EMPIRE telecom
A QualTek Company

January 19, 2017

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

RE: NOTICE OF EXEMPT MODIFICATION
2108 Main Street, Glastonbury, CT 06033

Dear Ms. Bachman:

Enclosed please find and original and two (2) copies of a Notice of Exempt Modification including drawings, structural analyses, RF emissions reports, and a check in the amount of six hundred twenty five ($625.00) for the filing fee. In addition, I have included a single copy of each notification letter mailed this day to the municipality town council, the municipality Zoning Enforcement Officer, and to the property and tower owner.

I have submitted electronic copies of these documents via email to the CSC today.

Please feel free to contact me with any questions or comments. Thank you for your kind cooperation in this matter.

Respectfully submitted,

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4006
jandrews@empiretelecomm.com

Enclosures

EMPIRE telecom
A QualTek Company

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4007
jandrews@empiretelecomm.com

January 19, 2017

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

NOTICE OF EXEMPT MODIFICATION

2108 Main Street, Glastonbury, CT 06033

Lat: 41-42-22.4 (41.70622222)
Long. 72-36-24.9 (-72.60691667)

Dear Ms. Bachman:

AT&T Wireless currently maintains nine (9) antennas at the 166 foot level of an existing 170 foot tall lattice tower located at 2108 Main Street in Glastonbury, CT. The tower is owned by the Town of Glastonbury. The property is owned by the Town of Glastonbury. AT&T Wireless now seeks to replace three (3) existing panel antennas, install three (3) new Remote Radio Units ("RRU") and install six (6) new triplexers, to be mounted behind the antennas at the 166 foot level of the monopole.

The facility was approved by the Connecticut Siting Council in EM-AT&T-054-141224 on January 20, 2015. Six (6) conditions were enumerated in the Council's decision: 1) any deviation from the modification as specified in the Notice and supporting documentation shall render the acknowledgement invalid; 2) Any material changes to the modification as proposed shall require the filing of a new Notice with the Council; 3) Within 45 days after the completion of construction the Council shall be notified in writing that the construction has been completed; 4) Any

nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function; 5) the validity of the action shall expire one year from the date of the letter; and 6) the applicant may request an extension of time beyond the one year deadline provided that such a request is submitted to the Council not less than 60 days prior to the expiration.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies section 16-50j-73 for construction that constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2). In accordance with RCSA section 16-50j-73, a copy of this letter and attachments is being sent to the Honorable Stewart "Chip" Beckett III,, the Chairman of the Glastonbury Town Council, as well as to the Glastonbury Police Department, the tower owner, the Glastonbury Police Department, the property owner, and to Peter R. Carey, the Glastonbury Building Official and Zoning Enforcement Officer.

The planned modifications to the facility fall squarely within those activities expressly provided for in RCSA section 50j-72(b)(2).

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

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

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

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

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

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

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For the foregoing reasons, AT&T Wireless respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under RCSA section 16-50j-72(b)(2).

Respectfully submitted,

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-286-4007
jandrews@empiretelecomm.com

Enclosures

cc: 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

EMPIRE telecom
A QualTek Company

January 19, 2017

Peter R. Carey, Glastonbury Building Official and Zoning Enforcement Officer
Glastonbury Town Hall
2155 Main Street
PO Box 6523
Glastonbury, CT 06033

RE: AT&T Wireless Modifications to Telecommunication Facility –
2108 Main Street, Glastonbury, CT 06033

Dear Mr. Carey:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains nine (9) antennas at the 166 foot level of an existing 170 foot tall lattice tower located at 2108 Main Street in Glastonbury, CT. The tower is owned by the Glastonbury Police Department. The property is owned by the Glastonbury Police Department.

AT&T Wireless now seeks to replace three (3) existing panel antennas, install three (3) new Remote Radio Units ("RRU") and install six (6) new triplexers, to be mounted behind the antennas at the 166 foot level of the monopole.

This letter is intended to serve as the required notice to the Planning and Zoning offices of the municipality. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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A QualTek Company

The enclosed letter to the CSC fully describes AT&T's proposal for the above referenced site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-286-4006 or contact Melanie Bachman, Acting Executive Director of the CSC at 860-872-2935.

Respectfully submitted,

Jack Andrews
Zoning Manager, Empire Telecom
o/b/o AT&T Wireless
10130 Donleigh Drive
Columbia, MD 21046
443-677-0144
jandrews@empiretelecomm.com

Enclosures

cc: Melanie Bachman, Connecticut Siting Council

EMPIRE telecom
A QualTek Company

January 19, 2017

Richard J. Johnson, Glastonbury Town Manager
Glastonbury Town Hall
2155 Main Street
PO Box 6523
Glastonbury, CT 06033

RE: AT&T Wireless Modifications to Telecommunication Facility –
2108 Main Street, Glastonbury, CT 06033

Dear Mr. Johnson:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains nine (9) antennas at the 166 foot level of an existing 170 foot tall lattice tower located at 2108 Main Street in Glastonbury, CT. The tower is owned by the Town of Glastonbury. The property is owned by the Town of Glastonbury.

AT&T Wireless now seeks to replace three (3) existing panel antennas, install three (3) new Remote Radio Units ("RRU") and install six (6) new triplexers, to be mounted behind the antennas at the 166 foot level of the monopole.

This letter is intended to serve as the required notice to both the tower owner and the property owner. As required by the Regulations of Connecticut State Agencies ("RCSA") section 16-50j-73, the Connecticut Siting Council ("CSC") has been notified of the proposed changes and will review AT&T's proposal. Please accept this letter as notification under RCSA section 16-50j-73 of construction which constitutes an exempt modification pursuant to RCSA section 16-50j-72(b)(2).

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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

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January 19, 2017

The Honorable Stewart "Chip" Beckett III, Chairman of the Glastonbury Town Council
Glastonbury Town Hall
2155 Main Street
PO Box 6523
Glastonbury, CT 06033

RE: AT&T Wireless Modifications to Telecommunication Facility –
2108 Main Street, Glastonbury, CT 06033

Dear Councilman Beckett:

In order to accommodate technological changes, implement the Uniform Mobile Telecommunications System and enhance system performance in the State of Connecticut, AT&T Wireless ("AT&T") will be changing its equipment configuration at the above referenced telecommunications facility. AT&T Wireless currently maintains nine (9) antennas at the 166 foot level of an existing 170 foot tall lattice tower located at 2108 Main Street in Glastonbury, CT. The tower is owned by the Glastonbury Police Department. The property is owned by the Glastonbury Police Department.

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1150 First Ave
Suite 600
King of Prussia, PA 19406

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The enclosed letter to the CSC fully describes AT&T's proposal for the above referenced site. However, if you have any questions or require any additional information concerning our plans or the CSC procedures, please contact me at 443-286-4006 or contact Melanie Bachman, Acting Executive Director of the CSC at 860-872-2935.

Respectfully submitted,

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Enclosures

cc: Melanie Bachman, Connecticut Siting Council

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1083

Glastonbury PD
2108 Main Street
Glastonbury, CT 06033

January 3, 2017

Centerline Communications Project Number: 950006-009

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general Population allowable limit:	**2.71 %**

January 3, 2017

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1083 – Glastonbury PD**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **2108 Main Street, Glastonbury, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **2108 Main Street, Glastonbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60
GSM	850 MHz	2	30
LTE	2300 MHz (WCS)	2	60
GSM	1900 MHz (PCS)	2	30

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Kathrein 800-10121	166
A	2	CCI OPA-65R-LCUU-H6	166
A	3	CCI OPA-65R-LCUU-H6	166
B	1	Kathrein 800-10121	166
B	2	CCI OPA-65R-LCUU-H6	166
B	3	CCI OPA-65R-LCUU-H6	166
C	1	Kathrein 800-10121	166
C	2	CCI OPA-65R-LCUU-H8	166
C	3	CCI OPA-65R-LCUU-H8	166

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general Population threshold limits.

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	4	120	2,471.44	0.44
Antenna A2	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	4	240	5,420.52	1.04
Antenna A3	CCI OPA-65R-LCUU-H6	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	12.45 / 15.45 / 14.85	6	240	7,096.73	1.11
						Sector A Composite MPE%	**2.59**
Antenna B1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	4	120	2,471.44	0.44
Antenna B2	CCI OPA-65R-LCUU-H6	700 MHz / 1900 MHz (PCS)	11.65 / 14.85	4	240	5,420.52	1.04
Antenna B3	CCI OPA-65R-LCUU-H6	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	12.45 / 15.45 / 14.85	6	240	7,096.73	1.11
						Sector B Composite MPE%	**2.59**
Antenna C1	Kathrein 800-10121	850 MHz / 1900 MHz (PCS)	11.45 / 14.35	4	120	2,471.44	0.44
Antenna C2	CCI OPA-65R-LCUU-H8	700 MHz / 1900 MHz (PCS)	12.55 / 14.85	4	240	5,824.55	1.16
Antenna C3	CCI OPA-65R-LCUU-H8	850 MHz / 2300 MHz (WCS) / 1900 MHz (PCS)	13.35 / 14.95 / 14.85	6	240	6,881.88	1.11
						Sector C Composite MPE%	**2.71**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, the sector with the largest calculated MPE% is Sector C. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**2.71 %**
No Additional Carriers Listed in CSC Active MPE Database	NA
Site Total MPE %:	**2.71 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	2.59 %
AT&T Sector B Total:	2.59 %
AT&T Sector C Total:	2.71 %
Site Total:	2.71 %

Table 5: Site MPE Summary

Per FCC OET 65, carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, the sector with the largest calculated MPE% is Sector C.

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	418.91	166	1.18	850 MHz	567	0.21%
AT&T 1900 MHz (PCS) UMTS	2	816.81	166	2.29	1900 MHz (PCS)	1000	0.23%
AT&T 700 MHz LTE	2	1,079.32	166	3.03	700 MHz	467	0.65%
AT&T 1900 MHz (PCS) LTE	2	1,832.95	166	5.15	1900 MHz (PCS)	1000	0.51%
AT&T 850 MHz GSM	2	648.82	166	1.82	850 MHz	567	0.32%
AT&T 2300 MHz (WCS) LTE	2	1,875.65	166	5.27	2300 MHz (WCS)	1000	0.53%
AT&T 1900 MHz (PCS) GSM	2	916.48	166	2.57	1900 MHz (PCS)	1000	0.26%
						Total:	2.71%

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	2.59 %
Sector B:	2.59 %
Sector C:	2.71 %
AT&T Maximum Total (per sector):	2.71 %
Site Total:	2.71 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.71 %** of the allowable FCC established general Population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

WIRELESS COMMUNICATIONS FACILITY
CT1083 - LTE 3C
GLASTONBURY PD
GLASTONBURY POLICE DEPARTMENT
GLASTONBURY, CT 06033

GENERAL NOTES

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

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT

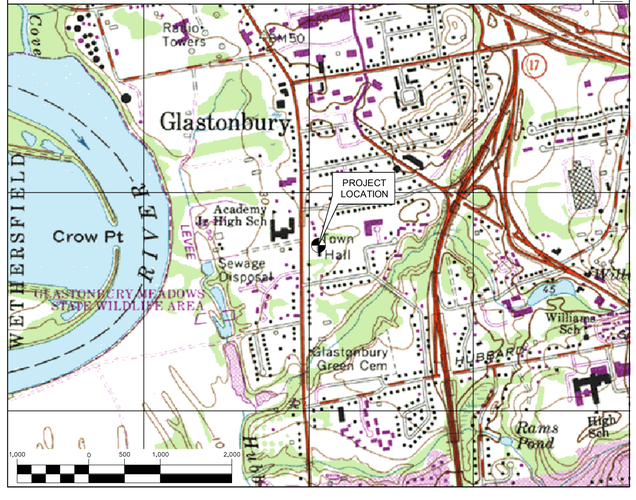
TO: GLASTONBURY POLICE DEPARTMENT, GLASTONBURY, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.31 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3.	TURN LEFT ONTO WEST ST	0.16 MI
4.	MERGE ONTO CT-3 N via EXIT 25 TOWARD GLASTONBURY	1.80 MI
5.	TAKE THE EXIT TOWARD MAIN ST/GLASTONBURY	0.29 MI
6.	TURN LEFT ONTO GLASTONBURY BLVD	0.35 MI
7.	TURN RIGHT ONTO MAIN ST.	1.19 MI
8.	2108 MAIN ST IS ON THE LEFT	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   - A. REMOVE AND REPLACE EXISTING POSITION 4 ANTENNA FOR PROPOSED OCTOPORT ANTENNA, (1) PER SECTOR.
   - B. INSTALL (3) NEW RRUS-32 BEHIND POSITION 4 ANTENNA.
   - C. INSTALL (2) NEW TRIPLEXERS BEHIND POSITION 4 ANTENNA, (2) PER SECTOR/(6) TOTAL.
   - D. INSTALL (6) NEW TRIPLEXERS WITHIN EXISTING EQUIPMENT ROOM.
   - E. INSTALL (1) AT&T SURGE ARRESTOR.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT1083
AT&T SITE NAME:	GLASTONBURY PD
SITE ADDRESS:	GLASTONBURY POLICE DEPARTMENT GLASTONBURY, CT 06033
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-42'-22.39" N LONGITUDE: 72°-36'-24.93" W GROUND ELEVATION: ±50' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES, SPECIFICATIONS AND DETAILS	0
C-1	PLANS AND ELEVATION	0
C-2	LTE 3C EQUIPMENT DETAILS	0
E-1	LTE SCHEMATIC DIAGRAM AND NOTES	0
E-2	LTE WIRING DIAGRAM	0
E-3	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	12/20/16	KAW/JR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

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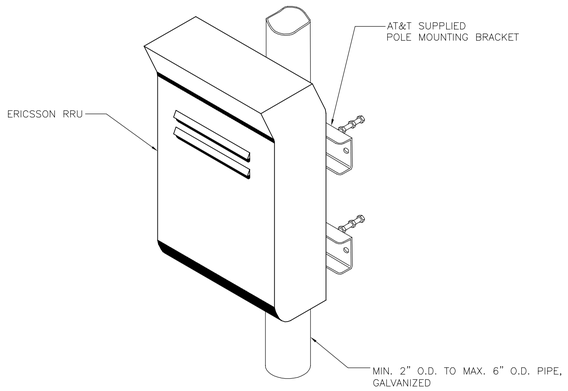
GLASTONBURY, CT 06033

DATE: 12/13/16
SCALE: AS NOTED
JOB NO. 16071.83

TITLE SHEET

T-1

Sheet No. 1 of 7



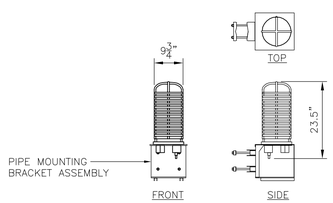
ISOMETRIC VIEW

NOTES:

1. AT&T SHALL SUPPLY RRU, AND RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 / N–1 **TYPICAL RRUS MOUNTING DETAILS**

SCALE: NTS



SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6–48–60–18–8F	(1) PER SITE	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

2 / N–1 **SURGE ARRESTOR DETAIL**

SCALE: NTS

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 G–05 (ANTENNA MOUNTS): 90–105 MPH (3 SECOND GUST)
   - RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
   - BASIC WIND SPEED (OTHER STRUCTURE): 97 MPH (NOMINAL DESIGN WIND SPEED) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT SUPPLEMENT AND AMENDMENTS.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

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

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   - A. STRUCTURAL STEEL (W SHAPES)–––ASTM A992 (FY = 50 KSI)
   - B. STRUCTURAL STEEL (OTHER SHAPES)–––ASTM A36 (FY = 36 KSI)
   - C. STRUCTURAL HSS (RECTANGULAR SHAPES)–––ASTM A500 GRADE B, (FY = 46 KSI)
   - D. STRUCTURAL HSS (ROUND SHAPES)–––ASTM A500 GRADE B, (FY = 42 KSI)
   - E. PIPE–––ASTM A53 (FY = 35 KSI)
   - F. CONNECTION BOLTS–––ASTM A325–N
   - G. U–BOLTS–––ASTM A36
   - H. ANCHOR RODS–––ASTM F 1554
   - I. WELDING ELECTRODE–––ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. ANTENNA PANELS:
   - A. SHERWIN WILLIAMS POLANE–B
   - B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
2. COAXIAL CABLES:
   - A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   - B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   - C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI–SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH–PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON–PETROLEUM–BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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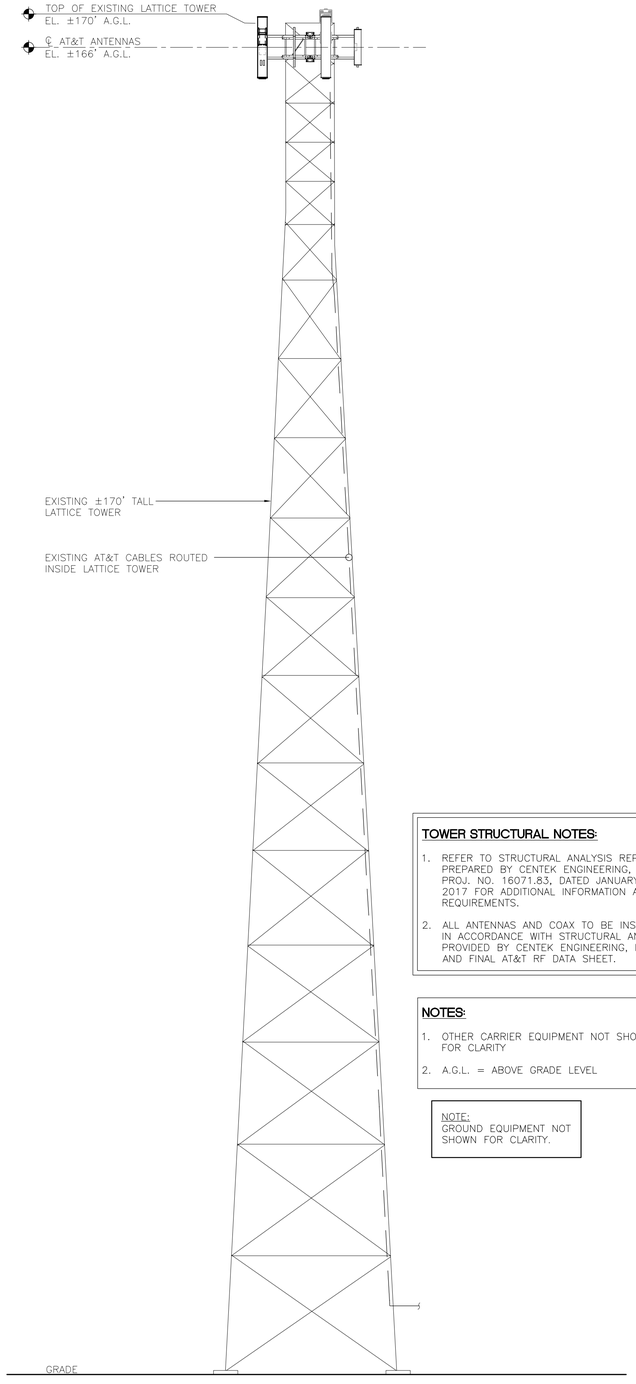
SCALE: AS NOTED
JOB NO. 16071.83

NOTES, SPECIFICATIONS AND DETAILS

N–1



TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 16071.83, DATED JANUARY 09, 2017 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC.. AND FINAL AT&T RF DATA SHEET.

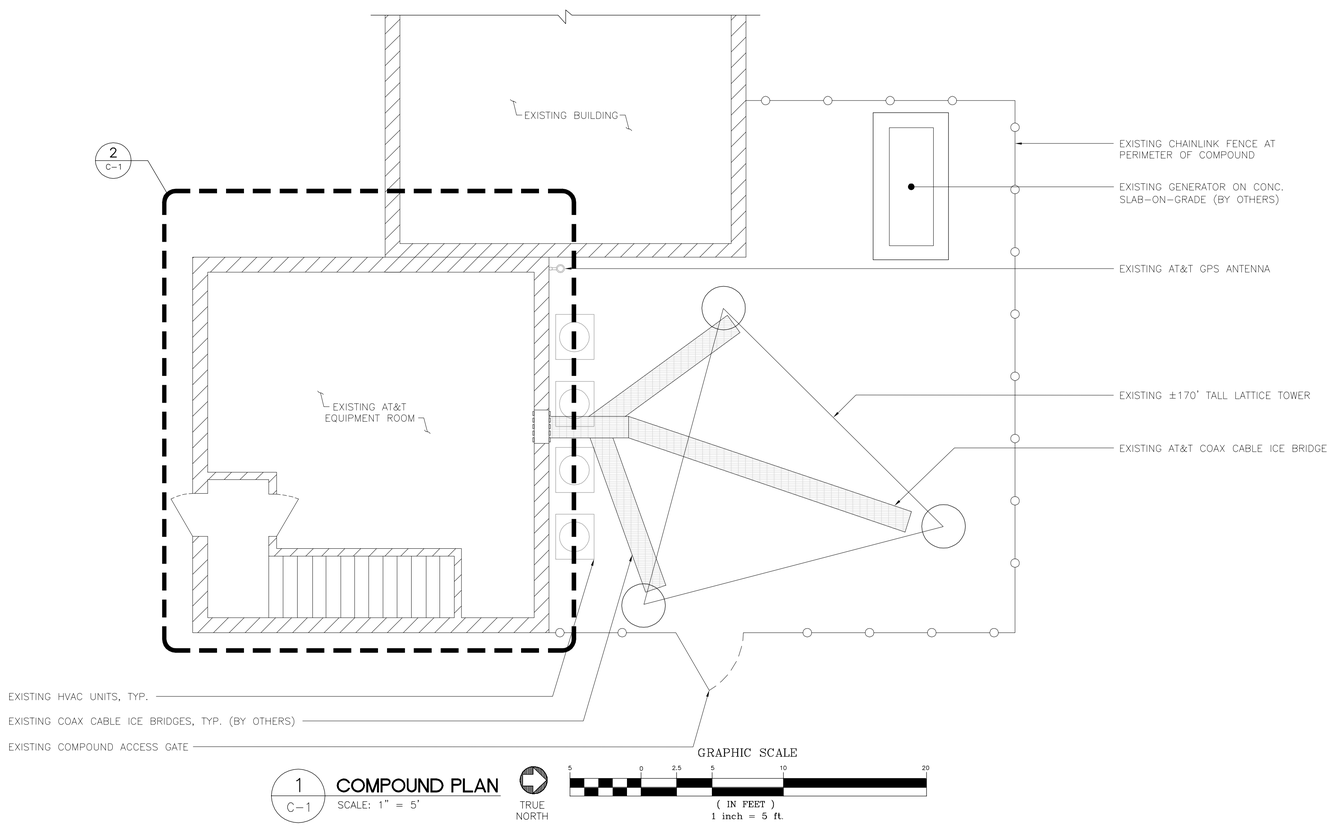
NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.G.L. = ABOVE GRADE LEVEL

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

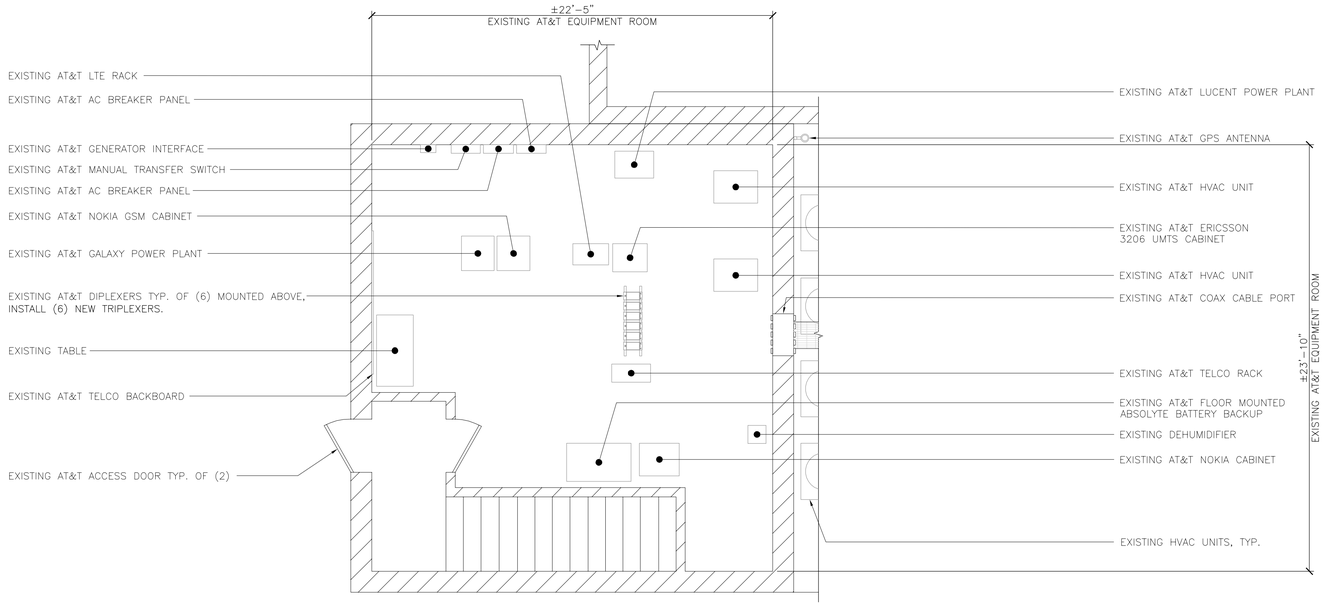
GRAPHIC SCALE
9 0 4.5 9 18 36
(IN FEET)
1 inch = 9 ft.

3 / C-1 **TOWER ELEVATION**
SCALE: 1" = 9'



1 / C-1 **COMPOUND PLAN**
SCALE: 1" = 5'

TRUE NORTH



2 / C-1 **EQUIPMENT LAYOUT PLAN**
SCALE: 1/4" = 1'-0"

TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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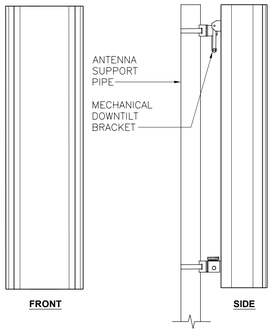
GLASTONBURY POLICE DEPARTMENT
GLASTONBURY, CT 06033

DATE:	12/13/16
SCALE:	AS NOTED
JOB NO.	16071.83

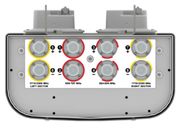
PLANS AND ELEVATION

C-1

Sheet No. 3 of 7



OPA-65R-LCUU-H6 BOTTOM

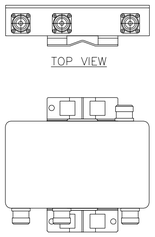


OPA-65R-LCUU-H8 BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: OPA-65R-LCUU-H6	72"L x 14.8"W x 7.4"D	73 LBS.
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: OPA-65R-LCUU-H8	92.7"L x 14.4"W x 7"D	88 LBS.

5 C-2 PROPOSED ANTENNA DETAIL

SCALE: 1/2" = 1'-0"

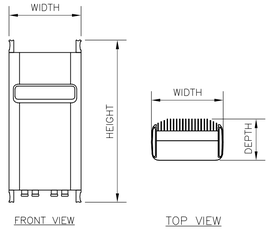


TRIPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: TPX-070821	5.83"H x 9.65"W x 2.05"D	7.5 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 C-2 TRIPLEXER DETAIL

SCALE: NONE

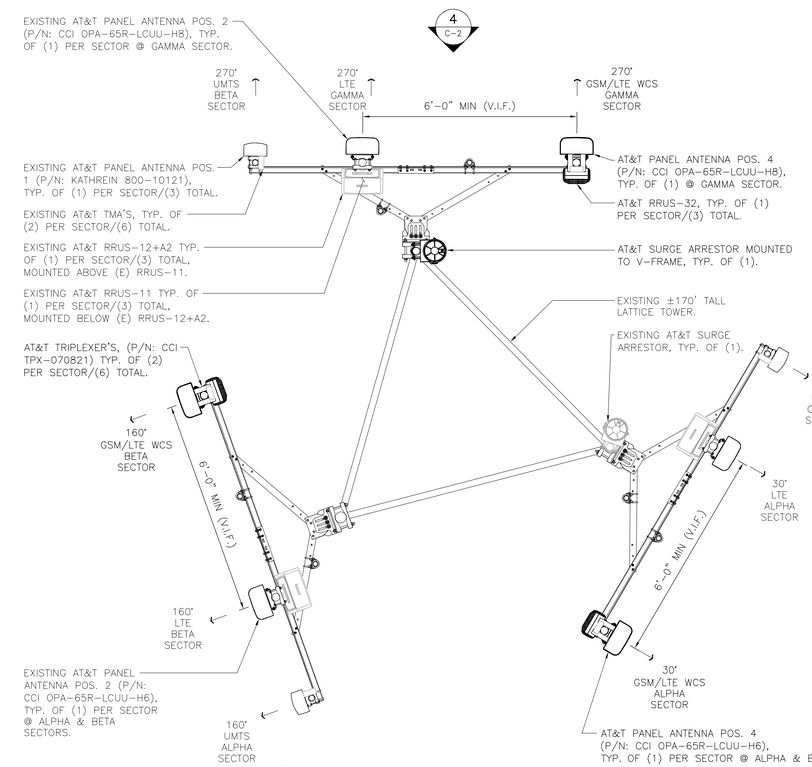


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-32	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

7 C-2 ERICSSON RRUS-32 DETAIL

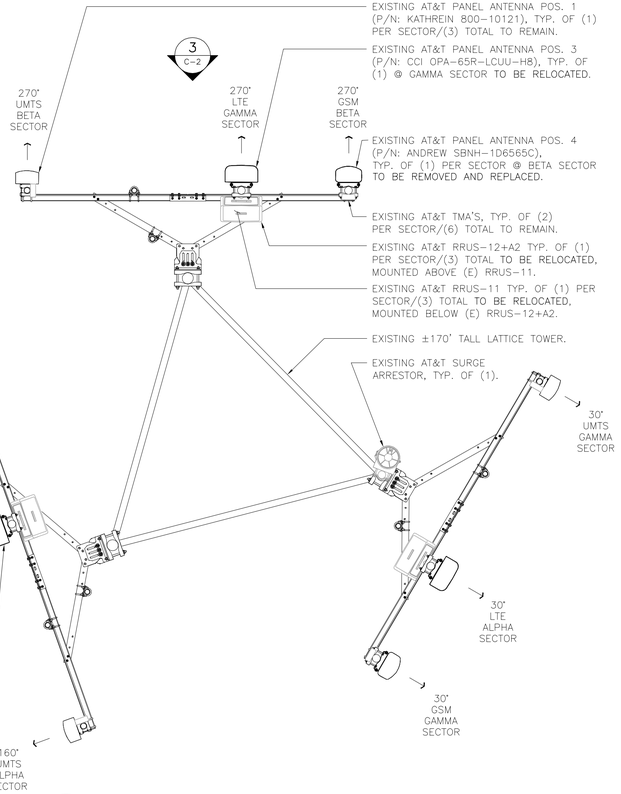
SCALE: 1" = 1'-0"



2 C-2 PROPOSED ANTENNA PLAN

SCALE: 1/2" = 1'-0"

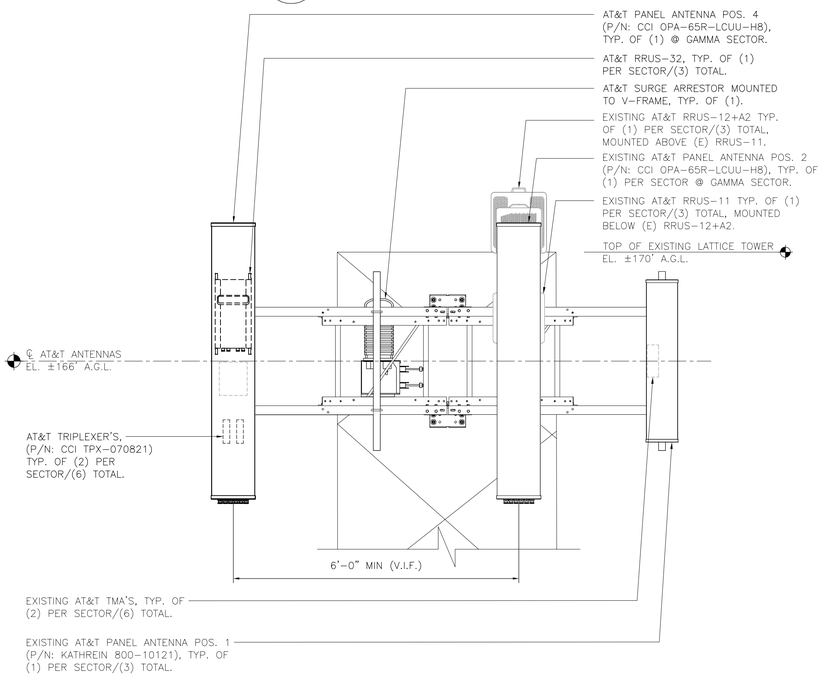
NORTH



1 C-2 EXISTING ANTENNA PLAN

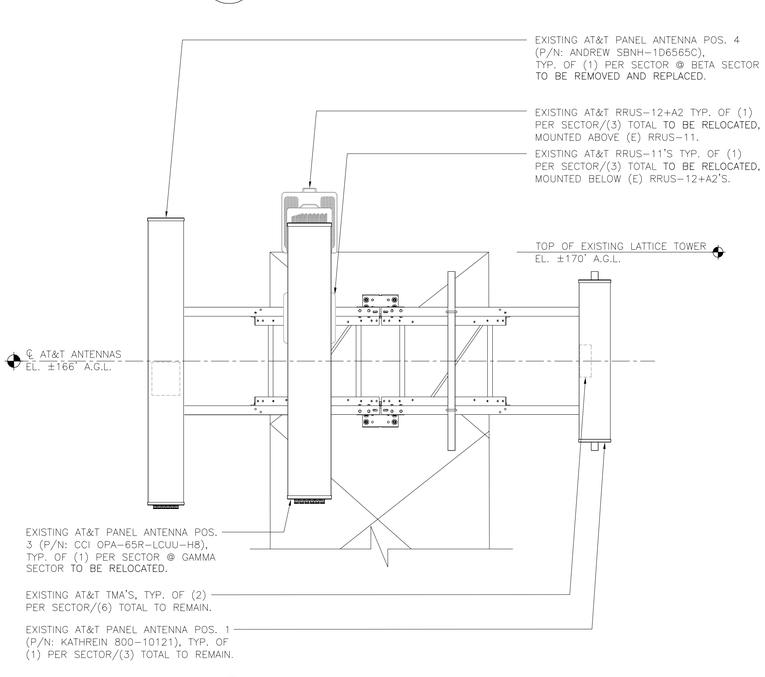
SCALE: 1/2" = 1'-0"

NORTH



4 C-2 PROPOSED ANTENNA ELEVATION

SCALE: 1/2" = 1'-0"



3 C-2 EXISTING ANTENNA ELEVATION

SCALE: 1/2" = 1'-0"

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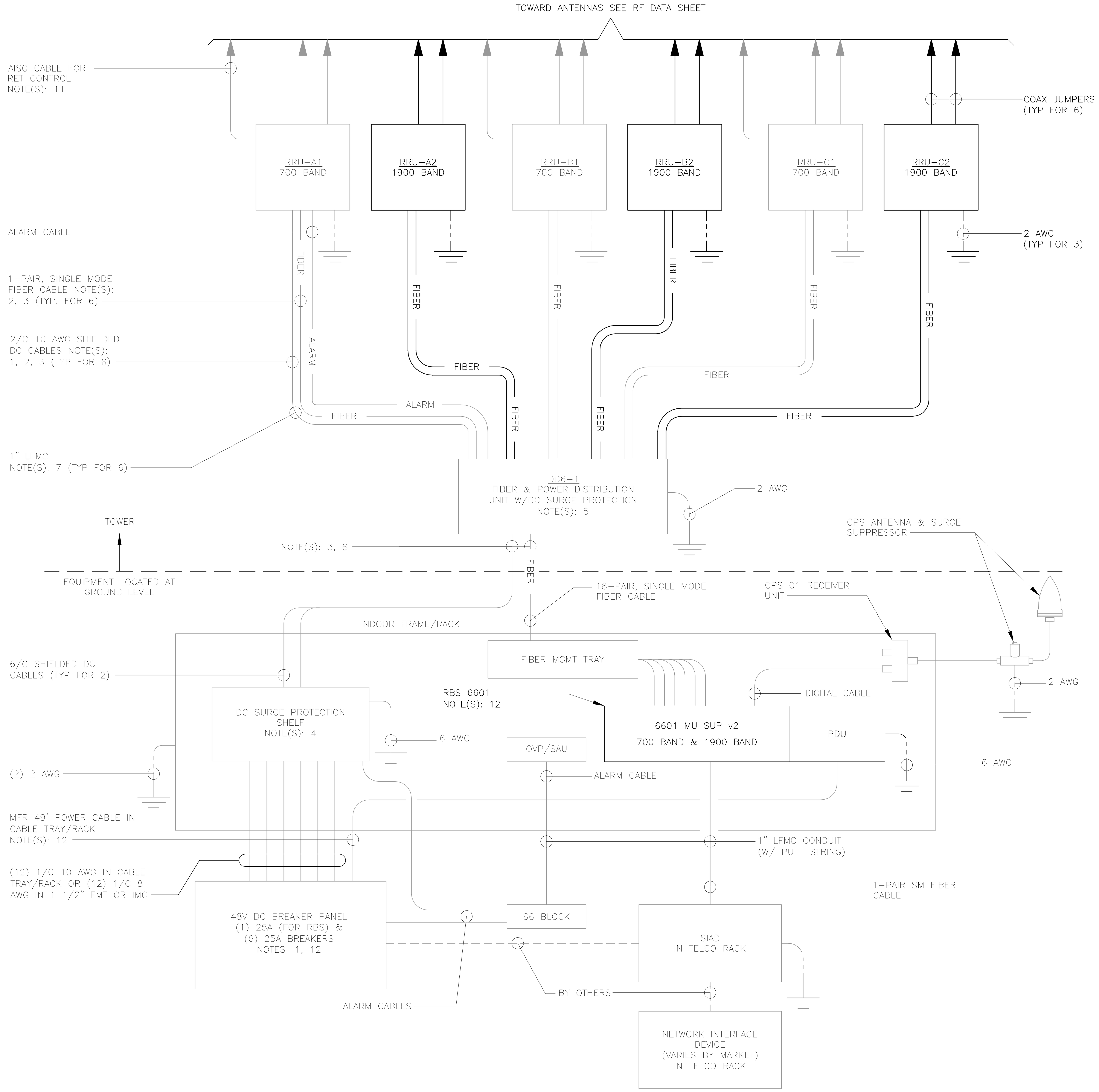
LTE 3C EQUIPMENT DETAILS

C-2

Sheet No. 4 of 7



1 E-1

LTE SCHEMATIC DIAGRAM

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

   TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

   THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

   1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
   2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
   3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

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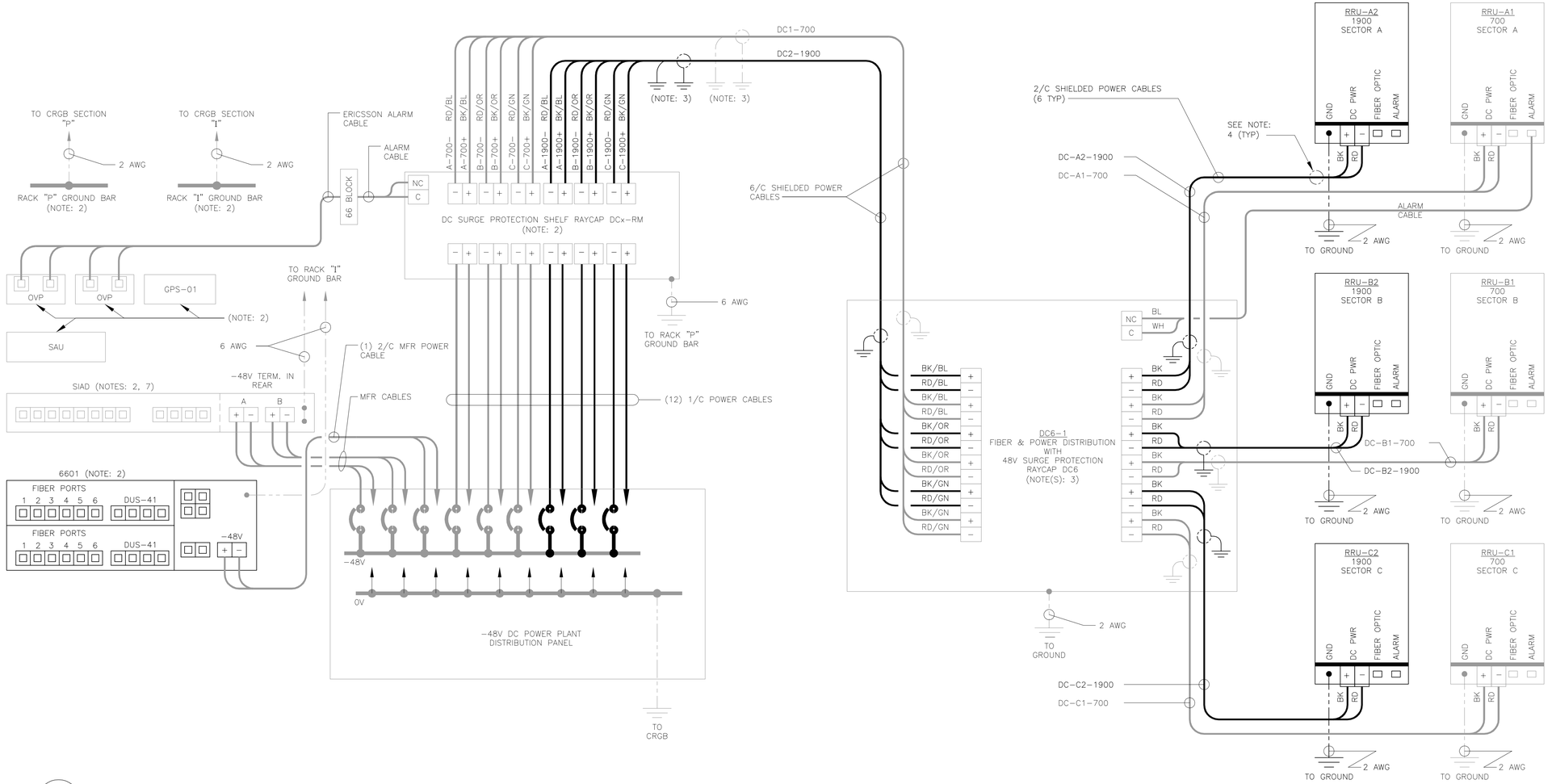
LTE SCHEMATIC DIAGRAM AND NOTES

E-1

Sheet No. 5 of 7



1 / E-2 LTE WIRING DIAGRAM

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

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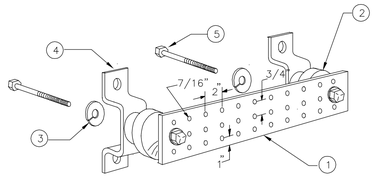
LTE WIRING DIAGRAM

E-2

Sheet No. 6 of 7

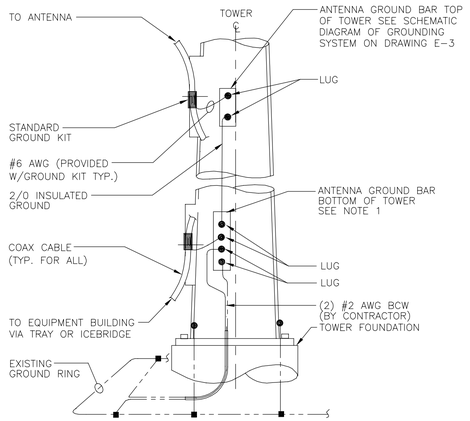


LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

3 E-3 GROUND BAR DETAIL

NOT TO SCALE

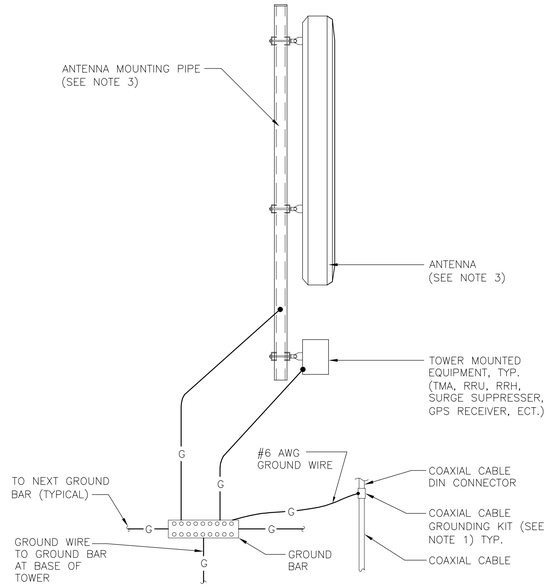


NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

2 E-3 ANTENNA CABLE GROUNDING - TOWER

NOT TO SCALE

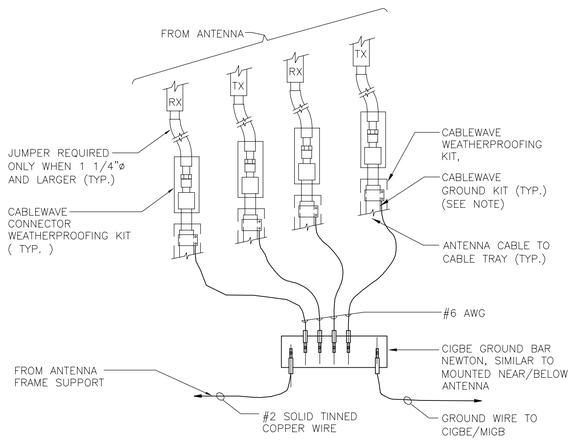


NOTES:

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

1 E-3 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

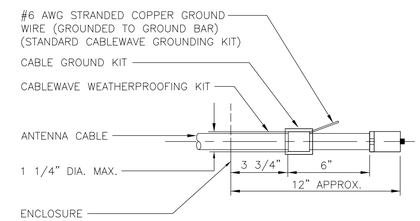


NOTE:

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

5 E-3 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE



NOTE:

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

4 E-3 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 7 of 7

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Structural Analysis Report

170-ft Existing ROHN Lattice Tower

Proposed AT&T Mobility
Antenna Upgrade

AT&T Site Ref: CT1083

2108 Main Street
Glastonbury, CT

Centek Project No. 16071.83

Date: January 9, 2017

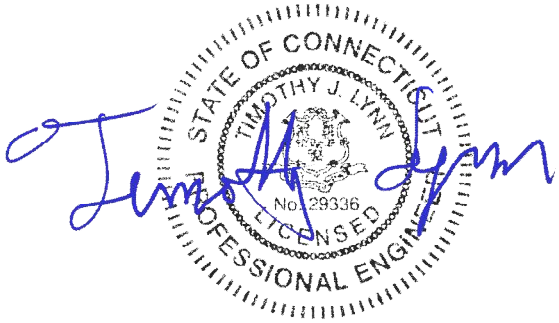

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Table of Contents

Introduction

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

The host tower is a 170-ft, three legged, tapered steel lattice tower originally designed and manufactured by ROHN file # 34586PH dated September 18, 1997. The manufacturer's drawings and calculations were unavailable for use in this report. The existing tower geometry, structure member sizes and foundation information were obtained from a previous structural report prepared by URS job no. 36928231.00001 July 28, 2006.

Antenna and appurtenance information were obtained from a previous structural report prepared by Destek job no.1429024 November 21, 2014, visual verification conducted from grade by Centek personnel on December 9, 2016 and an RF data sheet.

The tower consists of eight (8) tapered and one (1) straight vertical sections consisting of structural steel pipe legs conforming to ASTM A572 Gr. 50. Diagonal lateral support bracing consists of structural steel angle shapes conforming to ASTM A572 Gr. 50. The vertical tower sections are connected by bolted flange plates while the pipe legs and bracing are connected by welded and bolted gusset connections. The width of the tower face is 4.56-ft at the top and 20.86-ft at the base.

AT&T proposes the removal of three (3) panel antennas and three (3) TMAs and the installation of three (3) panel antennas, three (3) remote radio heads and six (6) triplexers mounted on the existing Boom Gates. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna configuration.

Antenna and Appurtenance Summary

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

- UNKNOWN (Existing):
  Antenna: One (1) 10-ft Omni-directional whip antenna and two (2) 8-ft Omni-directional whip antennas mounted on the existing AT&T boom gates.
  Coax Cable: Three (3) 7/8-in ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: Four (4) Kathrein PR-950 paraflectors mounted on three (3) 3-ft side arms with an elevation of 152-ft above grade.
  Coax Cable: Four (4) 7/8-in ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 5-ft Omni-directional whip antenna mounted on one (1) 3-ft side arm with an elevation of 140-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (EXISTING):
  Antenna: One (1) empty 4-ft side arm with an elevation of ±140-ft above the tower base.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 10-ft Omni-directional whip antenna mounted on one (1) 3-ft side arm with an elevation of 129-ft above grade.
  Coax Cable: One (1) 1/2-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 12-ft Omni-directional whip antenna and one (1) 10-ft Omni-directional whip antenna mounted on two (2) 3-ft side arm with an elevation of 124-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ and one (1) 1/2"-in ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 6-ft ∅ Dish leg mounted with an elevation of 115-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 10-ft dipole leg mounted with an elevation of 107-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 20-ft Omni-directional whip antenna and two (2) 10-ft Omni-directional whip antennas mounted on three (3) 3-ft side arm with an elevation of 100-ft above grade.
  Coax Cable: Three (3) 7/8-in ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 10-ft Omni-directional whip antenna mounted on one (1) 3-ft side arm with an elevation of 84-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 12-ft Omni-directional whip antenna mounted on one (1) 3-ft side arm with an elevation of 70-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- UNKNOWN (Existing):
  Antenna: One (1) 8-ft Omni-directional whip antenna mounted on one (1) 3-ft side arm with an elevation of 67-ft above grade.
  Coax Cable: One (1) 7/8-in ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: One (1) 20-ft Omni-directional whip antenna, one (1) 10-ft Omni-directional whip antennas\ and one (1) ground plane mounted on three (3) 3-ft side arm with an elevation of 50-ft above grade.
  Coax Cable: Two (2) 7/8-in ∅ and one (1) 1/2"-in ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antenna: Two (2) 20-ft Omni-directional whip antennas and one (1) Cellwave PD1150 antenna mounted on three (3) 3-ft side arm with an elevation of 30-ft above grade.
  Coax Cable: Two (2) 7/8-in ∅ and one (1) 1/2"-in ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing to Remain):
  Antennas: Three (3) Kathrein 800-10121 panel antennas, two (2) CCI OPA-65R-LCUU-H6 panel antennas, one (1) CCI OPA-65R-LCUU-H8 panel antenna, three (3) Powerwave TT19-08BP111001 TMAs, three (3) Ericsson RRUS-11 remote radio heads, three (3) Ericsson RRUS-12 remote radio heads, three (3) Ericsson A2s and one (1) Raycap DC-6-48-60-18-8F surge arrestor mounted on three (3) boom gates with a RAD center elevation of ±166-ft above the existing tower base.
  Coax Cables: Twelve (12) 1-1/4" ∅ coax cables, one (1) fiber trunk and two (2) DC trunks running on the leg/face of the existing tower as specified within Section 3 of this report.
- AT&T (Existing to Remove):
  Antennas: Two (2) KMW AM-X-CD-16-65 panel antennas, one (1) Andrew SBNH-1D6565C panel antenna and three (3) CCI DTMABP7819VG12A TMAs mounted on three (3) boom gates with a RAD center elevation of ±166-ft above the existing tower base.
- **AT&T (Proposed):**
  Antennas: Two (2) CCI OPA-65R-LCUU-H6 panel antennas, one (1) CCI OPA-65R-LCUU-H8 panel antenna, six (6) CCI TPX-070821 triplexers and three (3) Ericsson RRUS-32 remote radio heads mounted on three (3) boom gates with a RAD center elevation of ±166-ft above the existing tower base.

Primary Assumptions Used in the Analysis

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

Analysis

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

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

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

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components.

Basic Wind Speed:	Hartford; v = 90-105 mph (3-second gust)	*[Annex B of TIA-222-G-2005]*
	Glastonbury; v = 97 mph (3 second gust)	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 97 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

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

Tower Capacity

- Calculated stresses were found to be within allowable limits. In Load Case 2, per tnxTower "Section Capacity Table", this tower was found to be at **98.8%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T9)	0'-0"- 20'-0"	81.2%	**PASS**
Diagonal (T8)	20'-0"- 40'-0"	98.8%	**PASS**

Foundation and Anchors

The existing foundation consists of three (3) 7.5-ft ∅ x 45.5-ft long reinforced concrete caissons. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned URS structural report. The tower legs are connected to the three (3) reinforced concrete caissons by means of six (6) 1" ∅ ASTM A354 Grade BC anchor bolts per leg embedded into the concrete foundation structure.

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

Leg Reactions	Vector	Proposed Tower Reactions
Leg	Shear	**23 kips**
	Compression	**205 kips**
	Uplift	**179 kips**
Base	Shear	**38 kips**
	Compression	**27 kips**
	Moment	**3534 kip-ft**

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

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	67.9%	**PASS**

- The foundation was found to be within allowable limits.

Foundation Type	Design Limit	Limit/FS	Proposed Loading	Result
Reinforced Concrete Caisson (x3)	Cpmpression	1.00	1.22	**PASS**
	Uplift	1.00 (1)	3.30	**PASS**

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

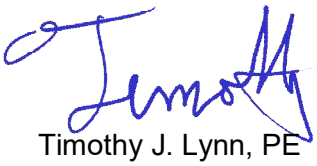
C o n c l u s i o n

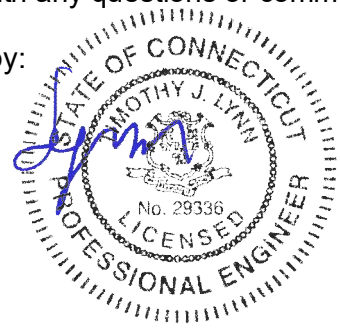
This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:





Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

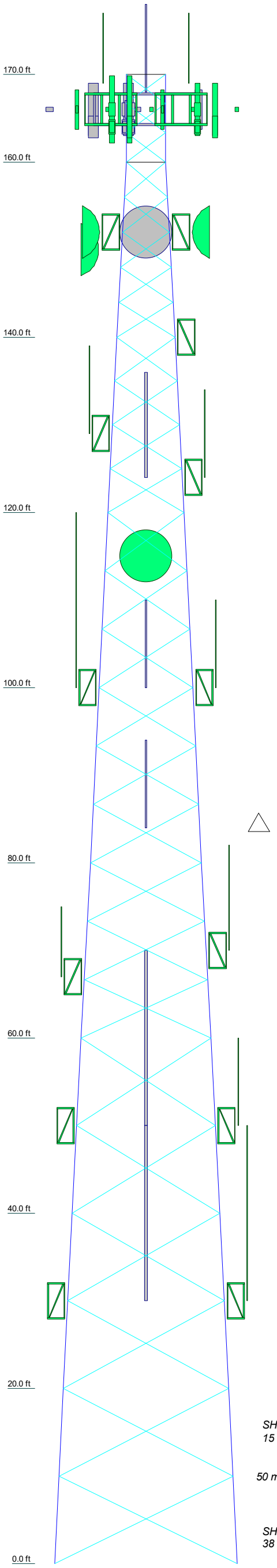
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

tnxTower Features:

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

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9
Legs	ROHN 2.5 STD		ROHN 3 STD	ROHN 3.5 X-STR	ROHN 4 X-STR		ROHN 5 X-STR	ROHN 6 EHS	
Leg Grade	A572-50								
Diagonals	L1 1/2x1 1/2x1/8	L1 1/2x1 1/2x3/16	L1 3/4x1 3/4x3/16	L2 1/2x2 1/2x3/16		L2 1/2x2 1/2x1/4		L3x3x1/4	L3 1/2x3 1/2x1/4
Diagonal Grade	A572-50								
Top Girts	N.A.								
Face Width (ft)	4.56		6.6				8.64	16.85	18.85
# Panels @ (ft)	3 @ 3.33333	5 @ 4	4 @ 5	9 @ 6.66667				6 @ 10	
Weight (K)	0.3	0.8	0.9	1.4	1.6	2.0	2.4	2.6	2.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' x 1" Dia Omni	173	3' Side Mount Standoff	152
8' x 2" Omni	173	3' Side Mount Standoff	152
8' x 2" Omni	173	PR-950	150
Rohn 6' x 12' Boom Gate (1) (ATI - Existing)	166	3' Side Mount Standoff (Empty)	140
Rohn 6' x 12' Boom Gate (1) (ATI - Existing)	166	5' x 1" dia. Omni	140
Rohn 6' x 12' Boom Gate (1) (ATI - Existing)	166	3' Side Mount Standoff	140
800-10121 (ATI - Existing)	166	10' x 1" Dia Omni	129
OPA-65R-LCUU-H6 (ATI - Existing)	166	3' Side Mount Standoff	129
OPA-65R-LCUU-H6 (ATI - Proposed)	166	12' x 3" Dia Omni	124
800-10121 (ATI - Existing)	166	3' Side Mount Standoff	124
OPA-65R-LCUU-H6 (ATI - Existing)	166	10' x 1" Dia Omni	124
OPA-65R-LCUU-H6 (ATI - Proposed)	166	3' Side Mount Standoff	124
800-10121 (ATI - Existing)	166	Andrew 6' w/Radome	115
OPA-65R-LCUU-H8 (ATI - Existing)	166	10' Dipole	107
OPA-65R-LCUU-H8 (ATI - Proposed)	166	10' x 2" Dia Omni	100
TT19-08BP111-001 TMA (ATI - Existing)	166	3' Side Mount Standoff	100
TT19-08BP111-001 TMA (ATI - Existing)	166	10' x 1" Dia Omni	100
TT19-08BP111-001 TMA (ATI - Existing)	166	3' Side Mount Standoff	100
(2) TPX-070821 (ATI - Proposed)	166	20' x 2" Dia Omni	100
(2) TPX-070821 (ATI - Proposed)	166	3' Side Mount Standoff	100
(2) TPX-070821 (ATI - Proposed)	166	10' x 2" Dia Omni	84
RRUS-11 (ATI - Existing)	166	3' Side Mount Standoff	84
RRUS-11 (ATI - Existing)	166	12' x 3" Dia Omni	70
RRUS-11 (ATI - Existing)	166	3' Side Mount Standoff	70
RRUS-12 (ATI - Existing)	166	8' x 3" Dia Omni	67
RRUS-12 (ATI - Existing)	166	3' Side Mount Standoff	67
RRUS-12 (ATI - Existing)	166	3' Side Mount Standoff	50
A2 (ATI - Existing)	166	Ground Plane	50
A2 (ATI - Existing)	166	3' Side Mount Standoff	50
A2 (ATI - Existing)	166	10' x 2" Dia Omni	50
RRUS-32 (ATI - Proposed)	166	20' x 3" Dia Omni	50
RRUS-32 (ATI - Proposed)	166	3' Side Mount Standoff	50
RRUS-32 (ATI - Proposed)	166	PD1150	30
DC6-48-60-18-8F Surge Arrestor (ATI - Existing)	166	3' Side Mount Standoff	30
PR-950	152	20' x 2" Dia Omni	30
PR-950	152	20' x 3" Dia Omni	30
PR-950	152	3' Side Mount Standoff	30
3' Side Mount Standoff	152	3' Side Mount Standoff	30

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 98.8%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 205 K
SHEAR: 23 K

UPLIFT: -179 K
SHEAR: 21 K

AXIAL 102 K
SHEAR 15 K *MOMENT 1445 kip-ft*
TORQUE 3 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 27 K
SHEAR 38 K *MOMENT 3534 kip-ft*
TORQUE 8 kip-ft
REACTIONS - 97 mph WIND

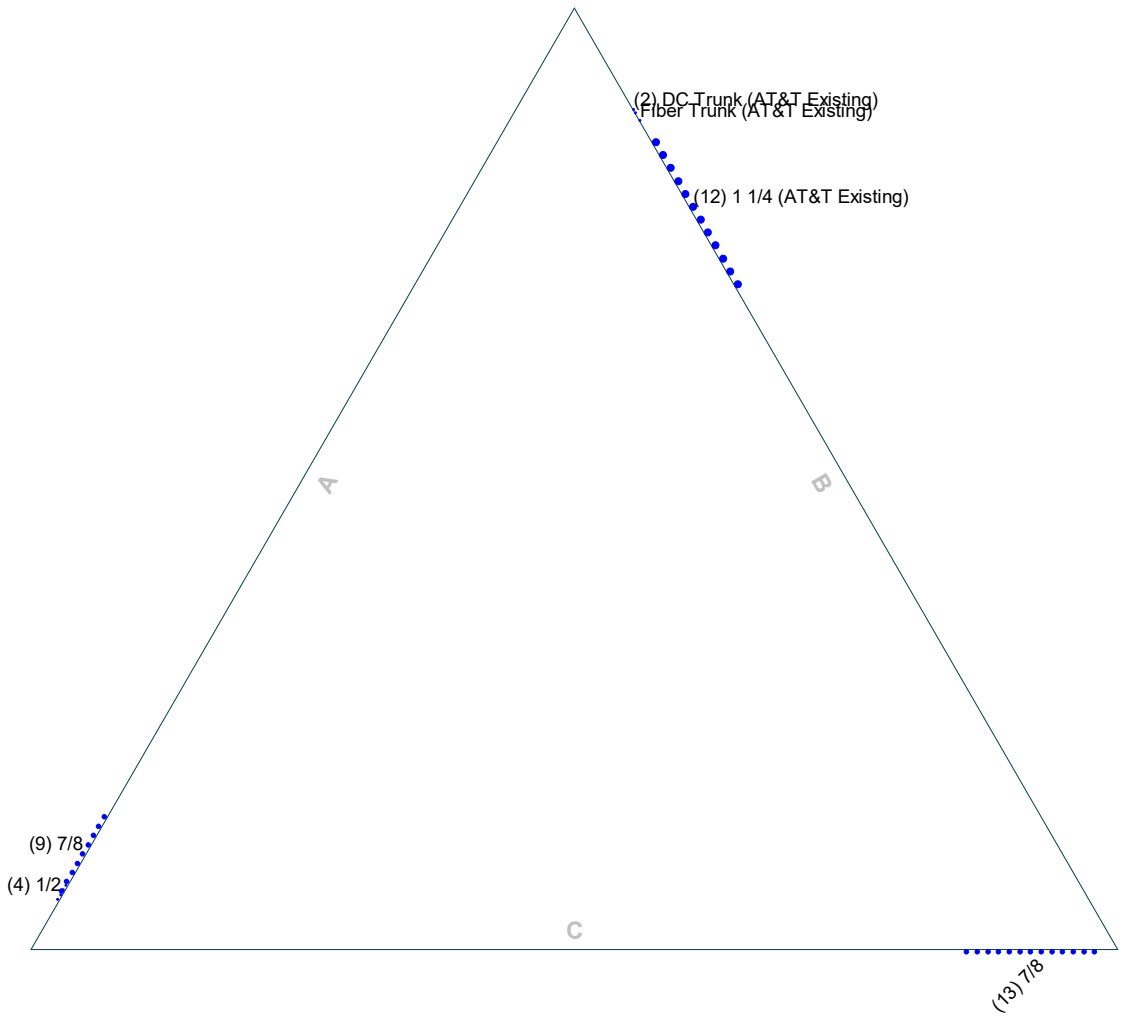
Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **16071.83 - CT1083**			
Project: **170' Lattice Tower - 2108 Main Street Glastonbury, CT**			
Client: AT&T Mobility	Drawn by: TJL		App'd:
Code: TIA-222-G	Date: 01/09/17		Scale: NTS
Path: J:\Jobs\16071\00.WI\83_Glastonbury PD CT1083\04_Structural\Tower\Backup Documentation\ERI Files\170' Lattice Glastonbury.eri			Dwg No. E-1

Feed Line Plan
20'

Round Flat App In Face App Out Face

Section @ 20'



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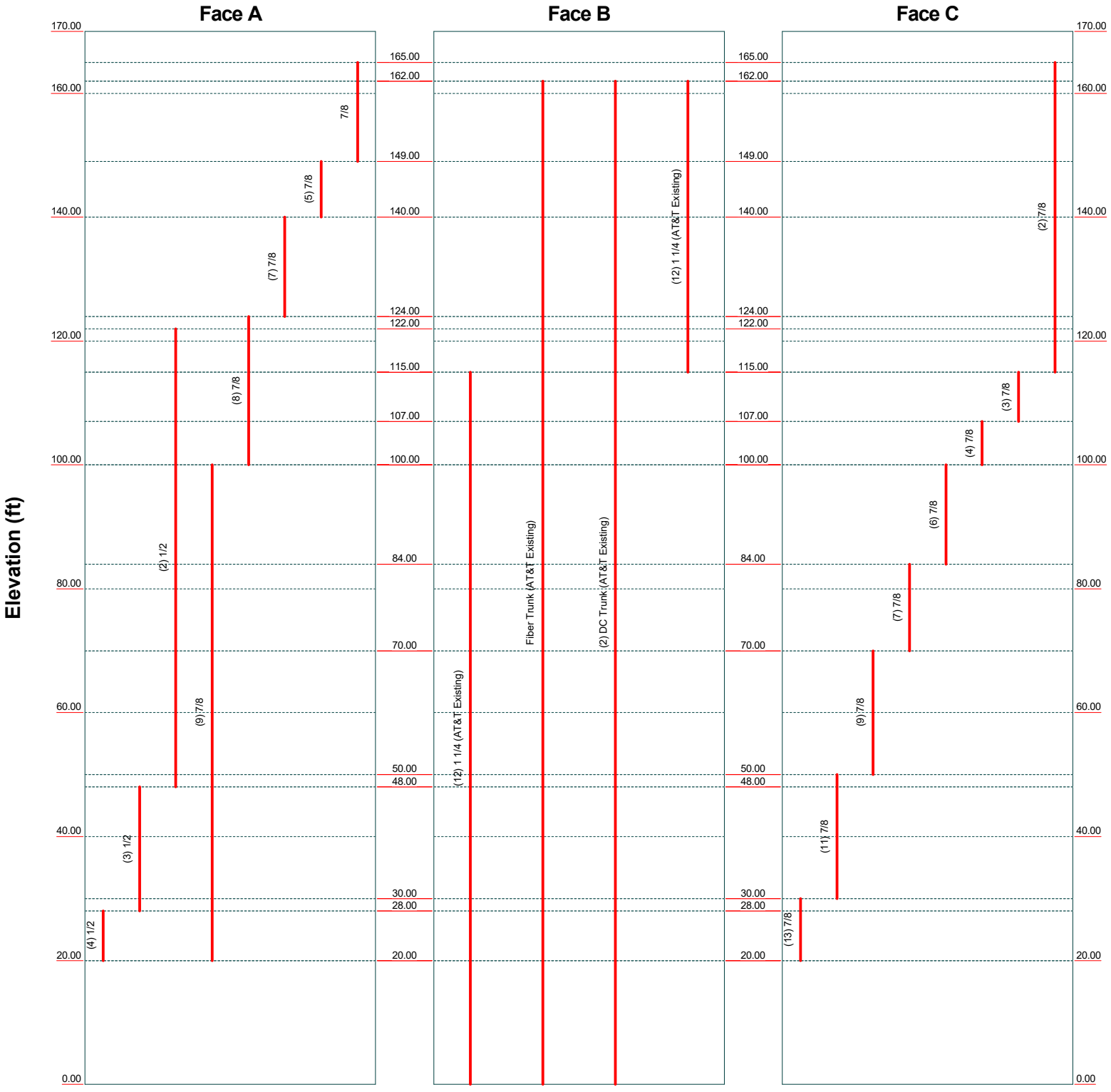
Feed Line Distribution Chart
0' - 170'

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



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Path: J:\Jobs\16071\00.WI\83_Glastonbury PD CT1083\04_Structural\Tower\Backup Documentation\ER Files\170' Lattice Glastonbury.eri		Dwg No. E-7

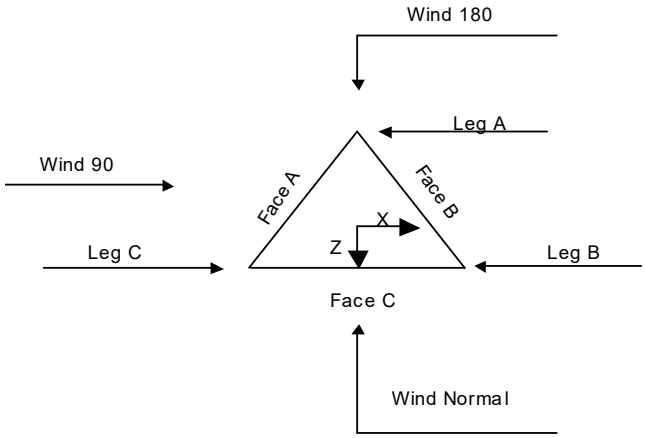
Tower Input Data

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:

Basic wind speed of 97 mph.
Structure Class II.
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.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation 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	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T8	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T9	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 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 3.5 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 1/2x1/4	A572-50 (50 ksi)
T7 60.00-40.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T8 40.00-20.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T9 20.00-0.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (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)	Equal Angle		A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 170.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
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 170.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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	0	0.5000 A325N	1	0.6250 A325N	0	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	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 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	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T7 60.00-40.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T8 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T9 20.00-0.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2	A	No	Ar (CaAa)	28.00 - 20.00	0.0000	-0.44	4	4	0.5800	0.5800		0.25
1/2	A	No	Ar (CaAa)	48.00 - 28.00	0.0000	-0.44	3	3	0.5800	0.5800		0.25

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2	A	No	Ar (CaAa)	122.00 - 48.00	0.0000	-0.44	2	2	0.5800	0.5800		0.25
7/8	A	No	Ar (CaAa)	100.00 - 20.00	0.0000	-0.4	9	9	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	124.00 - 100.00	0.0000	-0.4	8	8	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	140.00 - 124.00	0.0000	-0.4	7	7	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	149.00 - 140.00	0.0000	-0.4	5	5	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	165.00 - 149.00	0.0000	-0.4	1	1	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	30.00 - 20.00	0.0000	-0.42	13	13	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	50.00 - 30.00	0.0000	-0.42	11	11	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	70.00 - 50.00	0.0000	-0.42	9	9	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	84.00 - 70.00	0.0000	-0.42	7	7	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	100.00 - 84.00	0.0000	-0.42	6	6	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	107.00 - 100.00	0.0000	-0.42	4	4	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	115.00 - 107.00	0.0000	-0.42	3	3	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	165.00 - 115.00	0.0000	-0.42	2	2	1.1100	1.1100		0.54
1 1/4 (AT&T Existing)	B	No	Ar (CaAa)	115.00 - 0.00	0.0000	-0.28	12	12	1.5500	1.5500		0.66
Fiber Trunk (AT&T Existing)	B	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.38	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T Existing)	B	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.39	2	2	0.4000	0.4000		0.11
1 1/4 (AT&T Existing)	B	No	Ar (CaAa)	162.00 - 115.00	0.0000	-0.18	12	12	1.5500	1.5500		0.66

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	170.00-160.00	A	0.000	0.000	0.555	0.000	0.00
		B	0.000	0.000	3.960	0.000	0.02
		C	0.000	0.000	1.110	0.000	0.01
T2	160.00-140.00	A	0.000	0.000	6.216	0.000	0.03
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	4.440	0.000	0.02
T3	140.00-120.00	A	0.000	0.000	16.216	0.000	0.08
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	4.440	0.000	0.02
T4	120.00-100.00	A	0.000	0.000	20.080	0.000	0.10
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	6.882	0.000	0.03
T5	100.00-80.00	A	0.000	0.000	22.300	0.000	0.11
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	13.764	0.000	0.07
T6	80.00-60.00	A	0.000	0.000	22.300	0.000	0.11
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	17.760	0.000	0.09
T7	60.00-40.00	A	0.000	0.000	22.764	0.000	0.11
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	22.200	0.000	0.11
T8	40.00-20.00	A	0.000	0.000	23.924	0.000	0.11
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	26.640	0.000	0.13

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T9	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	39.600	0.000	0.18
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	170.00-160.00	A	2.349	0.000	0.000	2.904	0.000	0.05
		B		0.000	0.000	13.176	0.000	0.22
		C		0.000	0.000	6.193	0.000	0.08
T2	160.00-140.00	A	2.327	0.000	0.000	24.045	0.000	0.39
		B		0.000	0.000	131.389	0.000	2.23
		C		0.000	0.000	24.618	0.000	0.31
T3	140.00-120.00	A	2.294	0.000	0.000	52.743	0.000	0.85
		B		0.000	0.000	130.835	0.000	2.20
		C		0.000	0.000	24.387	0.000	0.30
T4	120.00-100.00	A	2.256	0.000	0.000	74.897	0.000	1.11
		B		0.000	0.000	130.198	0.000	2.16
		C		0.000	0.000	29.375	0.000	0.41
T5	100.00-80.00	A	2.211	0.000	0.000	79.692	0.000	1.18
		B		0.000	0.000	129.448	0.000	2.12
		C		0.000	0.000	44.880	0.000	0.70
T6	80.00-60.00	A	2.156	0.000	0.000	78.976	0.000	1.15
		B		0.000	0.000	128.530	0.000	2.07
		C		0.000	0.000	54.149	0.000	0.86
T7	60.00-40.00	A	2.085	0.000	0.000	78.982	0.000	1.13
		B		0.000	0.000	127.338	0.000	2.00
		C		0.000	0.000	64.524	0.000	1.02
T8	40.00-20.00	A	1.981	0.000	0.000	80.034	0.000	1.12
		B		0.000	0.000	125.604	0.000	1.91
		C		0.000	0.000	74.819	0.000	1.16
T9	20.00-0.00	A	1.775	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	122.169	0.000	1.73
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	170.00-160.00	0.6851	-0.6463	0.1354	-0.3773
T2	160.00-140.00	1.2066	-2.2515	0.6379	-1.7336
T3	140.00-120.00	0.2110	-2.0646	0.1209	-1.9164
T4	120.00-100.00	-0.3887	-2.5209	-0.2332	-2.4077
T5	100.00-80.00	0.0149	-2.1559	0.1198	-2.1745
T6	80.00-60.00	0.5868	-1.9860	0.6309	-2.0815
T7	60.00-40.00	1.2188	-1.6182	1.2570	-1.8708
T8	40.00-20.00	1.7495	-1.0831	1.8181	-1.4177
T9	20.00-0.00	2.6139	-9.4084	2.7179	-10.0698

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	8	7/8	160.00 - 165.00	0.6000	0.3943
T1	16	7/8	160.00 - 165.00	0.6000	0.3943
T1	18	Fiber Trunk	160.00 - 162.00	0.6000	0.3943
T1	19	DC Trunk	160.00 - 162.00	0.6000	0.3943
T1	20	1 1/4	160.00 - 162.00	0.6000	0.3943
T2	7	7/8	140.00 - 149.00	0.6000	0.5051
T2	8	7/8	149.00 - 160.00	0.6000	0.5051
T2	16	7/8	140.00 - 160.00	0.6000	0.5051
T2	18	Fiber Trunk	140.00 - 160.00	0.6000	0.5051
T2	19	DC Trunk	140.00 - 160.00	0.6000	0.5051
T2	20	1 1/4	140.00 - 160.00	0.6000	0.5051
T3	3	1/2	120.00 - 122.00	0.6000	0.6000
T3	5	7/8	120.00 - 124.00	0.6000	0.6000
T3	6	7/8	124.00 - 140.00	0.6000	0.6000
T3	16	7/8	120.00 - 140.00	0.6000	0.6000
T3	18	Fiber Trunk	120.00 - 140.00	0.6000	0.6000
T3	19	DC Trunk	120.00 - 140.00	0.6000	0.6000
T3	20	1 1/4	120.00 - 140.00	0.6000	0.6000
T4	3	1/2	100.00 - 120.00	0.6000	0.6000
T4	5	7/8	100.00 - 120.00	0.6000	0.6000
T4	14	7/8	100.00 - 107.00	0.6000	0.6000
T4	15	7/8	107.00 - 115.00	0.6000	0.6000
T4	16	7/8	115.00 - 120.00	0.6000	0.6000
T4	17	1 1/4	100.00 - 115.00	0.6000	0.6000
T4	18	Fiber Trunk	100.00 - 120.00	0.6000	0.6000
T4	19	DC Trunk	100.00 - 120.00	0.6000	0.6000
T4	20	1 1/4	115.00 - 120.00	0.6000	0.6000
T5	3	1/2	80.00 - 100.00	0.6000	0.6000
T5	4	7/8	80.00 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	12	7/8	80.00 - 84.00	0.6000	0.6000
T5	13	7/8	84.00 - 100.00	0.6000	0.6000
T5	17	1 1/4	80.00 - 100.00	0.6000	0.6000
T5	18	Fiber Trunk	80.00 - 100.00	0.6000	0.6000
T5	19	DC Trunk	80.00 - 100.00	0.6000	0.6000
T6	3	1/2	60.00 - 80.00	0.6000	0.6000
T6	4	7/8	60.00 - 80.00	0.6000	0.6000
T6	11	7/8	60.00 - 70.00	0.6000	0.6000
T6	12	7/8	70.00 - 80.00	0.6000	0.6000
T6	17	1 1/4	60.00 - 80.00	0.6000	0.6000
T6	18	Fiber Trunk	60.00 - 80.00	0.6000	0.6000
T6	19	DC Trunk	60.00 - 80.00	0.6000	0.6000
T7	2	1/2	40.00 - 48.00	0.6000	0.6000
T7	3	1/2	48.00 - 60.00	0.6000	0.6000
T7	4	7/8	40.00 - 60.00	0.6000	0.6000
T7	10	7/8	40.00 - 50.00	0.6000	0.6000
T7	11	7/8	50.00 - 60.00	0.6000	0.6000
T7	17	1 1/4	40.00 - 60.00	0.6000	0.6000
T7	18	Fiber Trunk	40.00 - 60.00	0.6000	0.6000
T7	19	DC Trunk	40.00 - 60.00	0.6000	0.6000
T8	1	1/2	20.00 - 28.00	0.6000	0.6000
T8	2	1/2	28.00 - 40.00	0.6000	0.6000
T8	4	7/8	20.00 - 40.00	0.6000	0.6000
T8	9	7/8	20.00 - 30.00	0.6000	0.6000
T8	10	7/8	30.00 - 40.00	0.6000	0.6000
T8	17	1 1/4	20.00 - 40.00	0.6000	0.6000
T8	18	Fiber Trunk	20.00 - 40.00	0.6000	0.6000
T8	19	DC Trunk	20.00 - 40.00	0.6000	0.6000
T9	17	1 1/4	0.00 - 20.00	0.6000	0.6000
T9	18	Fiber Trunk	0.00 - 20.00	0.6000	0.6000
T9	19	DC Trunk	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
10' x 1" Dia Omni	A	From Leg	3.00 0.00 0.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice	1.00 2.02 3.05	1.00 2.02 3.05	0.03 0.04 0.05
8' x 2" 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	0.02 0.03 0.05
8' x 2" 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	0.02 0.03 0.05
PR-950	A	From Leg	3.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	6.35 11.43 16.51	6.35 11.43 16.51	0.04 0.05 0.06
PR-950	B	From Leg	3.00 0.00	0.0000	152.00	No Ice 1/2" Ice	6.35 11.43	6.35 11.43	0.04 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	16.51	16.51	0.06
PR-950	C	From Leg	3.00	0.0000	152.00	No Ice	6.35	6.35	0.04
			0.00			1/2" Ice	11.43	11.43	0.05
			0.00			1" Ice	16.51	16.51	0.06
PR-950	C	From Leg	3.00	0.0000	150.00	No Ice	6.35	6.35	0.04
			0.00			1/2" Ice	11.43	11.43	0.05
			0.00			1" Ice	16.51	16.51	0.06
3' Side Mount Standoff	A	From Leg	1.50	0.0000	152.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
3' Side Mount Standoff	B	From Leg	1.50	0.0000	152.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
3' Side Mount Standoff	C	From Leg	1.50	0.0000	152.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
3' Side Mount Standoff (Empty)	A	From Leg	1.50	0.0000	140.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
5' x 1" dia. Omni	B	From Leg	3.00	0.0000	140.00	No Ice	0.50	0.50	0.01
			0.00			1/2" Ice	1.02	1.02	0.01
			3.00			1" Ice	1.43	1.43	0.02
3' Side Mount Standoff	B	From Leg	1.50	0.0000	140.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' x 1" Dia Omni	C	From Leg	3.00	0.0000	129.00	No Ice	1.00	1.00	0.03
			0.00			1/2" Ice	2.02	2.02	0.04
			5.00			1" Ice	3.05	3.05	0.05
3' Side Mount Standoff	C	From Leg	1.50	0.0000	129.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
12' x 3" Dia Omni	A	From Leg	3.00	0.0000	124.00	No Ice	3.60	3.60	0.04
			0.00			1/2" Ice	4.83	4.83	0.06
			6.00			1" Ice	6.08	6.08	0.09
3' Side Mount Standoff	A	From Leg	1.50	0.0000	124.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' x 1" Dia Omni	B	From Leg	3.00	0.0000	124.00	No Ice	1.00	1.00	0.03
			0.00			1/2" Ice	2.02	2.02	0.04
			5.00			1" Ice	3.05	3.05	0.05
3' Side Mount Standoff	B	From Leg	1.50	0.0000	124.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' Dipole	A	From Leg	1.00	0.0000	107.00	No Ice	4.00	4.00	0.05
			0.00			1/2" Ice	6.00	6.00	0.07
			5.00			1" Ice	8.00	8.00	0.10
10' x 2" Dia Omni	A	From Leg	3.00	0.0000	100.00	No Ice	2.00	2.00	0.02
			0.00			1/2" Ice	3.02	3.02	0.03
			5.00			1" Ice	4.07	4.07	0.05
3' Side Mount Standoff	A	From Leg	1.50	0.0000	100.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' x 1" Dia Omni	B	From Leg	3.00	0.0000	100.00	No Ice	1.00	1.00	0.03
			0.00			1/2" Ice	2.02	2.02	0.04
			5.00			1" Ice	3.05	3.05	0.05
3' Side Mount Standoff	B	From Leg	1.50	0.0000	100.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	4.74	4.74	0.06
20' x 2" Dia Omni	C	From Leg	3.00	0.0000	100.00	No Ice	4.00	4.00	0.02
			0.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
3' Side Mount Standoff	C	From Leg	1.50	0.0000	100.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' x 2" Dia Omni	A	From Leg	3.00	0.0000	84.00	No Ice	2.00	2.00	0.02
			0.00			1/2" Ice	3.02	3.02	0.03
			5.00			1" Ice	4.07	4.07	0.05
3' Side Mount Standoff	A	From Leg	1.50	0.0000	84.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
12' x 3" Dia Omni	B	From Leg	3.00	0.0000	70.00	No Ice	3.60	3.60	0.04
			0.00			1/2" Ice	4.83	4.83	0.06
			6.00			1" Ice	6.08	6.08	0.09
3' Side Mount Standoff	B	From Leg	1.50	0.0000	70.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
8' x 3" Dia Omni	C	From Leg	3.00	0.0000	67.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			4.00			1" Ice	3.67	3.67	0.07
3' Side Mount Standoff	C	From Leg	1.50	0.0000	67.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
20' x 3" Dia Omni	A	From Leg	3.00	0.0000	50.00	No Ice	6.00	6.00	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			10.00			1" Ice	10.08	10.08	0.15
3' Side Mount Standoff	A	From Leg	1.50	0.0000	50.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' x 2" Dia Omni	B	From Leg	3.00	0.0000	50.00	No Ice	2.00	2.00	0.02
			0.00			1/2" Ice	3.02	3.02	0.03
			5.00			1" Ice	4.07	4.07	0.05
3' Side Mount Standoff	B	From Leg	1.50	0.0000	50.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
Ground Plane	C	From Leg	3.00	0.0000	50.00	No Ice	5.00	5.00	0.05
			0.00			1/2" Ice	9.00	9.00	0.07
			0.00			1" Ice	13.00	13.00	0.10
3' Side Mount Standoff	C	From Leg	1.50	0.0000	50.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
20' x 3" Dia Omni	A	From Leg	3.00	0.0000	30.00	No Ice	6.00	6.00	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			10.00			1" Ice	10.08	10.08	0.15
3' Side Mount Standoff	A	From Leg	1.50	0.0000	30.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
20' x 2" Dia Omni	B	From Leg	3.00	0.0000	30.00	No Ice	4.00	4.00	0.02
			0.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
3' Side Mount Standoff	B	From Leg	1.50	0.0000	30.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
PD1150	C	From Leg	3.00	0.0000	30.00	No Ice	1.22	1.22	0.01
			0.00			1/2" Ice	2.43	2.43	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			5.00			1" Ice	3.64	3.64	0.02
3' Side Mount Standoff	C	From Leg	1.50	0.0000	30.00	No Ice	2.00	2.00	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
Rohn 6' x 12' Boom Gate (1)	A	From Leg	2.00	0.0000	166.00	No Ice	15.00	15.00	0.50
(AT&T - Existing)			0.00			1/2" Ice	18.00	18.00	0.70
			0.00			1" Ice	21.00	21.00	0.84
Rohn 6' x 12' Boom Gate (1)	B	From Leg	2.00	0.0000	166.00	No Ice	15.00	15.00	0.50
(AT&T - Existing)			0.00			1/2" Ice	18.00	18.00	0.70
			0.00			1" Ice	21.00	21.00	0.84
Rohn 6' x 12' Boom Gate (1)	C	From Leg	2.00	0.0000	166.00	No Ice	15.00	15.00	0.50
(AT&T - Existing)			0.00			1/2" Ice	18.00	18.00	0.70
			0.00			1" Ice	21.00	21.00	0.84
800-10121	A	From Leg	3.00	0.0000	166.00	No Ice	5.16	3.29	0.05
(AT&T - Existing)			6.00			1/2" Ice	5.51	3.64	0.08
			0.00			1" Ice	5.87	3.99	0.12
OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	166.00	No Ice	9.66	5.52	0.07
(AT&T - Existing)			-2.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	166.00	No Ice	9.66	5.52	0.07
(AT&T - Proposed)			-6.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
800-10121	B	From Leg	3.00	0.0000	166.00	No Ice	5.16	3.29	0.05
(AT&T - Existing)			6.00			1/2" Ice	5.51	3.64	0.08
			0.00			1" Ice	5.87	3.99	0.12
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	166.00	No Ice	9.66	5.52	0.07
(AT&T - Existing)			-2.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	166.00	No Ice	9.66	5.52	0.07
(AT&T - Proposed)			-6.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
800-10121	C	From Leg	3.00	0.0000	166.00	No Ice	5.16	3.29	0.05
(AT&T - Existing)			6.00			1/2" Ice	5.51	3.64	0.08
			0.00			1" Ice	5.87	3.99	0.12
OPA-65R-LCUU-H8	C	From Leg	3.00	0.0000	166.00	No Ice	12.98	7.52	0.09
(AT&T - Existing)			-2.00			1/2" Ice	13.56	8.09	0.16
			0.00			1" Ice	14.15	8.67	0.24
OPA-65R-LCUU-H8	C	From Leg	3.00	0.0000	166.00	No Ice	12.98	7.52	0.09
(AT&T - Proposed)			-6.00			1/2" Ice	13.56	8.09	0.16
			0.00			1" Ice	14.15	8.67	0.24
TT19-08BP111-001 TMA	A	From Leg	3.00	0.0000	166.00	No Ice	0.55	0.45	0.02
(AT&T - Existing)			6.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
TT19-08BP111-001 TMA	B	From Leg	3.00	0.0000	166.00	No Ice	0.55	0.45	0.02
(AT&T - Existing)			6.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
TT19-08BP111-001 TMA	C	From Leg	3.00	0.0000	166.00	No Ice	0.55	0.45	0.02
(AT&T - Existing)			6.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
(2) TPX-070821	A	From Leg	3.00	0.0000	166.00	No Ice	0.47	0.10	0.01
(AT&T - Proposed)			-6.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Leg	3.00	0.0000	166.00	No Ice	0.47	0.10	0.01
(AT&T - Proposed)			-6.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Leg	3.00	0.0000	166.00	No Ice	0.47	0.10	0.01
(AT&T - Proposed)			-6.00			1/2" Ice	0.56	0.15	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	0.66	0.20	0.02
RRUS-11	A	From Leg	3.00	0.0000	166.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			-2.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-11	B	From Leg	3.00	0.0000	166.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			-2.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-11	C	From Leg	3.00	0.0000	166.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			-2.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-12	A	From Leg	3.00	0.0000	166.00	No Ice	3.15	1.29	0.06
(AT&T - Existing)			-2.00			1/2" Ice	3.36	1.44	0.08
			-2.00			1" Ice	3.59	1.60	0.11
RRUS-12	B	From Leg	3.00	0.0000	166.00	No Ice	3.15	1.29	0.06
(AT&T - Existing)			-2.00			1/2" Ice	3.36	1.44	0.08
			-2.00			1" Ice	3.59	1.60	0.11
RRUS-12	C	From Leg	3.00	0.0000	166.00	No Ice	3.15	1.29	0.06
(AT&T - Existing)			-2.00			1/2" Ice	3.36	1.44	0.08
			-2.00			1" Ice	3.59	1.60	0.11
A2	A	From Leg	3.00	0.0000	166.00	No Ice	2.08	0.50	0.02
(AT&T - Existing)			-2.00			1/2" Ice	2.26	0.61	0.03
			-2.00			1" Ice	2.44	0.73	0.05
A2	B	From Leg	3.00	0.0000	166.00	No Ice	2.08	0.50	0.02
(AT&T - Existing)			-2.00			1/2" Ice	2.26	0.61	0.03
			-2.00			1" Ice	2.44	0.73	0.05
A2	C	From Leg	3.00	0.0000	166.00	No Ice	2.08	0.50	0.02
(AT&T - Existing)			-2.00			1/2" Ice	2.26	0.61	0.03
			-2.00			1" Ice	2.44	0.73	0.05
RRUS-32	A	From Leg	3.00	0.0000	166.00	No Ice	3.31	2.42	0.08
(AT&T - Proposed)			-6.00			1/2" Ice	3.56	2.64	0.10
			-2.00			1" Ice	3.81	2.86	0.14
RRUS-32	B	From Leg	3.00	0.0000	166.00	No Ice	3.31	2.42	0.08
(AT&T - Proposed)			-6.00			1/2" Ice	3.56	2.64	0.10
			-2.00			1" Ice	3.81	2.86	0.14
RRUS-32	C	From Leg	3.00	0.0000	166.00	No Ice	3.31	2.42	0.08
(AT&T - Proposed)			-6.00			1/2" Ice	3.56	2.64	0.10
			-2.00			1" Ice	3.81	2.86	0.14
DC6-48-60-18-8F Surge	A	From Leg	3.00	0.0000	166.00	No Ice	1.91	1.91	0.02
Arrestor			-2.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existing)			0.00			1" Ice	2.29	2.29	0.06

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Andrew 6' w/Radome		Paraboloid w/Radome	None		0.0000		115.00	6.00	No Ice	28.27	0.38
									1/2" Ice	29.07	0.45
									1" Ice	29.86	0.52

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	29	47.996	A	4.554	4.792	4.792	51.27	0.555	0.000
170.00-160.00					B	4.554	4.792		51.27	3.960	0.000
					C	4.554	4.792		51.27	1.110	0.000
T2	150.00	1.378	28	116.398	A	9.123	9.600	9.600	51.27	6.216	0.000
160.00-140.00					B	9.123	9.600		51.27	39.600	0.000
					C	9.123	9.600		51.27	4.440	0.000
T3	130.00	1.337	27	158.241	A	10.242	11.687	11.687	53.29	16.216	0.000
140.00-120.00					B	10.242	11.687		53.29	39.600	0.000
					C	10.242	11.687		53.29	4.440	0.000
T4	110.00	1.291	26	199.875	A	14.183	13.356	13.356	48.50	20.080	0.000
120.00-100.00					B	14.183	13.356		48.50	39.600	0.000
					C	14.183	13.356		48.50	6.882	0.000
T5	90.00	1.238	25	241.109	A	16.286	15.025	15.025	47.99	22.300	0.000
100.00-80.00					B	16.286	15.025		47.99	39.600	0.000
					C	16.286	15.025		47.99	13.764	0.000
T6 80.00-60.00	70.00	1.174	24	282.010	A	18.556	15.027	15.027	44.75	22.300	0.000
					B	18.556	15.027		44.75	39.600	0.000
					C	18.556	15.027		44.75	17.760	0.000
T7 60.00-40.00	50.00	1.094	22	325.484	A	18.189	18.577	18.577	50.53	22.764	0.000
					B	18.189	18.577		50.53	39.600	0.000
					C	18.189	18.577		50.53	22.200	0.000
T8 40.00-20.00	30.00	0.982	20	368.055	A	19.856	22.120	22.120	52.70	23.924	0.000
					B	19.856	22.120		52.70	39.600	0.000
					C	19.856	22.120		52.70	26.640	0.000
T9 20.00-0.00	10.00	0.85	17	408.156	A	25.219	22.120	22.120	46.73	0.000	0.000
					B	25.219	22.120		46.73	39.600	0.000
					C	25.219	22.120		46.73	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	8	2.3492	51.911	A	4.554	26.886	12.622	40.15	2.904	0.000
170.00-160.00						B	4.554	26.886		40.15	13.176	0.000
						C	4.554	26.886		40.15	6.193	0.000
T2	150.00	1.378	7	2.3270	124.164	A	9.123	52.329	25.140	40.91	24.045	0.000
160.00-140.00						B	9.123	52.329		40.91	131.389	0.000
						C	9.123	52.329		40.91	24.618	0.000
T3	130.00	1.337	7	2.2939	165.897	A	10.242	53.857	27.006	42.13	52.743	0.000
140.00-120.00						B	10.242	53.857		42.13	130.835	0.000
						C	10.242	53.857		42.13	24.387	0.000
T4	110.00	1.291	7	2.2559	207.405	A	14.183	54.017	28.422	41.67	74.897	0.000
120.00-100.00						B	14.183	54.017		41.67	130.198	0.000
						C	14.183	54.017		41.67	29.375	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T5 100.00-80.00	90.00	1.238	7	2.2111	248.489	A	16.286	58.598	29.790	39.78	79.692	0.000
						B	16.286	58.598		39.78	129.448	0.000
						C	16.286	58.598		39.78	44.880	0.000
T6 80.00-60.00	70.00	1.174	6	2.1562	289.207	A	18.556	61.436	29.428	36.79	78.976	0.000
						B	18.556	61.436		36.79	128.530	0.000
						C	18.556	61.436		36.79	54.149	0.000
T7 60.00-40.00	50.00	1.094	6	2.0849	332.443	A	18.189	57.782	32.501	42.78	78.982	0.000
						B	18.189	57.782		42.78	127.338	0.000
						C	18.189	57.782		42.78	64.524	0.000
T8 40.00-20.00	30.00	0.982	5	1.9810	374.667	A	19.856	61.573	35.349	43.41	80.034	0.000
						B	19.856	61.573		43.41	125.604	0.000
						C	19.856	61.573		43.41	74.819	0.000
T9 20.00-0.00	10.00	0.85	5	1.7749	414.079	A	25.219	59.551	33.973	40.08	0.000	0.000
						B	25.219	59.551		40.08	122.169	0.000
						C	25.219	59.551		40.08	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	11	47.996	A	4.554	4.792	4.792	51.27	0.555	0.000
170.00-160.00					B	4.554	4.792		51.27	3.960	0.000
					C	4.554	4.792		51.27	1.110	0.000
T2	150.00	1.378	11	116.398	A	9.123	9.600	9.600	51.27	6.216	0.000
160.00-140.00					B	9.123	9.600		51.27	39.600	0.000
					C	9.123	9.600		51.27	4.440	0.000
T3	130.00	1.337	10	158.241	A	10.242	11.687	11.687	53.29	16.216	0.000
140.00-120.00					B	10.242	11.687		53.29	39.600	0.000
					C	10.242	11.687		53.29	4.440	0.000
T4	110.00	1.291	10	199.875	A	14.183	13.356	13.356	48.50	20.080	0.000
120.00-100.00					B	14.183	13.356		48.50	39.600	0.000
					C	14.183	13.356		48.50	6.882	0.000
T5	90.00	1.238	10	241.109	A	16.286	15.025	15.025	47.99	22.300	0.000
100.00-80.00					B	16.286	15.025		47.99	39.600	0.000
					C	16.286	15.025		47.99	13.764	0.000
T6 80.00-60.00	70.00	1.174	9	282.010	A	18.556	15.027	15.027	44.75	22.300	0.000
					B	18.556	15.027		44.75	39.600	0.000
					C	18.556	15.027		44.75	17.760	0.000
T7 60.00-40.00	50.00	1.094	9	325.484	A	18.189	18.577	18.577	50.53	22.764	0.000
					B	18.189	18.577		50.53	39.600	0.000
					C	18.189	18.577		50.53	22.200	0.000
T8 40.00-20.00	30.00	0.982	8	368.055	A	19.856	22.120	22.120	52.70	23.924	0.000
					B	19.856	22.120		52.70	39.600	0.000
					C	19.856	22.120		52.70	26.640	0.000
T9 20.00-0.00	10.00	0.85	7	408.156	A	25.219	22.120	22.120	46.73	0.000	0.000
					B	25.219	22.120		46.73	39.600	0.000
					C	25.219	22.120		46.73	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.32	A	0.195	2.614	29	1	1	7.302	0.55	54.97	C
170.00-160.00			B	0.195	2.614		1	1	7.302			
			C	0.195	2.614		1	1	7.302			
T2	0.23	0.76	A	0.161	2.732	28	1	1	14.583	1.68	83.95	C
160.00-140.00			B	0.161	2.732		1	1	14.583			
			C	0.161	2.732		1	1	14.583			
T3	0.28	0.92	A	0.139	2.814	27	1	1	16.822	1.94	97.17	C
140.00-120.00			B	0.139	2.814		1	1	16.822			
			C	0.139	2.814		1	1	16.822			
T4	0.31	1.40	A	0.138	2.817	26	1	1	21.443	2.25	112.74	C
120.00-100.00			B	0.138	2.817		1	1	21.443			
			C	0.138	2.817		1	1	21.443			
T5	0.36	1.64	A	0.13	2.847	25	1	1	24.162	2.46	122.99	C
100.00-80.00			B	0.13	2.847		1	1	24.162			
			C	0.13	2.847		1	1	24.162			
T6	0.38	2.01	A	0.119	2.889	24	1	1	26.486	2.54	126.99	C
80.00-60.00			B	0.119	2.889		1	1	26.486			
			C	0.119	2.889		1	1	26.486			
T7	0.40	2.35	A	0.113	2.912	22	1	1	27.251	2.48	123.83	C
60.00-40.00			B	0.113	2.912		1	1	27.251			
			C	0.113	2.912		1	1	27.251			
T8	0.43	2.58	A	0.114	2.908	20	1	1	29.969	2.41	120.73	C
40.00-20.00			B	0.114	2.908		1	1	29.969			
			C	0.114	2.908		1	1	29.969			
T9 20.00-0.00	0.18	2.91	A	0.116	2.901	17	1	1	35.761	1.89	94.29	C
			B	0.116	2.901		1	1	35.761			
			C	0.116	2.901		1	1	35.761			
Sum Weight:	2.60	14.89						OTM	1457.53 kip-ft	18.20		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.32	A	0.195	2.614	29	0.8	1	6.391	0.49	49.15	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	0.23	0.76	A	0.161	2.732	28	0.8	1	12.759	1.56	77.97	C
160.00-140.00			B	0.161	2.732		0.8	1	12.759			
			C	0.161	2.732		0.8	1	12.759			
T3	0.28	0.92	A	0.139	2.814	27	0.8	1	14.774	1.81	90.46	C
140.00-120.00			B	0.139	2.814		0.8	1	14.774			
			C	0.139	2.814		0.8	1	14.774			
T4	0.31	1.40	A	0.138	2.817	26	0.8	1	18.607	2.08	103.77	C
120.00-100.00			B	0.138	2.817		0.8	1	18.607			
			C	0.138	2.817		0.8	1	18.607			
T5	0.36	1.64	A	0.13	2.847	25	0.8	1	20.905	2.26	113.01	C
100.00-80.00			B	0.13	2.847		0.8	1	20.905			
			C	0.13	2.847		0.8	1	20.905			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T6	0.38	2.01	A	0.119	2.889	24	0.8	1	22.775	2.32	116.04	C
80.00-60.00			B	0.119	2.889		0.8	1	22.775			
			C	0.119	2.889		0.8	1	22.775			
T7	0.40	2.35	A	0.113	2.912	22	0.8	1	23.613	2.27	113.74	C
60.00-40.00			B	0.113	2.912		0.8	1	23.613			
			C	0.113	2.912		0.8	1	23.613			
T8	0.43	2.58	A	0.114	2.908	20	0.8	1	25.998	2.22	110.86	C
40.00-20.00			B	0.114	2.908		0.8	1	25.998			
			C	0.114	2.908		0.8	1	25.998			
T9 20.00-0.00	0.18	2.91	A	0.116	2.901	17	0.8	1	30.718	1.67	83.47	C
			B	0.116	2.901		0.8	1	30.718			
			C	0.116	2.901		0.8	1	30.718			
Sum Weight:	2.60	14.89						OTM	1341.30 kip-ft	16.68		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.32	A	0.195	2.614	29	0.85	1	6.619	0.51	50.60	C
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	0.23	0.76	A	0.161	2.732	28	0.85	1	13.215	1.59	79.47	C
160.00-140.00			B	0.161	2.732		0.85	1	13.215			
			C	0.161	2.732		0.85	1	13.215			
T3	0.28	0.92	A	0.139	2.814	27	0.85	1	15.286	1.84	92.14	C
140.00-120.00			B	0.139	2.814		0.85	1	15.286			
			C	0.139	2.814		0.85	1	15.286			
T4	0.31	1.40	A	0.138	2.817	26	0.85	1	19.316	2.12	106.01	C
120.00-100.00			B	0.138	2.817		0.85	1	19.316			
			C	0.138	2.817		0.85	1	19.316			
T5	0.36	1.64	A	0.13	2.847	25	0.85	1	21.720	2.31	115.50	C
100.00-80.00			B	0.13	2.847		0.85	1	21.720			
			C	0.13	2.847		0.85	1	21.720			
T6	0.38	2.01	A	0.119	2.889	24	0.85	1	23.703	2.38	118.77	C
80.00-60.00			B	0.119	2.889		0.85	1	23.703			
			C	0.119	2.889		0.85	1	23.703			
T7	0.40	2.35	A	0.113	2.912	22	0.85	1	24.523	2.33	116.27	C
60.00-40.00			B	0.113	2.912		0.85	1	24.523			
			C	0.113	2.912		0.85	1	24.523			
T8	0.43	2.58	A	0.114	2.908	20	0.85	1	26.990	2.27	113.33	C
40.00-20.00			B	0.114	2.908		0.85	1	26.990			
			C	0.114	2.908		0.85	1	26.990			
T9 20.00-0.00	0.18	2.91	A	0.116	2.901	17	0.85	1	31.979	1.72	86.18	C
			B	0.116	2.901		0.85	1	31.979			
			C	0.116	2.901		0.85	1	31.979			
Sum Weight:	2.60	14.89						OTM	1370.36 kip-ft	17.06		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.36	2.24	A	0.606	1.801	8	1	1	24.647	0.35	34.57	C
170.00-160.00			B	0.606	1.801		1	1	24.647			
			C	0.606	1.801		1	1	24.647			
T2	2.93	4.49	A	0.495	1.907	7	1	1	44.826	1.12	56.22	C
160.00-140.00			B	0.495	1.907		1	1	44.826			
			C	0.495	1.907		1	1	44.826			
T3	3.35	4.82	A	0.386	2.092	7	1	1	44.196	1.34	67.17	C
140.00-120.00			B	0.386	2.092		1	1	44.196			
			C	0.386	2.092		1	1	44.196			
T4	3.68	5.81	A	0.329	2.222	7	1	1	47.048	1.46	73.21	C
120.00-100.00			B	0.329	2.222		1	1	47.048			
			C	0.329	2.222		1	1	47.048			
T5	4.01	6.49	A	0.301	2.292	7	1	1	51.406	1.55	77.34	C
100.00-80.00			B	0.301	2.292		1	1	51.406			
			C	0.301	2.292		1	1	51.406			
T6	4.08	7.19	A	0.277	2.36	6	1	1	54.926	1.56	77.80	C
80.00-60.00			B	0.277	2.36		1	1	54.926			
			C	0.277	2.36		1	1	54.926			
T7	4.16	7.14	A	0.229	2.503	6	1	1	51.706	1.48	73.83	C
60.00-40.00			B	0.229	2.503		1	1	51.706			
			C	0.229	2.503		1	1	51.706			
T8	4.19	7.53	A	0.217	2.539	5	1	1	55.429	1.40	70.18	C
40.00-20.00			B	0.217	2.539		1	1	55.429			
			C	0.217	2.539		1	1	55.429			
T9 20.00-0.00	1.73	7.89	A	0.205	2.58	5	1	1	59.479	0.89	44.57	C
			B	0.205	2.58		1	1	59.479			
			C	0.205	2.58		1	1	59.479			
Sum Weight:	28.49	53.60						OTM	934.40 kip-ft	11.15		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.36	2.24	A	0.606	1.801	8	0.8	1	23.737	0.34	33.51	C
170.00-160.00			B	0.606	1.801		0.8	1	23.737			
			C	0.606	1.801		0.8	1	23.737			
T2	2.93	4.49	A	0.495	1.907	7	0.8	1	43.002	1.10	55.11	C
160.00-140.00			B	0.495	1.907		0.8	1	43.002			
			C	0.495	1.907		0.8	1	43.002			
T3	3.35	4.82	A	0.386	2.092	7	0.8	1	42.148	1.32	65.85	C
140.00-120.00			B	0.386	2.092		0.8	1	42.148			
			C	0.386	2.092		0.8	1	42.148			
T4	3.68	5.81	A	0.329	2.222	7	0.8	1	44.211	1.43	71.33	C
120.00-100.00			B	0.329	2.222		0.8	1	44.211			
			C	0.329	2.222		0.8	1	44.211			
T5	4.01	6.49	A	0.301	2.292	7	0.8	1	48.149	1.50	75.21	C
100.00-80.00			B	0.301	2.292		0.8	1	48.149			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.301	2.292		0.8	1	48.149			
T6	4.08	7.19	A	0.277	2.36	6	0.8	1	51.214	1.51	75.43	C
80.00-60.00			B	0.277	2.36		0.8	1	51.214			
			C	0.277	2.36		0.8	1	51.214			
T7	4.16	7.14	A	0.229	2.503	6	0.8	1	48.068	1.43	71.53	C
60.00-40.00			B	0.229	2.503		0.8	1	48.068			
			C	0.229	2.503		0.8	1	48.068			
T8	4.19	7.53	A	0.217	2.539	5	0.8	1	51.458	1.36	67.89	C
40.00-20.00			B	0.217	2.539		0.8	1	51.458			
			C	0.217	2.539		0.8	1	51.458			
T9 20.00-0.00	1.73	7.89	A	0.205	2.58	5	0.8	1	54.436	0.84	42.01	C
			B	0.205	2.58		0.8	1	54.436			
			C	0.205	2.58		0.8	1	54.436			
Sum Weight:	28.49	53.60						OTM	910.37 kip-ft	10.82		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.36	2.24	A	0.606	1.801	8	0.85	1	23.964	0.34	33.77	C
170.00-160.00			B	0.606	1.801		0.85	1	23.964			
			C	0.606	1.801		0.85	1	23.964			
T2	2.93	4.49	A	0.495	1.907	7	0.85	1	43.458	1.11	55.39	C
160.00-140.00			B	0.495	1.907		0.85	1	43.458			
			C	0.495	1.907		0.85	1	43.458			
T3	3.35	4.82	A	0.386	2.092	7	0.85	1	42.660	1.32	66.18	C
140.00-120.00			B	0.386	2.092		0.85	1	42.660			
			C	0.386	2.092		0.85	1	42.660			
T4	3.68	5.81	A	0.329	2.222	7	0.85	1	44.920	1.44	71.80	C
120.00-100.00			B	0.329	2.222		0.85	1	44.920			
			C	0.329	2.222		0.85	1	44.920			
T5	4.01	6.49	A	0.301	2.292	7	0.85	1	48.963	1.51	75.74	C
100.00-80.00			B	0.301	2.292		0.85	1	48.963			
			C	0.301	2.292		0.85	1	48.963			
T6	4.08	7.19	A	0.277	2.36	6	0.85	1	52.142	1.52	76.02	C
80.00-60.00			B	0.277	2.36		0.85	1	52.142			
			C	0.277	2.36		0.85	1	52.142			
T7	4.16	7.14	A	0.229	2.503	6	0.85	1	48.978	1.44	72.10	C
60.00-40.00			B	0.229	2.503		0.85	1	48.978			
			C	0.229	2.503		0.85	1	48.978			
T8	4.19	7.53	A	0.217	2.539	5	0.85	1	52.451	1.37	68.46	C
40.00-20.00			B	0.217	2.539		0.85	1	52.451			
			C	0.217	2.539		0.85	1	52.451			
T9 20.00-0.00	1.73	7.89	A	0.205	2.58	5	0.85	1	55.697	0.85	42.65	C
			B	0.205	2.58		0.85	1	55.697			
			C	0.205	2.58		0.85	1	55.697			
Sum Weight:	28.49	53.60						OTM	916.37 kip-ft	10.90		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.03	0.32	A	0.195	2.614	11	1	1	7.302	0.21	21.03	C
170.00-160.00			B	0.195	2.614		1	1	7.302			
			C	0.195	2.614		1	1	7.302			
T2	0.23	0.76	A	0.161	2.732	11	1	1	14.583	0.64	32.12	C
160.00-140.00			B	0.161	2.732		1	1	14.583			
			C	0.161	2.732		1	1	14.583			
T3	0.28	0.92	A	0.139	2.814	10	1	1	16.822	0.74	37.18	C
140.00-120.00			B	0.139	2.814		1	1	16.822			
			C	0.139	2.814		1	1	16.822			
T4	0.31	1.40	A	0.138	2.817	10	1	1	21.443	0.86	43.14	C
120.00-100.00			B	0.138	2.817		1	1	21.443			
			C	0.138	2.817		1	1	21.443			
T5	0.36	1.64	A	0.13	2.847	10	1	1	24.162	0.94	47.06	C
100.00-80.00			B	0.13	2.847		1	1	24.162			
			C	0.13	2.847		1	1	24.162			
T6	0.38	2.01	A	0.119	2.889	9	1	1	26.486	0.97	48.59	C
80.00-60.00			B	0.119	2.889		1	1	26.486			
			C	0.119	2.889		1	1	26.486			
T7	0.40	2.35	A	0.113	2.912	9	1	1	27.251	0.95	47.38	C
60.00-40.00			B	0.113	2.912		1	1	27.251			
			C	0.113	2.912		1	1	27.251			
T8	0.43	2.58	A	0.114	2.908	8	1	1	29.969	0.92	46.19	C
40.00-20.00			B	0.114	2.908		1	1	29.969			
			C	0.114	2.908		1	1	29.969			
T9 20.00-0.00	0.18	2.91	A	0.116	2.901	7	1	1	35.761	0.72	36.08	C
			B	0.116	2.901		1	1	35.761			
			C	0.116	2.901		1	1	35.761			
Sum Weight:	2.60	14.89						OTM	557.67 kip-ft	6.96		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.03	0.32	A	0.195	2.614	11	0.8	1	6.391	0.19	18.80	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	0.23	0.76	A	0.161	2.732	11	0.8	1	12.759	0.60	29.83	C
160.00-140.00			B	0.161	2.732		0.8	1	12.759			
			C	0.161	2.732		0.8	1	12.759			
T3	0.28	0.92	A	0.139	2.814	10	0.8	1	14.774	0.69	34.61	C
140.00-120.00			B	0.139	2.814		0.8	1	14.774			
			C	0.139	2.814		0.8	1	14.774			
T4	0.31	1.40	A	0.138	2.817	10	0.8	1	18.607	0.79	39.70	C
120.00-100.00			B	0.138	2.817		0.8	1	18.607			
			C	0.138	2.817		0.8	1	18.607			
T5	0.36	1.64	A	0.13	2.847	10	0.8	1	20.905	0.86	43.24	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
100.00-80.00			B	0.13	2.847		0.8	1	20.905			
			C	0.13	2.847		0.8	1	20.905			
T6	0.38	2.01	A	0.119	2.889	9	0.8	1	22.775	0.89	44.40	C
80.00-60.00			B	0.119	2.889		0.8	1	22.775			
			C	0.119	2.889		0.8	1	22.775			
T7	0.40	2.35	A	0.113	2.912	9	0.8	1	23.613	0.87	43.52	C
60.00-40.00			B	0.113	2.912		0.8	1	23.613			
			C	0.113	2.912		0.8	1	23.613			
T8	0.43	2.58	A	0.114	2.908	8	0.8	1	25.998	0.85	42.42	C
40.00-20.00			B	0.114	2.908		0.8	1	25.998			
			C	0.114	2.908		0.8	1	25.998			
T9 20.00-0.00	0.18	2.91	A	0.116	2.901	7	0.8	1	30.718	0.64	31.94	C
			B	0.116	2.901		0.8	1	30.718			
			C	0.116	2.901		0.8	1	30.718			
Sum Weight:	2.60	14.89						OTM	513.20 kip-ft	6.38		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.32	A	0.195	2.614	11	0.85	1	6.619	0.19	19.36	C
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	0.23	0.76	A	0.161	2.732	11	0.85	1	13.215	0.61	30.41	C
160.00-140.00			B	0.161	2.732		0.85	1	13.215			
			C	0.161	2.732		0.85	1	13.215			
T3	0.28	0.92	A	0.139	2.814	10	0.85	1	15.286	0.71	35.25	C
140.00-120.00			B	0.139	2.814		0.85	1	15.286			
			C	0.139	2.814		0.85	1	15.286			
T4	0.31	1.40	A	0.138	2.817	10	0.85	1	19.316	0.81	40.56	C
120.00-100.00			B	0.138	2.817		0.85	1	19.316			
			C	0.138	2.817		0.85	1	19.316			
T5	0.36	1.64	A	0.13	2.847	10	0.85	1	21.720	0.88	44.19	C
100.00-80.00			B	0.13	2.847		0.85	1	21.720			
			C	0.13	2.847		0.85	1	21.720			
T6	0.38	2.01	A	0.119	2.889	9	0.85	1	23.703	0.91	45.44	C
80.00-60.00			B	0.119	2.889		0.85	1	23.703			
			C	0.119	2.889		0.85	1	23.703			
T7	0.40	2.35	A	0.113	2.912	9	0.85	1	24.523	0.89	44.48	C
60.00-40.00			B	0.113	2.912		0.85	1	24.523			
			C	0.113	2.912		0.85	1	24.523			
T8	0.43	2.58	A	0.114	2.908	8	0.85	1	26.990	0.87	43.36	C
40.00-20.00			B	0.114	2.908		0.85	1	26.990			
			C	0.114	2.908		0.85	1	26.990			
T9 20.00-0.00	0.18	2.91	A	0.116	2.901	7	0.85	1	31.979	0.66	32.97	C
			B	0.116	2.901		0.85	1	31.979			
			C	0.116	2.901		0.85	1	31.979			
Sum Weight:	2.60	14.89						OTM	524.32 kip-ft	6.53		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	7.53					
Bracing Weight	7.36					
Total Member Self-Weight	14.89			-4.35	-1.07	
Total Weight	22.28			-4.35	-1.07	
Wind 0 deg - No Ice		0.02	-23.62	-2201.71	-4.78	0.55
Wind 30 deg - No Ice		11.27	-19.48	-1833.69	-1061.53	-1.98
Wind 60 deg - No Ice		19.17	-11.07	-1048.14	-1808.96	-3.83
Wind 90 deg - No Ice		22.50	-0.02	-8.07	-2115.55	-4.77
Wind 120 deg - No Ice		20.47	11.79	1091.11	-1905.89	-4.65
Wind 150 deg - No Ice		11.23	19.45	1821.27	-1055.09	-2.78
Wind 180 deg - No Ice		-0.02	22.10	2076.78	2.65	-0.43
Wind 210 deg - No Ice		-11.27	19.48	1824.99	1059.39	1.98
Wind 240 deg - No Ice		-20.49	11.83	1097.55	1907.48	4.10
Wind 270 deg - No Ice		-22.50	0.02	-0.63	2113.41	4.77
Wind 300 deg - No Ice		-19.15	-11.03	-1041.70	1803.11	4.27
Wind 330 deg - No Ice		-11.23	-19.45	-1829.97	1052.95	2.78
Member Ice	38.71					
Total Weight Ice	98.01			-47.44	-11.43	
Wind 0 deg - Ice		0.01	-14.56	-1424.09	-12.39	-0.38
Wind 30 deg - Ice		7.16	-12.40	-1224.52	-692.13	-1.57
Wind 60 deg - Ice		12.33	-7.12	-724.58	-1184.27	-2.31
Wind 90 deg - Ice		14.32	-0.01	-48.40	-1371.16	-2.45
Wind 120 deg - Ice		12.61	7.27	640.05	-1204.12	-1.99
Wind 150 deg - Ice		7.15	12.39	1128.68	-690.46	-0.88
Wind 180 deg - Ice		-0.01	14.23	1305.18	-10.47	0.41
Wind 210 deg - Ice		-7.16	12.40	1129.64	669.27	1.57
Wind 240 deg - Ice		-12.62	7.28	641.72	1182.22	2.37
Wind 270 deg - Ice		-14.32	0.01	-46.48	1348.30	2.45
Wind 300 deg - Ice		-12.32	-7.11	-722.92	1160.45	1.90
Wind 330 deg - Ice		-7.15	-12.39	-1223.56	667.61	0.88
Total Weight	22.28			-4.35	-1.07	
Wind 0 deg - Service		0.01	-9.04	-841.43	-1.31	0.21
Wind 30 deg - Service		4.31	-7.45	-700.62	-405.63	-0.76
Wind 60 deg - Service		7.33	-4.23	-400.06	-691.61	-1.47
Wind 90 deg - Service		8.61	-0.01	-2.11	-808.91	-1.82
Wind 120 deg - Service		7.83	4.51	418.44	-728.70	-1.78
Wind 150 deg - Service		4.30	7.44	697.81	-403.17	-1.07
Wind 180 deg - Service		-0.01	8.45	795.58	1.53	-0.17
Wind 210 deg - Service		-4.31	7.45	699.23	405.86	0.76
Wind 240 deg - Service		-7.84	4.53	420.91	730.35	1.57
Wind 270 deg - Service		-8.61	0.01	0.73	809.14	1.82
Wind 300 deg - Service		-7.33	-4.22	-397.59	690.41	1.63
Wind 330 deg - Service		-4.30	-7.44	-699.20	403.39	1.07

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice

Comb. No.	Description
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	170 - 160	Leg	Max Tension	7	4.62	-0.13	0.07
			Max. Compression	18	-6.98	0.05	-0.03
			Max. Mx	8	1.38	0.55	0.04
			Max. My	2	-0.59	0.04	-0.58
			Max. Vy	20	1.24	0.28	-0.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	1.21	-0.01	0.31
		Diagonal	Max Tension	20	2.33	0.00	0.00
			Max. Compression	8	-2.36	0.00	0.00
			Max. Mx	35	0.56	0.01	0.00
			Max. My	20	-1.79	0.00	0.00
			Max. Vy	35	-0.02	0.01	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.33	0.00	0.00
			Max. Compression	18	-0.34	0.00	0.00
			Max. Mx	26	-0.02	-0.04	0.00
			Max. My	27	0.02	0.00	-0.00
			Max. Vy	26	0.03	0.00	0.00
			Max. Vx	27	0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	7	26.73	-0.05	0.00
			Max. Compression	18	-30.56	0.08	-0.00
			Max. Mx	6	26.35	-0.09	0.00
			Max. My	24	-1.72	-0.01	0.14
			Max. Vy	6	-0.32	-0.07	0.00
			Max. Vx	12	-0.35	0.01	-0.05
		Diagonal	Max Tension	8	2.56	0.00	0.00
			Max. Compression	8	-2.56	0.00	0.00
			Max. Mx	27	0.75	0.02	0.00
			Max. My	38	-0.53	0.02	0.00
			Max. Vy	29	0.03	0.02	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Top Girt	Max Tension	11	0.03	0.00	0.00
			Max. Compression	29	-0.05	0.00	0.00
			Max. Mx	26	-0.02	-0.05	0.00
			Max. My	33	0.00	0.00	0.00
			Max. Vy	26	0.05	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	7	46.97	-0.24	0.01
			Max. Compression	18	-52.54	0.25	-0.01
			Max. Mx	19	-51.85	0.25	-0.01
			Max. My	8	-2.66	-0.01	0.31
			Max. Vy	14	-0.10	-0.13	0.01
			Max. Vx	10	0.15	-0.07	0.12
		Diagonal	Max Tension	16	2.97	0.00	0.00
			Max. Compression	16	-3.02	0.00	0.00
			Max. Mx	29	1.01	0.05	0.01
			Max. My	27	-0.11	0.04	0.01
			Max. Vy	29	0.04	0.05	0.01
			Max. Vx	27	0.00	0.00	0.00
T4	120 - 100	Leg	Max Tension	7	67.25	-0.13	0.01
			Max. Compression	18	-75.16	0.22	-0.00
			Max. Mx	6	59.30	-0.35	0.01
			Max. My	8	-2.77	-0.01	0.31
			Max. Vy	14	0.30	-0.35	-0.00
			Max. Vx	20	0.28	-0.01	-0.29
		Diagonal	Max Tension	16	4.08	0.00	0.00
			Max. Compression	16	-4.15	0.00	0.00
			Max. Mx	29	1.30	0.09	0.01
			Max. My	35	-0.05	0.08	-0.01
			Max. Vy	29	0.07	0.09	-0.01
			Max. Vx	27	0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	7	89.39	-0.25	0.03
			Max. Compression	18	-100.09	0.37	-0.04
			Max. Mx	18	-100.09	0.37	-0.04
			Max. My	20	-3.82	-0.02	-0.33
			Max. Vy	22	-0.17	-0.22	-0.01
			Max. Vx	24	0.21	-0.01	0.18

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	16	4.79	0.00	0.00
			Max. Compression	16	-4.88	0.00	0.00
			Max. Mx	29	1.50	0.12	-0.01
			Max. My	35	-0.20	0.11	-0.02
			Max. Vy	29	0.08	0.12	-0.01
			Max. Vx	35	-0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	7	110.91	-0.29	-0.03
			Max. Compression	18	-124.79	0.39	-0.02
			Max. Mx	33	23.19	-0.43	-0.00
			Max. My	20	-4.94	-0.01	-0.46
			Max. Vy	2	-0.14	0.32	-0.03
			Max. Vx	4	-0.16	-0.02	-0.42
		Diagonal	Max Tension	16	5.23	0.00	0.00
			Max. Compression	16	-5.32	0.00	0.00
			Max. Mx	29	1.78	0.15	0.02
			Max. My	30	-0.67	0.12	0.02
			Max. Vy	29	0.09	0.15	0.02
			Max. Vx	30	0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	7	130.38	-0.46	-0.00
			Max. Compression	18	-147.58	0.61	-0.01
			Max. Mx	37	30.16	-0.84	-0.01
			Max. My	4	-6.10	-0.03	-0.56
			Max. Vy	14	-0.24	-0.46	0.01
			Max. Vx	8	0.30	-0.03	0.55
		Diagonal	Max Tension	16	6.43	0.00	0.00
			Max. Compression	16	-6.58	0.00	0.00
			Max. Mx	29	2.40	0.23	-0.03
			Max. My	30	-1.58	0.21	0.03
			Max. Vy	29	0.12	0.23	-0.03
			Max. Vx	30	0.01	0.00	0.00
T8	40 - 20	Leg	Max Tension	7	152.12	-0.59	-0.00
			Max. Compression	18	-173.11	0.92	-0.01
			Max. Mx	33	31.90	-1.71	0.00
			Max. My	4	-7.36	-0.06	-0.92
			Max. Vy	35	0.30	1.25	0.01
			Max. Vx	8	0.33	-0.05	0.91
		Diagonal	Max Tension	16	7.17	0.00	0.00
			Max. Compression	16	-7.38	0.00	0.00
			Max. Mx	29	1.67	0.26	-0.03
			Max. My	35	-0.71	0.26	-0.03
			Max. Vy	29	0.12	0.25	-0.03
			Max. Vx	35	-0.01	0.00	0.00
T9	20 - 0	Leg	Max Tension	7	173.62	-0.63	0.02
			Max. Compression	18	-198.23	0.00	0.00
			Max. Mx	33	36.92	-1.71	0.00
			Max. My	8	-9.04	-0.07	1.45
			Max. Vy	33	-0.33	-1.71	0.00
			Max. Vx	8	0.25	-0.07	1.45
		Diagonal	Max Tension	12	7.47	0.00	0.00
			Max. Compression	12	-7.74	0.00	0.00
			Max. Mx	29	1.01	0.35	0.04
			Max. My	29	-3.33	0.30	0.05
			Max. Vy	29	0.14	0.35	0.04
			Max. Vx	29	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	204.55	19.96	-11.74
	Max. H_x	18	204.55	19.96	-11.74
	Max. H_z	7	-178.83	-17.70	10.42
	Min. Vert	7	-178.83	-17.70	10.42
	Min. H_x	7	-178.83	-17.70	10.42
	Min. H_z	18	204.55	19.96	-11.74
Leg B	Max. Vert	10	204.10	-19.92	-11.74
	Max. H_x	23	-178.17	17.66	10.41
	Max. H_z	23	-178.17	17.66	10.41
	Min. Vert	23	-178.17	17.66	10.41
	Min. H_x	10	204.10	-19.92	-11.74
	Min. H_z	10	204.10	-19.92	-11.74
Leg A	Max. Vert	2	204.47	0.03	23.13
	Max. H_x	21	6.57	2.83	0.49
	Max. H_z	2	204.47	0.03	23.13
	Min. Vert	15	-177.89	-0.02	-20.49
	Min. H_x	9	7.23	-2.83	0.53
	Min. H_z	15	-177.89	-0.02	-20.49

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	22.28	0.00	0.00	-4.35	-1.07	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	26.73	0.04	-37.79	-3532.89	-7.25	0.89
0.9 Dead+1.6 Wind 0 deg - No Ice	20.05	0.04	-37.79	-3528.56	-6.93	0.88
1.2 Dead+1.6 Wind 30 deg - No Ice	26.73	18.03	-31.16	-2942.13	-1703.79	-3.18
0.9 Dead+1.6 Wind 30 deg - No Ice	20.05	18.03	-31.16	-2938.31	-1702.01	-3.19
1.2 Dead+1.6 Wind 60 deg - No Ice	26.73	30.67	-17.71	-1681.00	-2903.77	-6.15
0.9 Dead+1.6 Wind 60 deg - No Ice	20.05	30.67	-17.71	-1678.25	-2900.95	-6.15
1.2 Dead+1.6 Wind 90 deg - No Ice	26.73	36.01	-0.04	-11.23	-3395.96	-7.66
0.9 Dead+1.6 Wind 90 deg - No Ice	20.05	36.01	-0.04	-9.91	-3392.73	-7.65
1.2 Dead+1.6 Wind 120 deg - No Ice	26.73	32.75	18.87	1753.41	-3059.31	-7.46
0.9 Dead+1.6 Wind 120 deg - No Ice	20.05	32.75	18.87	1753.22	-3056.38	-7.46
1.2 Dead+1.6 Wind 150 deg - No Ice	26.73	17.97	31.13	2925.68	-1693.45	-4.47
0.9 Dead+1.6 Wind 150 deg - No Ice	20.05	17.97	31.13	2924.48	-1691.68	-4.47
1.2 Dead+1.6 Wind 180 deg - No Ice	26.73	-0.04	35.35	3335.92	4.70	-0.69
0.9 Dead+1.6 Wind 180 deg - No Ice	20.05	-0.04	35.35	3334.37	5.01	-0.69
1.2 Dead+1.6 Wind 210 deg - No Ice	26.73	-18.03	31.16	2931.65	1701.24	3.18
0.9 Dead+1.6 Wind 210 deg - No Ice	20.05	-18.03	31.16	2930.45	1700.10	3.19

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 240 deg - No Ice	26.73	-32.79	18.93	1763.75	3062.73	6.58
0.9 Dead+1.6 Wind 240 deg - No Ice	20.05	-32.79	18.93	1763.55	3060.43	6.57
1.2 Dead+1.6 Wind 270 deg - No Ice	26.73	-36.01	0.04	0.72	3393.40	7.66
0.9 Dead+1.6 Wind 270 deg - No Ice	20.05	-36.01	0.04	2.03	3390.81	7.65
1.2 Dead+1.6 Wind 300 deg - No Ice	26.73	-30.63	-17.65	-1670.65	2895.23	6.85
0.9 Dead+1.6 Wind 300 deg - No Ice	20.05	-30.63	-17.65	-1667.91	2893.06	6.84
1.2 Dead+1.6 Wind 330 deg - No Ice	26.73	-17.97	-31.13	-2936.16	1690.88	4.47
0.9 Dead+1.6 Wind 330 deg - No Ice	20.05	-17.97	-31.13	-2932.33	1689.75	4.47
1.2 Dead+1.0 Ice+1.0 Temp	102.47	-0.00	0.00	-48.96	-11.72	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	102.47	0.01	-14.56	-1444.60	-12.70	-0.37
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	102.47	7.16	-12.40	-1242.32	-701.83	-1.61
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	102.47	12.33	-7.12	-735.48	-1200.79	-2.39
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	102.47	14.32	-0.01	-49.96	-1390.25	-2.55
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	102.47	12.61	7.27	647.99	-1220.86	-2.08
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	102.47	7.15	12.39	1143.39	-700.13	-0.94
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	102.47	-0.01	14.23	1322.34	-10.74	0.40
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	102.47	-7.16	12.40	1144.37	678.39	1.61
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	102.47	-12.62	7.28	649.68	1198.39	2.45
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	102.47	-14.32	0.01	-48.00	1366.80	2.55
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	102.47	-12.32	-7.11	-733.79	1176.36	1.99
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	102.47	-7.15	-12.39	-1241.34	676.69	0.94
Dead+Wind 0 deg - Service	22.28	0.01	-9.04	-847.48	-2.50	0.21
Dead+Wind 30 deg - Service	22.28	4.31	-7.45	-706.28	-407.97	-0.76
Dead+Wind 60 deg - Service	22.28	7.33	-4.23	-404.87	-694.77	-1.47
Dead+Wind 90 deg - Service	22.28	8.61	-0.01	-5.79	-812.40	-1.83
Dead+Wind 120 deg - Service	22.28	7.83	4.51	415.96	-731.94	-1.78
Dead+Wind 150 deg - Service	22.28	4.30	7.44	696.13	-405.50	-1.07
Dead+Wind 180 deg - Service	22.28	-0.01	8.45	794.18	0.36	-0.17
Dead+Wind 210 deg - Service	22.28	-4.31	7.45	697.56	405.83	0.76
Dead+Wind 240 deg - Service	22.28	-7.84	4.53	418.43	731.23	1.57
Dead+Wind 270 deg - Service	22.28	-8.61	0.01	-2.94	810.26	1.83
Dead+Wind 300 deg - Service	22.28	-7.33	-4.22	-402.40	691.20	1.64
Dead+Wind 330 deg - Service	22.28	-4.30	-7.44	-704.86	403.36	1.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-22.28	0.00	0.00	22.28	0.00	0.000%
2	0.04	-26.73	-37.79	-0.04	26.73	37.79	0.000%
3	0.04	-20.05	-37.79	-0.04	20.05	37.79	0.000%
4	18.03	-26.73	-31.16	-18.03	26.73	31.16	0.000%
5	18.03	-20.05	-31.16	-18.03	20.05	31.16	0.000%
6	30.67	-26.73	-17.71	-30.67	26.73	17.71	0.000%
7	30.67	-20.05	-17.71	-30.67	20.05	17.71	0.000%
8	36.01	-26.73	-0.04	-36.01	26.73	0.04	0.000%
9	36.01	-20.05	-0.04	-36.01	20.05	0.04	0.000%
10	32.75	-26.73	18.87	-32.75	26.73	-18.87	0.000%
11	32.75	-20.05	18.87	-32.75	20.05	-18.87	0.000%
12	17.97	-26.73	31.13	-17.97	26.73	-31.13	0.000%
13	17.97	-20.05	31.13	-17.97	20.05	-31.13	0.000%
14	-0.04	-26.73	35.35	0.04	26.73	-35.35	0.000%
15	-0.04	-20.05	35.35	0.04	20.05	-35.35	0.000%
16	-18.03	-26.73	31.16	18.03	26.73	-31.16	0.000%
17	-18.03	-20.05	31.16	18.03	20.05	-31.16	0.000%
18	-32.79	-26.73	18.93	32.79	26.73	-18.93	0.000%
19	-32.79	-20.05	18.93	32.79	20.05	-18.93	0.000%
20	-36.01	-26.73	0.04	36.01	26.73	-0.04	0.000%
21	-36.01	-20.05	0.04	36.01	20.05	-0.04	0.000%
22	-30.63	-26.73	-17.65	30.63	26.73	17.65	0.000%
23	-30.63	-20.05	-17.65	30.63	20.05	17.65	0.000%
24	-17.97	-26.73	-31.13	17.97	26.73	31.13	0.000%
25	-17.97	-20.05	-31.13	17.97	20.05	31.13	0.000%
26	0.00	-102.47	0.00	0.00	102.47	-0.00	0.000%
27	0.01	-102.47	-14.56	-0.01	102.47	14.56	0.000%
28	7.16	-102.47	-12.40	-7.16	102.47	12.40	0.000%
29	12.33	-102.47	-7.12	-12.33	102.47	7.12	0.000%
30	14.32	-102.47	-0.01	-14.32	102.47	0.01	0.000%
31	12.61	-102.47	7.27	-12.61	102.47	-7.27	0.000%
32	7.15	-102.47	12.39	-7.15	102.47	-12.39	0.000%
33	-0.01	-102.47	14.23	0.01	102.47	-14.23	0.000%
34	-7.16	-102.47	12.40	7.16	102.47	-12.40	0.000%
35	-12.62	-102.47	7.28	12.62	102.47	-7.28	0.000%
36	-14.32	-102.47	0.01	14.32	102.47	-0.01	0.000%
37	-12.32	-102.47	-7.11	12.32	102.47	7.11	0.000%
38	-7.15	-102.47	-12.39	7.15	102.47	12.39	0.000%
39	0.01	-22.28	-9.04	-0.01	22.28	9.04	0.000%
40	4.31	-22.28	-7.45	-4.31	22.28	7.45	0.000%
41	7.33	-22.28	-4.23	-7.33	22.28	4.23	0.000%
42	8.61	-22.28	-0.01	-8.61	22.28	0.01	0.000%
43	7.83	-22.28	4.51	-7.83	22.28	-4.51	0.000%
44	4.30	-22.28	7.44	-4.30	22.28	-7.44	0.000%
45	-0.01	-22.28	8.45	0.01	22.28	-8.45	0.000%
46	-4.31	-22.28	7.45	4.31	22.28	-7.45	0.000%
47	-7.84	-22.28	4.53	7.84	22.28	-4.53	0.000%
48	-8.61	-22.28	0.01	8.61	22.28	-0.01	0.000%
49	-7.33	-22.28	-4.22	7.33	22.28	4.22	0.000%
50	-4.30	-22.28	-7.44	4.30	22.28	7.44	0.000%

Non-Linear Convergence Results

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

2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000164
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000163
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00001060
28	Yes	4	0.00000001	0.00001074
29	Yes	4	0.00000001	0.00001088
30	Yes	4	0.00000001	0.00001067
31	Yes	4	0.00000001	0.00001042
32	Yes	4	0.00000001	0.00001049
33	Yes	4	0.00000001	0.00001063
34	Yes	4	0.00000001	0.00001049
35	Yes	4	0.00000001	0.00001041
36	Yes	4	0.00000001	0.00001064
37	Yes	4	0.00000001	0.00001085
38	Yes	4	0.00000001	0.00001072
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	170 - 160	4.012	39	0.2237	0.0048
T2	160 - 140	3.538	39	0.2212	0.0042
T3	140 - 120	2.648	39	0.1903	0.0040
T4	120 - 100	1.909	39	0.1514	0.0042
T5	100 - 80	1.316	39	0.1227	0.0035

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	80 - 60	0.835	39	0.0955	0.0024
T7	60 - 40	0.475	39	0.0659	0.0015
T8	40 - 20	0.227	39	0.0434	0.0010
T9	20 - 0	0.067	39	0.0222	0.0005

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' x 1" Dia Omni	39	4.012	0.2237	0.0048	150478
166.00	Rohn 6' x 12' Boom Gate (1)	39	3.822	0.2234	0.0045	150478
152.00	PR-950	39	3.168	0.2123	0.0038	44308
150.00	PR-950	39	3.078	0.2092	0.0037	40179
140.00	3' Side Mount Standoff	39	2.648	0.1903	0.0040	28324
129.00	10' x 1" Dia Omni	39	2.222	0.1681	0.0043	29711
124.00	12' x 3" Dia Omni	39	2.044	0.1585	0.0043	30893
115.00	Andrew 6' w/Radome	39	1.749	0.1433	0.0041	34894
107.00	10' Dipole	39	1.510	0.1319	0.0039	41087
100.00	10' x 2" Dia Omni	39	1.316	0.1227	0.0035	47057
84.00	10' x 2" Dia Omni	39	0.922	0.1013	0.0026	39672
70.00	12' x 3" Dia Omni	39	0.640	0.0803	0.0019	39160
67.00	8' x 3" Dia Omni	39	0.587	0.0758	0.0018	39548
50.00	20' x 3" Dia Omni	39	0.339	0.0539	0.0013	50240
30.00	20' x 3" Dia Omni	39	0.135	0.0329	0.0008	49543

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 160	16.774	18	0.9370	0.0200
T2	160 - 140	14.785	18	0.9266	0.0174
T3	140 - 120	11.061	18	0.7958	0.0168
T4	120 - 100	7.973	18	0.6319	0.0177
T5	100 - 80	5.498	18	0.5120	0.0147
T6	80 - 60	3.489	18	0.3986	0.0099
T7	60 - 40	1.984	18	0.2749	0.0064
T8	40 - 20	0.948	18	0.1812	0.0044
T9	20 - 0	0.280	18	0.0924	0.0022

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' x 1" Dia Omni	18	16.774	0.9370	0.0200	36566
166.00	Rohn 6' x 12' Boom Gate (1)	18	15.975	0.9359	0.0189	36566
152.00	PR-950	18	13.237	0.8888	0.0158	10653

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	PR-950	18	12.861	0.8755	0.0157	9647
140.00	3' Side Mount Standoff	18	11.061	0.7958	0.0168	6772
129.00	10' x 1" Dia Omni	18	9.278	0.7020	0.0178	7095
124.00	12' x 3" Dia Omni	18	8.537	0.6618	0.0179	7373
115.00	Andrew 6' w/Radome	18	7.304	0.5982	0.0173	8335
107.00	10' Dipole	18	6.306	0.5504	0.0161	9832
100.00	10' x 2" Dia Omni	18	5.498	0.5120	0.0147	11282
84.00	10' x 2" Dia Omni	18	3.853	0.4227	0.0108	9516
70.00	12' x 3" Dia Omni	18	2.673	0.3353	0.0079	9382
67.00	8' x 3" Dia Omni	18	2.453	0.3164	0.0074	9471
50.00	20' x 3" Dia Omni	18	1.416	0.2250	0.0053	12024
30.00	20' x 3" Dia Omni	18	0.563	0.1374	0.0033	11869

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	170	Diagonal	A325N	0.5000	1	2.33	6.58	0.354 ✔	1	Member Bearing
T2	160	Leg	A325N	0.7500	4	2.25	29.82	0.076 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2.56	7.95	0.322 ✔	1	Bolt Shear
T3	140	Leg	A325N	0.7500	4	7.87	29.82	0.264 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3.02	7.95	0.379 ✔	1	Bolt Shear
T4	120	Leg	A325N	0.8750	4	13.21	40.59	0.325 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	4.15	7.95	0.522 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.8750	4	18.65	40.59	0.459 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	4.88	7.95	0.614 ✔	1	Bolt Shear
T6	80	Leg	A325N	0.8750	4	24.17	40.59	0.596 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	5.32	7.95	0.669 ✔	1	Bolt Shear
T7	60	Leg	A325N	1.0000	4	29.90	53.01	0.564 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6.58	12.43	0.530 ✔	1	Bolt Shear
T8	40	Leg	A325N	1.0000	6	23.56	53.01	0.444 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7.38	12.43	0.594 ✔	1	Bolt Shear
T9	20	Leg	A325N	1.0000	6	27.26	53.01	0.514 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7.74	12.43	0.623 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	ROHN 2.5 STD	10.00	3.33	42.2 K=1.00	1.7040	-6.98	67.31	0.104 [1] ✔
T2	160 - 140	ROHN 2.5 STD	20.03	4.01	50.8 K=1.00	1.7040	-30.56	63.52	0.481 [1] ✔
T3	140 - 120	ROHN 3 STD	20.03	5.01	51.7 K=1.00	2.2285	-52.54	82.51	0.637 [1] ✔
T4	120 - 100	ROHN 3.5 X-STR	20.03	6.68	61.3 K=1.00	3.6784	-75.16	125.73	0.598 [1] ✔
T5	100 - 80	ROHN 4 X-STR	20.03	6.68	54.3 K=1.00	4.4074	-100.09	159.91	0.626 [1] ✔
T6	80 - 60	ROHN 4 X-STR	20.04	6.68	54.3 K=1.00	4.4074	-124.79	159.90	0.780 [1] ✔
T7	60 - 40	ROHN 5 X-STR	20.04	10.02	65.4 K=1.00	6.1120	-147.57	201.23	0.733 [1] ✔
T8	40 - 20	ROHN 6 EHS	20.03	10.02	54.0 K=1.00	6.7133	-173.11	244.06	0.709 [1] ✔
T9	20 - 0	ROHN 6 EHS	20.03	10.02	54.0 K=1.00	6.7133	-198.23	244.06	0.812 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L1 1/2x1 1/2x1/8	5.65	2.55	107.5 K=1.04	0.3594	-2.36	6.95	0.340 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	7.54	3.63	148.3 K=1.00	0.5273	-2.51	5.41	0.464 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x3/16	9.76	4.74	165.5 K=1.00	0.6211	-3.02	5.13	0.589 [1] ✔
T4	120 - 100	L2 1/2x2 1/2x3/16	12.30	6.03	146.2 K=1.00	0.9020	-4.15	9.53	0.435 [1] ✔
T5	100 - 80	L2 1/2x2 1/2x3/16	14.03	6.87	166.5 K=1.00	0.9020	-4.88	7.35	0.664 [1] ✔
T6	80 - 60	L2 1/2x2 1/2x1/4	15.89	7.80	190.8 K=1.00	1.1900	-5.32	7.39	0.720 [1] ✔
T7	60 - 40	L3x3x1/4	19.15	9.48	192.2 K=1.00	1.4400	-6.58	8.80	0.748 [1] ✔
T8	40 - 20	L3x3x1/4	20.90	10.30	208.7 K=1.00	1.4400	-7.38	7.47	0.988 [1] ✔
T9	20 - 0	KL/R > 200 (C) - 174 L3 1/2x3 1/2x1/4	22.68	11.19	193.5 K=1.00	1.6900	-7.74	10.20	0.759 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L1 1/2x1 1/2x1/8	4.56	4.32	153.9 K=0.88	0.3594	-0.34	3.43	0.098 [1] ✔
T2	160 - 140	L2 1/2x2 1/2x3/16	4.56	4.32	112.4 K=1.07	0.9020	-0.05	15.03	0.004 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	ROHN 2.5 STD	10.00	3.33	42.2	1.7040	4.62	76.68	0.060 [1] ✔
T2	160 - 140	ROHN 2.5 STD	20.03	4.01	50.8	1.7040	26.73	76.68	0.349 [1] ✔
T3	140 - 120	ROHN 3 STD	20.03	5.01	51.7	2.2285	46.97	100.28	0.468 [1] ✔
T4	120 - 100	ROHN 3.5 X-STR	20.03	6.68	61.3	3.6784	67.25	165.53	0.406 [1] ✔
T5	100 - 80	ROHN 4 X-STR	20.03	6.68	54.3	4.4074	89.39	198.34	0.451 [1] ✔
T6	80 - 60	ROHN 4 X-STR	20.04	6.68	54.3	4.4074	110.91	198.34	0.559 [1] ✔
T7	60 - 40	ROHN 5 X-STR	20.04	10.02	65.4	6.1120	130.44	275.04	0.474 [1] ✔
T8	40 - 20	ROHN 6 EHS	20.03	10.02	54.0	6.7133	152.25	302.10	0.504 [1] ✔
T9	20 - 0	ROHN 6 EHS	20.03	10.02	54.0	6.7133	173.63	302.10	0.575 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L1 1/2x1 1/2x1/8	5.65	2.55	103.5	0.2813	2.33	13.71	0.170 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	L1 1/2x1 1/2x3/16	7.20	3.46	138.0	0.4102	2.56	20.00	0.128 [1]
T3	140 - 120	L1 3/4x1 3/4x3/16	9.76	4.74	159.6	0.5039	2.97	24.57	0.121 [1]
T4	120 - 100	L2 1/2x2 1/2x3/16	12.30	6.03	139.3	0.7848	4.08	38.26	0.107 [1]
T5	100 - 80	L2 1/2x2 1/2x3/16	14.03	6.87	158.9	0.7848	4.79	38.26	0.125 [1]
T6	80 - 60	L2 1/2x2 1/2x1/4	15.89	7.80	182.6	1.0338	5.23	50.40	0.104 [1]
T7	60 - 40	L3x3x1/4	19.15	9.48	182.0	1.2525	6.43	61.06	0.105 [1]
T8	40 - 20	L3x3x1/4	20.90	10.30	198.0	1.2525	7.17	61.06	0.117 [1]
T9	20 - 0	L3 1/2x3 1/2x1/4	22.68	11.19	183.8	1.5025	7.47	73.25	0.102 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L1 1/2x1 1/2x1/8	4.56	4.32	111.5	0.3594	0.33	11.64	0.029 [1]
T2	160 - 140	L2 1/2x2 1/2x3/16	4.56	4.32	66.6	0.9020	0.03	29.22	0.001 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	170 - 160	Leg	ROHN 2.5 STD	1	-6.98	67.31	10.4	Pass
T2	160 - 140	Leg	ROHN 2.5 STD	25	-30.56	63.52	48.1	Pass
T3	140 - 120	Leg	ROHN 3 STD	61	-52.54	82.51	63.7	Pass
T4	120 - 100	Leg	ROHN 3.5 X-STR	88	-75.16	125.73	59.8	Pass
T5	100 - 80	Leg	ROHN 4 X-STR	109	-100.09	159.91	62.6	Pass
T6	80 - 60	Leg	ROHN 4 X-STR	130	-124.79	159.90	78.0	Pass
T7	60 - 40	Leg	ROHN 5 X-STR	151	-147.57	201.23	73.3	Pass
T8	40 - 20	Leg	ROHN 6 EHS	166	-173.11	244.06	70.9	Pass
T9	20 - 0	Leg	ROHN 6 EHS	181	-198.23	244.06	81.2	Pass
T1	170 - 160	Diagonal	L1 1/2x1 1/2x1/8	8	-2.36	6.95	34.0 35.4 (b)	Pass
T2	160 - 140	Diagonal	L1 1/2x1 1/2x3/16	32	-2.51	5.41	46.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T3	140 - 120	Diagonal	L1 3/4x1 3/4x3/16	69	-3.02	5.13	58.9	Pass
T4	120 - 100	Diagonal	L2 1/2x2 1/2x3/16	96	-4.15	9.53	43.5 52.2 (b)	Pass
T5	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	117	-4.88	7.35	66.4	Pass
T6	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	138	-5.32	7.39	72.0	Pass
T7	60 - 40	Diagonal	L3x3x1/4	159	-6.58	8.80	74.8	Pass
T8	40 - 20	Diagonal	L3x3x1/4	174	-7.38	7.47	98.8	Pass
T9	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	186	-7.74	10.20	75.9	Pass
T1	170 - 160	Top Girt	L1 1/2x1 1/2x1/8	5	-0.34	3.43	9.8	Pass
T2	160 - 140	Top Girt	L2 1/2x2 1/2x3/16	28	-0.05	15.03	0.5	Pass
							Summary	
						Leg (T9)	81.2	Pass
						Diagonal (T8)	98.8	Pass
						Top Girt (T1)	9.8	Pass
						Bolt Checks	66.9	Pass
						RATING =	**98.8**	**Pass**

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Subject:	Anchor Bolt Analysis
Location:	170-ft ROHN Lattice Tower Glastonbury, CT
Rev. 0: 1/9/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16071.83

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Tension Force =	Tension := 179·kips	(Input From tnxTower)
Compression Force =	Compression := 205·kips	(Input From tnxTower)
Shear Force =	Shear := 23·kips	(Input From tnxTower)

Anchor Bolt Data:

ASTM A354-BC

Number of Anchor Bolts =	N := 6	(User Input)
Bolt Ultimate Strength =	F_u := 125·ksi	(User Input)
Bolt Yield Strength =	F_y := 105·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Anchor Bolts =	D := 1·in	(User Input)
Threads per Inch =	n := 8	(User Input)
	η := 0.55	For grouted Base Plate per TIA-222-G Section 4.9.9

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	Subject:	Anchor Bolt Analysis
	Location:	170-ft ROHN Lattice Tower Glastonbury, CT
	Rev. 0: 1/9/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16071.83

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 0.606 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 0.878 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.22 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.066 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := \frac{Tension}{N} = 29.8 \cdot kips$

Maximum Compressive Force = $C_{Max} := \frac{Compression}{N} = 34.2 \cdot kips$

Maximum Shear Force = $V_{Max} := \frac{Shear}{N} = 3.8 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 60.574 \cdot k$

Bolt % of Capacity = $\frac{\left(C_{Max} + \frac{V_{Max}}{\eta} \right)}{\Phi R_{nt}} \cdot 100 = 67.9$

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

Condition1 = "OK"

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Subject:	FOUNDATION ANALYSIS
Location:	170-ft Lattice Tower Glastonbury, CT
Rev. 0: 1/9/17	Prepared by: T.J.L Checked by: C.F.C. Job no. 16071.83

Caisson Foundation:

Input Data:

Tower Data

Uplift =	$Uplift := 179 \cdot kips$	(User Input)
Compression =	$Comp := 205 \cdot kips$	(User Input)
Shear Force =	$Shear := 23 \cdot kips$	(User Input)
Tower Height =	$H_t := 170 \cdot ft$	(User Input)

Footing Data:

Length of Caisson =	$L_c := 45.5 \cdot ft$	(User Input)
Extension of Caisson Above Grade =	$L_{cag} := 0.5 \cdot ft$	(User Input)
Diameter of Caisson =	$d_c := 7.5 \cdot ft$	(User Input)
Length of Caisson Above Wate Table =	$L_{c.AWT} := 4.5 \cdot ft$	(User Input)
Length of Caisson Below Wate Table =	$L_{c.BWT} := 41 \cdot ft$	(User Input)

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)
Ultimate Skin Friction =	$\mu := 0.58 \cdot ksf$	(User Input)
Ultimate Soil Bearing Capacity =	$q_u := 6000 \cdot psf$	(User Input)
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)
Depth to Neglect =	$n := 4 \cdot ft$	(User Input)
Resistance Factor for Bearing =	$\Phi_{sBearing} := 0.75$	(TIA-222-G 9.4.1)
Resistance Factor for Friction =	$\Phi_{sFriction} := 0.75$	(TIA-222-G 9.4.1)

Calculated Properties:

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

Weight of Concrete Caisson (no water) = $WT_{c.comp} := \frac{\pi}{4} \cdot \left(d_c^{\,2} L_c \right) \cdot \gamma_{conc} = 301.519 \cdot kip$

Weight of Concrete Caisson (water) = $WT_{c.uplift} := \frac{\pi}{4} \cdot \left[\left(d_c^{\,2} L_{c.AWT} \right) \cdot \gamma_{conc} + \left(d_c^{\,2} L_{c.BWT} \right) \cdot \gamma_c \right] = 188.493 \cdot kip$

Check Uplift:

Uplift Resistance from Concrete Weight = $Uplift_{conc} := WT_{c.uplift} \cdot 0.9 = 169.643 \cdot kips$

Uplift Resistance from Skin Friction = $Uplift_{SF} := \pi \cdot d_c \cdot \left(L_c - L_{cag} - n \right) \cdot \mu \cdot \Phi_{sFriction} = 420.227 \cdot kips$

Total Uplift Resistance = $Uplift_R := Uplift_{conc} + Uplift_{SF} = 589.871 \cdot kips$

Uplift Check = $\frac{Uplift}{Uplift_R} = 30.35 \cdot \%$

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

Uplift_Check = "Okay"

Check Compression:

Total Compression Force = $Comp_{tot} := WT_{c.comp} + Comp = 506.519 \cdot kips$

Compression Resistance from Bearing = $Comp_{bearing} := \frac{\pi}{4} \cdot d_c^{\,2} \cdot q_u \cdot \Phi_{sBearing} = 198.804 \cdot kips$

Compression Resistance from Skin Friction = $Comp_{SF} := \pi \cdot d_c \cdot \left(L_c - L_{cag} - n \right) \cdot \mu \cdot \Phi_{sFriction} = 420.227 \cdot kips$

Total Compression Resistance = $Comp_R := Comp_{bearing} + Comp_{SF} = 619.031 \cdot kips$

Compression Check = $\frac{Comp_{tot}}{Comp_R} = 81.82 \cdot \%$

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

Compression_Check = "Okay"

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTV1083	DATE:	09/15/2016	RF DESIGN ENG:	Omair Mohammed
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	860-721-4315
REVISION:	Preliminary	RF MANAGER:	Benedetto, John	RF DESIGN EMAIL:	OM636A@US.ATT.COM
INITIATIVE /PROJECT:	LTE 3C w/ Bronze Standard				

RF PERF ENG:		RFDS PROGRAM TYPE:	2017 LTE Next Carrier		
RF PERF PHONE:		RFDS TECHNOLOGY:	LTE 3C		
RF PERF EMAIL:		STATE/STATUS:	Final/Approved		
RFDS VERSION:	2.00	RFDS ID:	1128333		
GSM FREQUENCY:	850	Created By:	mm093q	Updated By:	om636a
UMTS FREQUENCY:	850, 1900	Date Created:	3/18/2016 3:14:54 PM	Date Updated:	9/15/2016 3:24:11 PM
LTE FREQUENCY:	700, 1900, WCS				
I-PLAN JOB # 1:	NER-RCTB-16-01059_UR	IPLAN PRD GRP || SUB GRP #1:	LTE Next Carrier || LTE 3C		
I-PLAN JOB # 2:		IPLAN PRD GRP || SUB GRP #2:			
I-PLAN JOB # 3:		IPLAN PRD GRP || SUB GRP #3:			
I-PLAN JOB # 4:		IPLAN PRD GRP || SUB GRP #4:			
I-PLAN JOB # 5:		IPLAN PRD GRP || SUB GRP #5:			
I-PLAN JOB # 6:		IPLAN PRD GRP || SUB GRP #6:			
I-PLAN JOB # 7:		IPLAN PRD GRP || SUB GRP #7:			
I-PLAN JOB # 8:		IPLAN PRD GRP || SUB GRP #8:			

Section 2 - LOCATION INFORMATION

USID:	59372	FA LOCATION CODE:	10035111	LOCATION NAME:	GLASTONBURY PD
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT
ADDRESS:	GLASTONBURY POLICE DEPARTMENT	CITY:	GLASTONBURY	STATE:	CT
ZIP CODE:	06033	COUNTY:	HARTFORD	LONG (DEC. DEG.):	-72.6069161
LATITUDE (D-M-S):	41d 42m22.37004s	LONGITUDE (D-M-S):	-72d -36m-24.89796s	LAT (DEC. DEG.):	41.7062139
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	1083 GLASTONBURY PD COMBO LOCK 5241 I 91 NORTH TO EXIT 25 GLASTONBURY BRIDGE RT 3 TO RT 2 SOUTH TO EXIT 8 HEBRON AVE RT 94 TURN RIGHT AND CONTINUE TO MAIN STREET TURN LEFT CONTINUE SOUTH TO 2108 MAIN ST. POLICE DEPT SITE IN REAR CODE 5241GSM:DHXV:238577GSM:DHXV:238578GSM:HCGS:715658UMTS;ON FIBERMICRIN GENERATOR PLUG ON BUILDINGSHELTER:GROUND LEVEL:CIPHER LOCK CHANGED TO MASTER LOCK AND CONTRACTOR CODE:09/11/15SHELTER:GROUND LEVEL ROOM BUILDOUT INSIDE P.D.T-1:LOCATED 1ST FLOOR PD, SEE MAIN LOBBY WINDOW FOR ACCESS.				

ORACLE PTN # 1:		PACE JOB # 1:	MRCTB018300		
ORACLE PTN # 2:		PACE JOB # 2:			
ORACLE PTN # 3:		PACE JOB # 3:			
ORACLE PTN # 4:		PACE JOB # 4:			
ORACLE PTN # 5:		PACE JOB # 5:			
ORACLE PTN # 6:		PACE JOB # 6:			
ORACLE PTN # 7:		PACE JOB # 7:			
ORACLE PTN # 8:		PACE JOB # 8:			
BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:			
AM STUDY REQ'D (Y/N):	No	SEARCH_RING_ID:			
FREQ COORD:		BTA:		MSA / RSA:	
OPS DISTRICT:	CT-North	LAC(GSM):	05021		
OPS ZONE:	NE_CT_N_HRFR_S_CS	LAC(UMTS):	05996		
RF DISTRICT:	NPO Triage	BSC(GSM):	MDTWCTBSC11		
RF ZONE:	Hotseat	RNC(UMTS):	MDTWCTNIRNC002		
PARENT NAME(GSM):	MIDDLETOWN-GSM MTSO-BSC-11	MME POOL ID(LTE):	FF01		
PARENT NAME(UMTS):	MIDDLETOWN RNC02				

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:	
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:	
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:			

CGSA CALL SIGNS:	

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	SELF SUPPORT
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	NR
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	0.00		
LIGHTING TYPE:	NOT REQUIRED				

MARKET LOCATION 700 MHz Band:			
MARKET LOCATION 850 MHz Band:			
MARKET LOCATION 1900 MHz Band:			
MARKET LOCATION AWS Band:			
MARKET LOCATION WCS Band:			
MARKET LOCATION Future Band:			

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911						0				
SECTOR B						0				
SECTOR C						0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911						0				
SECTOR B						0				
SECTOR C						0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RBS ID:	96468	96469	208883	330088	366874							
CTS COMMON ID:	184D1083_2	184D1083	CTV1083	CTU1083	CTL01083							
CELL ID / BCF:	032D1083	032D1083	CTV1083	CTV1083	CTL01083							
BTA/TID:	184G	184P	184U	184W	184L							
4-9 DIGIT SITE ID:	1083	1083	1083	1083	1083							
COW OR TOY?:	No	No	No	No	No							
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED							
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:	GROUND	GROUND	INTERNAL	INTERNAL	INTERNAL							
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY	BASE							
EQUIPMENT NAME:	GLASTONBURY PD	GLASTONBURY PD	GLASTONBURY PD	GLASTONBURY PD	GLASTONBURY PD							
DISASTER PRIORITY:	0	0	0	3	3							

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RBS ID:	96468	96469	208883	330088	366874							
CTS COMMON ID:	184D1083_2	184D1083	CTV1083	CTU1083	CTL01083							
CELL ID / BCF:	032D1083	032D1083	CTV1083	CTV1083	CTL01083							
BTA/TID:	184G	184P	184U	184W	184L							
4-9 DIGIT SITE ID:	1083	1083	1083	1083	1083							
COW OR TOY?:	No	No	No	No	No							
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED							
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:	GROUND	GROUND	INTERNAL	INTERNAL	INTERNAL							
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY	BASE							
EQUIPMENT NAME:	GLASTONBURY PD	GLASTONBURY PD	GLASTONBURY PD	GLASTONBURY PD	GLASTONBURY PD							
DISASTER PRIORITY:	0	0	0	3	3							

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	NOKIA	NOKIA	ERICSSON	ERICSSON	ERICSSON							
EQUIPMENT TYPE:	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR	6601 INDOOR MU							
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:	Yes	Yes	Yes	Yes	Yes							
NODE B NUMBER:	0	0	0	0	1083							

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	NOKIA	NOKIA	ERICSSON	ERICSSON	ERICSSON							
EQUIPMENT TYPE:	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR	6601 INDOOR MU							
BASEBAND CONFIGURATION:	1x6601 / 1x5216 / 1xXMU03	1x6601 / 1x5216 / 1xXMU03	1x6601 / 1x5216 / 1xXMU03	1x6601 / 1x5216 / 1xXMU03	1x6601 / 1x5216 / 1xXMU03							
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:	Yes	Yes	Yes	Yes	Yes							
NODE B NUMBER:	0	0	0	0	1083							

Section 8 - RBS/SECTOR ASSOCIATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS														
CTS Common ID	184D1083_2	184D1083	CTV1083	CTU1083	CTL01083														
Soft Sector IDs	184G10831	184P10831	CTV10831	CTU10837	CTL01083_7A_1														
	184G10832	184P10832	CTV10832	CTU10838	CTL01083_7B_1														
	184G10833	184P10833	CTV10833	CTU10839	CTL01083_7C_1														
					CTL01083_9A_1														
					CTL01083_9B_1														
					CTL01083_9C_1														

Section 8 - RBS/SECTOR ASSOCIATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS														
CTS Common ID	184D1083_2	184D1083	CTV1083	CTU1083	CTL01083														
Soft Sector IDs	184G10831	184P10831	CTV10831	CTU10837	CTL01083_3A_1														
	184G10832	184P10832	CTV10832	CTU10838	CTL01083_3B_1														
	184G10833	184P10833	CTV10833	CTU10839	CTL01083_3C_1														
					CTL01083_7A_1														
					CTL01083_7B_1														
					CTL01083_7C_1														
					CTL01083_9A_1														
					CTL01083_9B_1														
					CTL01083_9C_1														

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																		
USEID (excluding Hard Sector)	59372.850.25G.1	59372.1900.25G.1	59372.850.3G.1	59372.1900.3G.2																					
SECTOR A **SOFT SECTOR ID**	184G10831	184P10831	CTV10831	CTU10837	CTL01083_7A_1	CTL01083_9A_1																			
SECTOR B	184G10832	184P10832	CTV10832	CTU10838	CTL01083_7B_1	CTL01083_9B_1																			
SECTOR C	184G10833	184P10833	CTV10833	CTU10839	CTL01083_7C_1	CTL01083_9C_1																			
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																		
USEID (excluding Hard Sector)	59372.850.25G.1	59372.1900.25G.1	59372.850.3G.1	59372.1900.3G.2																					
SECTOR A **SOFT SECTOR ID**	184G10831	184P10831	CTV10831	CTU10837	CTL01083_7A_1	CTL01083_9A_1	CTL01083_3A_1																		
SECTOR B	184G10832	184P10832	CTV10832	CTU10838	CTL01083_7B_1	CTL01083_9B_1	CTL01083_3B_1																		
SECTOR C	184G10833	184P10833	CTV10833	CTU10839	CTL01083_7C_1	CTL01083_9C_1	CTL01083_3C_1																		
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																		
USEID (excluding Hard Sector)	59372.850.25G.1	59372.1900.25G.1	59372.850.3G.1	59372.1900.3G.2																					
SECTOR A **CELL NUMBER**					15	8																			
SECTOR B					16	9																			
SECTOR C					17	10																			
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																		
USEID (excluding Hard Sector)	59372.850.25G.1	59372.1900.25G.1	59372.850.3G.1	59372.1900.3G.2																					
SECTOR A **CELL NUMBER**					15	8	149																		
SECTOR B					16	9	150																		
SECTOR C					17	10	151																		
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 10 - CID/SAC - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																			
SECTOR A CID/SAC	10831	10831	10831	10837																						
SECTOR B	10832	10832	10832	10838																						
SECTOR C	10833	10833	10833	10839																						
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 10 - CID/SAC - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																			
SECTOR A CID/SAC	10831	10831	10831	10837																						
SECTOR B	10832	10832	10832	10838																						
SECTOR C	10833	10833	10833	10839																						
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 15A - CURRENT SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	OPA-65R-LCUU-H6		AM-X-CD-16-65-00T-RET			
ANTENNA VENDOR	Kathrein	CCI Antennas		KMW			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X14.8X7.4		72X11.8X5.9			
ANTENNA WEIGHT	44.1	73		48.5			
AZIMUTH	160	30		160			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	166.04	166.04		166.04			
ANTENNA TIP HEIGHT	168	169.04		169.04			
MECHANICAL DOWNTILT	0	0		2			
FEEDER AMOUNT	2			2			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Kathrein 860-10025	Internal		Internal			
SURGE ARRESTOR (QTY/MODEL)	1 Polyphaser 1000860	1 DC/ Fiber Squid					
DIPLEXER (QTY/MODEL)	2 LGP 13519						
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein 860 10006	LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 Powerwave TT19-08BP111001 (Twin BP)			1 CCI DTMABP7819VG12A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1 Kathrein / K SBT 782-10253 (12V)			2 Polyphaser 1000860			
PDU FOR TMAS (QTY/MODEL)				1 LGP 12104 (1900 AND 850 Bypass TMA)			
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-11					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)		1 RRUS-12+RRUS-A2					
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		59372.A.850.3G.1	CTV10831	CTV10831		UMTS 850	800 10121 @850_Xpol_7dt	13.42		7	NONE	RFS 1-1/4 (850)	210.05									
	PORT 3		59372.A.1900.3G.2	CTU10837	CTU10837		UMTS 1900	800 10121 @1950_Xpol_7dt	16.5		7	NONE	RFS 1-1/4 (1900)	210.05									
ANTENNA POSITION 2	PORT 1		59372.A.700.4G.1	CTL01083_7A_1	CTL01083_7A_1		LTE 700	OPA-65R-LCUU-H6_719MHz_08DT	13.9		8	TOP	FIBER	0									
	PORT 3		59372.A.1900.4G.1	CTL01083_9A_1	CTL01083_9A_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_03DT	17.2		3	TOP	FIBER	0									

ANTENNA POSITION 4	**PORT 1**		59372.A.850.25G.1	184G10831	184G10831		GSM 850	AM-X-CD-16-65-00T-RET_850MHz_07DT	13.27		7	NONE	RFS 1-1/4 (850)	210.05									
	PORT 3		59372.A.1900.25G.1	184P10831	184P10831		GSM 1900	AM-X-CD-16-65-00T-RET_1950MHz_07DT	16.45		7	NONE	RFS 1-1/4 (1900)	210.05									

Section 15B - CURRENT SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	800-10121		OPA-65R-LCUU-H6				SBNH-1D6565C							
ANTENNA VENDOR	Kathrein		CCI Antennas				Andrew							
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9		72X14.8X7.4				96.4X11.9X7.1							
ANTENNA WEIGHT	44.1		73				66.1							
AZIMUTH	270		160				270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	166.04		166.04				166.04							
ANTENNA TIP HEIGHT	168		169.04				170.04							
MECHANICAL DOWNTILT	0		0				3							
FEEDER AMOUNT	2						2							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Kathrein 860-10025		Internal				Internal						
SURGE ARRESTOR (QTY/MODEL)	1	Polyphaser 1000860												
DIPLEXER (QTY/MODEL)	2	LGP 13519												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Powerwave TT19-08BP111001 (Twin BP)					1	CCI DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	Kathrein / K SBT 782-10253 (12V)					2	Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		59372.B.850.3G.1	CTV10832	CTV10832		UMTS 850	800 10121 @850_Xpol_12dt	13.3		12	NONE	RFS 1-1/4 (850)	210.05									
	PORT 3		59372.B.1900.3G.2	CTU10838	CTU10838		UMTS 1900	800 10121 @1950_Xpol_6dt	16.6		6	NONE	RFS 1-1/4 (1900)	210.05									
ANTENNA POSITION 2	PORT 1		59372.B.700.4G.1	CTL01083_7B_1	CTL01083_7B_1		LTE 700	OPA-65R-LCUU-H6_719MHz_02DT	13.9		2	TOP	FIBER	0									
	PORT 3		59372.B.1900.4G.1	CTL01083_9B_1	CTL01083_9B_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_02DT	17		2	TOP	FIBER	0									
ANTENNA POSITION 4	PORT 1		59372.B.850.25G.1	184G10832	184G10832		GSM 850	SBNH-	16.1		12	NONE	RFS 1-1/4 (850)	210.05									

								1D6565C_850MHz_12DT															
	PORT 3		59372.B.1900.25G.1	184P10832	184P10832		GSM 1900	SBNH-1D6565C_1950MHz_6DT	8		6	NONE	RFS 1-1/4 (1900)	210.05									

Section 15C - CURRENT SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	800-10121		OPA-65R-LCUU-H8				AM-X-CD-16-65-00T-RET							
ANTENNA VENDOR	Kathrein		CCI Antennas				KMW							
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9		92.7X14.4X7				72X11.8X5.9							
ANTENNA WEIGHT	44.1		88				48.5							
AZIMUTH	30		270				30							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	166.04		166.04				166.04							
ANTENNA TIP HEIGHT	168		170.04				169.04							
MECHANICAL DOWNTILT	0		0				3							
FEEDER AMOUNT	2						2							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Kathrein 860-10025		Internal				Internal						
SURGE ARRESTOR (QTY/MODEL)	1	Polyphaser 1000860												
DIPLEXER (QTY/MODEL)	2	LGP 13519												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Powerwave TT19-08BP111001 (Twin BP)					1	CCI DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	Kathrein / K SBT 782-10253 (12V)					2	Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		59372.C.850.3G.1	CTV10833	CTV10833		UMTS 850	800 10121 @850_Xpol_12dt	13.3		12	NONE	RFS 1-1/4 (850)	210.05									
	PORT 3		59372.C.1900.3G.2	CTU10839	CTU10839		UMTS 1900	800 10121 @1950_Xpol_6dt	16.6		6	NONE	RFS 1-1/4 (1900)	210.05									
ANTENNA POSITION 2	PORT 1		59372.C.700.4G.1	CTL01083_7C_1	CTL01083_7C_1		LTE 700	OPA-65R-LCUU-H8_719MHz_05DT		270	5	TOP	FIBER	0									
	PORT 3		59372.C.1900.4G.1	CTL01083_9C_1	CTL01083_9C_1		LTE 1900	OPA-65R-LCUU-H8_1948MHz_08DT		270	8	TOP	FIBER	0									
ANTENNA POSITION 4	PORT 1		59372.C.850.25G.1	184G10833	184G10833		GSM 850	AM-X-CD-16-65-00T-	13.14		12	NONE	RFS 1-1/4 (850)	210.05									

								RET_850MHz_012DT														
	PORT 3		59372.C.1900.25G.1	184P10833	184P10833		GSM 1900	AM-X-CD-16-65-00T-RET_1950MHz_06DT	16.63		6	NONE	RFS 1-1/4 (1900)	210.05								

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				OPA-65R-LCUU-H6			
ANTENNA VENDOR				CCI Antennas			
ANTENNA SIZE (H x W x D)				72X14.8X7.4			
ANTENNA WEIGHT				73			
AZIMUTH				30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				166			
ANTENNA TIP HEIGHT				169			
MECHANICAL DOWNTILT				2			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)				4 CCI Triplexer -TPX-070821			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard- Replace existing GSM Antenna with Octo port Antenna- GSM 1900 Decom- Add LTE WCS RRUS-32 to Octo port Antenna- Add Fiber DC Squid- Add 4 Triplexers - Remove TMAs and PDU- Replace existing DUS with 5216- Add / Reuse XMU- Configuration should be 1x5216 + 1 x XMU						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		59372.A.WCS.4G.1	CTL01083_3A_1	CTL01083_3A_1		LTE WCS	OPA-65R-LCUU-H6_2310MHz_08DT	17.5	30	8	Top	RFS 1-1/4 (850)	210.05				NO		1285.2866		7	

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				OPA-65R-LCUU-H6			
ANTENNA VENDOR				CCI Antennas			
ANTENNA SIZE (H x W x D)				72X14.8X7.4			
ANTENNA WEIGHT				73			
AZIMUTH				160			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				166			
ANTENNA TIP HEIGHT				169			
MECHANICAL DOWNTILT				3			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)				4 CCI Triplexer -TPX-070821			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard- Replace existing GSM Antenna with Octo port Antenna- GSM 1900 Decom- Add LTE WCS RRUS-32 to Octo port Antenna- Add Fiber DC Squid- Add 4 Triplexers - Remove TMAs and PDU- Replace existing DUS with 5216- Add / Reuse XMU- Configuration should be 1x5216 + 1 x XMU						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		59372.B.WCS.4G.1	CTL01083_3B_1	CTL01083_3B_1		LTE WCS	OPA-65R-LCUU-H6_2310MHz_08DT	17.5	160	8	Top	RFS 1-1/4 (850)	210.05				NO		1285.2866		15	

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				OPA-65R-LCUU-H8			
ANTENNA VENDOR				CCI Antennas			
ANTENNA SIZE (H x W x D)				92.7X14.4X7			
ANTENNA WEIGHT				88			
AZIMUTH				270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				166			
ANTENNA TIP HEIGHT				170			
MECHANICAL DOWNTILT				3			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)				4 CCI Triplexer -TPX-070821			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1 RRUS-32			
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard- Replace existing GSM Antenna with Octo port Antenna- GSM 1900 Decom- Add LTE WCS RRUS-32 to Octo port Antenna- Add Fiber DC Squid- Add 4 Triplexers - Remove TMAs and PDU- Replace existing DUS with 5216- Add / Reuse XMU- Configuration should be 1x5216 + 1 x XMU						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		59372.C.WCS.4G.1	CTL01083_3C_1	CTL01083_3C_1		LTE WCS	OPA-65R-LCUU-H8_2310MHz_08DT	17.2	270	8	Top	RFS 1-1/4 (850)	210.05				NO		1285.2866		23	

Section 17A - FINAL SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	800-10121		OPA-65R-LCUU-H6				OPA-65R-LCUU-H6							
ANTENNA VENDOR	Kathrein		CCI Antennas				CCI Antennas							
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9		72X14.8X7.4				72X14.8X7.4							
ANTENNA WEIGHT	44.1		73				73							
AZIMUTH	160		30				30							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	166		166				166							
ANTENNA TIP HEIGHT	168		169				169							
MECHANICAL DOWNTILT	0		0				2							
FEEDER AMOUNT	2						Fiber + 2 Coax							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Kathrein 860-10025		Internal				Internal						
SURGE ARRESTOR (QTY/MODEL)	1	Polyphaser 1000860	1	DC/ Fiber Squid			1	DC Fiber Squid						
DIPLEXER (QTY/MODEL)	2	LGP 13519					4	CCI Triplexer -TPX-070821						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006		LTE RRH										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Powerwave TT19-08BP111001 (Twin BP)					1	CCI DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	Kathrein / K SBT 782-10253 (12V)					2	Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Bronze Standard- Replace existing GSM Antenna with Octo port Antenna- GSM 1900 Decom- Add LTE WCS RRUS-32 to Octo port Antenna- Add Fiber DC Squid- Add 4 Triplexers - Remove TMAs and PDU- Replace existing DUS with 5216- Add / Reuse XMU- Configuration should be 1x5216 + 1 x XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59372.A.850.3G.1	59372.A.850.3G.1	CTV10831	CTV10831		UMTS 850	800 10121 @850_Xpol_7dt	13.42	160	7	NONE	RFS 1-1/4 (850)	210.05				NO		236.05		1	
	PORT 3	59372.A.1900.3G.2	59372.A.1900.3G.2	CTU10837	CTU10837		UMTS 1900	800 10121 @1950_Xpol_7dt	16.5	160	7	NONE	RFS 1-1/4 (1900)	210.05				NO		392.64		2	
ANTENNA POSITION 2	PORT 1	59372.A.700.4G.1	59372.A.700.4G.1	CTL01083_7A_1	CTL01083_7A_1		LTE 700	OPA-65R-LCUU-H6_719MHz_08DT	13.9	30	8	TOP	FIBER	0						827.9421		3	
	PORT 3	59372.A.1900.4G.1	59372.A.1900.4G.1	CTL01083_9A_1	CTL01083_9A_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_03DT	17.2	30	3	TOP	FIBER	0						3258.367		3	
ANTENNA POSITION 4	PORT 1	59372.A.850.25G.1	59372.A.850.25G.1	184G10831	184G10831		GSM 850	OPA-65R-LCUU-	14.5	30	8	NONE	RFS 1-1/4 (850)	210.05								7	

								H6_849MHz_08DT															
	PORT 3	59372.A.WCS.4G.tmp1	59372.A.WCS.4G.1	CTL01083_3A_1	CTL01083_3A_1		LTE WCS	OPA-65R-LCUU-H6_2310MHz_08DT	17.5	30	8	Top	RFS 1-1/4 (850)	210.05				NO		1285.2866		7	
	PORT 4	59372.A.1900.25G.1	59372.A.1900.25G.1	184P10831	184P10831		GSM 1900	OPA-65R-LCUU-H6_1930MHz_08DT	17.4	30	8	None	RFS 1-1/4 (850)	210.05								7	

Section 17B - FINAL SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	800-10121		OPA-65R-LCUU-H6				OPA-65R-LCUU-H6							
ANTENNA VENDOR	Kathrein		CCI Antennas				CCI Antennas							
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9		72X14.8X7.4				72X14.8X7.4							
ANTENNA WEIGHT	44.1		73				73							
AZIMUTH	270		160				160							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	166		166				166							
ANTENNA TIP HEIGHT	168		169				169							
MECHANICAL DOWNTILT	0		0				3							
FEEDER AMOUNT	2						Fiber + 2 Coax							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Kathrein 860-10025		Internal				Internal						
SURGE ARRESTOR (QTY/MODEL)	1	Polyphaser 1000860												
DIPLEXER (QTY/MODEL)	2	LGP 13519					4	CCI Triplexer -TPX-070821						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Powerwave TT19-08BP111001 (Twin BP)					1	CCI DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	Kathrein / K SBT 782-10253 (12V)					2	Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Bronze Standard- Replace existing GSM Antenna with Octo port Antenna- GSM 1900 Decom- Add LTE WCS RRUS-32 to Octo port Antenna- Add Fiber DC Squid- Add 4 Triplexers - Remove TMAs and PDU- Replace existing DUS with 5216- Add / Reuse XMU- Configuration should be 1x5216 + 1 x XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59372.B.850.3G.1	59372.B.850.3G.1	CTV10832	CTV10832		UMTS 850	800 10121 @850_Xpol_12dt	13.3	270	12	NONE	RFS 1-1/4 (850)	210.05				NO		229.61		9	
	PORT 3	59372.B.1900.3G.2	59372.B.1900.3G.2	CTU10838	CTU10838		UMTS 1900	800 10121 @1950_Xpol_6dt	16.6	270	6	NONE	RFS 1-1/4 (1900)	210.05				NO		401.79		10	
ANTENNA POSITION 2	PORT 1	59372.B.700.4G.1	59372.B.700.4G.1	CTL01083_7B_1	CTL01083_7B_1		LTE 700	OPA-65R-LCUU-H6_719MHz_08DT	13.9	160	2	TOP	FIBER	0						827.9421		11	
	PORT 3	59372.B.1900.4G.1	59372.B.1900.4G.1	CTL01083_9B_1	CTL01083_9B_1		LTE 1900	OPA-65R-LCUU-H6_1930MHz_02DT	17	160	2	TOP	FIBER	0						3258.367		11	
ANTENNA POSITION 4	PORT 1	59372.B.850.25G.1	59372.B.850.25G.1	184G10832	184G10832		GSM 850	OPA-65R-LCUU-	14.5	160	7	NONE	RFS 1-1/4 (850)	210.05								15	

								H6_849MHz_07DT															
	PORT 3	59372.B.WCS.4G.tmp1	59372.B.WCS.4G.1	CTL01083_3B_1	CTL01083_3B_1		LTE WCS	OPA-65R-LCUU-H6_2310MHz_08DT	17.5	160	8	Top	RFS 1-1/4 (850)	210.05				NO		1285.2866		15	
	PORT 4	59372.B.1900.25G.1	59372.B.1900.25G.1	184P10832	184P10832		GSM 1900	OPA-65R-LCUU-H6_1930MHz_08DT	17.4	160	8	None	RFS 1-1/4 (850)	210.05								15	

Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	800-10121		OPA-65R-LCUU-H8				OPA-65R-LCUU-H8							
ANTENNA VENDOR	Kathrein		CCI Antennas				CCI Antennas							
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9		92.7X14.4X7				92.7X14.4X7							
ANTENNA WEIGHT	44.1		88				88							
AZIMUTH	30		270				270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	166		166				166							
ANTENNA TIP HEIGHT	168		170				170							
MECHANICAL DOWNTILT	0		0				3							
FEEDER AMOUNT	2						Fiber + 2 Coax							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Kathrein 860-10025		Internal				Internal						
SURGE ARRESTOR (QTY/MODEL)	1	Polyphaser 1000860												
DIPLEXER (QTY/MODEL)	2	LGP 13519					4	CCI Triplexer -TPX-070821						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Powerwave TT19-08BP111001 (Twin BP)					1	CCI DTMABP7819VG12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	1	Kathrein / K SBT 782-10253 (12V)					2	Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)							1	RRUS-32						
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Bronze Standard- Replace existing GSM Antenna with Octo port Antenna- GSM 1900 Decom- Add LTE WCS RRUS-32 to Octo port Antenna- Add Fiber DC Squid- Add 4 Triplexers - Remove TMAs and PDU- Replace existing DUS with 5216- Add / Reuse XMU- Configuration should be 1x5216 + 1 x XMU													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59372.C.850.3G.1	59372.C.850.3G.1	CTV10833	CTV10833		UMTS 850	800 10121 @850_Xpol_12dt	13.3	30	12	NONE	RFS 1-1/4 (850)	210.05				NO		229.61		17	
	PORT 3	59372.C.1900.3G.2	59372.C.1900.3G.2	CTU10839	CTU10839		UMTS 1900	800 10121 @1950_Xpol_6dt	16.6	30	6	NONE	RFS 1-1/4 (1900)	210.05				NO		401.79		18	
ANTENNA POSITION 2	PORT 1	59372.C.700.4G.1	59372.C.700.4G.1	CTL01083_7C_1	CTL01083_7C_1		LTE 700	OPA-65R-LCUU-H6_719MHz_08DT		270	5	TOP	FIBER	0						827.9421		19	
	PORT 3	59372.C.1900.4G.1	59372.C.1900.4G.1	CTL01083_9C_1	CTL01083_9C_1		LTE 1900	OPA-65R-LCUU-H8_1948MHz_08DT		270	8	TOP	FIBER	0						3380.6483		19	
ANTENNA POSITION 4	PORT 1	59372.C.850.25G.1	59372.C.850.25G.1	184G10833	184G10833		GSM 850	OPA-65R-LCUU-	15.4	270	8	NONE	RFS 1-1/4 (850)	210.05								23	

								H8_849MHz_08DT															
	PORT 3	59372.C.WCS.4G.tmp1	59372.C.WCS.4G.1	CTL01083_3C_1	CTL01083_3C_1		LTE WCS	OPA-65R-LCUU-H8_2310MHz_08DT	17.2	270	8	Top	RFS 1-1/4 (850)	210.05				NO		1285.2866		23	
	PORT 4	59372.C.1900.25G.1	59372.C.1900.25G.1	184P10833	184P10833		GSM 1900	OPA-65R-LCUU-H8_1930MHz_08DT	17.3	270	8	None	RFS 1-1/4 (850)	210.05								23	

Diagram - Sector	A	Diagram File Name - CT1083_A_B_C_LTE3C_WCS_BrStd_Rev3.vsd					
Atoll Site Name -	CTV1083	Location Name -	GLASTONBURY PD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

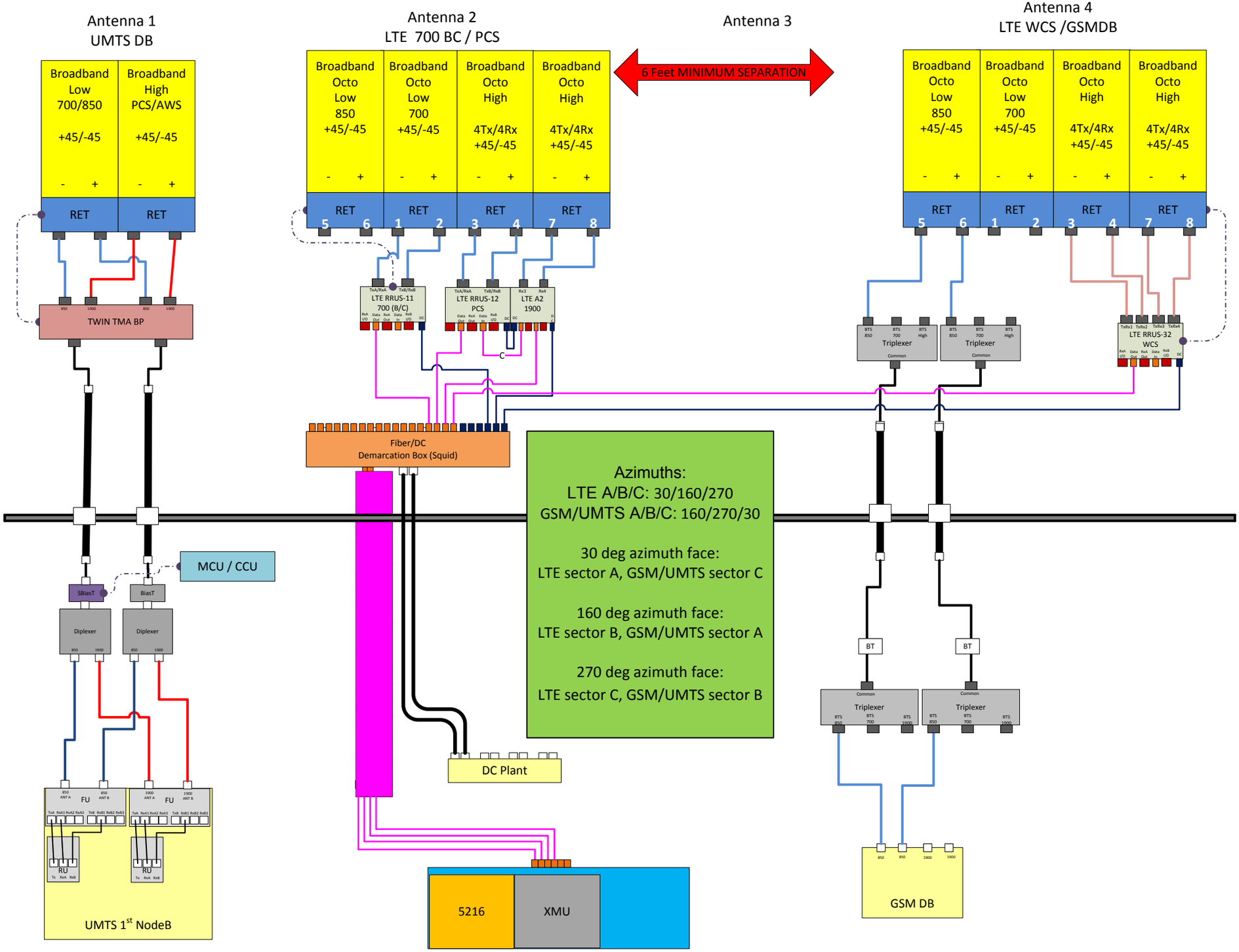

Diagram - Sector	B	Diagram File Name - CT1083_A_B_C_LTE3C_WCS_BrStd_Rev3.vsd					
Atoll Site Name -	CTV1083	Location Name -	GLASTONBURY PD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

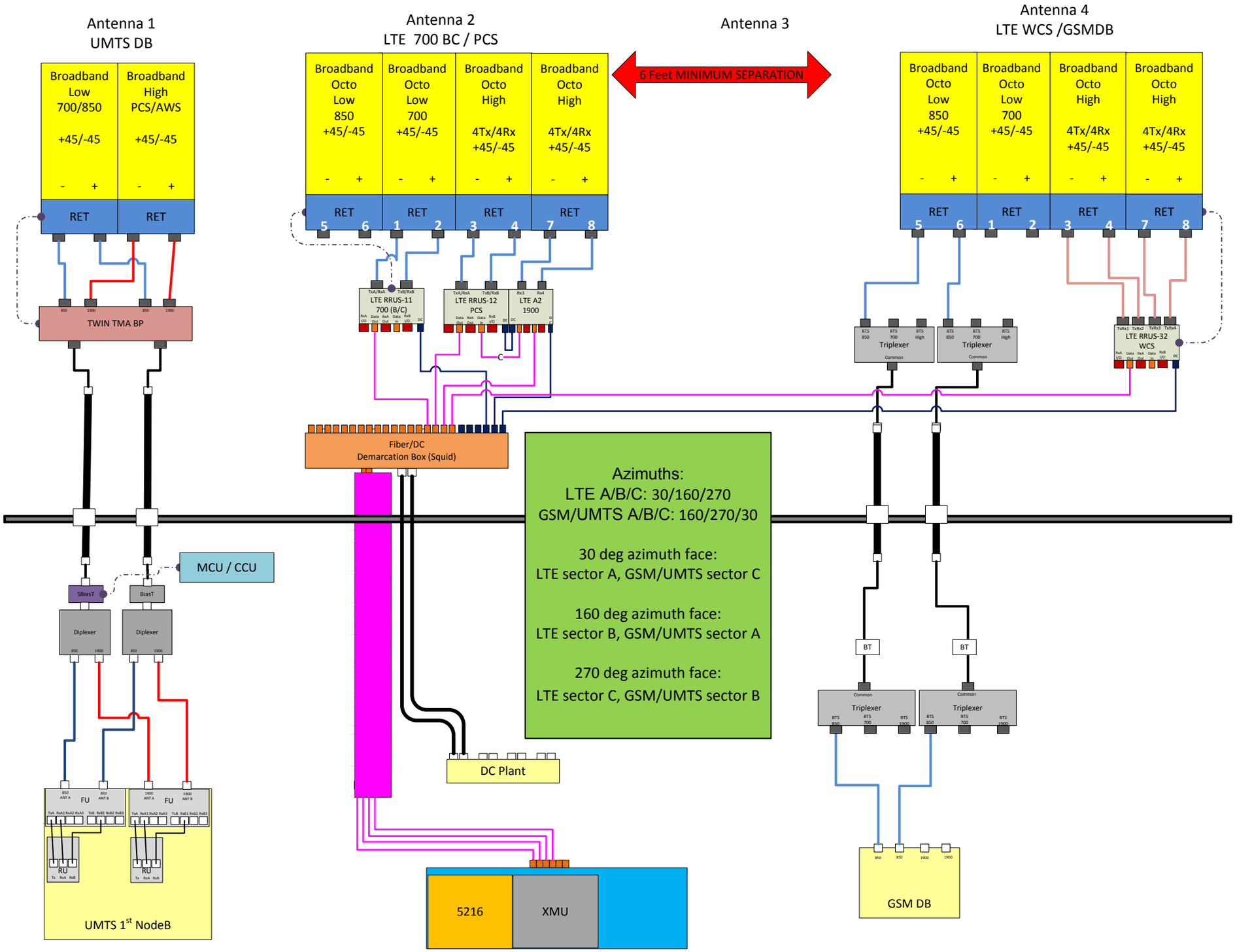

Diagram - Sector	C	Diagram File Name - CT1083_A_B_C_LTE3C_WCS_BrStd_Rev3.vsd					
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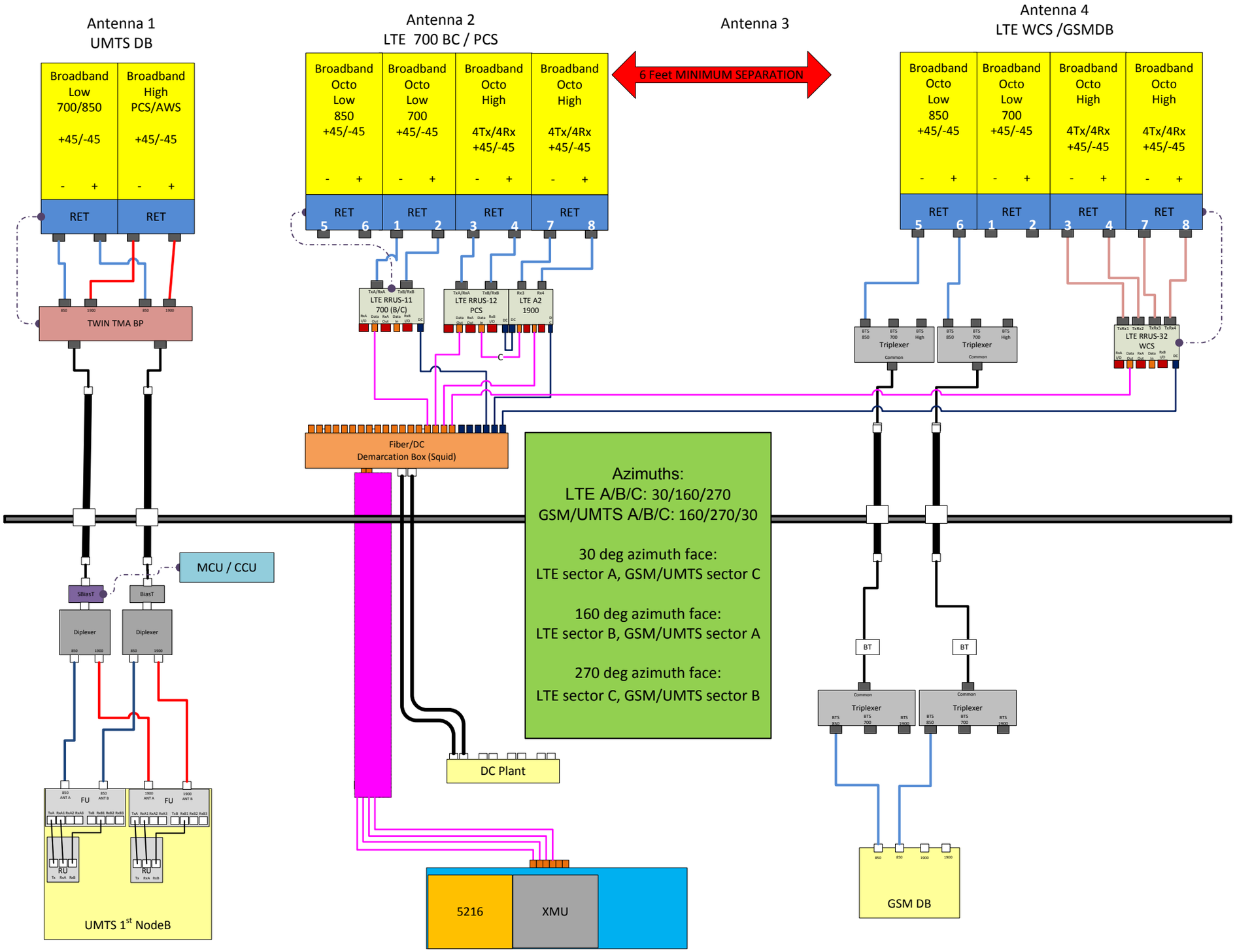
Comments:							



WORKFLOW SUMMARY							
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
03/24/2016	Preliminary In Progress	mm093q	Preliminary Submitted for Approval	AB014M	Promote	LTE 3C Preliminary RFDS	
04/14/2016	Preliminary Submitted for Approval	AB014M	Preliminary Approved	BG144B	Promote		
06/28/2016	Preliminary Approved	BG144B	Final RF Approval	OM636A	Promote	Needs Final	
09/15/2016	Final RF Approval	OM636A	Final Approved	BG144B	Promote	LTE Final RFDS	

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H6

Octoport Multi-Band Antenna Array

The CCI Octoport Multi-Band Antenna Array is an industry first 8-port antenna with full WCS Band Coverage. With four high band ports covering PCS, AWS and WCS bands, two 700 MHZ ports, and two 850 MHz ports our octoport antenna is ready for 4X4 high band MIMO.

Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.

Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1710/2155 MHz and WCS 2300 MHz coverage in a single enclosure.

Benefits

- **RET System allows Independent Tilt of each band specific paired port**
- **Reduces tower loading**
- **Frees up space for tower mounted Remote Radio Heads**
- **Single radome with eight ports**
- **All Band design simplifies radio assignments**
- **Sharp elevation beam eases network planning**

Features

- High Band Ports include WCS Band
- Four High Band ports with four Low Band ports in one antenna
- Sharp elevation beam
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Excellent PIM Performance
- A multi-network solution in one radome

Applications

- 4x4 MIMO on High Band and Dual 2x2 MIMO on 700 & 850 Low Bands
- Adding additional capacity without adding additional antennas
- Adding WCS Band without increasing antenna count

ISO 9001:2008
Quality Management Systems
Système de Qualité
www.ca.sgs.com

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H6

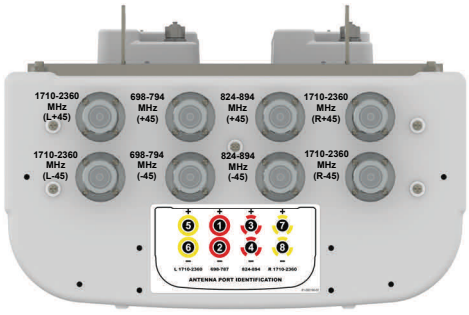
OPA-65R Multi-Band Antenna

Electrical Specifications

Frequency Range	2 X Low Band Ports (L) which cover the range from 698-787	2 X Low Band Ports (C) which cover the range from 824-894	4 X High Band Ports (H1 & H2) which cover the full range from 1710-2360 MHz			
			1850-1990 MHz	1710-1755/2110-2170 MHz	2305-2360 MHz	
Gain	13.8 dBi	14.6 dBi	17.0 dBi	16.3 dBi	17.4 dBi	17.6 dBi
Azimuth Beamwidth (-3dB)	66°	61°	60°	68°	64°	60°
Elevation Beamwidth (-3dB)	12.2°	10.3°	5.7°	6.3°	5.1°	4.5°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -18 dB	< -19 dB	< -19 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 30 dB	> 27 dB	> 32 dB	> 32 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 27 dB	> 25 dB	> 27 dB	> 27 dB	> 28 dB	> 28 dB
Cross-Polar Discrimination (at Peak)	> 22 dB	> 22 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 16 dB	> 14 dB	> 17 dB	> 17 dB	> 17 dB	> 17 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
VSWR	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power	500 Watts CW	500 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical Specifications

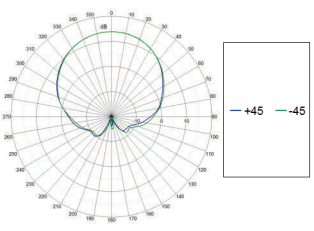
Dimensions (LxWxD)	72.0 x 14.8 x 7.4 inches (1828 x 376 x 189 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	247 lbs (1099 N) @ 100 mph
Side Wind Load	142 lbs (631 N) @ 100 mph
Equivalent Flat Plate Area	9.7 ft^2 (0.9 m^2)
Weight (w/o RET/Mounting)	73 lbs (33 kg)
RET System Weight	7.0 lbs (3.0 kg)
Connector	8; 7-16 DIN female long neck
Mounting Pole	2-5 inches (5-12 cm)



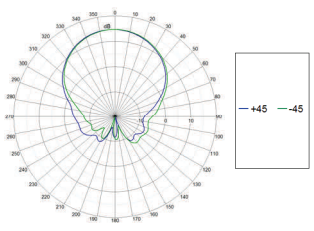
Bottom View

Rear View

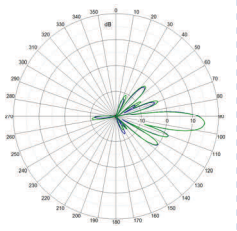
Antenna Patterns*



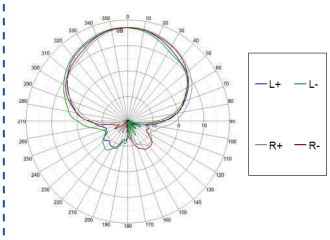
737 MHz Azimuth



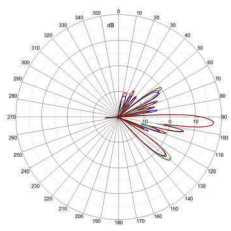
887 MHz Azimuth



Elevation 5°



1920 MHz Azimuth



Elevation 4°

*Typical antenna patterns. For detail information on antenna pattern, please contact us at info@cciproducts.com. All specifications are subject to change without notice.

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H8

Octoport Multi-Band Antenna Array

The CCI Octoport Multi-Band Antenna Array is an industry first 8-port antenna with full WCS Band Coverage. With four high band ports covering PCS, AWS and WCS bands, two 700 MHZ ports, and two 850 MHz ports our octoport antenna is ready for 4X4 high band MIMO.

Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.

Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.

Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1710/2155 MHz and WCS 2300 MHz coverage in a single enclosure.

All CCI antennas are manufactured under ISO 9001.

Benefits

- **RET System allows Independent Tilt of each band specific paired port**
- **Reduces tower loading**
- **Frees up space for tower mounted Remote Radio Heads**
- **Single radome with eight ports**
- **All Band design simplifies radio assignments**
- **Sharp elevation beam eases network planning**

Features

- High Band Ports include WCS Band
- Four High Band ports with four Low Band ports in one antenna
- Sharp elevation beam
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Excellent PIM Performance
- A multi-network solution in one radome

Applications

- 4x4 MIMO on High Band and Dual 2x2 MIMO on 700 & 850 Low Bands
- Adding additional capacity without adding additional antennas
- Adding WCS Band without increasing antenna count

65° OctoPort Multi-Band Antenna

Model OPA-65R-LCUU-H8

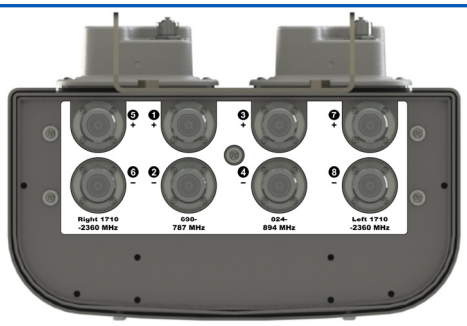
OPA-65R Multi-Band Antenna

Electrical Specifications

Frequency Range	2 X Low Band Ports (L) which cover the range from 698-787 MHz	2 X Low Band Ports (C) which cover the range from 824-894 MHz	4 X High Band Ports (H1 & H2) which cover the full range from 1710-2360 MHz			
			1850-1990 MHz	1710-1755/2110-2170 MHz	2305-2360 MHz	
Gain	14.7 dBi	15.5 dBi	17.0 dBi	16.5 dBi	17.2 dBi	17.1 dBi
Azimuth Beamwidth (-3dB)	65°	61°	62°	67°	64°	61°
Elevation Beamwidth (-3dB)	10.1°	8.5°	5.6°	6.2°	5.0°	4.5°
Electrical Downtilt	2° to 10°	2° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -17 dB	< -19 dB	< -18 dB	< -18 dB	< -17 dB
Front-to-Back Ratio @180°	> 28 dB	> 28 dB	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 28 dB	> 27 dB	> 28 dB	> 27 dB	> 27 dB	> 28 dB
Cross-Polar Discrimination (at Peak)	> 24 dB	> 20 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 16 dB	> 14 dB	> 18 dB	> 18 dB	> 18 dB	> 18 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
VSWR	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power	500 Watts CW	500 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW	300 Watts CW
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms	50 Ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical Specifications

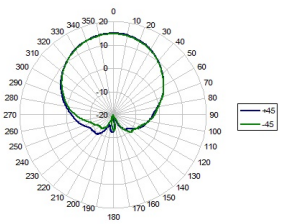
Dimensions (LxWxD)	92.7 x 14.4 x 7.0 inches (2355 x 366 x 179 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	327 lbs (1453 N) @ 100 mph (161 kph)
Side Wind Load	186 lbs (829 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	12.9 ft^2 (1.2 m^2)
Weight (w/o RET/Mounting)	88 lbs (40 kg)
RET System Weight	7.0 lbs (3.0 kg)
Connector	8; 7-16 DIN female long neck
Mounting Pole	2-5 inches (5-12 cm)



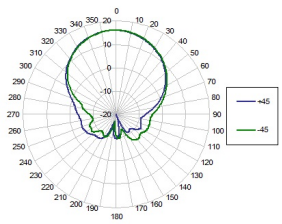
Bottom View

Rear View

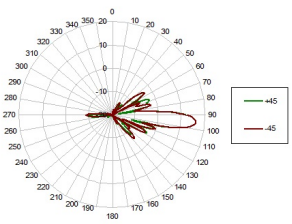
Antenna Patterns*



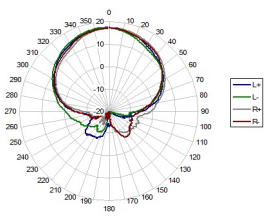
737 MHz Azimuth



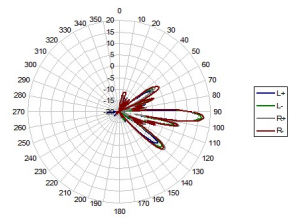
887 MHz Azimuth



Elevation 5°



1920 MHz Azimuth



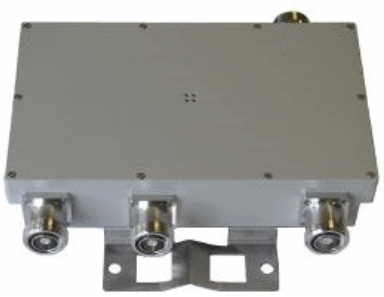
Elevation 4°

*Typical antenna patterns. For detail information on antenna pattern, please contact us at info@cciproducts.com. All specifications are subject to change without notice.

DATA SHEET

Outdoor Broadband Triplexer

TPX-070821



- Low Loss
- Small, lightweight
- AISG 2.0 compliant from PCS/AWS port to Common port
- Good Isolation
- Good IM
- Lightning protected
- High reliability
- Full 700, 850 MHz, and PCS/AWS (pre-combined) bands

Overview

Communication Components, Inc. Outdoor Broadband Triplexer combines 700 MHz, 850 MHz, and PCS/AWS band Basestation Tx/Rx signals onto a common port. Specifically intended for use in multi-band systems with limited feeder lines, the CCI Triplexer model TPX-070821 facilitates the addition of new technologies including LTE to existing sites while providing a high degree of isolation between systems. By reducing the number of feeder lines, the cost to upgrade a site (tower loading, leasing and installation costs) is reduced.
The CCI Outdoor Broadband Triplexer provides full band performance for each band with low insertion loss, low Intermodulation, and high power handling. Excellent return loss delivers the best match to the antennas and base station, saving precious transmit power. DC and AISG pass-through retains full RET and TMA capability utilizing CCI's AISG suite of products.

Technical Description:

The Outdoor Broadband Triplexer consists of multiple filters to combine (or divide) full band 700 MHz, 850 MHz and PCS/AWS signals. This tower mount unit can be used as either a splitter or combiner to aggregate multiple bands on a common feeder line. All RF ports are DIN 7-16 connectors. The fully weatherproof tower mount unit incorporates a unique intelligent Bias-T architecture which passes the DC and AISG carrier frequency from any of the input ports to the common port while blocking the DC and AISG signals from being re-injected into the other input ports. The unit has internal lightning strike protection using a multi-stage surge protection circuit.
The filters have been designed to minimize insertion loss while maximizing isolation. Particular attention has been given to the intermodulation performance of the Broadband Diplexer to minimize any passive intermodulation products from occurring. All DIN Connectors are fully IP68 rated and the unit body is rated for IP66.

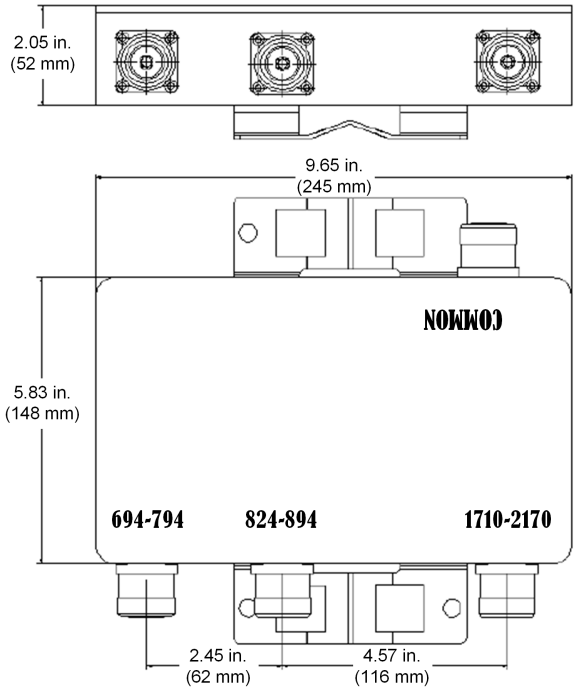
SPECIFICATIONS

Outdoor Broadband Triplexer

TPX-070821

Mechanical

Connectors	4 x 7-16 DIN female long neck
Dimensions (w/o connectors or brackets)(HxWxD)	5.83 x 9.65 x 2.05 in. (148 x 245 x 52 mm)
Weight	7.5 lbs (3.45 kg)
Mounting	Pole/Wall mounting bracket



Outdoor Broadband Triplexer Outline Drawing

CENTEK engineering

Centered on Solutions℠

January 9, 2017

Ms. Lauren Groppi
Site Acquisition Manager
Empire Telecom USA, LLC:
16 Esquire Road
Billerica, MA 01862

Re: Structural Letter ~ Antenna Mount
AT&T – Site Ref: CT1083 Glastonbury PD
2108 Main Street
Glastonbury, CT 06033

Centek Project No. 16071.83

Dear Ms. Groppi,

Centek Engineering, Inc. has reviewed the AT&T Mobility antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) V-Frames to support the existing/proposed equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2012 International Building Code as modified by the 2016 Connecticut State Building Code (CTBC) including ASCE7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The AT&T Mobility loads considered in this analysis consist of the following:

- **AT&T Mobility:**
  V-Frames: Three (3) Kathrein 800-10121 panel antennas, four (4) CCI OPA-65R-LCUU-H6 panel antennas, two (2) CCI OPA-65R-LCUU-H8 panel antennas, three (3) Powerwave TT19-08BP111-001 TMAs, six (6) CCI TPX-070821 triplexers, three (3) Ericsson RRUS-11, three (3) Ericsson RRUS-12, three (3) Ericsson RRUS-32, three (3) Ericsson A2s and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted to the V-Frames with a RAD center elevation of 166-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2012 International Building Code as modified by the 2016 Connecticut State Building Code considering a nominal design wind speed of 97 mph for Glastonbury as required in *Appendix N* of the 2016 Connecticut State Building Code. Antenna mount sizes, lengths and geometry were obtained from a mount mapping provided by Construction Services of Branford (CSB) personnel on January 9, 2017.

Based on our review and analysis of the proposed installation, it is our opinion that the **subject antenna mount has adequate capacity** to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER