" Ice	0.65	0.20	15.72
Raycap DC6-48-60-18-8F	A	From Leg	1.00	0.0000	166.00	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
Proposed									
Kathrein 800-10965	A	From Leg	3.00	0.0000	166.00	No Ice	13.92	7.50	143.15
			0.00			1/2" Ice	14.50	8.71	238.18
			0.00			1" Ice	15.07	9.65	342.12
Kathrein 800-10965	B	From Leg	3.00	0.0000	166.00	No Ice	13.92	7.50	143.15
			0.00			1/2" Ice	14.50	8.71	238.18
			0.00			1" Ice	15.07	9.65	342.12
Kathrein 800-10966	C	From Leg	3.00	0.0000	166.00	No Ice	17.36	9.40	154.90
			0.00			1/2" Ice	17.99	10.82	268.18
			0.00			1" Ice	18.63	12.09	391.69
RRUS-32 B2	A	From Leg	3.00	0.0000	166.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRUS-32 B2	B	From Leg	3.00	0.0000	166.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRUS-32 B2	C	From Leg	3.00	0.0000	166.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRUS-32 B66	A	From Leg	3.00	0.0000	166.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRUS-32 B66	B	From Leg	3.00	0.0000	166.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRUS-32 B66	C	From Leg	3.00	0.0000	166.00	No Ice	2.74	1.67	60.00
			0.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
RRUS-4478 B14	A	From Leg	3.00	0.0000	166.00	No Ice	1.84	1.06	60.00
			0.00			1/2" Ice	2.01	1.20	75.88
			0.00			1" Ice	2.19	1.34	94.39
RRUS-4478 B14	B	From Leg	3.00	0.0000	166.00	No Ice	1.84	1.06	60.00

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	2.01	1.20	75.88
			0.00				1" Ice	2.19	1.34	94.39
RRUS-4478 B14	C	From Leg	3.00	0.0000		166.00	No Ice	1.84	1.06	60.00
			0.00				1/2" Ice	2.01	1.20	75.88
			0.00				1" Ice	2.19	1.34	94.39
Raycap DC6-48-60-0-8F	B	From Leg	1.00	0.0000		166.00	No Ice	0.83	0.83	32.80
			0.00				1/2" Ice	1.34	1.34	48.71
			0.00				1" Ice	1.52	1.52	67.01

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
Kathrein PR-950	C	Grid	From Leg	3.00	0.0000			152.00	4.65	No Ice	8.50	47.00
				0.00						1/2" Ice	8.93	137.35
				0.00						1" Ice	9.36	227.69
Commscope VHPL3-11W-SE1	C	Paraboloid w/Shroud (HP)	From Leg	0.00	0.0000			118.00	3.27	No Ice	8.40	37.00
				0.00						1/2" Ice	8.83	82.33
				0.00						1" Ice	9.27	127.65
6' Dish w/ Radome	A	Paraboloid w/Radome	From Leg	0.00	0.0000			115.00	6.00	No Ice	28.27	380.00
				0.00						1/2" Ice	29.05	450.00
				0.00						1" Ice	29.80	520.00

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	165.00	1.406	39	47.996	A	4.554	4.792	4.792	51.27	0.545	0.000
170.00-160.00					B	4.554	4.792		51.27	5.132	0.000
					C	4.554	4.792		51.27	1.090	0.000
T2	150.00	1.378	38	116.398	A	8.763	9.600	9.600	52.28	4.469	0.000
160.00-140.00					B	8.763	9.600		52.28	51.320	0.000
					C	8.763	9.600		52.28	4.360	0.000
T3	130.00	1.337	37	158.241	A	10.242	11.687	11.687	53.29	9.408	0.000
140.00-120.00					B	10.242	11.687		53.29	51.320	0.000
					C	10.242	11.687		53.29	4.360	0.000
T4	110.00	1.291	36	199.875	A	14.183	13.356	13.356	48.50	13.420	0.000
120.00-100.00					B	14.183	13.356		48.50	51.320	0.000
					C	14.183	13.356		48.50	7.208	0.000
T5	90.00	1.238	34	241.109	A	16.286	15.025	15.025	47.99	15.600	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
100.00-80.00					B	16.286	15.025		47.99	51.320	0.000
					C	16.286	15.025		47.99	14.016	0.000
T6 80.00-60.00	70.00	1.174	32	282.010	A	26.894	15.027	15.027	35.85	15.600	0.000
					B	26.894	15.027		35.85	51.320	0.000
					C	26.894	15.027		35.85	17.940	0.000
T7 60.00-40.00	50.00	1.094	30	325.484	A	25.854	18.577	18.577	41.81	16.104	0.000
					B	25.854	18.577		41.81	51.320	0.000
					C	25.854	18.577		41.81	22.300	0.000
T8 40.00-20.00	30.00	0.982	27	368.055	A	19.856	22.120	22.120	52.70	17.364	0.000
					B	19.856	22.120		52.70	51.320	0.000
					C	19.856	22.120		52.70	26.660	0.000
T9 20.00-0.00	10.00	0.85	23	408.156	A	36.443	22.120	22.120	37.77	0.000	0.000
					B	36.443	22.120		37.77	51.320	0.000
					C	36.443	22.120		37.77	0.375	0.000

Tower Pressure - With Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	8	2.9365	52.890	A	4.554	32.410	14.580	39.44	3.369	0.000
170.00-160.00						B	4.554	32.410		39.44	11.630	0.000
						C	4.554	32.410		39.44	6.893	0.000
T2	150.00	1.378	7	2.9087	126.106	A	8.763	63.012	29.025	40.44	23.225	0.000
160.00-140.00						B	8.763	63.012		40.44	115.603	0.000
						C	8.763	63.012		40.44	27.377	0.000
T3	130.00	1.337	7	2.8674	167.811	A	10.242	64.399	30.836	41.31	36.790	0.000
140.00-120.00						B	10.242	64.399		41.31	114.577	0.000
						C	10.242	64.399		41.31	27.086	0.000
T4	110.00	1.291	7	2.8199	209.287	A	14.183	64.183	32.188	41.07	61.043	0.000
120.00-100.00						B	14.183	64.183		41.07	113.397	0.000
						C	14.183	64.183		41.07	40.927	0.000
T5 100.00-80.00	90.00	1.238	7	2.7638	250.334	A	16.286	69.491	33.481	39.03	63.853	0.000
						B	16.286	69.491		39.03	112.006	0.000
						C	16.286	69.491		39.03	52.286	0.000
T6 80.00-60.00	70.00	1.174	6	2.6952	291.007	A	26.894	91.017	33.028	28.01	62.916	0.000
						B	26.894	91.017		28.01	110.303	0.000
						C	26.894	91.017		28.01	58.214	0.000
T7 60.00-40.00	50.00	1.094	6	2.6061	334.183	A	25.854	80.900	35.982	33.71	62.591	0.000
						B	25.854	80.900		33.71	108.090	0.000
						C	25.854	80.900		33.71	64.822	0.000
T8 40.00-20.00	30.00	0.982	5	2.4763	376.320	A	19.856	71.436	38.656	42.34	63.111	0.000
						B	19.856	71.436		42.34	104.871	0.000
						C	19.856	71.436		42.34	71.153	0.000
T9 20.00-0.00	10.00	0.85	5	2.2186	415.560	A	36.443	83.139	36.936	30.89	0.000	0.000
						B	36.443	83.139		30.89	98.487	0.000
						C	36.443	83.139		30.89	7.031	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	11	47.996	A	4.554	4.792	4.792	51.27	0.545	0.000
170.00-160.00					B	4.554	4.792		51.27	5.132	0.000
					C	4.554	4.792		51.27	1.090	0.000
T2	150.00	1.378	11	116.398	A	8.763	9.600	9.600	52.28	4.469	0.000
160.00-140.00					B	8.763	9.600		52.28	51.320	0.000
					C	8.763	9.600		52.28	4.360	0.000
T3	130.00	1.337	10	158.241	A	10.242	11.687	11.687	53.29	9.408	0.000
140.00-120.00					B	10.242	11.687		53.29	51.320	0.000
					C	10.242	11.687		53.29	4.360	0.000
T4	110.00	1.291	10	199.875	A	14.183	13.356	13.356	48.50	13.420	0.000
120.00-100.00					B	14.183	13.356		48.50	51.320	0.000
					C	14.183	13.356		48.50	7.208	0.000
T5	90.00	1.238	10	241.109	A	16.286	15.025	15.025	47.99	15.600	0.000
100.00-80.00					B	16.286	15.025		47.99	51.320	0.000
					C	16.286	15.025		47.99	14.016	0.000
T6 80.00-60.00	70.00	1.174	9	282.010	A	26.894	15.027	15.027	35.85	15.600	0.000
					B	26.894	15.027		35.85	51.320	0.000
					C	26.894	15.027		35.85	17.940	0.000
T7 60.00-40.00	50.00	1.094	9	325.484	A	25.854	18.577	18.577	41.81	16.104	0.000
					B	25.854	18.577		41.81	51.320	0.000
					C	25.854	18.577		41.81	22.300	0.000
T8 40.00-20.00	30.00	0.982	8	368.055	A	19.856	22.120	22.120	52.70	17.364	0.000
					B	19.856	22.120		52.70	51.320	0.000
					C	19.856	22.120		52.70	26.660	0.000
T9 20.00-0.00	10.00	0.85	7	408.156	A	36.443	22.120	22.120	37.77	0.000	0.000
					B	36.443	22.120		37.77	51.320	0.000
					C	36.443	22.120		37.77	0.375	0.000

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	27.19	330.77	A	0.195	2.614	39	1	1	7.302	737.28	73.73	B
170.00-160.00			B	0.195	2.614		1	1	7.302			
			C	0.195	2.614		1	1	7.302			
T2	249.13	780.32	A	0.158	2.743	38	1	1	14.220	2172.78	108.64	B
160.00-140.00			B	0.158	2.743		1	1	14.220			
			C	0.158	2.743		1	1	14.220			
T3	263.92	964.31	A	0.139	2.814	37	1	1	16.527	2392.15	119.61	B
140.00-120.00			B	0.139	2.814		1	1	16.527			
			C	0.139	2.814		1	1	16.527			
T4	283.66	1514.02	A	0.138	2.817	36	1	1	21.064	2777.76	138.89	B
120.00-100.00			B	0.138	2.817		1	1	21.064			
			C	0.138	2.817		1	1	21.064			
T5	310.92	1726.82	A	0.13	2.847	34	1	1	23.682	2969.44	148.47	B
100.00-80.00			B	0.13	2.847		1	1	23.682			
			C	0.13	2.847		1	1	23.682			
T6	322.80	3169.47	A	0.149	2.776	32	1	1	34.456	3623.54	181.18	B
80.00-60.00			B	0.149	2.776		1	1	34.456			
			C	0.149	2.776		1	1	34.456			
T7	337.20	3492.92	A	0.137	2.822	30	1	1	34.350	3443.04	172.15	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
60.00-40.00			B	0.137	2.822		1	1	34.350			
			C	0.137	2.822		1	1	34.350			
T8	353.40	3292.85	A	0.114	2.908	27	1	1	29.004	2839.48	141.97	B
40.00-20.00			B	0.114	2.908		1	1	29.004			
			C	0.114	2.908		1	1	29.004			
T9 20.00-0.00	223.90	4522.08	A	0.143	2.796	23	1	1	46.333	3061.78	153.09	B
			B	0.143	2.796		1	1	46.333			
			C	0.143	2.796		1	1	46.333			
Sum Weight:	2372.12	19793.55						OTM	1872954.6 6 lb-ft	24017.27		

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	27.19	330.77	A	0.195	2.614	39	0.8	1	6.391	658.78	65.88	C
170.00-160.00			B	0.195	2.614		0.8	1	6.391			
			C	0.195	2.614		0.8	1	6.391			
T2	249.13	780.32	A	0.158	2.743	38	0.8	1	12.467	2017.37	100.87	C
160.00-140.00			B	0.158	2.743		0.8	1	12.467			
			C	0.158	2.743		0.8	1	12.467			
T3	263.92	964.31	A	0.139	2.814	37	0.8	1	14.479	2211.35	110.57	C
140.00-120.00			B	0.139	2.814		0.8	1	14.479			
			C	0.139	2.814		0.8	1	14.479			
T4	283.66	1514.02	A	0.138	2.817	36	0.8	1	18.228	2535.81	126.79	C
120.00-100.00			B	0.138	2.817		0.8	1	18.228			
			C	0.138	2.817		0.8	1	18.228			
T5	310.92	1726.82	A	0.13	2.847	34	0.8	1	20.425	2700.26	135.01	C
100.00-80.00			B	0.13	2.847		0.8	1	20.425			
			C	0.13	2.847		0.8	1	20.425			
T6	322.80	3169.47	A	0.149	2.776	32	0.8	1	29.077	3212.36	160.62	C
80.00-60.00			B	0.149	2.776		0.8	1	29.077			
			C	0.149	2.776		0.8	1	29.077			
T7	337.20	3492.92	A	0.137	2.822	30	0.8	1	29.179	3068.79	153.44	C
60.00-40.00			B	0.137	2.822		0.8	1	29.179			
			C	0.137	2.822		0.8	1	29.179			
T8	353.40	3292.85	A	0.114	2.908	27	0.8	1	25.033	2573.45	128.67	C
40.00-20.00			B	0.114	2.908		0.8	1	25.033			
			C	0.114	2.908		0.8	1	25.033			
T9 20.00-0.00	223.90	4522.08	A	0.143	2.796	23	0.8	1	39.044	2655.62	132.78	C
			B	0.143	2.796		0.8	1	39.044			
			C	0.143	2.796		0.8	1	39.044			
Sum Weight:	2372.12	19793.55						OTM	1702806.7 4 lb-ft	21633.80		

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 ft^2	F lb	w plf	Ctrl. Face
T1	27.19	330.77	A	0.195	2.614	39	0.85	1	6.619	669.31	66.93	A
170.00-160.00			B	0.195	2.614		0.85	1	6.619			
			C	0.195	2.614		0.85	1	6.619			
T2	249.13	780.32	A	0.158	2.743	38	0.85	1	12.905	1934.52	96.73	C
160.00-140.00			B	0.158	2.743		0.85	1	12.905			
			C	0.158	2.743		0.85	1	12.905			
T3	263.92	964.31	A	0.139	2.814	37	0.85	1	14.991	2182.80	109.14	C
140.00-120.00			B	0.139	2.814		0.85	1	14.991			
			C	0.139	2.814		0.85	1	14.991			
T4	283.66	1514.02	A	0.138	2.817	36	0.85	1	18.937	2526.38	126.32	C
120.00-100.00			B	0.138	2.817		0.85	1	18.937			
			C	0.138	2.817		0.85	1	18.937			
T5	310.92	1726.82	A	0.13	2.847	34	0.85	1	21.240	2667.54	133.38	C
100.00-80.00			B	0.13	2.847		0.85	1	21.240			
			C	0.13	2.847		0.85	1	21.240			
T6	322.80	3169.47	A	0.149	2.776	32	0.85	1	30.422	3247.16	162.36	A
80.00-60.00			B	0.149	2.776		0.85	1	30.422			
			C	0.149	2.776		0.85	1	30.422			
T7	337.20	3492.92	A	0.137	2.822	30	0.85	1	30.472	3131.17	156.56	A
60.00-40.00			B	0.137	2.822		0.85	1	30.472			
			C	0.137	2.822		0.85	1	30.472			
T8	353.40	3292.85	A	0.114	2.908	27	0.85	1	26.026	2634.99	131.75	A
40.00-20.00			B	0.114	2.908		0.85	1	26.026			
			C	0.114	2.908		0.85	1	26.026			
T9 20.00-0.00	223.90	4522.08	A	0.143	2.796	23	0.85	1	40.866	2683.01	134.15	C
			B	0.143	2.796		0.85	1	40.866			
			C	0.143	2.796		0.85	1	40.866			
Sum Weight:	2372.12	19793.55						OTM	1692097.6 6 lb-ft	21676.88		

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 ft^2	F lb	w plf	Ctrl. Face
T1	393.68	3049.43	A	0.699	1.776	8	1	1	30.815	390.70	39.07	B
170.00-160.00			B	0.699	1.776		1	1	30.815			
			C	0.699	1.776		1	1	30.815			
T2	2975.83	5946.80	A	0.569	1.826	7	1	1	54.425	997.87	49.89	B
160.00-140.00			B	0.569	1.826		1	1	54.425			
			C	0.569	1.826		1	1	54.425			
T3	3133.34	6401.48	A	0.445	1.982	7	1	1	52.536	1113.80	55.69	B
140.00-120.00			B	0.445	1.982		1	1	52.536			
			C	0.445	1.982		1	1	52.536			
T4	3685.51	7554.22	A	0.374	2.117	7	1	1	54.332	1269.40	63.47	B
120.00-100.00			B	0.374	2.117		1	1	54.332			
			C	0.374	2.117		1	1	54.332			
T5	3946.37	8351.66	A	0.343	2.189	7	1	1	58.908	1307.30	65.36	B
100.00-80.00			B	0.343	2.189		1	1	58.908			
			C	0.343	2.189		1	1	58.908			
T6	3969.88	12762.68	A	0.405	2.054	6	1	1	85.009	1480.50	74.02	B
80.00-60.00			B	0.405	2.054		1	1	85.009			
			C	0.405	2.054		1	1	85.009			

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
T7	3988.54	12018.78	A	0.319	2.246	6	1	1	74.816	1363.30	68.16	C
60.00-40.00			B	0.319	2.246		1	1	74.816			
			C	0.319	2.246		1	1	74.816			
T8	3956.55	9939.31	A	0.243	2.46	5	1	1	61.520	1158.73	57.94	C
40.00-20.00			B	0.243	2.46		1	1	61.520			
			C	0.243	2.46		1	1	61.520			
T9 20.00-0.00	1747.93	13454.62	A	0.288	2.329	5	1	1	85.928	1002.52	50.13	B
			B	0.288	2.329		1	1	85.928			
			C	0.288	2.329		1	1	85.928			
Sum Weight:	27797.64	79478.99						OTM	832817.43 lb-ft	10084.11		

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	393.68	3049.43	A	0.699	1.776	8	0.8	1	29.904	380.19	38.02	C
170.00-160.00			B	0.699	1.776		0.8	1	29.904			
			C	0.699	1.776		0.8	1	29.904			
T2	2975.83	5946.80	A	0.569	1.826	7	0.8	1	52.673	977.47	48.87	C
160.00-140.00			B	0.569	1.826		0.8	1	52.673			
			C	0.569	1.826		0.8	1	52.673			
T3	3133.34	6401.48	A	0.445	1.982	7	0.8	1	50.488	1088.69	54.43	C
140.00-120.00			B	0.445	1.982		0.8	1	50.488			
			C	0.445	1.982		0.8	1	50.488			
T4	3685.51	7554.22	A	0.374	2.117	7	0.8	1	51.496	1233.54	61.68	C
120.00-100.00			B	0.374	2.117		0.8	1	51.496			
			C	0.374	2.117		0.8	1	51.496			
T5	3946.37	8351.66	A	0.343	2.189	7	0.8	1	55.651	1266.49	63.32	C
100.00-80.00			B	0.343	2.189		0.8	1	55.651			
			C	0.343	2.189		0.8	1	55.651			
T6	3969.88	12762.68	A	0.405	2.054	6	0.8	1	79.630	1420.52	71.03	C
80.00-60.00			B	0.405	2.054		0.8	1	79.630			
			C	0.405	2.054		0.8	1	79.630			
T7	3988.54	12018.78	A	0.319	2.246	6	0.8	1	69.645	1304.57	65.23	A
60.00-40.00			B	0.319	2.246		0.8	1	69.645			
			C	0.319	2.246		0.8	1	69.645			
T8	3956.55	9939.31	A	0.243	2.46	5	0.8	1	57.548	1114.36	55.72	A
40.00-20.00			B	0.243	2.46		0.8	1	57.548			
			C	0.243	2.46		0.8	1	57.548			
T9 20.00-0.00	1747.93	13454.62	A	0.288	2.329	5	0.8	1	78.639	935.80	46.79	C
			B	0.288	2.329		0.8	1	78.639			
			C	0.288	2.329		0.8	1	78.639			
Sum Weight:	27797.64	79478.99						OTM	808008.21 lb-ft	9721.63		

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	393.68	3049.43	A	0.699	1.776	8	0.85	1	30.132	382.39	38.24	A
170.00-160.00			B	0.699	1.776		0.85	1	30.132			
			C	0.699	1.776		0.85	1	30.132			
T2	2975.83	5946.80	A	0.569	1.826	7	0.85	1	53.111	965.97	48.30	C
160.00-140.00			B	0.569	1.826		0.85	1	53.111			
			C	0.569	1.826		0.85	1	53.111			
T3	3133.34	6401.48	A	0.445	1.982	7	0.85	1	51.000	1089.37	54.47	C
140.00-120.00			B	0.445	1.982		0.85	1	51.000			
			C	0.445	1.982		0.85	1	51.000			
T4	3685.51	7554.22	A	0.374	2.117	7	0.85	1	52.205	1243.00	62.15	C
120.00-100.00			B	0.374	2.117		0.85	1	52.205			
			C	0.374	2.117		0.85	1	52.205			
T5	3946.37	8351.66	A	0.343	2.189	7	0.85	1	56.465	1273.41	63.67	C
100.00-80.00			B	0.343	2.189		0.85	1	56.465			
			C	0.343	2.189		0.85	1	56.465			
T6	3969.88	12762.68	A	0.405	2.054	6	0.85	1	80.974	1439.07	71.95	A
80.00-60.00			B	0.405	2.054		0.85	1	80.974			
			C	0.405	2.054		0.85	1	80.974			
T7	3988.54	12018.78	A	0.319	2.246	6	0.85	1	70.938	1317.35	65.87	A
60.00-40.00			B	0.319	2.246		0.85	1	70.938			
			C	0.319	2.246		0.85	1	70.938			
T8	3956.55	9939.31	A	0.243	2.46	5	0.85	1	58.541	1116.40	55.82	A
40.00-20.00			B	0.243	2.46		0.85	1	58.541			
			C	0.243	2.46		0.85	1	58.541			
T9 20.00-0.00	1747.93	13454.62	A	0.288	2.329	5	0.85	1	80.462	935.65	46.78	C
			B	0.288	2.329		0.85	1	80.462			
			C	0.288	2.329		0.85	1	80.462			
Sum Weight:	27797.64	79478.99						OTM	810396.27 lb-ft	9762.61		

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	27.19	330.77	A	0.195	2.614	11	1	1	7.302	209.34	20.93	B
170.00-160.00			B	0.195	2.614		1	1	7.302			
			C	0.195	2.614		1	1	7.302			
T2	249.13	780.32	A	0.158	2.743	11	1	1	14.220	616.94	30.85	B
160.00-140.00			B	0.158	2.743		1	1	14.220			
			C	0.158	2.743		1	1	14.220			
T3	263.92	964.31	A	0.139	2.814	10	1	1	16.527	679.23	33.96	B
140.00-120.00			B	0.139	2.814		1	1	16.527			
			C	0.139	2.814		1	1	16.527			
T4	283.66	1514.02	A	0.138	2.817	10	1	1	21.064	788.72	39.44	B
120.00-100.00			B	0.138	2.817		1	1	21.064			
			C	0.138	2.817		1	1	21.064			
T5	310.92	1726.82	A	0.13	2.847	10	1	1	23.682	843.14	42.16	B
100.00-80.00			B	0.13	2.847		1	1	23.682			
			C	0.13	2.847		1	1	23.682			
T6	322.80	3169.47	A	0.149	2.776	9	1	1	34.456	1028.87	51.44	B
80.00-60.00			B	0.149	2.776		1	1	34.456			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.149	2.776		1	1	34.456			
T7	337.20	3492.92	A	0.137	2.822	9	1	1	34.350	977.62	48.88	B
60.00-40.00			B	0.137	2.822		1	1	34.350			
			C	0.137	2.822		1	1	34.350			
T8	353.40	3292.85	A	0.114	2.908	8	1	1	29.004	806.24	40.31	B
40.00-20.00			B	0.114	2.908		1	1	29.004			
			C	0.114	2.908		1	1	29.004			
T9 20.00-0.00	223.90	4522.08	A	0.143	2.796	7	1	1	46.333	869.36	43.47	B
			B	0.143	2.796		1	1	46.333			
			C	0.143	2.796		1	1	46.333			
Sum Weight:	2372.12	19793.55						OTM	531806.11 lb-ft	6819.46		

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 ft^2	F lb	w plf	Ctrl. Face
T1	27.19	330.77	A	0.195	2.614	11	0.8	1	6.391	187.05	18.71	C
170.00-160.00			B	0.195	2.614		0.8	1	6.391			
			C	0.195	2.614		0.8	1	6.391			
T2	249.13	780.32	A	0.158	2.743	11	0.8	1	12.467	572.81	28.64	C
160.00-140.00			B	0.158	2.743		0.8	1	12.467			
			C	0.158	2.743		0.8	1	12.467			
T3	263.92	964.31	A	0.139	2.814	10	0.8	1	14.479	627.89	31.39	C
140.00-120.00			B	0.139	2.814		0.8	1	14.479			
			C	0.139	2.814		0.8	1	14.479			
T4	283.66	1514.02	A	0.138	2.817	10	0.8	1	18.228	720.02	36.00	C
120.00-100.00			B	0.138	2.817		0.8	1	18.228			
			C	0.138	2.817		0.8	1	18.228			
T5	310.92	1726.82	A	0.13	2.847	10	0.8	1	20.425	766.71	38.34	C
100.00-80.00			B	0.13	2.847		0.8	1	20.425			
			C	0.13	2.847		0.8	1	20.425			
T6	322.80	3169.47	A	0.149	2.776	9	0.8	1	29.077	912.12	45.61	C
80.00-60.00			B	0.149	2.776		0.8	1	29.077			
			C	0.149	2.776		0.8	1	29.077			
T7	337.20	3492.92	A	0.137	2.822	9	0.8	1	29.179	871.35	43.57	C
60.00-40.00			B	0.137	2.822		0.8	1	29.179			
			C	0.137	2.822		0.8	1	29.179			
T8	353.40	3292.85	A	0.114	2.908	8	0.8	1	25.033	730.71	36.54	C
40.00-20.00			B	0.114	2.908		0.8	1	25.033			
			C	0.114	2.908		0.8	1	25.033			
T9 20.00-0.00	223.90	4522.08	A	0.143	2.796	7	0.8	1	39.044	754.04	37.70	C
			B	0.143	2.796		0.8	1	39.044			
			C	0.143	2.796		0.8	1	39.044			
Sum Weight:	2372.12	19793.55						OTM	483494.37 lb-ft	6142.69		

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	27.19	330.77	A	0.195	2.614	11	0.85	1	6.619	190.04	19.00	A
170.00-160.00			B	0.195	2.614		0.85	1	6.619			
			C	0.195	2.614		0.85	1	6.619			
T2	249.13	780.32	A	0.158	2.743	11	0.85	1	12.905	549.29	27.46	C
160.00-140.00			B	0.158	2.743		0.85	1	12.905			
			C	0.158	2.743		0.85	1	12.905			
T3	263.92	964.31	A	0.139	2.814	10	0.85	1	14.991	619.78	30.99	C
140.00-120.00			B	0.139	2.814		0.85	1	14.991			
			C	0.139	2.814		0.85	1	14.991			
T4	283.66	1514.02	A	0.138	2.817	10	0.85	1	18.937	717.34	35.87	C
120.00-100.00			B	0.138	2.817		0.85	1	18.937			
			C	0.138	2.817		0.85	1	18.937			
T5	310.92	1726.82	A	0.13	2.847	10	0.85	1	21.240	757.42	37.87	C
100.00-80.00			B	0.13	2.847		0.85	1	21.240			
			C	0.13	2.847		0.85	1	21.240			
T6	322.80	3169.47	A	0.149	2.776	9	0.85	1	30.422	922.00	46.10	A
80.00-60.00			B	0.149	2.776		0.85	1	30.422			
			C	0.149	2.776		0.85	1	30.422			
T7	337.20	3492.92	A	0.137	2.822	9	0.85	1	30.472	889.06	44.45	A
60.00-40.00			B	0.137	2.822		0.85	1	30.472			
			C	0.137	2.822		0.85	1	30.472			
T8	353.40	3292.85	A	0.114	2.908	8	0.85	1	26.026	748.18	37.41	A
40.00-20.00			B	0.114	2.908		0.85	1	26.026			
			C	0.114	2.908		0.85	1	26.026			
T9 20.00-0.00	223.90	4522.08	A	0.143	2.796	7	0.85	1	40.866	761.81	38.09	C
			B	0.143	2.796		0.85	1	40.866			
			C	0.143	2.796		0.85	1	40.866			
Sum Weight:	2372.12	19793.55						OTM	480453.64 lb-ft	6154.92		

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	7948.71					
Bracing Weight	11844.84					
Total Member Self-Weight	19793.55			-10170.80	-3376.71	
Total Weight	28656.97			-10170.80	-3376.71	
Wind 0 deg - No Ice		204.79	-30667.20	-2884313.73	-29112.82	6930.73
Wind 30 deg - No Ice		15149.94	-26003.00	-2481713.03	-1448120.44	1452.19
Wind 60 deg - No Ice		26101.33	-15035.05	-1448896.26	-2502355.51	-16907.89
Wind 90 deg - No Ice		29822.60	-21.31	-14306.50	-2857569.53	-20324.70
Wind 120 deg - No Ice		26503.99	15174.46	1413501.29	-2499191.88	-8775.32
Wind 150 deg - No Ice		14205.65	24728.70	2340783.24	-1351872.20	-3426.57
Wind 180 deg - No Ice		-151.31	28421.08	2709701.45	16320.77	-6751.65
Wind 210 deg - No Ice		-15226.37	26162.03	2479360.37	1450286.43	-1685.18
Wind 240 deg - No Ice		-28256.08	16422.50	1536338.27	2653726.11	16781.07
Wind 270 deg - No Ice		-29758.24	239.84	19357.76	2843219.65	20353.47
Wind 300 deg - No Ice		-24271.80	-13804.06	-1328166.57	2325887.10	8723.07

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 330 deg - No Ice		-14160.65	-24477.20	-2331600.01	1340987.19	3630.79
Member Ice	59685.44					
Total Weight Ice	138699.93			-56767.78	-23414.99	
Wind 0 deg - Ice		135.65	-13948.59	-1394683.79	-42629.64	2862.00
Wind 30 deg - Ice		7001.46	-11950.00	-1209954.96	-703889.65	-831.02
Wind 60 deg - Ice		11966.42	-6895.47	-726202.45	-1186009.12	-7005.61
Wind 90 deg - Ice		13805.61	-61.96	-66216.89	-1362960.08	-8074.92
Wind 120 deg - Ice		12123.17	6861.04	598690.46	-1193915.43	-4250.61
Wind 150 deg - Ice		6780.64	11758.54	1077251.99	-677400.54	-2400.97
Wind 180 deg - Ice		-44.21	13587.91	1255517.67	-17590.65	-2656.47
Wind 210 deg - Ice		-6956.02	11983.41	1100165.33	649593.92	1010.38
Wind 240 deg - Ice		-12267.21	7100.83	627206.65	1158047.66	6977.57
Wind 270 deg - Ice		-13758.70	57.17	-49762.10	1309531.30	7850.42
Wind 300 deg - Ice		-11707.55	-6694.96	-703540.53	1111576.23	4073.13
Wind 330 deg - Ice		-6767.78	-11704.61	-1184536.24	629178.15	2446.12
Total Weight	28656.97			-10170.80	-3376.71	
Wind 0 deg - Service		58.15	-8707.63	-819007.14	-7860.25	1967.91
Wind 30 deg - Service		4301.67	-7383.28	-704692.83	-410772.80	412.33
Wind 60 deg - Service		7411.20	-4269.05	-411435.19	-710111.95	-4800.82
Wind 90 deg - Service		8467.82	-6.05	-4098.26	-810971.30	-5770.99
Wind 120 deg - Service		7525.53	4308.63	401313.01	-709213.67	-2491.66
Wind 150 deg - Service		4033.55	7021.46	664605.13	-383444.10	-972.94
Wind 180 deg - Service		-42.96	8069.87	769355.64	5040.15	-1917.06
Wind 210 deg - Service		-4323.37	7428.44	703952.67	412199.87	-478.49
Wind 240 deg - Service		-8023.02	4663.00	436191.30	753904.13	4764.81
Wind 270 deg - Service		-8449.54	68.10	5460.36	807708.86	5779.16
Wind 300 deg - Service		-6891.73	-3919.52	-377155.24	660817.63	2476.82
Wind 330 deg - Service		-4020.77	-6950.05	-662069.80	381165.48	1030.93

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

Comb. No.	Description
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
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	170 - 160	Leg	Max Tension	7	9144.89	-239.70	139.48
			Max. Compression	2	-12272.76	3.74	110.46
			Max. Mx	8	-1883.43	1086.54	-11.94
			Max. My	2	-188.68	81.13	-1053.79
			Max. Vy	8	-2243.33	-521.95	-105.99
			Max. Vx	2	2287.68	-6.13	585.01
		Diagonal	Max Tension	4	3964.22	0.00	0.00
			Max. Compression	4	-4002.87	0.00	0.00
			Max. Mx	27	878.16	20.34	-0.50
			Max. My	18	-3080.99	-2.67	-5.17
			Max. Vy	27	-29.75	20.34	-0.50
			Max. Vx	18	1.84	-2.67	-5.17
		Top Girt	Max Tension	6	629.60	0.00	0.00
			Max. Compression	18	-633.13	0.00	0.00
			Max. Mx	26	-34.86	-51.17	0.00
			Max. My	30	-34.94	0.00	0.00
			Max. Vy	26	44.89	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	7	44105.46	-197.10	11.43
			Max. Compression	18	-48644.43	201.07	-10.93
			Max. Mx	19	-48037.37	201.82	-11.08
			Max. My	20	-2312.20	-4.51	-206.74
			Max. Vy	18	252.53	153.51	-9.40
			Max. Vx	18	-278.60	-63.77	-80.05
		Diagonal	Max Tension	5	3580.83	0.00	0.00
			Max. Compression	16	-3654.38	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	27	761.28	33.13	4.39
			Max. My	30	-750.94	26.99	4.97
			Max. Vy	37	41.56	32.08	3.89
			Max. Vx	30	2.37	0.00	0.00
		Top Girt	Max Tension	25	3.26	0.00	0.00
			Max. Compression	34	-33.43	0.00	0.00
			Max. Mx	26	-31.85	-52.31	0.00
			Max. My	30	-30.55	0.00	1.54
			Max. Vy	26	-45.89	0.00	0.00
			Max. Vx	30	-1.35	0.00	0.00
T3	140 - 120	Leg	Max Tension	7	72413.62	-473.09	74.18
			Max. Compression	18	-79074.87	504.79	-91.40
			Max. Mx	19	-78324.46	504.85	-91.65
			Max. My	8	-3453.44	6.11	559.98
			Max. Vy	19	280.25	308.06	0.21
			Max. Vx	20	-306.80	-1.63	-255.52
		Diagonal	Max Tension	16	4002.87	0.00	0.00
			Max. Compression	16	-4087.89	0.00	0.00
			Max. Mx	29	822.38	59.62	7.81
			Max. My	30	-646.65	50.59	8.15
			Max. Vy	29	58.12	59.61	-7.38
			Max. Vx	30	3.26	0.00	0.00
T4	120 - 100	Leg	Max Tension	7	100092.58	-461.87	13.58
			Max. Compression	18	-109734.93	517.95	-20.67
			Max. Mx	14	83552.50	-724.15	-86.39
			Max. My	9	-3203.59	-29.24	762.72
			Max. Vy	14	595.80	-724.14	-86.38
			Max. Vx	8	-669.11	-34.19	762.72
		Diagonal	Max Tension	16	5678.51	0.00	0.00
			Max. Compression	18	-5918.41	0.00	0.00
			Max. Mx	29	1401.21	110.45	-14.10
			Max. My	30	-734.27	91.20	16.18
			Max. Vy	29	86.29	110.45	-14.10
			Max. Vx	30	5.04	0.00	0.00
T5	100 - 80	Leg	Max Tension	7	129479.19	-626.50	59.16
			Max. Compression	18	-142713.46	344.42	-84.12
			Max. Mx	19	-130786.87	634.39	-50.56
			Max. My	8	-5807.03	-0.01	855.02
			Max. Vy	19	372.49	520.57	-20.59
			Max. Vx	8	388.21	-17.89	535.02
		Diagonal	Max Tension	18	6368.51	0.00	0.00
			Max. Compression	18	-6727.18	0.00	0.00
			Max. Mx	29	982.56	151.21	19.96
			Max. My	30	-1056.85	130.79	20.62
			Max. Vy	29	100.75	151.20	-18.67
			Max. Vx	35	-5.54	0.00	0.00
T6	80 - 60	Leg	Max Tension	7	157206.02	644.75	4.60
			Max. Compression	18	-175214.42	1666.87	6.05
			Max. Mx	18	-175144.41	1666.88	6.09
			Max. My	8	-7043.67	-102.82	1316.73
			Max. Vy	18	952.10	1666.88	6.09
			Max. Vx	8	-621.40	-102.82	1316.73
		Diagonal	Max Tension	17	6980.45	74.96	1.24
			Max. Compression	18	-7801.11	0.00	0.00
			Max. Mx	27	1417.51	208.14	23.84
			Max. My	29	-2087.98	179.68	27.85
			Max. Vy	29	127.67	199.12	25.10
			Max. Vx	30	6.89	0.00	0.00
		Secondary Horizontal	Max Tension	18	3038.94	0.00	0.00
			Max. Compression	18	-3038.94	28.03	1.51

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	36	572.69	161.10	18.92
			Max. My	28	-59.79	154.57	24.23
			Max. Vy	36	113.73	154.66	24.08
			Max. Vx	30	-6.28	0.00	0.00
T7	60 - 40	Leg	Max Tension	7	182872.25	1178.41	15.19
			Max. Compression	18	-205760.83	150.49	-24.32
			Max. Mx	18	-188442.10	2705.61	-2.73
			Max. My	17	-3951.36	-100.94	1954.40
			Max. Vy	18	1084.52	2705.61	-2.73
			Max. Vx	12	-819.94	-142.56	-1802.24
		Diagonal	Max Tension	7	8494.68	132.29	-1.32
			Max. Compression	18	-9609.62	0.00	0.00
			Max. Mx	29	1063.02	310.48	32.27
			Max. My	30	2660.13	295.29	40.02
			Max. Vy	29	161.23	308.39	-35.45
			Max. Vx	29	-8.59	0.00	0.00
		Secondary Horizontal	Max Tension	18	3568.69	0.00	0.00
			Max. Compression	18	-3568.69	49.86	-2.57
			Max. Mx	30	-690.94	219.51	33.40
			Max. My	28	-129.36	216.90	40.17
			Max. Vy	30	-140.98	219.51	33.40
			Max. Vx	30	-8.56	0.00	0.00
T8	40 - 20	Leg	Max Tension	7	212192.24	-1641.45	25.40
			Max. Compression	18	-240502.50	370.12	-40.41
			Max. Mx	19	-221705.26	1742.54	-26.61
			Max. My	4	-9945.80	-53.01	-1799.20
			Max. Vy	19	602.07	1742.54	-26.61
			Max. Vx	4	-557.68	-53.01	-1799.20
		Diagonal	Max Tension	18	9234.63	0.00	0.00
			Max. Compression	18	-10239.00	0.00	0.00
			Max. Mx	29	1186.67	367.80	45.53
			Max. My	30	-1669.53	319.46	48.62
			Max. Vy	29	170.88	348.20	-43.51
			Max. Vx	30	9.16	0.00	0.00
T9	20 - 0	Leg	Max Tension	7	248295.77	1159.87	-61.32
			Max. Compression	18	-284584.89	-0.36	-0.08
			Max. Mx	18	-273497.53	3853.40	-2.49
			Max. My	8	-11732.39	-317.07	3432.32
			Max. Vy	18	-16209.19	-0.36	-0.08
			Max. Vx	20	3794.02	-0.01	-0.06
		Diagonal	Max Tension	7	10472.91	191.26	-11.48
			Max. Compression	18	-12149.56	0.00	0.00
			Max. Mx	29	261.95	486.98	47.88
			Max. My	29	-4377.96	443.11	57.78
			Max. Vy	29	192.75	486.98	47.88
			Max. Vx	29	10.08	0.00	0.00
		Secondary Horizontal	Max Tension	18	4744.15	0.00	0.00
			Max. Compression	18	-4744.15	104.53	0.66
			Max. Mx	28	-313.15	360.58	51.04
			Max. My	28	-313.15	360.58	51.04
			Max. Vy	28	166.20	360.58	51.04
			Max. Vx	30	-9.04	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	283178.43	27838.30	-16938.25
	Max. H_x	18	283178.43	27838.30	-16938.25
	Max. H_z	7	-247063.68	-24162.67	14819.85
	Min. Vert	7	-247063.68	-24162.67	14819.85
	Min. H_x	7	-247063.68	-24162.67	14819.85
	Min. H_z	18	283178.43	27838.30	-16938.25
Leg B	Max. Vert	10	265752.65	-26241.10	-15607.81
	Max. H_x	23	-228417.94	22503.35	13427.28
	Max. H_z	23	-228417.94	22503.35	13427.28
	Min. Vert	23	-228417.94	22503.35	13427.28
	Min. H_x	10	265752.65	-26241.10	-15607.81
	Min. H_z	10	265752.65	-26241.10	-15607.81
Leg A	Max. Vert	2	266648.38	297.33	30647.33
	Max. H_x	21	6428.87	3789.98	482.69
	Max. H_z	2	266648.38	297.33	30647.33
	Min. Vert	15	-231671.64	-295.61	-26666.92
	Min. H_x	9	9409.10	-3787.22	749.05
	Min. H_z	15	-231671.64	-295.61	-26666.92

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	28656.97	-0.00	0.04	-10167.67	-3376.38	0.11
1.2 Dead+1.6 Wind 0 deg - No Ice	34348.99	326.19	-48925.66	-4610238.78	-45227.24	11115.73
0.9 Dead+1.6 Wind 0 deg - No Ice	25752.47	326.61	-48963.35	-4607654.02	-44217.98	11108.83
1.2 Dead+1.6 Wind 30 deg - No Ice	34348.39	24158.88	-41479.55	-3965737.32	-2313635.19	2288.78
0.9 Dead+1.6 Wind 30 deg - No Ice	25751.89	24178.14	-41512.51	-3963096.45	-2312860.37	2286.80
1.2 Dead+1.6 Wind 60 deg - No Ice	34347.56	41625.62	-23978.91	-2312910.66	-3999648.75	-27141.59
0.9 Dead+1.6 Wind 60 deg - No Ice	25751.03	41658.21	-23998.07	-2310110.20	-3999061.02	-27121.25
1.2 Dead+1.6 Wind 90 deg - No Ice	34348.55	47567.51	-28.42	-17949.10	-4568940.47	-32641.13
0.9 Dead+1.6 Wind 90 deg - No Ice	25751.97	47605.50	-28.73	-14905.90	-4568412.87	-32595.15
1.2 Dead+1.6 Wind 120 deg - No Ice	34349.25	42283.43	24209.26	2265270.69	-3996903.76	-14156.74
0.9 Dead+1.6 Wind 120 deg - No Ice	25752.63	42316.17	24227.44	2268545.33	-3996296.42	-14127.04
1.2 Dead+1.6 Wind 150 deg - No Ice	34353.05	22663.93	39441.71	3747305.98	-2161731.48	-5559.60
0.9 Dead+1.6 Wind 150 deg - No Ice	25756.37	22681.78	39472.62	3750735.92	-2160942.73	-5551.10
1.2 Dead+1.6 Wind 180 deg - No Ice	34352.40	-241.18	45326.72	4336799.61	27442.30	-10831.02
0.9 Dead+1.6 Wind 180 deg - No Ice	25755.68	-241.37	45362.03	4340309.95	28457.84	-10824.43
1.2 Dead+1.6 Wind 210 deg - No Ice	34348.56	-24292.93	41727.59	3968895.49	2322004.43	-2663.93
0.9 Dead+1.6 Wind 210 deg - No Ice	25751.91	-24312.10	41760.31	3972343.99	2323255.70	-2661.84

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+1.6 Wind 240 deg - No Ice	34344.15	-45080.62	26199.42	2461691.87	4247037.17	26947.56
0.9 Dead+1.6 Wind 240 deg - No Ice	25747.56	-45115.26	26219.10	2464979.68	4248471.53	26923.07
1.2 Dead+1.6 Wind 270 deg - No Ice	34348.86	-47465.29	387.59	35885.71	4548717.89	32689.20
0.9 Dead+1.6 Wind 270 deg - No Ice	25752.24	-47503.10	387.73	38934.50	4550214.97	32643.56
1.2 Dead+1.6 Wind 300 deg - No Ice	34352.78	-38707.85	-22014.48	-2119718.93	3720272.96	14069.05
0.9 Dead+1.6 Wind 300 deg - No Ice	25756.16	-38738.34	-22032.16	-2116904.03	3721694.28	14041.61
1.2 Dead+1.6 Wind 330 deg - No Ice	34353.19	-22582.39	-39045.28	-3725539.93	2145135.14	5886.61
0.9 Dead+1.6 Wind 330 deg - No Ice	25756.61	-22600.23	-39076.25	-3722879.58	2146371.23	5877.96
1.2 Dead+1.0 Ice+1.0 Temp	144431.28	-2.29	12.71	-58421.04	-24086.60	-0.86
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	144430.76	131.69	-13796.61	-1405276.10	-43570.64	2894.96
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	144430.75	6926.17	-11817.16	-1219428.44	-708780.67	-886.14
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	144430.77	11838.91	-6814.10	-732666.30	-1193908.69	-7128.48
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	144430.80	13659.43	-51.51	-68558.58	-1371987.82	-8234.98
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	144430.81	11988.93	6796.77	599880.96	-1200949.06	-4410.87
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	144430.86	6705.07	11639.29	1080905.34	-681742.83	-2514.41
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	144430.87	-45.09	13448.04	1260123.42	-18358.83	-2690.94
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	144430.85	-6881.36	11861.40	1103945.46	652448.42	1063.75
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	144430.81	-12135.08	7032.95	628549.40	1163552.96	7102.01
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	144430.83	-13616.34	65.58	-51995.91	1316901.08	8009.95
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	144430.81	-11586.25	-6616.20	-709854.57	1117680.68	4229.41
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	144430.80	-6698.85	-11574.62	-1193849.41	632269.97	2559.37
Dead+Wind 0 deg - Service	28655.70	57.86	-8685.57	-825998.16	-10683.09	1972.13
Dead+Wind 30 deg - Service	28655.68	4290.24	-7363.99	-711698.61	-413414.76	408.46
Dead+Wind 60 deg - Service	28655.67	7391.58	-4257.47	-418517.97	-712639.68	-4814.23
Dead+Wind 90 deg - Service	28655.71	8445.65	-5.43	-11311.12	-813500.71	-5789.86
Dead+Wind 120 deg - Service	28655.75	7506.58	4298.26	393949.44	-711823.83	-2509.31
Dead+Wind 150 deg - Service	28655.89	4023.26	7003.66	657113.38	-386159.25	-983.29
Dead+Wind 180 deg - Service	28655.88	-42.89	8049.03	761806.62	2213.50	-1920.67
Dead+Wind 210 deg - Service	28655.76	-4312.48	7409.58	696447.66	409263.76	-474.72
Dead+Wind 240 deg - Service	28655.61	-8003.13	4651.73	428816.03	750865.72	4779.13
Dead+Wind 270 deg - Service	28655.74	-8427.60	68.45	-1755.99	804593.63	5798.08
Dead+Wind 300 deg - Service	28655.85	-6873.51	-3908.80	-384242.04	657717.66	2493.52
Dead+Wind 330 deg - Service	28655.84	-4010.31	-6931.87	-669085.74	378174.31	1041.25

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	-28656.97	-0.00	0.00	28656.97	-0.04	0.000%
2	327.66	-34388.36	-49067.51	-326.19	34348.99	48925.66	0.246%
3	327.66	-25791.27	-49067.51	-326.61	25752.47	48963.35	0.201%
4	24239.90	-34388.36	-41604.81	-24158.88	34348.39	41479.55	0.261%
5	24239.90	-25791.27	-41604.81	-24178.14	25751.89	41512.51	0.216%
6	41762.13	-34388.36	-24056.09	-41625.62	34347.56	23978.91	0.274%
7	41762.13	-25791.27	-24056.09	-41658.21	25751.03	23998.07	0.230%
8	47716.16	-34388.36	-34.10	-47567.51	34348.55	28.42	0.262%
9	47716.16	-25791.27	-34.10	-47605.50	25751.97	28.73	0.217%
10	42406.38	-34388.36	24279.14	-42283.43	34349.25	-24209.26	0.246%
11	42406.38	-25791.27	24279.14	-42316.17	25752.63	-24227.44	0.201%
12	22729.04	-34388.36	39565.93	-22663.93	34353.05	-39441.71	0.253%
13	22729.04	-25791.27	39565.93	-22681.78	25756.37	-39472.62	0.210%
14	-242.09	-34388.36	45473.73	241.18	34352.40	-45326.72	0.265%
15	-242.09	-25791.27	45473.73	241.37	25755.68	-45362.03	0.224%
16	-24362.19	-34388.36	41859.25	24292.93	34348.56	-41727.59	0.259%
17	-24362.19	-25791.27	41859.25	24312.10	25751.91	-41760.31	0.214%
18	-45209.73	-34388.36	26275.99	45080.62	34344.15	-26199.42	0.250%
19	-45209.73	-25791.27	26275.99	45115.26	25747.56	-26219.10	0.203%
20	-47613.18	-34388.36	383.75	47465.29	34348.86	-387.59	0.261%
21	-47613.18	-25791.27	383.75	47503.10	25752.24	-387.73	0.216%
22	-38834.88	-34388.36	-22086.50	38707.85	34352.78	22014.48	0.267%
23	-38834.88	-25791.27	-22086.50	38738.34	25756.16	22032.16	0.225%
24	-22657.04	-34388.36	-39163.53	22582.39	34353.19	39045.28	0.254%
25	-22657.04	-25791.27	-39163.53	22600.23	25756.61	39076.25	0.211%
26	0.00	-144431.33	-0.00	2.29	144431.28	-12.71	0.009%
27	135.65	-144431.33	-13948.59	-131.69	144430.76	13796.61	0.105%
28	7001.46	-144431.33	-11950.00	-6926.17	144430.75	11817.16	0.105%
29	11966.42	-144431.33	-6895.47	-11838.91	144430.77	6814.10	0.104%
30	13805.61	-144431.33	-61.96	-13659.43	144430.80	51.51	0.101%
31	12123.17	-144431.33	6861.04	-11988.93	144430.81	-6796.77	0.103%
32	6780.64	-144431.33	11758.54	-6705.07	144430.86	-11639.29	0.097%
33	-44.21	-144431.33	13587.91	45.09	144430.87	-13448.04	0.096%
34	-6956.02	-144431.33	11983.41	6881.36	144430.85	-11861.40	0.099%
35	-12267.21	-144431.33	7100.83	12135.08	144430.81	-7032.95	0.102%
36	-13758.70	-144431.33	57.17	13616.34	144430.83	-65.58	0.098%
37	-11707.55	-144431.33	-6694.96	11586.25	144430.81	6616.20	0.100%
38	-6767.78	-144431.33	-11704.61	6698.85	144430.80	11574.62	0.101%
39	58.15	-28656.97	-8707.63	-57.86	28655.70	8685.57	0.074%
40	4301.67	-28656.97	-7383.28	-4290.24	28655.68	7363.99	0.075%
41	7411.20	-28656.97	-4269.05	-7391.58	28655.67	4257.47	0.076%
42	8467.82	-28656.97	-6.05	-8445.65	28655.71	5.43	0.074%
43	7525.53	-28656.97	4308.63	-7506.58	28655.75	-4298.26	0.072%
44	4033.55	-28656.97	7021.46	-4023.26	28655.89	-7003.66	0.069%
45	-42.96	-28656.97	8069.87	42.89	28655.88	-8049.03	0.070%
46	-4323.37	-28656.97	7428.44	4312.48	28655.76	-7409.58	0.073%
47	-8023.02	-28656.97	4663.00	8003.13	28655.61	-4651.73	0.076%
48	-8449.54	-28656.97	68.10	8427.60	28655.74	-68.45	0.074%
49	-6891.73	-28656.97	-3919.52	6873.51	28655.85	3908.80	0.071%
50	-4020.77	-28656.97	-6950.05	4010.31	28655.84	6931.87	0.071%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001

2	Yes	4	0.00030419	0.00078947
3	Yes	4	0.00022369	0.00076217
4	Yes	4	0.00032243	0.00080341
5	Yes	4	0.00024198	0.00077460
6	Yes	4	0.00033932	0.00081701
7	Yes	4	0.00025867	0.00078702
8	Yes	4	0.00032279	0.00080263
9	Yes	4	0.00024226	0.00077428
10	Yes	4	0.00030421	0.00078695
11	Yes	4	0.00022374	0.00076063
12	Yes	4	0.00032237	0.00076239
13	Yes	4	0.00024190	0.00073343
14	Yes	4	0.00033857	0.00077580
15	Yes	4	0.00025788	0.00074555
16	Yes	4	0.00032152	0.00080024
17	Yes	4	0.00024120	0.00077303
18	Yes	4	0.00030246	0.00082704
19	Yes	4	0.00022220	0.00080259
20	Yes	4	0.00032227	0.00080015
21	Yes	4	0.00024172	0.00077203
22	Yes	4	0.00033920	0.00077544
23	Yes	4	0.00025829	0.00074379
24	Yes	4	0.00032277	0.00076314
25	Yes	4	0.00024214	0.00073278
26	Yes	4	0.00000001	0.00010998
27	Yes	13	0.00095191	0.00073812
28	Yes	13	0.00095452	0.00074084
29	Yes	13	0.00095597	0.00073843
30	Yes	13	0.00094992	0.00072487
31	Yes	12	0.00099526	0.00074725
32	Yes	12	0.00099404	0.00072916
33	Yes	12	0.00099680	0.00072778
34	Yes	12	0.00099593	0.00073525
35	Yes	12	0.00099701	0.00074864
36	Yes	13	0.00095107	0.00071820
37	Yes	13	0.00095649	0.00072587
38	Yes	13	0.00095453	0.00073002
39	Yes	4	0.00000001	0.00028328
40	Yes	4	0.00000001	0.00028735
41	Yes	4	0.00000001	0.00029050
42	Yes	4	0.00000001	0.00028630
43	Yes	4	0.00000001	0.00028065
44	Yes	4	0.00000001	0.00027990
45	Yes	4	0.00000001	0.00028332
46	Yes	4	0.00000001	0.00028333
47	Yes	4	0.00000001	0.00028365
48	Yes	4	0.00000001	0.00028570
49	Yes	4	0.00000001	0.00028673
50	Yes	4	0.00000001	0.00028344

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		*°*	*°*
T1	170 - 160	4.215	47	0.2445	0.0249
T2	160 - 140	3.694	47	0.2414	0.0236
T3	140 - 120	2.733	47	0.2025	0.0199
T4	120 - 100	1.954	47	0.1579	0.0157
T5	100 - 80	1.336	47	0.1282	0.0113

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	80 - 60	0.835	47	0.0993	0.0066
T7	60 - 40	0.469	47	0.0682	0.0042
T8	40 - 20	0.219	47	0.0449	0.0027
T9	20 - 0	0.062	47	0.0228	0.0012

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
173.00	10' Omni	47	4.215	0.2445	0.0249	96357
166.00	SM303-1	47	4.005	0.2442	0.0244	96357
152.00	Kathrein PR-950	47	3.292	0.2299	0.0223	33160
143.00	5' Omni	47	2.867	0.2099	0.0205	24562
140.00	SO311-1	47	2.733	0.2025	0.0199	23286
134.00	10' Omni	47	2.479	0.1880	0.0187	24324
130.00	12' Omni	47	2.320	0.1787	0.0179	25669
129.00	SO311-1	47	2.282	0.1764	0.0176	26018
124.00	SO311-1	47	2.096	0.1656	0.0166	27921
118.00	Commscope VHPL3-11W-SE1	47	1.886	0.1543	0.0153	30811
115.00	6' Dish w/ Radome	47	1.787	0.1493	0.0147	32728
112.00	10' DiPole	47	1.691	0.1447	0.0140	34897
110.00	20' Omni	47	1.629	0.1418	0.0136	36511
105.00	10' Omni	47	1.479	0.1349	0.0125	41283
100.00	SO311-1	47	1.336	0.1282	0.0113	45556
89.00	10' Omni	47	1.045	0.1129	0.0085	38251
84.00	SO311-1	47	0.925	0.1055	0.0074	35022
76.00	SO311-1	47	0.751	0.0930	0.0059	34113
71.00	12' Omni	47	0.654	0.0849	0.0052	35900
70.00	12' Omni	47	0.635	0.0833	0.0051	36281
67.00	SO311-1	47	0.582	0.0786	0.0048	37476
60.00	20' Omni	47	0.469	0.0682	0.0042	40749
55.00	10' Omni	47	0.397	0.0617	0.0038	44233
50.00	SO311-1	47	0.331	0.0558	0.0034	48587
40.00	20' Omni	47	0.219	0.0449	0.0027	57978
35.00	Celwave PD1150	47	0.170	0.0394	0.0023	53152
30.00	SO311-1	47	0.127	0.0339	0.0019	47398

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 160	23.974	19	1.3938	0.1404
T2	160 - 140	21.009	19	1.3749	0.1330
T3	140 - 120	15.539	19	1.1533	0.1126
T4	120 - 100	11.108	19	0.8990	0.0888
T5	100 - 80	7.588	19	0.7296	0.0638
T6	80 - 60	4.743	19	0.5651	0.0370
T7	60 - 40	2.660	19	0.3878	0.0238
T8	40 - 20	1.239	19	0.2550	0.0151
T9	20 - 0	0.349	19	0.1294	0.0069

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

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
173.00	10' Omni	19	23.974	1.3938	0.1404	17939
166.00	SM303-1	19	22.781	1.3915	0.1376	17939
152.00	Kathrein PR-950	19	18.721	1.3094	0.1257	6062
143.00	5' Omni	19	16.300	1.1951	0.1160	4381
140.00	SO311-1	19	15.539	1.1533	0.1126	4136
134.00	10' Omni	19	14.096	1.0705	0.1055	4297
130.00	12' Omni	19	13.191	1.0174	0.1008	4523
129.00	SO311-1	19	12.971	1.0045	0.0996	4583
124.00	SO311-1	19	11.912	0.9433	0.0936	4909
118.00	Commscope VHPL3-11W-SE1	19	10.721	0.8787	0.0864	5414
115.00	6' Dish w/ Radome	19	10.156	0.8503	0.0829	5750
112.00	10' DiPole	19	9.609	0.8239	0.0792	6135
110.00	20' Omni	19	9.255	0.8073	0.0768	6422
105.00	10' Omni	19	8.401	0.7678	0.0705	7272
100.00	SO311-1	19	7.588	0.7296	0.0638	8025
89.00	10' Omni	19	5.936	0.6423	0.0481	6706
84.00	SO311-1	19	5.253	0.6002	0.0416	6149
76.00	SO311-1	19	4.264	0.5288	0.0333	5996
71.00	12' Omni	19	3.712	0.4829	0.0296	6310
70.00	12' Omni	19	3.607	0.4738	0.0290	6377
67.00	SO311-1	19	3.304	0.4468	0.0272	6587
60.00	20' Omni	19	2.660	0.3878	0.0238	7163
55.00	10' Omni	19	2.250	0.3507	0.0216	7775
50.00	SO311-1	19	1.879	0.3170	0.0194	8541
40.00	20' Omni	19	1.239	0.2550	0.0151	10195
35.00	Celwave PD1150	19	0.965	0.2241	0.0129	9349
30.00	SO311-1	19	0.722	0.1929	0.0108	8339

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	170	Leg	A325N	0.7500	4	2286.22	29820.60	0.077 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3964.22	4631.25	0.856 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	629.60	4132.50	0.152 ✔	1	Member Bearing
T2	160	Leg	A325N	0.7500	4	11026.40	29820.60	0.370 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3580.83	6946.88	0.515 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	33.43	7952.16	0.004 ✔	1	Bolt Shear
T3	140	Leg	A325N	0.8750	4	18103.40	40589.10	0.446 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	4002.87	6946.88	0.576 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T4	120	Leg	A325N	0.8750	4	25023.10	40589.10	0.616 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	5678.51	6946.88	0.817 ✔	1	Member Bearing
T5	100	Leg	A325N	0.8750	4	32369.80	40589.10	0.797 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	6368.51	6946.88	0.917 ✔	1	Member Bearing
T6	80	Leg	A325N	1.0000	4	39265.70	53014.40	0.741 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	7801.11	7952.16	0.981 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3038.94	10440.00	0.291 ✔	1	Member Bearing
T7	60	Leg	A325N	1.0000	6	30432.50	53014.40	0.574 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	9609.63	12425.20	0.773 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3568.69	10440.00	0.342 ✔	1	Member Bearing
T8	40	Leg	A325N	1.0000	6	35357.10	53014.40	0.667 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	10239.00	12425.20	0.824 ✔	1	Bolt Shear
T9	20	Diagonal	A325N	0.6250	1	12149.60	12425.20	0.978 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	4744.15	10440.00	0.454 ✔	1	Member Bearing

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 $\frac{P_u}{\phi P_n}$
T1	170 - 160	ROHN 2.5 STD	10.00	3.33	42.2 K=1.00	1.7040	-12272.80	67311.90	0.182 [1] ✔
T2	160 - 140	ROHN 2.5 STD	20.03	4.01	50.8 K=1.00	1.7040	-48644.40	63519.00	0.766 [1] ✔
T3	140 - 120	ROHN 3 STD	20.03	5.01	51.7 K=1.00	2.2285	-79074.90	82507.40	0.958 [1] ✔
T4	120 - 100	ROHN 3 1/2 X-STR	20.03	6.68	61.6 K=1.00	3.8781	-109735.00	132208.00	0.830 [1] ✔
T5	100 - 80	ROHN 4 X-STR	20.03	6.68	54.3 K=1.00	4.4074	-142713.00	159914.00	0.892 [1] ✔
T6	80 - 60	ROHN 4 X-STR	20.04	3.43	27.9 K=1.00	4.4074	-175214.00	187390.00	0.935 [1] ✔
T7	60 - 40	ROHN 5 X-STR	20.04	5.18	33.8 K=1.00	6.1120	-205761.00	253002.00	0.813 [1] ✔
T8	40 - 20	ROHN 6 EHS	20.03	10.02	54.0 K=1.00	6.7133	-240503.00	244063.00	0.985 [1] ✔
T9	20 - 0	ROHN 6 EHS	20.03	5.12	27.6 K=1.00	6.7133	-284585.00	285742.00	0.996 [1] ✔

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

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L1 1/2x1 1/2x1/8	5.65	2.57	108.1 K=1.04	0.3594	-4002.87	6876.95	0.582 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	7.54	3.65	149.2 K=1.00	0.5273	-3510.74	5352.05	0.656 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x3/16	9.76	4.76	166.2 K=1.00	0.6211	-4087.89	5080.52	0.805 [1] ✔
T4	120 - 100	L2 1/2x2 1/2x3/16	12.30	6.05	146.7 K=1.00	0.9020	-5918.41	9466.52	0.625 [1] ✔
T5	100 - 80	L2 1/2x2 1/2x3/16	14.03	6.89	167.0 K=1.00	0.9020	-6727.18	7306.84	0.921 [1] ✔
T6	80 - 60	L2 1/2x2 1/2x3/8	15.89	7.83	192.8 K=1.00	1.7300	-7801.11	10510.50	0.742 [1] ✔
T7	60 - 40	L3x3x3/8	19.15	9.49	194.0 K=1.00	2.1100	-9609.63	12668.10	0.759 [1] ✔
T8	40 - 20	L3x3x3/8	20.90	10.30	210.6 K=1.00	2.1100	-10239.00	10750.20	0.952 [1] ✔
T9	20 - 0	KL/R > 200 (C) - 189 L3 1/2x3 1/2x3/8	22.66	11.18	195.3 K=1.00	2.4800	-12149.60	14688.90	0.827 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	80 - 60	L2 1/2x2 1/2x1/4	14.41	13.80	215.3 K=1.00	1.1900	-3038.94	5798.32	0.524 [1] ✔
T7	60 - 40	L3x3x1/4	16.31	15.61	201.4 K=1.00	1.4400	-3568.69	8018.34	0.445 [1] ✔
T9	20 - 0	L3 1/2x3 1/2x1/4	20.34	19.55	215.2 K=1.00	1.6900	-4744.15	8244.15	0.575 [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	170 - 160	L1 1/2x1 1/2x1/8	4.56	4.11	166.6 K=1.00	0.3594	-633.13	2925.06	0.216 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	4.56	4.11	168.2 K=1.00	0.5273	-33.43	4210.39	0.008 [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	170 - 160	ROHN 2.5 STD	10.00	3.33	42.2	1.7040	9144.89	76682.30	0.119 [1] ✔
T2	160 - 140	ROHN 2.5 STD	20.03	4.01	50.8	1.7040	44105.50	76682.30	0.575 [1] ✔
T3	140 - 120	ROHN 3 STD	20.03	5.01	51.7	2.2285	72413.60	100281.00	0.722 [1] ✔
T4	120 - 100	ROHN 3 1/2 X-STR	20.03	6.68	61.6	3.8781	100093.00	174514.00	0.574 [1] ✔
T5	100 - 80	ROHN 4 X-STR	20.03	6.68	54.3	4.4074	129479.00	198335.00	0.653 [1] ✔
T6	80 - 60	ROHN 4 X-STR	20.04	3.43	27.9	4.4074	157206.00	198335.00	0.793 [1] ✔
T7	60 - 40	ROHN 5 X-STR	20.04	5.18	33.8	6.1120	182780.00	275039.00	0.665 [1] ✔
T8	40 - 20	ROHN 6 EHS	20.03	10.02	54.0	6.7133	212142.00	302097.00	0.702 [1] ✔
T9	20 - 0	ROHN 6 EHS	20.03	5.12	27.6	6.7133	248296.00	302097.00	0.822 [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	170 - 160	L1 1/2x1 1/2x1/8	5.65	2.57	69.0	0.2109	3964.22	10283.20	0.386 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	L1 1/2x1 1/2x3/16	6.87	3.31	89.8	0.3076	3580.83	14996.30	0.239 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x3/16	9.33	4.54	103.8	0.3779	4002.87	18424.10	0.217 [1] ✔
T4	120 - 100	L2 1/2x2 1/2x3/16	12.30	6.05	95.0	0.5886	5678.51	28694.70	0.198 [1] ✔
T5	100 - 80	L2 1/2x2 1/2x3/16	14.03	6.89	107.9	0.5886	6368.51	28694.70	0.222 [1] ✔
T6	80 - 60	L2 1/2x2 1/2x3/8	15.89	7.83	126.4	1.1217	6980.45	54683.80	0.128 [1] ✔
T7	60 - 40	L3x3x3/8	19.15	9.49	126.3	1.3716	8494.68	66863.70	0.127 [1] ✔
T8	40 - 20	L3x3x3/8	20.03	9.87	131.3	1.3716	9234.63	66863.70	0.138 [1] ✔
T9	20 - 0	L3 1/2x3 1/2x3/8	22.66	11.18	126.7	1.6491	10472.90	80391.80	0.130 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	80 - 60	L2 1/2x2 1/2x1/4	14.41	13.80	219.1	0.7519	3038.94	32706.60	0.093 [1] ✔
T7	60 - 40	L3x3x1/4	16.31	15.61	204.5	0.9394	3568.69	40862.80	0.087 [1] ✔
T9	20 - 0	L3 1/2x3 1/2x1/4	20.34	19.55	217.8	1.1269	4744.15	49019.10	0.097 [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	170 - 160	L1 1/2x1 1/2x1/8	4.56	4.11	111.5	0.2109	629.60	9175.78	0.069 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	4.56	4.11	113.5	0.3076	3.26	13381.30	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	170 - 160	Leg	ROHN 2.5 STD	3	-12272.80	67311.90	18.2	Pass
T2	160 - 140	Leg	ROHN 2.5 STD	25	-48644.40	63519.00	76.6	Pass
T3	140 - 120	Leg	ROHN 3 STD	61	-79074.90	82507.40	95.8	Pass
T4	120 - 100	Leg	ROHN 3 1/2 X-STR	88	-109735.00	132208.00	83.0	Pass
T5	100 - 80	Leg	ROHN 4 X-STR	109	-142713.00	159914.00	89.2	Pass
T6	80 - 60	Leg	ROHN 4 X-STR	130	-175214.00	187390.00	93.5	Pass
T7	60 - 40	Leg	ROHN 5 X-STR	160	-205761.00	253002.00	81.3	Pass
T8	40 - 20	Leg	ROHN 6 EHS	181	-240503.00	244063.00	98.5	Pass
T9	20 - 0	Leg	ROHN 6 EHS	196	-284585.00	285742.00	99.6	Pass
T1	170 - 160	Diagonal	L1 1/2x1 1/2x1/8	11	-4002.87	6876.95	58.2	Pass
							85.6 (b)	
T2	160 - 140	Diagonal	L1 1/2x1 1/2x3/16	36	-3510.74	5352.05	65.6	Pass
T3	140 - 120	Diagonal	L1 3/4x1 3/4x3/16	69	-4087.89	5080.52	80.5	Pass
T4	120 - 100	Diagonal	L2 1/2x2 1/2x3/16	96	-5918.41	9466.52	62.5	Pass
							81.7 (b)	
T5	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	117	-6727.18	7306.84	92.1	Pass
T6	80 - 60	Diagonal	L2 1/2x2 1/2x3/8	138	-7801.11	10510.50	74.2	Pass
							98.1 (b)	
T7	60 - 40	Diagonal	L3x3x3/8	168	-9609.63	12668.10	75.9	Pass
							77.3 (b)	
T8	40 - 20	Diagonal	L3x3x3/8	189	-10239.00	10750.20	95.2	Pass
T9	20 - 0	Diagonal	L3 1/2x3 1/2x3/8	204	-12149.60	14688.90	82.7	Pass
							97.8 (b)	
T6	80 - 60	Secondary Horizontal	L2 1/2x2 1/2x1/4	139	-3038.94	5798.32	52.4	Pass
T7	60 - 40	Secondary Horizontal	L3x3x1/4	169	-3568.69	8018.34	44.5	Pass
T9	20 - 0	Secondary Horizontal	L3 1/2x3 1/2x1/4	205	-4744.15	8244.15	57.5	Pass
T1	170 - 160	Top Girt	L1 1/2x1 1/2x1/8	5	-633.13	2925.06	21.6	Pass
T2	160 - 140	Top Girt	L1 1/2x1 1/2x3/16	28	-33.43	4210.39	0.8	Pass
							Summary	
						Leg (T9)	99.6	Pass
						Diagonal (T8)	95.2	Pass
						Secondary Horizontal (T9)	57.5	Pass
						Top Girt (T1)	21.6	Pass
						Bolt Checks	98.1	Pass
						RATING =	**99.6**	**Pass**

Program Version 8.0.1.0 - 2/8/2018 File://files.fullertonengineering.com/PDrive/Dept 400/SMLINK/SMLINK-ATT-NEWEN 4/CTL01083/Structural/Structural Analysis/R1- 04.24.2018/Analysis/tnxTower/CTL01083_R1.eri

Self Support Tower Anchor Rod Check

Anchor Rods are (6) 1"ϕ ASTM A354 Gr. BC (1/4 to 2-1/2 incl.) Bolts

$Pu := 283.178 \cdot kip$ *Max Tension force for Detail type A,B, or C Connections*

$Vu := 32.586 \cdot kip$ *Shear force Corresponfing to Max Tension or Compression Force*

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

$Dbolt := 1 \cdot in$ *Diameter of Anchor Bolt*

$Nbolt := 6$ *Number of Anchor Bolts*

$\eta := 0.55$ *η is dependent on Anchor Rod Detail Type per Figure 4-4 TIA Rev.G*

$Anet := 0.75 \cdot \left(\frac{\pi}{4}\right) \cdot (Dbolt)^2$ $Anet = 0.59 \cdot in^2$ *Net Area of Bolt taken as 0.75 x unthreaded Area*

$Rnt := Fub \cdot Anet$ $Rnt = 73.6 \cdot kip$ *Nominal Tensile Strength of Anchor Rod per Section 4.9.6.1*

$$StressRatio := \frac{\left(Pu + \frac{Vu}{\eta}\right)}{Nbolt} \Big/ 0.8 \cdot Rnt$$ *Interaction Equation*

$StressRatio = 96.9 \cdot \%$ *<100%. Okay.*

$AncorBoltsCheck = \text{"Anchor Bolts are adequate"}$

Section II

Foundation Analysis

Foundation Calculations: Drilled Pier

(all foundation and geotechnical data has been based on Structural Analysis Report by Centek, job No.16071.83, dated 01/09/2017.)

Geotechnical and Material data:

$\gamma_{conc} := 150 \cdot pcf$ — *Unit Weight of Concrete*

$\gamma_{H20} := 62.4 \cdot pcf$ — *Unit Weight of Water*

$\gamma_{H20\_conc} := \gamma_{conc} - \gamma_{H20}$ $\gamma_{H20\_conc} = 87.6 \cdot pcf$ — *Unit Weight of Submerged Concrete*

$\gamma_{soil} := 120 \cdot pcf$ — *Unit Weight of Soil*

$\gamma_{H20\_soil} := \gamma_{soil} - \gamma_{H20}$ $\gamma_{H20\_soil} = 57.6 \cdot pcf$ — *Unit Weight of Submerged Soil*

$Dfrost := 4 \cdot ft$ — *Frost Depth ignored for skin friction, in ft*

$Skin_{fric\_UPLIFT} := 580 \cdot psf$ — *Ultimate Skin Friction (Uplift)*

$Skin_{fric\_COMPR} := 580 \cdot psf$ — *Ultimate Skin Friction (Compression)*

$Bearingtip := 6 \cdot ksf$ — *Ultimate Soil Bearing Capacity*

Foundation dimensions and properties:

$L := 45.5 \cdot ft$ — *Total length of pier*

$p := 6 \cdot in$ $p = 0.5\ ft$ — *Projection above grade*

$OD_{pier} := 7.5 \cdot ft$ — *Diameter of top foundation*

$D := L - p$ $D = 45\ ft$ — *Depth of foundation*

$D_{H20} := 4 \cdot ft$ — *Water depth*

$A := \frac{\pi \cdot OD_{pier}^{2}}{4}$ $A = 44.18\ ft^2$ — *Area of foundation*

$P_1 := \pi \cdot OD_{pier}$ $P_1 = 23.56\ ft$ — *Circumference of top foundation*

$$Wt_{conc} := \begin{cases} A \cdot L \cdot \gamma_{conc} & \text{if } D_{H20} > D \\ \left[A \cdot \left(p + D_{H20}\right)\right] \cdot \gamma_{conc} + \left[A \cdot \left(D - D_{H20}\right)\right] \cdot \gamma_{H20\_conc} & \text{otherwise} \end{cases}$$

$Wt_{conc} = 188.49 \cdot kip$ — *Weight of concrete*

Factored Leg Reactions (based on tnxTower calculations):

$C := 283.178 \cdot kip$ — *Factored Axial reaction*

$T := -247.064 \cdot kip$ — *Factored Uplift reaction*

$V := 32.586 \cdot kip$ — *Factored Shear reaction*

Uplift Check

Required Uplift Strength

$|T| = 247.06 \cdot kip$ *Required Uplift Strength (LRFD)*

Design Uplift Strength:

Boundary 1 *Boundary 2* *Ultimate Skin Friction (Uplift)* *Circumference*

$D_A := \begin{pmatrix} 0 \\ 4 \end{pmatrix} ft$ $D_B := \begin{pmatrix} 4 \\ 45 \end{pmatrix} ft$ $Skin_{fric\_UPLIFT} := \begin{pmatrix} 0 \\ 580 \end{pmatrix} psf$ $P_{found} := \begin{pmatrix} P_1 \\ P_1 \end{pmatrix}$

$N_{SF} := 2$ *number of skin friction groups*

$S_{f\_UPLIFT} := \sum_{i=1}^{N_{SF}} \left[\left(D_{B_i} - D_{A_i} \right) \cdot \left(Skin_{fric\_UPLIFT} \right)_i \cdot P_{found_i} \right] = 560.3 \cdot kip$ *Nominal Skin Friction Strength in Uplift*

$U_N := 0.9 \cdot Wt_{conc} + S_{f\_UPLIFT}$ $U_N = 729.95 \cdot kip$ *Total Nominal Uplift Resistance (including weight of concrete)*

$\phi := 0.75$ *Resistance factor for uplift*

$U_U := \phi \cdot U_N = 547.46 \cdot kip$ *Design Uplift Strength*

$\frac{|T|}{U_U} = 45.13 \cdot \%$ *<100%. OK*

UpliftCheck = "Foundation is sufficient for uplift"

Bearing (Axial Compression) Check

Required bearing strength:

$Download := C + 1.2Wt_{conc}$ $Download = 509.37 \cdot kip$ *Total designed factored Axial Compression Force (including weight of concrete foundation)*

Design Bearing Strength:

Boundary 1 *Boundary 2* *Ultimate Skin Friction (Compression)* *Circumference*

$D_A := \begin{pmatrix} 0 \\ 4 \end{pmatrix} ft$ $D_B := \begin{pmatrix} 4 \\ 45 \end{pmatrix} ft$ $Skin_{fric\_COMPR} := \begin{pmatrix} 0 \\ 580 \end{pmatrix} psf$ $P_{found} := \begin{pmatrix} P_1 \\ P_1 \end{pmatrix}$

$N_{SF} := 2$ *number of skin friction groups*

$S_{f\_COMPR} := \sum_{i=1}^{N_{SF}} \left[\left(D_{B_i} - D_{A_i} \right) \cdot \left(Skin_{fric\_COMPR} \right)_i \cdot P_{found_i} \right] = 560.3 \cdot kip$ *Nominal Skin Friction Strength in Compression*

$Capacity_N := S_{f\_COMPR} + Bearingtip \cdot A$ $Capacity_N = 825.37 \cdot kip$ *Total Nominal Bearing Resistance*

$\phi := 0.75$ *Resistance factor for bearing*

$Capacity_U := \phi \cdot Capacity_N = 619.03 \cdot kip$ *Design Bearing Strength*

$\frac{Download}{Capacity_U} = 82.28 \cdot \%$ *<100%. OK*

DownloadCheck = "Foundation is adequte to support axial compression."

at&t

PROJECT:	LTE 4C/5C/6C/RETROFIT
SITE NUMBER:	CTL01083
FA NUMBER:	10035111
PTN NUMBER:	2051A0ACL6/2051A0DAXS/2051A0DB1A
PACE NUMBER:	MRCTB022337/MRCTB025618/MRCTB025635
SITE NAME:	GLASTONBURY PD
SITE ADDRESS:	2108 MAIN STREET GLASTONBURY, CT 06033

PROJECT INFORMATION

SITE NAME:	GLASTONBURY PD
SITE NUMBER:	CTL01083
SITE ADDRESS:	2108 MAIN STREET GLASTONBURY, CT 06033
FA NUMBER:	10035111
PTN NUMBER:	2051A0ACL6/2051A0DAXS/2051A0DB1A
PACE NUMBER:	MRCTB022337/MRCTB025618/MRCTB025635
USID NUMBER:	59372
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
OWNER:	TOWN OF GLASTONBURY
JURISDICTION:	HARTFORD COUNTY
COUNTY:	HARTFORD
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.7062139°
LONGITUDE:	-72.6069161°
GROUND ELEV.:	50'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	DEEPAK RATHORE
PHONE:	(860) 965-3068
EMAIL:	dr701e@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	EDWARD WEISSMAN (917) 528-1857
EMAIL:	Edward.Weissman@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

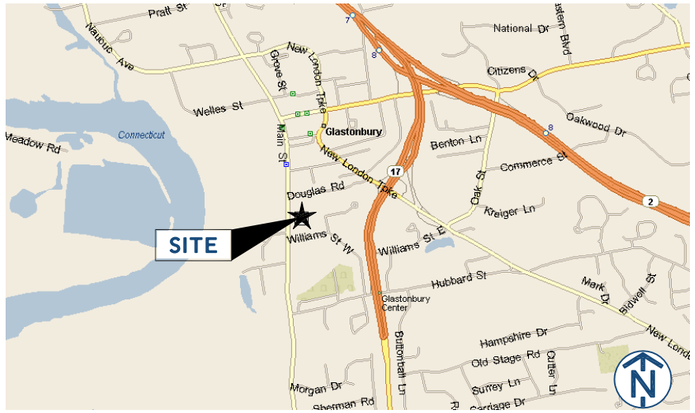
SCOPE OF WORK

LTE 850 WILL BE 4C/5C/6C AT THE SITE WITH BRONZE CONFIGURATION.
PROPOSED 4C/5C/6C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1717851, VERSION 2.00 LAST UPDATED 09/19/17.

- (3) NEW ANTENNAS
- (3) NEW RRUS-32 B2 UNITS
- (3) NEW RRUS-32 B66 UNITS
- (3) NEW RRUS-12 UNITS
- (3) NEW RRUS-B14 4478 UNITS
- (1) NEW RAYCAP UNIT
- (2) DC POWER CABLES
- ADD 2ND 5216 & ADD 2ND XMU

- 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



NO SCALE

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

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	11/02/17	90% REVIEW	EB
1	12/11/17	FOR PERMIT	EB
2	04/24/18	TOWER MODIFICATION	AD

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.

SITE NAME
GLASTONBURY PD

SITE NUMBER:
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

PROJECT# 2017.0278.0008

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. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

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GLASTONBURY PD

SITE NUMBER:
CTL01083

SITE ADDRESS
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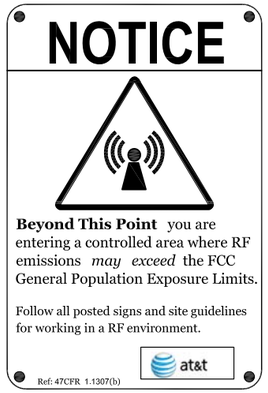
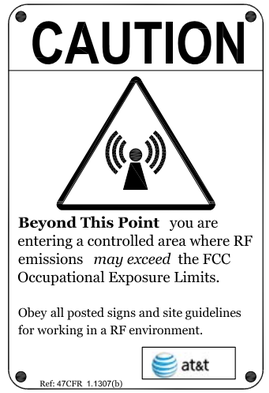
GLASTONBURY, CT 06033

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

PROJECT# 2017.0278.0008

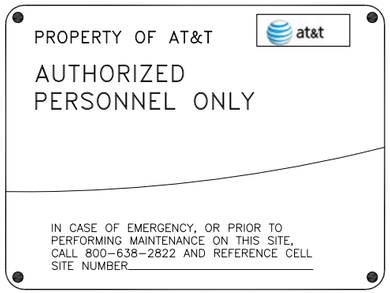




ALERTING SIGNS

ALERTING SIGN

INFO SIGN #4



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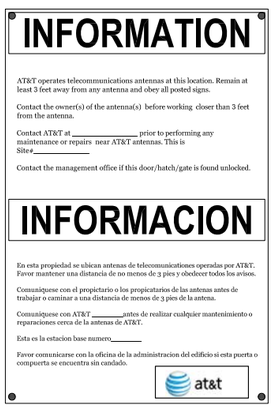

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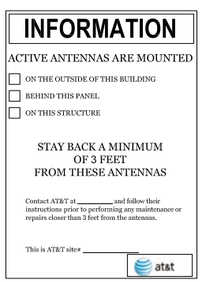

INFO SIGN #2

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						EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X			
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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NOTES AND SPECIFICATIONS

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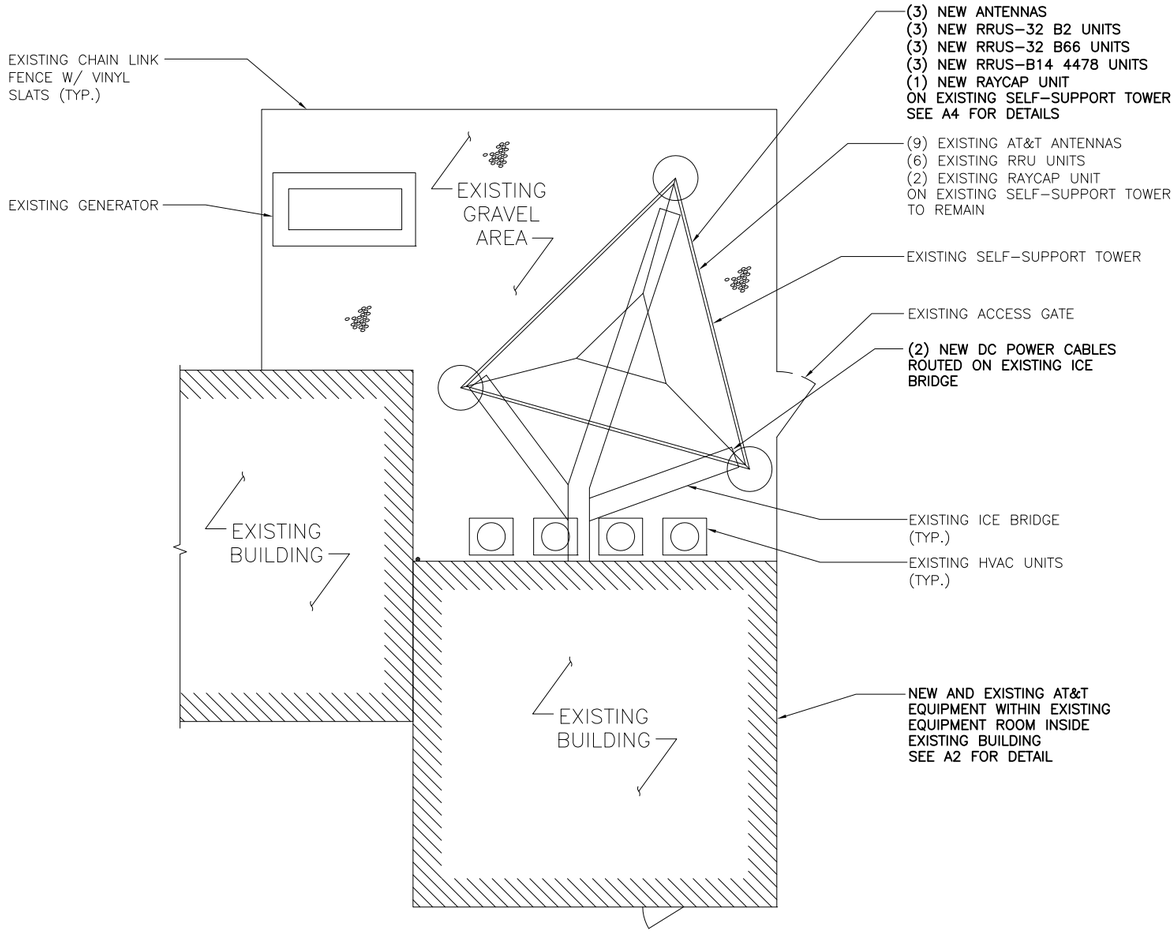
ABBREVIATIONS

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 (A / S-1 / A)



COMPOUND PLAN — SCALE: 3/32" = 1'-0" — 1

SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 2 — SCALE: N.T.S. — 3

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COMPOUND PLAN

SHEET NUMBER
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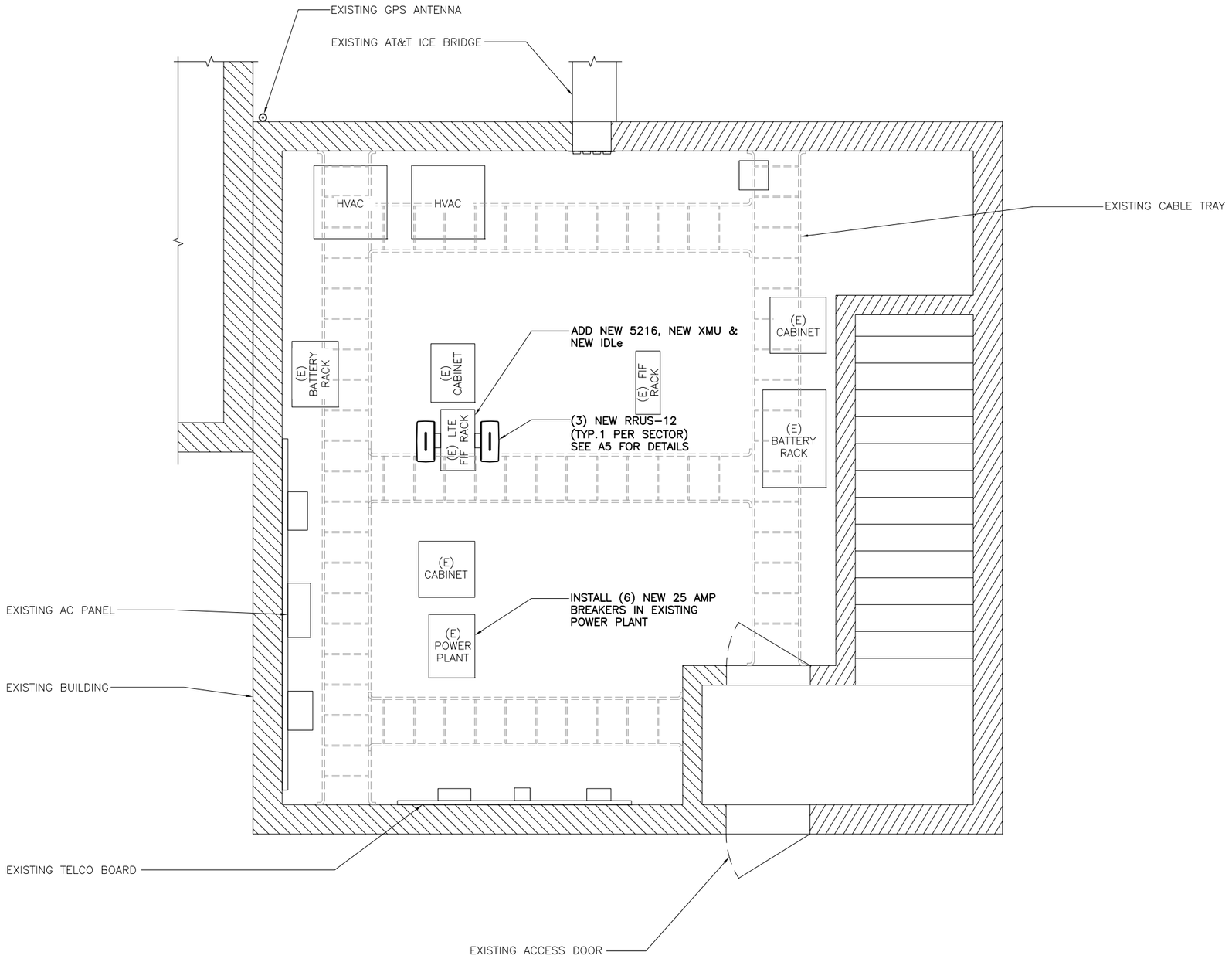
PROJECT# 2017.0278.0008



EQUIPMENT PLAN

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

1

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

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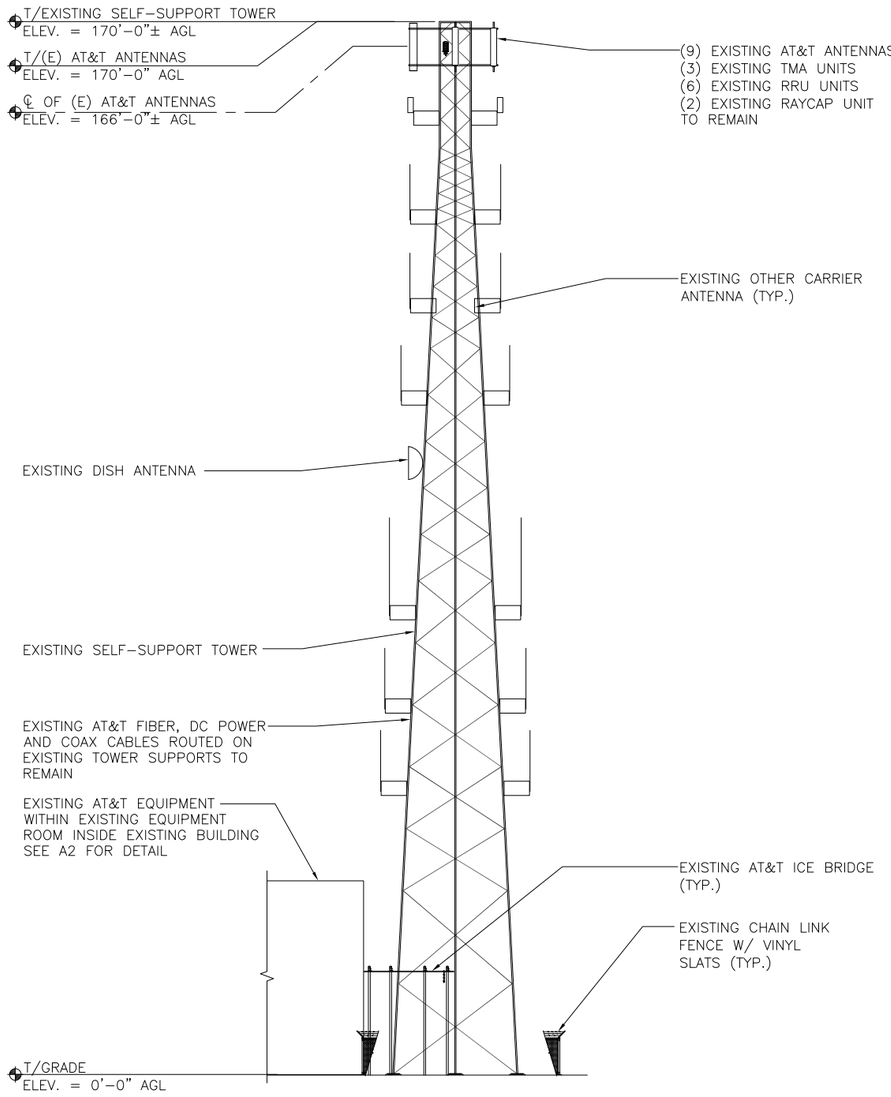
SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

PROJECT# 2017.0278.0008

NOTES:

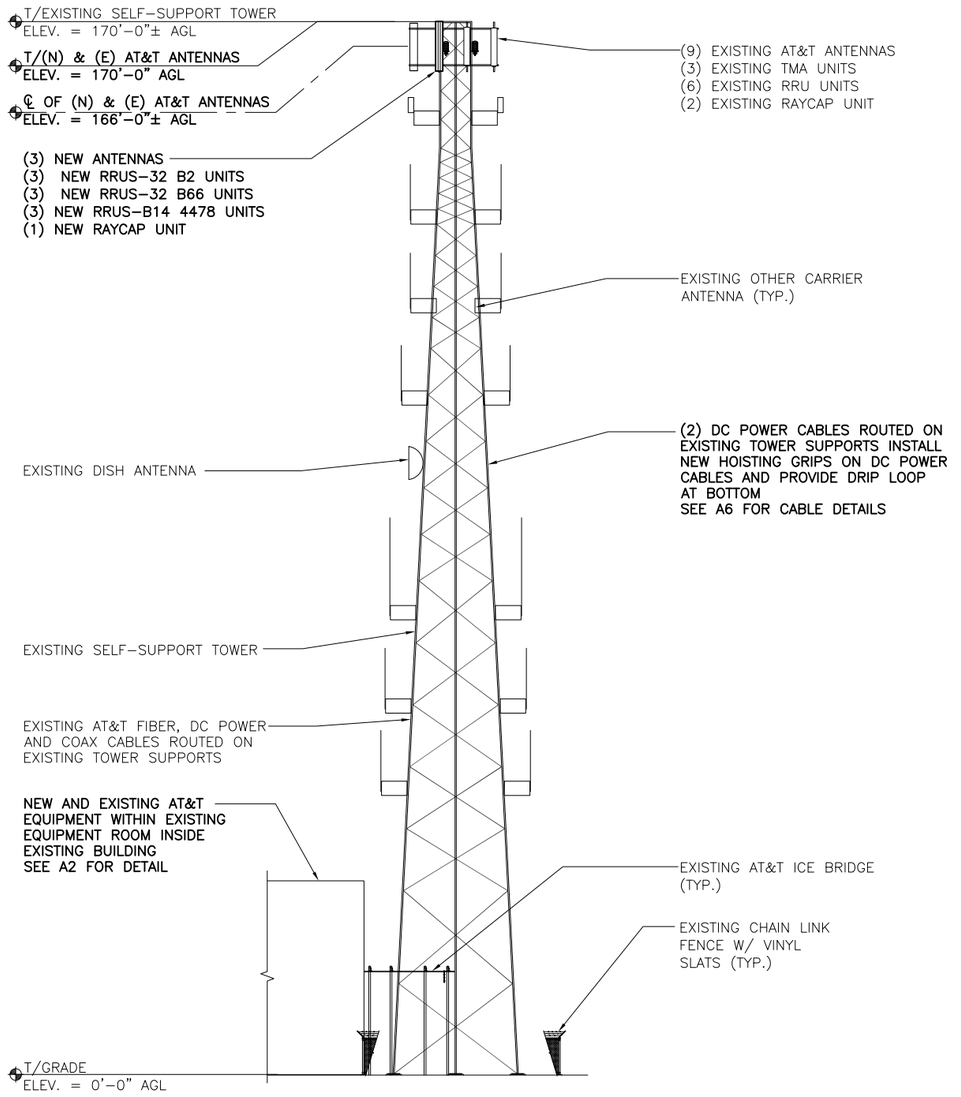
1. CALCULATIONS FOR THE STRUCTURE AND ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION — SCALE: 1/32" = 1'-0" — 1

NOTES:

1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC



NEW ELEVATION — SCALE: 1/32" = 1'-0" — 2

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

SITE NAME
GLASTONBURY PD

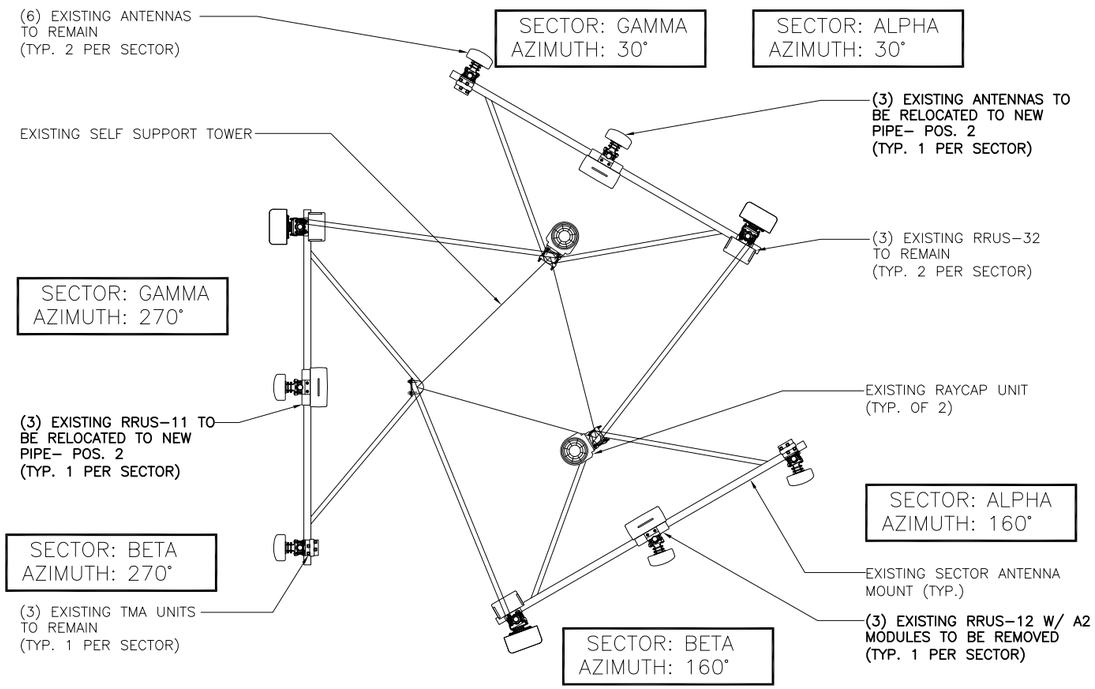
SITE NUMBER:
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
ELEVATIONS

SHEET NUMBER
A3

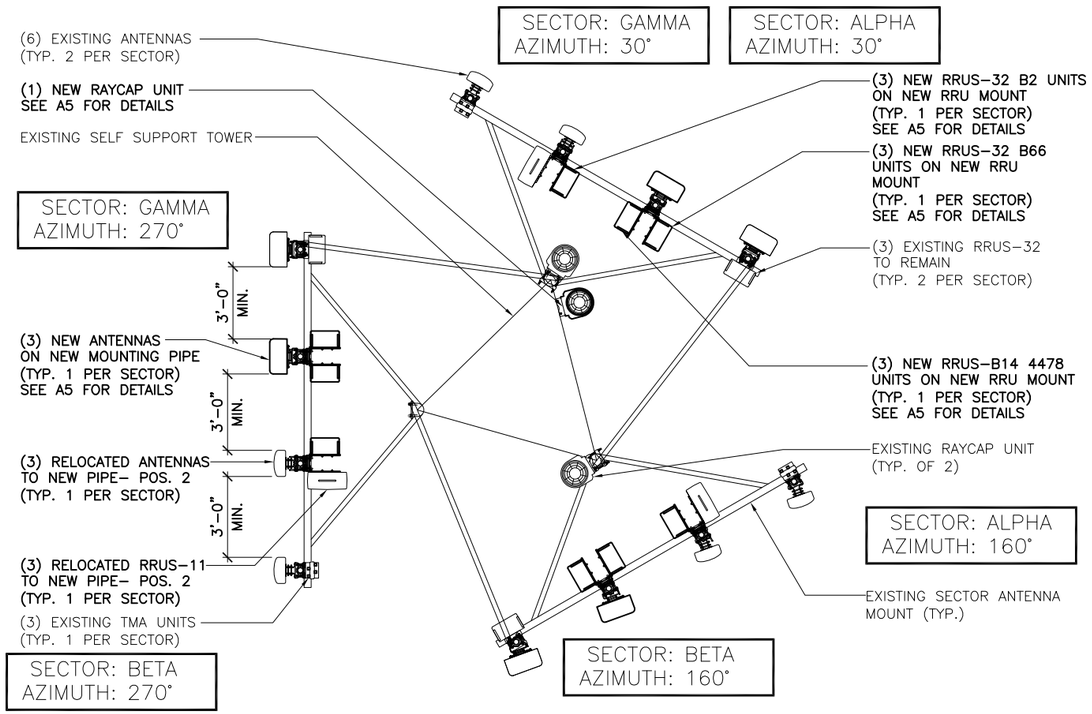
PROJECT# 2017.0278.0008



EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'–0" | 1

NOTES:
1. EXISTING ANTENNA MOUNTING PIPE TO BE REUSED, RELOCATED OR REPLACED AS REQUIRED
2. IF REQUIRED INSTALL NEW GALV. MOUNTING PIPE(S) 2.5 STD. (2–7/8" O.D.)



NOTES:
1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC

FINAL ANTENNA PLAN

SCALE: 3/16" = 1'–0" | 2

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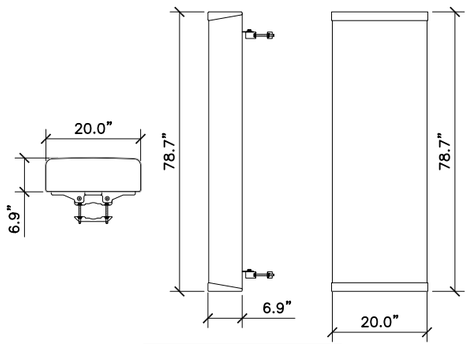
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

PROJECT# 2017.0278.0008



SECTOR 1 & 2

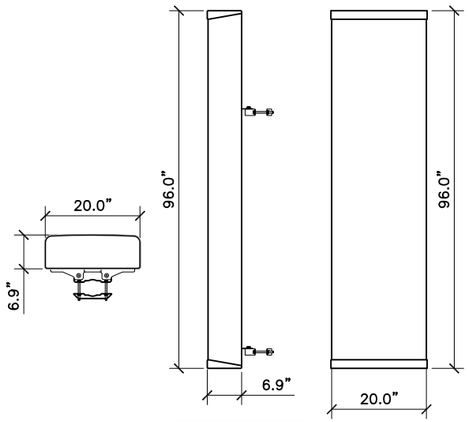
PLAN VIEW SIDE VIEW FRONT VIEW

KATHREIN – 800–10965

8–PORT ANTENNA, DUAL POLARIZATION, HPBW

FREQUENCY RANGE	698–960 MHz 1695–2690 MHz
ANTENNA	108.6 Lbs
BRACKET	9 Lbs
TOTAL WEIGHT	117.6 Lbs

ANTENNA SPEC SCALE: N.T.S. 1



SECTOR 3

PLAN VIEW SIDE VIEW FRONT VIEW

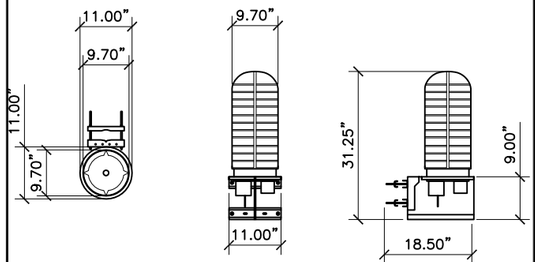
KATHREIN – 800–10966

8–PORT ANTENNA, DUAL POLARIZATION, HPBW

FREQUENCY RANGE	698–960 MHz 1695–2690 MHz
ANTENNA	114.6 Lbs
BRACKET	11.1 Lbs
TOTAL WEIGHT	125.7 Lbs

ANTENNA SPEC SCALE: N.T.S. 2

NOMINAL OPERATING VOLTAGE:	48 VDC
NOMINAL DISCHARGE CURRENT:	20 kA 8/20ms
MAXIMUM DISCHARGE CURRENT:	60 kA 8/20ms
MAXIMUM CONTINUOUS OPERATING VOLTAGE:	75 VDC
VOLTAGE PROTECTION RATING:	400 V
WIND LOADING:	150 MPH SUSTAINED (105.7 lbs) 195 MPH GUST (213.6 lbs)



PLAN VIEW FRONT VIEW SIDE VIEW

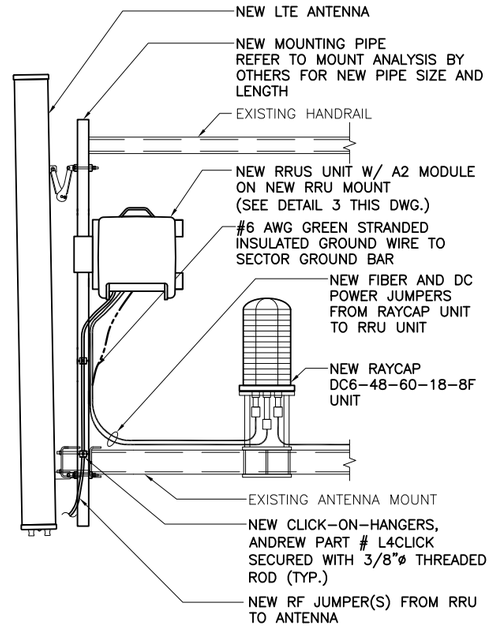
RAYCAP – DC6–48–60–0–8F

TOWER DC OVER VOLTAGE PROTECTION POWER CONNECTION SOLUTION

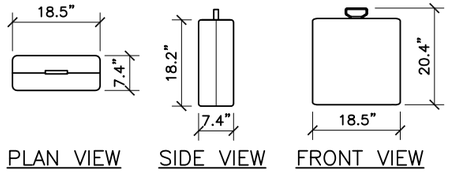
UNIT WEIGHT 32.8 Lbs

CONTRACTOR TO USE "THREAD LUBRICANT" ON MOUNTING BOLTS DURING INSTALLATION ON EXISTING STRUCTURAL MEMBER

RAYCAP SPEC SCALE: N.T.S. 3



ANTENNA SCHEMATIC SCALE: N.T.S. 4



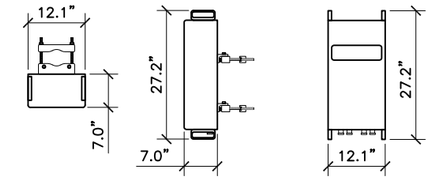
PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 12

WITH SOLAR SHIELD

UNIT WEIGHT 52.2 Lbs

RRU SPEC SCALE: N.T.S. 5

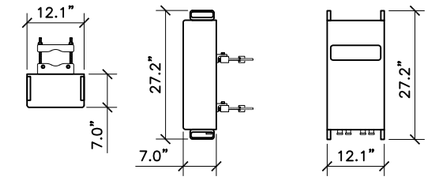


PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 32 B2

UNIT WEIGHT 53 Lbs

RRU SPEC SCALE: N.T.S. 6

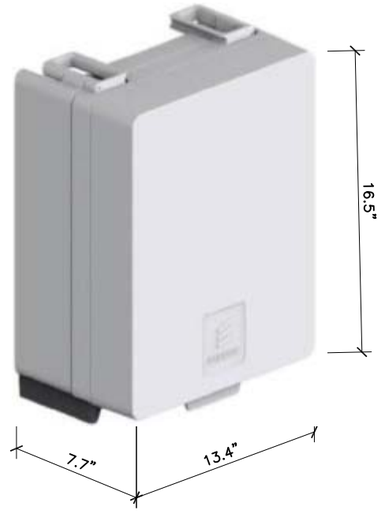


PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 32 B66

UNIT WEIGHT 53 Lbs

RRU SPEC SCALE: N.T.S. 7



ERICSSON – RRUS 4478 B14

FREQUENCY RANGE	TX 758–768 MHz RX 788–798 MHz
TOTAL WEIGHT	59.9 Lbs

RRU SPEC SCALE: N.T.S. 8

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GLASTONBURY, CT 06033

SHEET NAME

EQUIPMENT DETAILS

SHEET NUMBER

A5

PROJECT# 2017.0278.0008

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (09/19/17)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT (BY ANTENNAS)	TMA/RRU UNIT (BY EQUIPMENT)	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A–1	(E) UMTS ANTENNA	800–10121	KATHRIEN	(1) EXISTING TMA UNIT	–	160°	166'–0"	1–5/8"ø LDF7–50A	230'–0"	(2) (E) DC6–48–60–18–8F UNIT **(1) (N) DC6–48–60–0–8F UNIT**
									1–5/8"ø LDF7–50A	230'–0"	
	A–2	(E) LTE1C/2C ANTENNA	OPA–65R–LCUU–H6	CCI	(1) EXISTING RRUS–11 UNIT **(1) NEW RRUS–32 B2 UNIT**	–	30°	166'–0"	(1) EXISTING FIBER CABLE	230'–0"	
									(2) EXISTING DC POWER CABLES	230'–0"	
	A–3	**(N) LTE4C/5C ANTENNA**	**800–10965**	**KATHREIN**	**(1) NEW RRUS–32 B66 UNIT** **(1) NEW RRUS–B14 UNIT**	–	**30°**	**166'–0"**	(1) EXISTING FIBER & EXISTING DC POWER CABLES	230'–0"	
									(2) NEW DC POWER CABLES	**230'–0"**	
	A–4	(E) LTE3C & **(N) 6C ANTENNA**	OPA–65R–LCUU–H6	CCI	(1) EXISTING RRUS–32 UNIT	**(1) NEW RRUS–12 UNIT**	30°	166'–0"	1–5/8"ø LDF7–50A	230'–0"	
									1–5/8"ø LDF7–50A	230'–0"	
BETA	B–1	(E) UMTS ANTENNA	800–10121	KATHRIEN	(1) EXISTING TMA UNIT	–	270°	166'–0"	1–5/8"ø LDF7–50A	230'–0"	
									1–5/8"ø LDF7–50A	230'–0"	
	B–2	(E) LTE1C/2C ANTENNA	OPA–65R–LCUU–H6	CCI	(1) EXISTING RRUS–11 UNIT **(1) NEW RRUS–32 B2 UNIT**	–	160°	166'–0"	**SEE ANTENNA A–2 FOR CABLE TYPE AND LENGTH**		
	B–3	**(N) LTE4C/5C ANTENNA**	**800–10965**	**KATHREIN**	**(1) NEW RRUS–32 B66 UNIT** **(1) NEW RRUS–B14 UNIT**	–	**160°**	**166'–0"**	**SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH**		
	B–4	(E) LTE3C & **(N) 6C ANTENNA**	OPA–65R–LCUU–H6	CCI	(1) EXISTING RRUS–32 UNIT	**(1) NEW RRUS–12 UNIT**	160°	166'–0"	1–5/8"ø LDF7–50A	230'–0"	
									1–5/8"ø LDF7–50A	230'–0"	
GAMMA	C–1	(E) UMTS ANTENNA	800–10121	KATHRIEN	(1) EXISTING TMA UNIT	–	30°	166'–0"	1–5/8"ø LDF7–50A	230'–0"	
									1–5/8"ø LDF7–50A	230'–0"	
	C–2	(E) LTE1C/2C ANTENNA	OPA–65R–LCUU–H6	CCI	(1) EXISTING RRUS–11 UNIT **(1) NEW RRUS–32 B2 UNIT**	–	270°	166'–0"	**SEE ANTENNA A–2 FOR CABLE TYPE AND LENGTH**		
	C–3	**(N) LTE4C/5C ANTENNA**	**800–10966**	**KATHREIN**	**(1) NEW RRUS–32 B66 UNIT** **(1) NEW RRUS–B14 UNIT**	–	**270°**	**166'–0"**	**SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH**		
	C–4	(E) LTE3C & **(N) 6C ANTENNA**	OPA–65R–LCUU–H6	CCI	(1) EXISTING RRUS–32 UNIT	**(1) NEW RRUS–12 UNIT**	270°	166'–0"	1–5/8"ø LDF7–50A	230'–0"	
									1–5/8"ø LDF7–50A	230'–0"	

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

SITE NAME
GLASTONBURY PD

SITE NUMBER:
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

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.

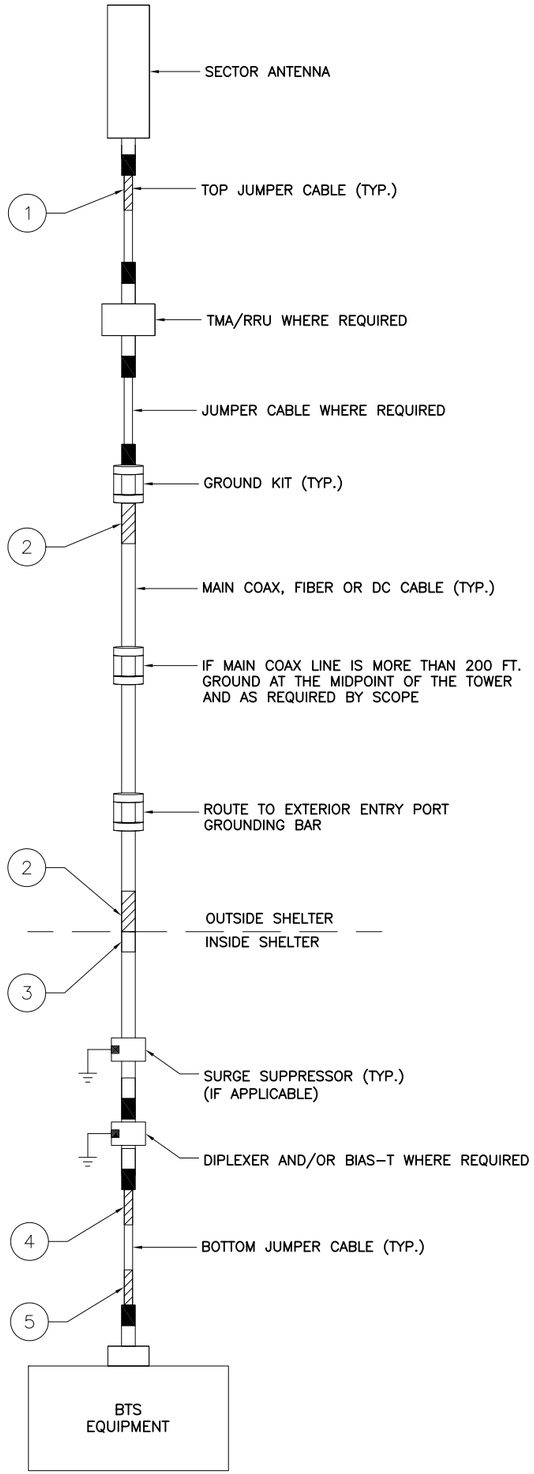
CABLE MARKING DIAGRAM

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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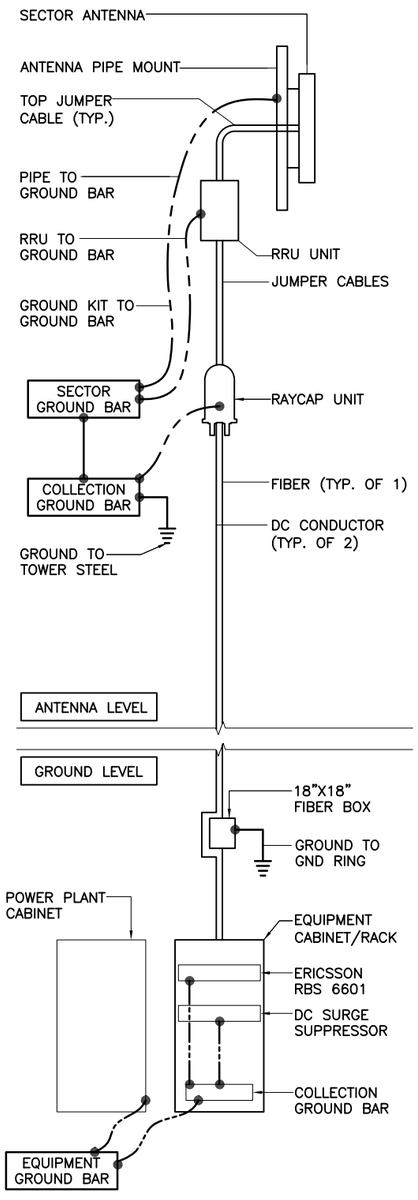
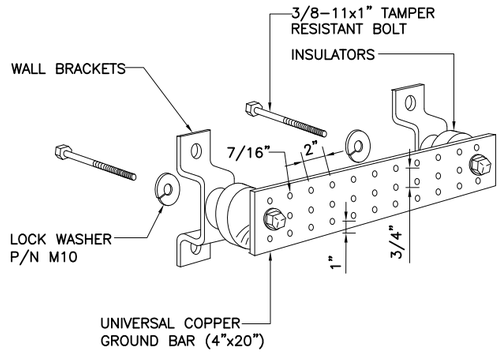
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

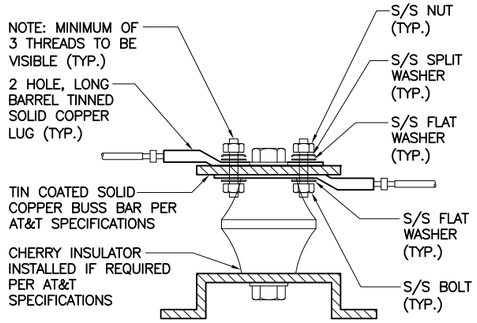
PROJECT# 2017.0278.0008



GROUNDING SCHEMATIC SCALE: N.T.S. 1



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

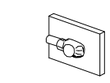


NOTES:

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

Type GT
THROUGH CABLE TO TOP OF GROUND ROD.

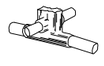


Type VN
HORIZONTAL CABLE TAP TO VERTICAL STEEL SURFACE OR THE SIDE OF HORIZONTAL PIPE

Type VV
THROUGH VERTICAL CABLE TO VERTICAL STEEL SURFACE OR TO THE SIDE OF EITHER HORIZONTAL OR VERTICAL PIPE

Type TA
TEE OF HORIZONTAL RUN AND TAP CABLES.

Type VS
CABLE TAP DOWN AT 45° TO VERTICAL STEEL SURFACE OR SIDE OF HORIZONTAL OR VERTICAL PIPE.



Type XB
CROSS OF HORIZONTAL CABLES. LAPPED AND NOT CUT

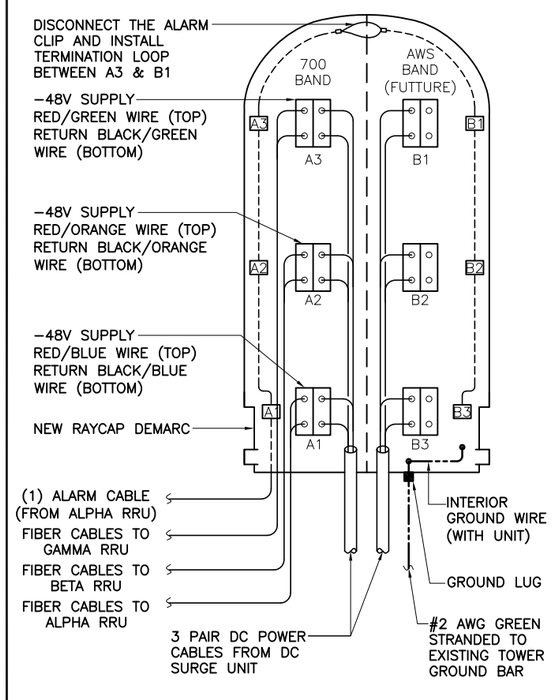
Type GR
CABLE TAP TO TOP OF GROUND ROD

Type HS
HORIZONTAL CABLE TAP TO HORIZONTAL STEEL SURFACE OR PIPE. CABLE OFF SURFACE.

Type GY
THROUGH CABLE TO SIDE OF GROUND ROD

Type NC
THROUGH AND TAP CABLES TO GROUND ROD

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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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.

SITE NAME
GLASTONBURY PD

SITE NUMBER:
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

PROJECT# 2017.0278.0008

APPLICABLE CODES

1. DESIGN, FABRICATION, CONSTRUCTION, AND ERECTION OF ALL WORK SHALL CONFORM TO THE FOLLOWING CODES:
   - CONNECTICUT STATE BUILDING CODE, 2016 EDITION
   - INTERNATIONAL BUILDING CODE, 2012 EDITION
   - ANSI/TIA–222–G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES
   - ANSI/TIA–1019–A STANDARD FOR INSTALLATION, ALTERATIONS AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   - ANSI/AISC 360–05 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

MANDATORY SUBMITTALS AND INSPECTIONS

1. THE FOLLOWING PRE CONSTRUCTION ITEMS SHALL BE SUBMITTED BY THE CONTRACTOR FOR REVIEW AND APPROVAL TO THE ENGINEER OF RECORD PRIOR TO ORDERING OR FABRICATION OF ANY MATERIAL:
   - SHOP DRAWINGS FOR:
   - STRUCTURAL STEEL
2. INTERNATIONAL BUILDING CODE CHAPTER 17 "SPECIAL INSPECTIONS AND TESTS", SECTION 1704 IS REQUIRED TO BE PERFORMED BY AN INDEPENDENT TESTING AGENCY EMPLOYED BY THE PROJECT MANAGER FOR THE FOLLOWING:
   - STEEL INSTALLATION / HIGH STRENGTH BOLTS
3. THE CONTRACTOR SHALL COORDINATE A FINAL INSPECTION WITH THE PROJECT MANAGER AFTER 100% COMPLETION OF THE INSTALLATION.

GENERAL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ALL LAWS, REGULATIONS, AND RULES SET FORTH BY FEDERAL, STATE, AND LOCAL AUTHORITIES WITH JURISDICTION OVER THE PROJECT. THIS RESPONSIBILITY IS IN EFFECT REGARDLESS OF WHETHER THE LAW, ORDINANCE, REGULATION, OR RULE IS MENTIONED IN THESE SPECIFICATIONS.
2. ALL WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS, PROJECT SPECIFICATIONS, AND THE CONSTRUCTION CONTRACT DOCUMENTS.
3. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND STATE LAW AS DEFINED IN THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.
5. THE CONTRACTOR SHALL HAVE AND MAINTAIN A VALID CONTRACTOR'S LICENSE FOR THE LOCATION IN WHICH THE WORK IS TO BE PERFORMED. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTOR PERFORMING THOSE TRADES SHALL BE LICENSED.
6. THE CONTRACTOR SHALL PROVIDE THE NECESSARY CERTIFICATIONS OF ALL WORKERS ON THE TOWER TO THE OWNER OR THE PROJECT MANAGER UPON REQUEST.
7. THE CONTRACTOR SHALL BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY AND THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED.
8. PRIOR TO THE SUBMISSION OF THE BID, THE CONTRACTOR SHALL VISIT THE JOB SITE, VERIFY ALL DIMENSIONS, POTENTIAL SAFETY HAZARDS, AND BECOME FAMILIAR WITH THE FIELD CONDITIONS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER.
9. DO NOT SCALE DRAWINGS. USE DIMENSIONS.
10. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE NOTED.
11. ALL MATERIALS SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE PROJECT MANAGER AND THE ENGINEER OF RECORD PRIOR TO PROCUREMENT.
12. ALL MEANS AND METHODS OF CONSTRUCTION DEALING WITH TOWER CONSTRUCTION AND SAFETY, STEEL ERECTION, EXCAVATIONS, SCAFFOLDING, FORMWORK, AND WORK IN CONFINED SPACES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
13. THE CONTRACTOR SHALL PROVIDE SUFFICIENT TEMPORARY BRACING AND/OR SHORING OF ALL STRUCTURAL AND NON–STRUCTURAL ELEMENTS DURING CONSTRUCTION UNTIL ALL STRUCTURAL ELEMENTS HAVE BEEN PROPERLY INSTALLED.
14. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT MANAGER IF ANY WIRELESS CARRIER DOWNTIME WILL BE REQUIRED FOR THE PROJECT. DO NOT PERFORM ANY WORK ON THE TOWER UNTIL ALL NECESSARY DOWNTIME HAS BEEN APPROVED.
15. WORK IS TO BE CONTAINED TO THE SITE COMPOUND AREA ONLY. ANY OUTSIDE OR ADJACENT PROPERTY NEEDED FOR ACCESS OR TO COMPLETE THE WORK SHALL BE COORDINATED WITH THE PROJECT MANAGER PRIOR TO CONSTRUCTION.
16. THE CONTRACTOR SHALL COORDINATE SITE ACCESS AND SECURITY WITH THE PROPERTY OWNER AND THE PROJECT MANAGER PRIOR TO CONSTRUCTION.
17. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SITE CONDITIONS AND UPON COMPLETION OF WORK REPAIR BACK TO ORIGINAL CONDITIONS ANY DAMAGE THAT OCCURRED DURING CONSTRUCTION.
18. THE CONTRACTOR SHALL KEEP THE CONSTRUCTION SITE CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. LEAVE PREMISES IN CLEAN CONDITION, SUBJECT TO APPROVAL BY THE PROPERTY OWNER AND THE PROJECT MANAGER.
19. THE CONTRACTOR SHALL PROVIDE ON–SITE TRASH RECEPTACLES FOR COLLECTION OF NON–TOXIC DEBRIS. ALL TRASH SHALL BE COLLECTED ON A DAILY BASIS.
20. ALL TOXIC AND ENVIRONMENTALLY HAZARDOUS SUBSTANCES SHALL BE USED AND DISPOSED OF IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. UNDER NO CIRCUMSTANCES SHALL RINSING OR DUMPING OF THESE SUBSTANCES OCCUR ON–SITE.
21. UNLESS NOTED OTHERWISE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL PERMITS NECESSARY FOR CONSTRUCTION.
22. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS SHALL BE REPORTED TO THE PROJECT MANAGER AND ENGINEER, AND SHALL REQUIRE APPROVAL PRIOR TO PERFORMING ANY REMEDIAL OR CORRECTIVE ACTION.
23. THE PROJECT MANAGER MAY RETAIN THE SERVICES OF A TESTING LABORATORY TO PERFORM QUALITY ASSURANCE TESTING ON VARIOUS PORTIONS OF THE CONTRACTOR'S WORK. WHEN REQUESTED, THE CONTRACTOR SHALL INFORM THE TESTING LABORATORY AND ASSIST THEM IN COMPLETING THE TESTS.
24. THE CONTRACTOR SHALL MAINTAIN AND SUPPLY THE PROJECT MANAGER WITH AS–BUILT PLANS UPON COMPLETION OF THE PROJECT.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS TO BE NEW AND CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE ON THE DRAWINGS:
   - ALL NEW REINFORCING STEEL SHALL BE:
   - A992 (Fy = 50 KSI) ROLLED SECTIONS
   - A500 (Fy = 46 KSI) TUBE SECTIONS
   - A53 GRADE B (Fy = 35 KSI) PIPE SECTIONS
   - A36 (Fy = 36 KSI) PLATES AND ANGLES
   - ALL NEW BOLTS SHALL BE:
   - A325N (Fy = 90 KSI)
2. ALL STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 AND A123, INCLUDING CONNECTION HARDWARE, (BOLTS, WASHERS, NUTS, AND PINS) PLATES, SPACERS AND FILLERS.
3. ALL BOLTS SHALL HAVE LOCK WASHERS OR LOCKING DEVICES. DO NOT RE–USE BOLTS. BOLT THREADS ARE TO BE EXCLUDED FROM THE SHEARING PLANES. USE BEARING TYPE CONNECTIONS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE PRETENSIONED USING THE TURN–OF–THE–NUT METHOD.
4. ALL U–BOLTS SHALL BE A307. ALL BOLTS SHALL BE HOT DIP GALVANIZED AND HAVE LOCK WASHERS OR LOCKING DEVICES. DO NOT RE–USE BOLTS.
5. THE FINISHED DIAMETER OF BOLT HOLES SHALL NOT BE MORE THAN 1/16" LARGER THAN THE NOMINAL BOLT DIAMETER UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED GUSSETS, SPACERS, FILLERS AND BATTEN PLATES.
7. NO HOLES SHALL BE MADE IN ANY NEW OR EXISTING STRUCTURAL STEEL MEMBER OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD.

COLD GALVANIZING

1. THE CONTRACTOR SHALL REPAIR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW STEEL COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE WIRE BRUSHED, CLEARED AND REPAIRED WITH TWO (2) COATS OF ZINC RICH COLD GALVANIZING COMPOUND PER MANUFACTURER'S RECOMMENDATION.
2. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH TWO (2) COATS OF ZINC RICH COLD GALVANIZING COMPOUND AND MANUFACTURER'S RECOMMENDATIONS.

NOTES

SCALE: N.T.S. | 1

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

SITE NAME
GLASTONBURY PD

SITE NUMBER:
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
STRUCTURAL NOTES

SHEET NUMBER
S1

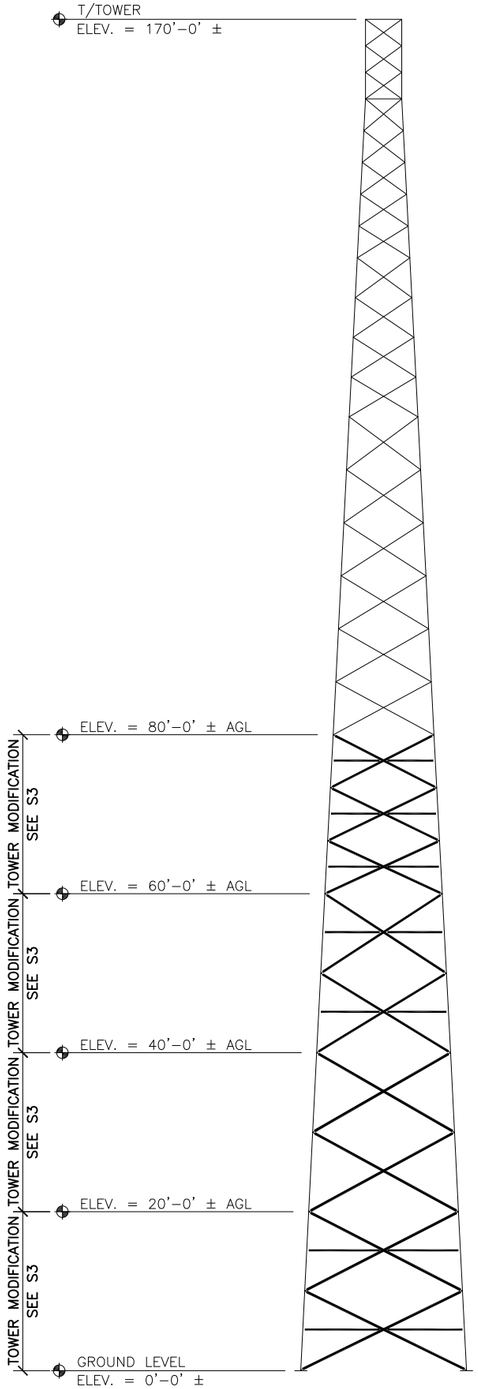
PROJECT# 2017.0278.0008

NOTES:

1. STRUCTURAL CALCULATIONS FOR THE TOWER WERE PREPARED BY FULLERTON ENGINEERING, INC. AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE TOWER STRUCTURE FOR THE ADDITIONAL LOADS. THE CONTRACTOR WILL COORDINATE WITH PROJECT MANAGER TO OBTAIN A COPY.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER OF RECORD PRIOR TO FABRICATION OR THE START OF ANY WORK.
3. ANTENNAS, MOUNTS AND CABLING NOT SHOWN FOR CLARITY.

MANDATORY SUBMITTALS AND INSPECTIONS

1. THE FOLLOWING PRE CONSTRUCTION ITEMS SHALL BE SUBMITTED BY THE CONTRACTOR FOR REVIEW AND APPROVAL TO THE ENGINEER OF RECORD PRIOR TO ORDERING OR FABRICATION OF ANY MATERIAL:
   SHOP DRAWINGS FOR:
   STRUCTURAL STEEL
2. INTERNATIONAL BUILDING CODE CHAPTER 17 "SPECIAL INSPECTIONS AND TESTS", SECTION 1704 IS REQUIRED TO BE PERFORMED BY AN INDEPENDENT TESTING AGENCY EMPLOYED BY THE PROJECT MANAGER FOR THE FOLLOWING:
   STEEL INSTALLATION / HIGH STRENGTH BOLTS
3. THE CONTRACTOR SHALL COORDINATE A FINAL INSPECTION WITH THE PROJECT MANAGER AFTER 100% COMPLETION OF THE INSTALLATION.



TOWER ELEVATION WITH MODIFICATION

SCALE: N.T.S. | 1

TOWER MODIFICATION SCHEDULE

ELEVATION	MEMBER	SHEET NUMBER
60.00' TO 80.00'	SECONDARY HORIZONTAL INSTALLATION	SEE S-3
	TOWER MAIN DIAGONAL REPLACEMENT	SEE S-3
40.00' TO 60.00'	SECONDARY HORIZONTAL INSTALLATION	SEE S-3
	TOWER MAIN DIAGONAL REPLACEMENT	SEE S-3
20.00' TO 40.00'	TOWER MAIN DIAGONAL REPLACEMENT	SEE S-3
0.00' TO 20.00'	SECONDARY HORIZONTAL INSTALLATION	SEE S-3
	TOWER MAIN DIAGONAL REPLACEMENT	SEE S-3

GENERAL NOTES:

PRIOR OF INSTALLING NEW TOWER LEGS REINFORCEMENT CLAMPS, CLIMBING PEGS AND ETC. ALL OBSTACLES THAT STAND IN THE WAY OF NEW LEG REINFORCEMENT. REMOVE/ REPLACE ONLY ONE MEMBER AT THE TIME. ALL FACES AND SIDES OF THE TOWER SHALL BE REINFORCED IDENTICALLY.

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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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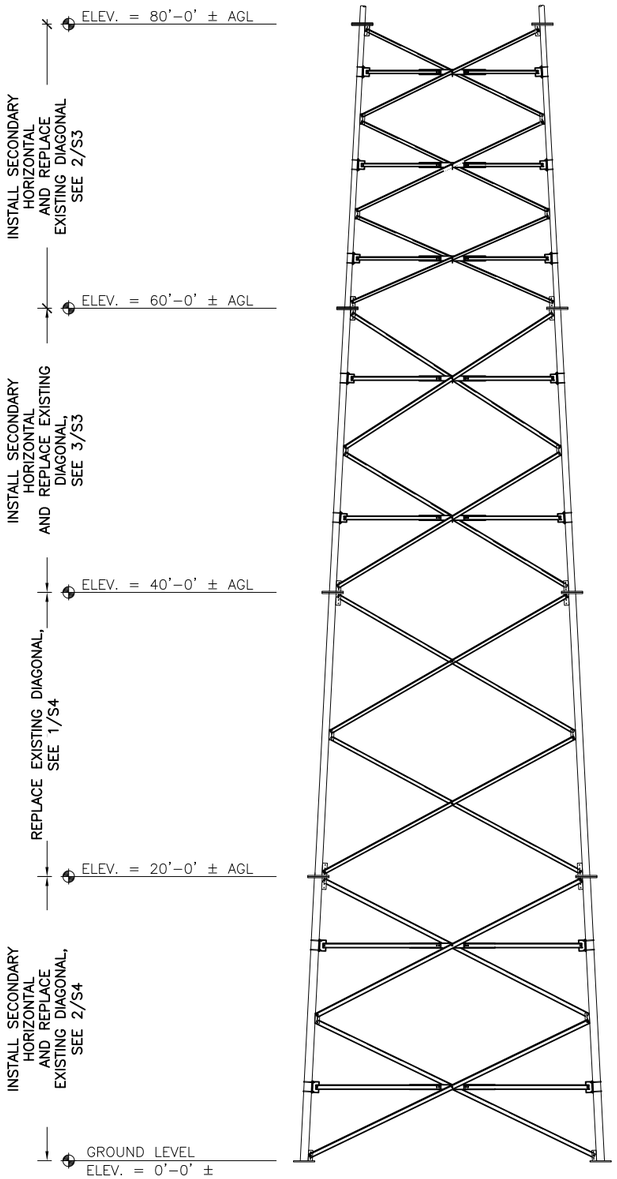
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
MODIFICATION ELEVATION

SHEET NUMBER
S2

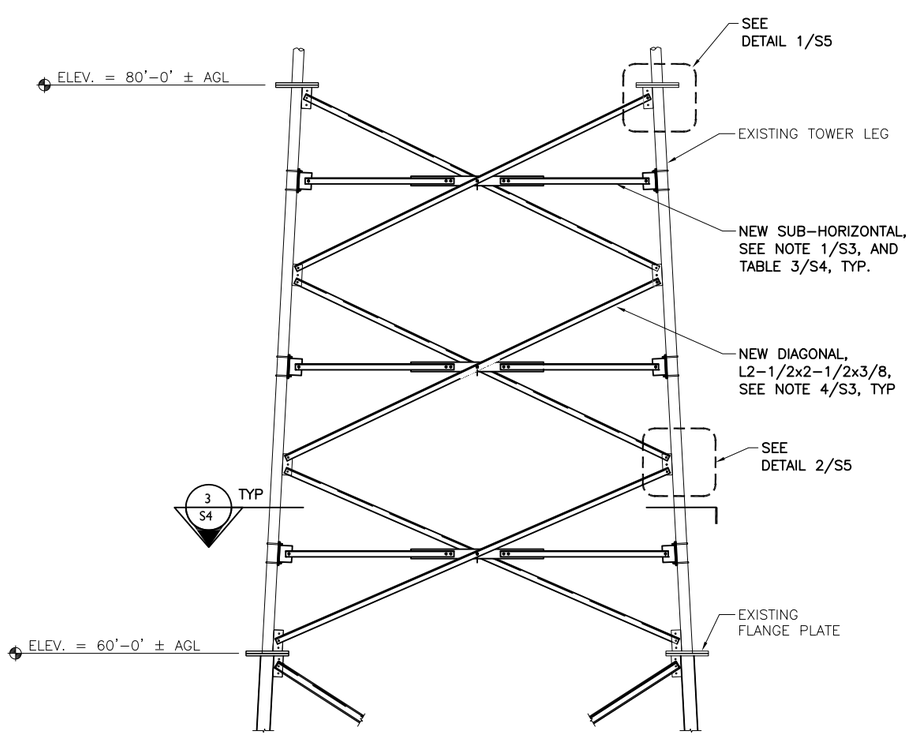
PROJECT# 2017.0278.0008



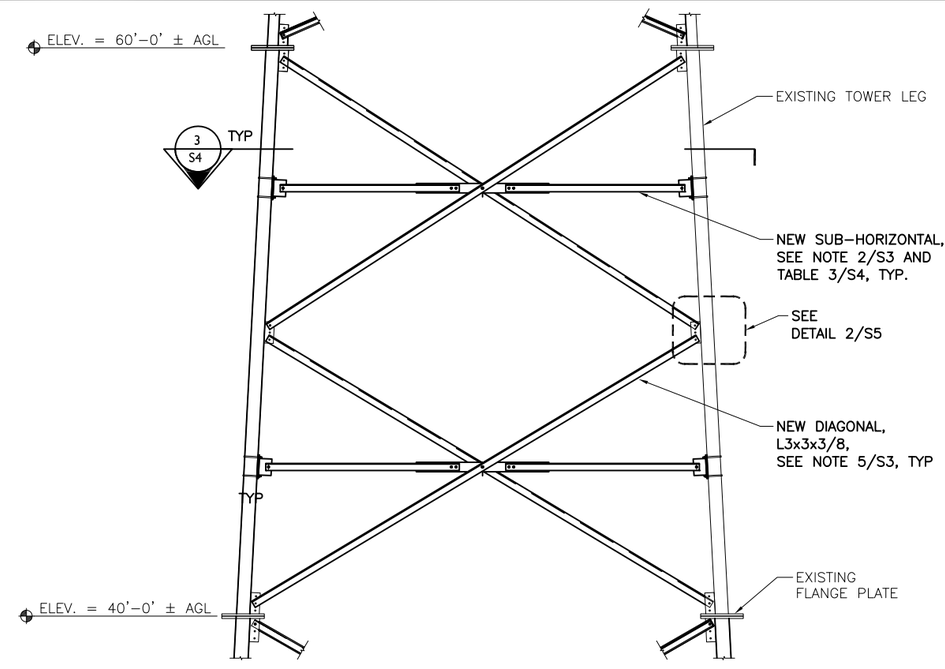
NOTES:

1. ELEVATION 60'–0" TO 80'–0"
   INSTALL ADDITIONAL RSH–SST SUB–HORIZONTAL BRACING KIT (STRUCTURAL COMPONENTS P/N: RSH–5113–15 & RSH–5035–45) TO EXISTING MAIN LEG. THE NEW SUB–HORIZONTALS SHALL BE CONNECTED TOGETHER WITH NEW DIAGONALS AT MID–SPAN WITH NEW STITCH BOLT 1/2"ø.
2. ELEVATION 40'–0" TO 60'–0"
   INSTALL ADDITIONAL RSH–SST SUB–HORIZONTAL BRACING KIT (STRUCTURAL COMPONENTS P/N: RSH–5115–17 & RSH–5045–67) TO EXISTING MAIN LEG. THE NEW SUB–HORIZONTALS SHALL BE CONNECTED TOGETHER WITH NEW DIAGONALS AT MID–SPAN WITH NEW STITCH BOLT 5/8"ø.
3. ELEVATION 0'–0" TO 20'–0"
   INSTALL ADDITIONAL RSH–SST SUB–HORIZONTAL BRACING KIT (STRUCTURAL COMPONENTS P/N: RSH–5119–21 & RSH–5067–86) TO EXISTING MAIN LEG. THE NEW SUB–HORIZONTALS SHALL BE CONNECTED TOGETHER WITH NEW DIAGONALS AT MID–SPAN WITH NEW STITCH BOLT 5/8"ø.
4. ELEVATION 60'–0" TO 80'–0"
   REPLACE EXISTING MAIN DIAGONALS WITH (1) L2–1/2X2–1/2X3/8. ATTACH NEW DIAGONALS TO EXISTING GUSSET PLATES WITH NEW BOLT 1/2"Ø AT EACH END. THE NEW DIAGONALS SHALL BE CONNECTED AT MID–SPAN WITH NEW STITCH BOLT 1/2"ø AND SPACER PLATE AS REQUIRED.
5. ELEVATION 20'–0" TO 60'–0"
   REPLACE EXISTING MAIN DIAGONALS WITH (1) L3X3X3/8. ATTACH NEW DIAGONALS TO EXISTING GUSSET PLATES WITH NEW BOLT 5/8"ø AT EACH END. THE NEW DIAGONALS SHALL BE CONNECTED AT MID–SPAN WITH NEW STITCH BOLT 5/8"Ø AND SPACER PLATE AS REQUIRED.
6. ELEVATION 0'–0" TO 20'–0"
   REPLACE EXISTING MAIN DIAGONALS WITH (1) L3–1/2X3–1/2X3/8 @ . ATTACH NEW DIAGONALS TO EXISTING GUSSET PLATES WITH NEW BOLT 5/8"Ø AT EACH END. THE NEW DIAGONALS SHALL BE CONNECTED AT MID–SPAN WITH NEW STITCH BOLT 5/8"Ø AND SPACER PLATE AS REQUIRED.

TOWER MODIFICATION ELEVATION — SCALE: 3/32" = 1'–0" — 1



MODIFICATION ELEVATION 60'-0" TO 80'-0" — SCALE: 3/16" = 1'–0" — 2



MODIFICATION ELEVATION 40'-0" TO 60'-0" — SCALE: 3/16" = 1'–0" — 3

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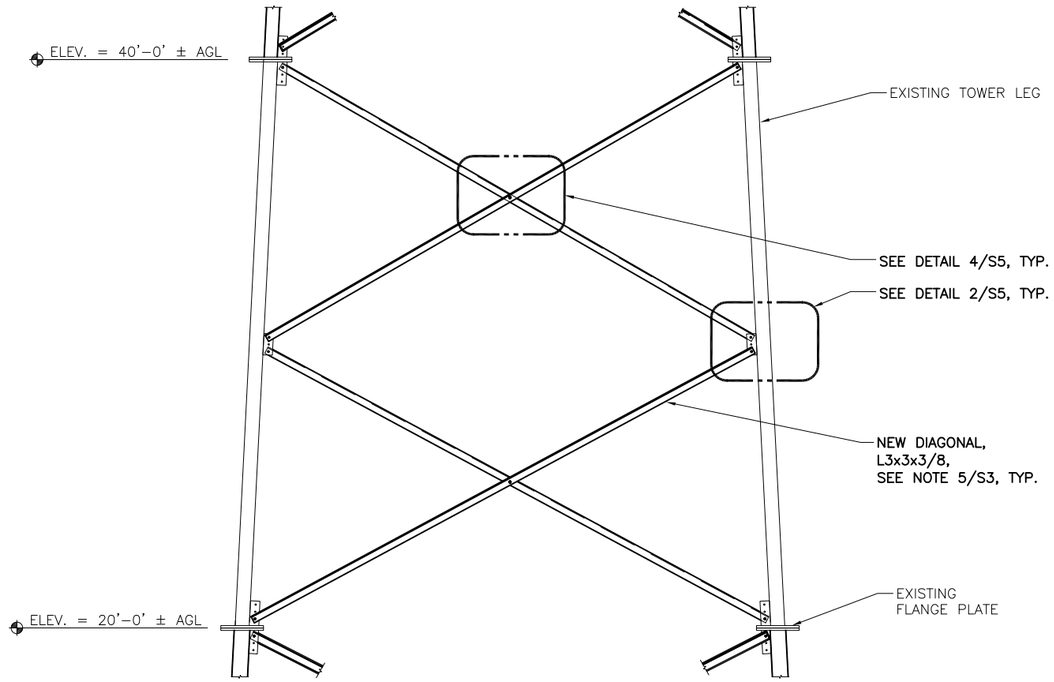
GLASTONBURY, CT 06033

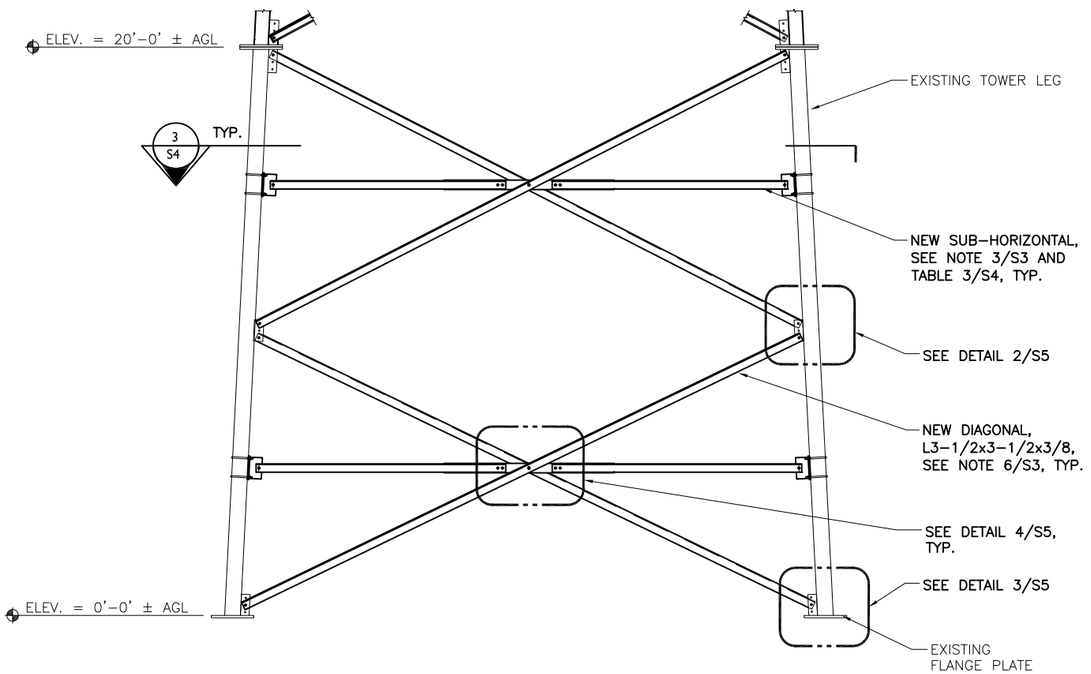
SHEET NAME
MODIFICATION ELEVATIONS

SHEET NUMBER
S3

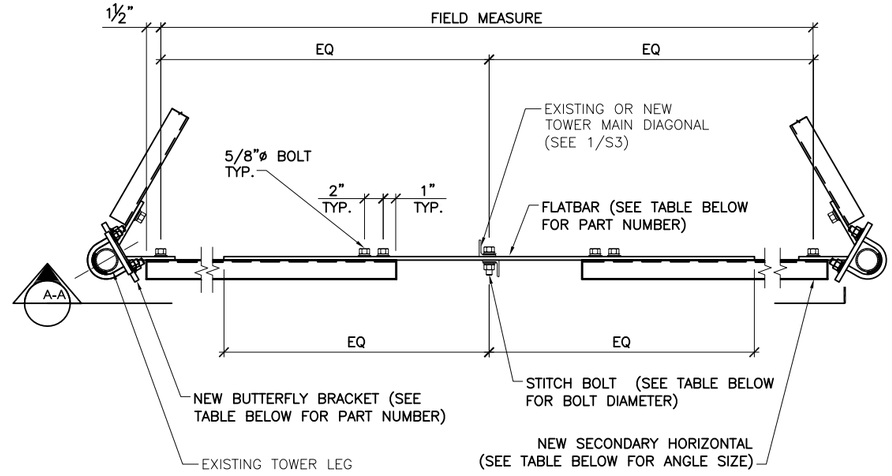
PROJECT# 2017.0278.0008

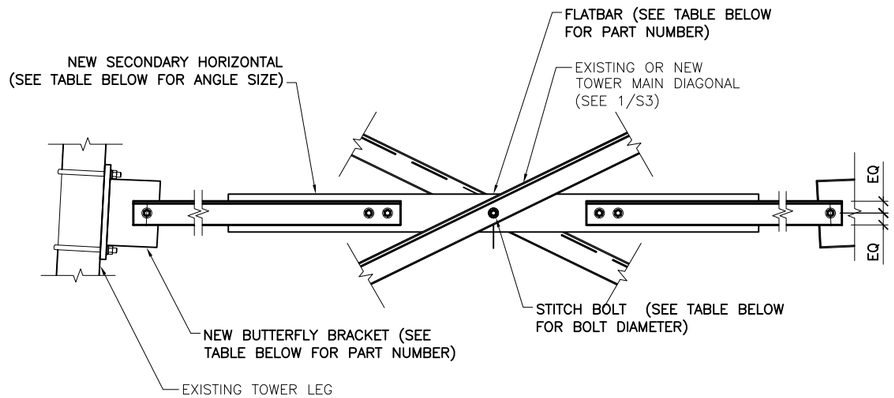


MODIFICATION ELEVATION 20'-0" TO 40'-0" — SCALE: 3/16" = 1'-0" | 1



MODIFICATION ELEVATION 0'-0" TO 20'-0" — SCALE: 3/16" = 1'-0" | 2





SECTION A-A

TOWER ELEVATION (FT)	STRUCTURAL COMPONENTS P/N			STITCH BOLT ø
	BUTTERFLY BRACKET	FLAT BAR	SECONDARY HORIZONTAL	
60'-80'	RSH-5035-45	RSH-5113-15	L2-1/2x2-1/2x1/4	1/2"
40'-60'	RSH-5045-67	RSH-5115-17	L3x3x1/4	5/8"
0'-20'	RSH-5067-86	RSH-5119-21	L3-1/2x3-1/2x1/4	5/8"

NEW SECONDARY HORIZONTAL KIT DETAIL — SCALE: 3/4" = 1'-0" | 3

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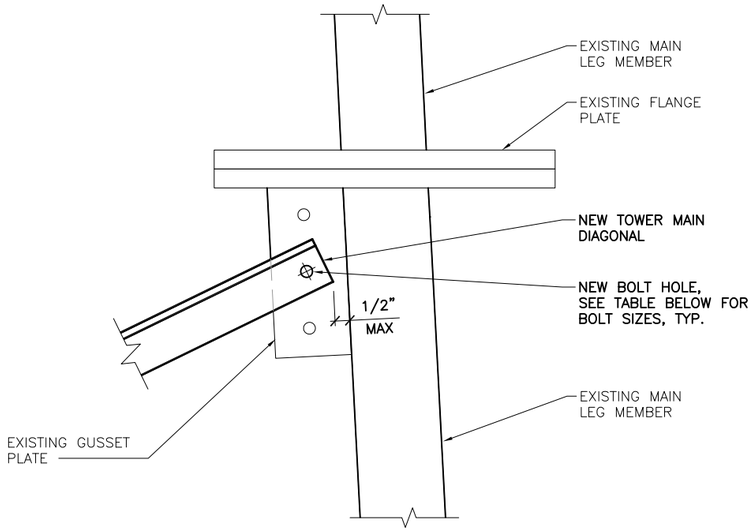
SHEET NAME
MODIFICATION ELEVATION AND DETAILS

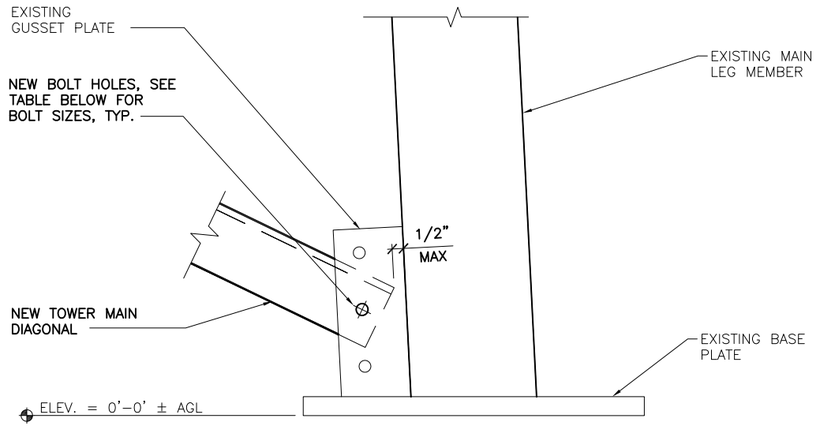
SHEET NUMBER
S4

PROJECT# 2017.0278.0008



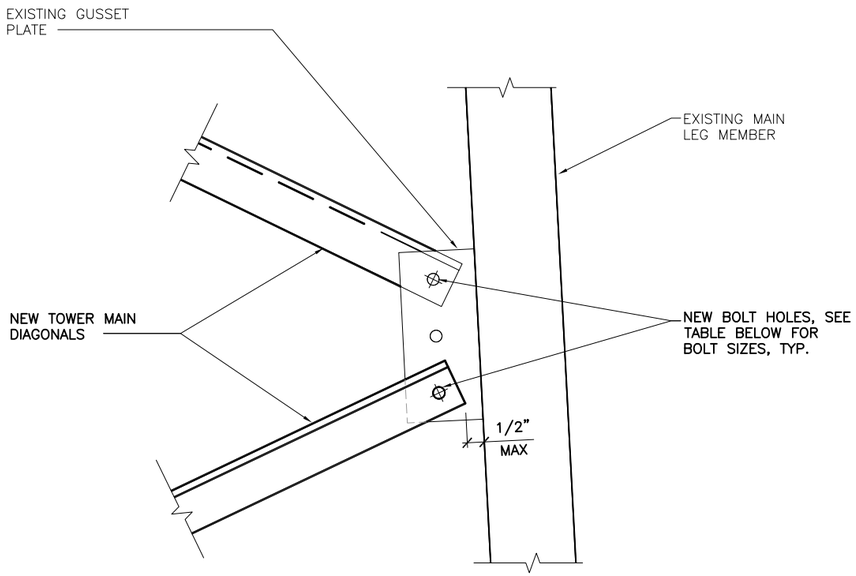
MOD. ELEVATION	BOLT SIZE ( )
60'–80'	1/2"ø
0'–60'	5/8"ø

NEW DIAGONAL MEMBER TO TOWER LEG CONNECTION DETAIL (TYP) SCALE: 1 1/2" = 1'–0" 1



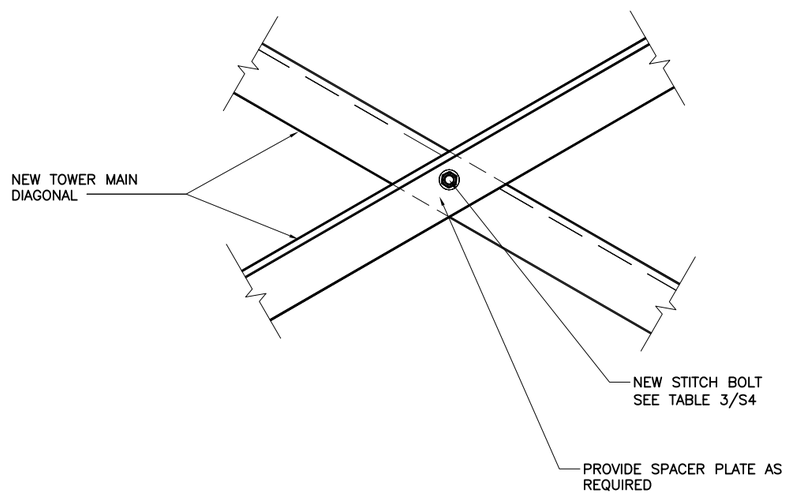
MOD. ELEVATION	BOLT SIZE ( )
0'–60'	5/8"ø

NEW DIAGONAL MEMBER TO TOWER LEG CONNECTION DETAIL (TYP) SCALE: 1 1/2" = 1'–0" 3



MOD. ELEVATION	BOLT SIZE ( )
60'–80'	1/2"ø
0'–60'	5/8"ø

NEW DIAGONAL MEMBER TO LEWER LEG CONNECTION DETAIL (TYP) SCALE: 1 1/2" = 1'–0" 2



NEW DIAGONAL MEMBERS CONNECTION DETAIL (TYP) SCALE: 1 1/2" = 1'–0" 4

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1	12/11/17	FOR PERMIT	EB
2	04/24/18	TOWER MODIFICATION	AD

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

SITE NAME
GLASTONBURY PD

SITE NUMBER:
CTL01083

SITE ADDRESS
2108 MAIN STREET
GLASTONBURY, CT 06033

SHEET NAME
SECTIONS AND DETAILS

SHEET NUMBER
S5

PROJECT# 2017.0278.0008

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