June 21, 2016

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

Regarding:	Notice of Exempt Modification – Swap of 3 Antennas, addition of 3 radio heads, (6) triplexers and associated lines
Property Address:	99 Cedarwood Lane, Newington, CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 170 foot guyed lattice tower ("tower") at the above-referenced address, latitude 41.69477, longitude -72.7089711. AT&T's facility consists of nine (9) wireless telecommunications antennas at 120 feet. The tower is controlled and owned by Callahan Acres, LLC. Assessor's Information is attached hereto.

AT&T desires to modify its existing telecommunications facility by swapping three (3) antennas, adding three (3) remote-radio heads ("RRHs"), adding six (6) triplexers, adding one (1) fiber trunk, and adding two (2) DC trunks. The centerline height of said antennas is and will remain at 120 feet.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor of Newington, the Town Manager of Newington, and the Town Planner of Newington. A copy of this letter is also being sent to Callahan Acres, LLC, the owner of the structure that AT&T is located.

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

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's antennas, RRHs, triplexers and associated lines will be installed at 120 foot level of the 170 foot tall guyed lattice tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.

16 Esquire Road, Billerica, MA 01862 Phone 978-284-3906 Email: ncaplan@empiretelecomm.com

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. An RF emissions calculation is attached.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by Centek Engineering dated April 26, 2016).

For the foregoing reasons AT&T respectfully requests that the proposed swap of 3 antennas, addition of 3 RRHs, 6 triplexers and associated lines be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

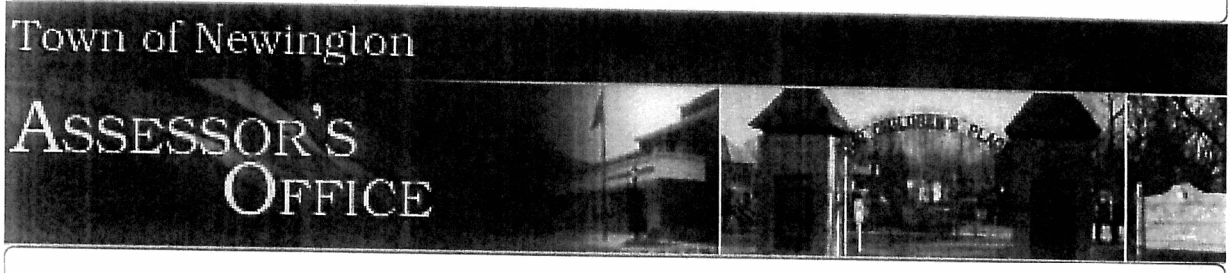
Sincerely,

Nicole Caplan
Site Acquisition Specialist
Empire Telecom

CC: The Honorable Roy Zartarian, Mayor, Town of Newington
John L. Salomone, Town Manager, Town of Newington
Craig Minor, Town Planner, Town of Newington
Callahan Acres, LLC c/o Fred Callahan

16 Esquire Road, Billerica, MA 01862 Phone 978-284-3906 Email: ncaplan@empiretelecomm.com

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2015.



Information on the Property Records for the Municipality of Newington was last updated on 5/12/2016.

Parcel Information

Location:	99 CEDARWOOD LN	Property Use:	Residential	Primary Use:	Residential
Unique ID:	C1000010	Map Block Lot:	17/480/000	Acres:	2.81
490 Acres:	0.00	Zone:	R-20	Volume / Page:	2117/0550
Developers Map / Lot:	N/E 2139 AKA 5	Census:			

Value Information

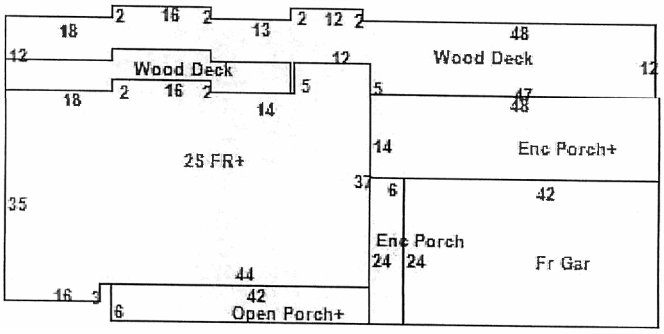
	Appraised Value	70% Assessed Value
Land	145,955	102,170

	Appraised Value	70% Assessed Value
Buildings	463,632	324,540
Detached Outbuildings	0	0
Total	609,587	426,710

Owner's Information

Owner's Data
CALLAHAN QUALIFIED PERSONAL RESIDENC THE CIOFFARI PAUL TRUSTEE 433 SOUTH MAIN ST STE 200 WEST HARTFORD CT 06110

Building 1



Building Use:	Single Family	Style:	Colonial	Living Area:	4,120
Stories:	2.00	Construction:	Wood Frame	Year Built:	1990
Total Rooms:	9	Bedrooms:	4	Full Baths:	3
Half Baths:	0	Fireplaces:	1	Heating:	Hot Water
Fuel:	Oil	Cooling Percent:	100	Basement Area:	2,060

Basement Finished Area:	500	Basement Garages:	0	Roof Material:	Asphalt
Siding:	Clapboards	Units:			

Special Features

Attached Components

Type:	Year Built:	Area:
Wood Deck	1990	235
Wood Deck	1990	1,248
Frame Garage	1990	1,008
Enclosed Porch	1990	672
Enclosed Porch	1990	144
Open Porch	1990	252

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Cell Tower	2000	0.00	0.00	0

Owner History - Sales

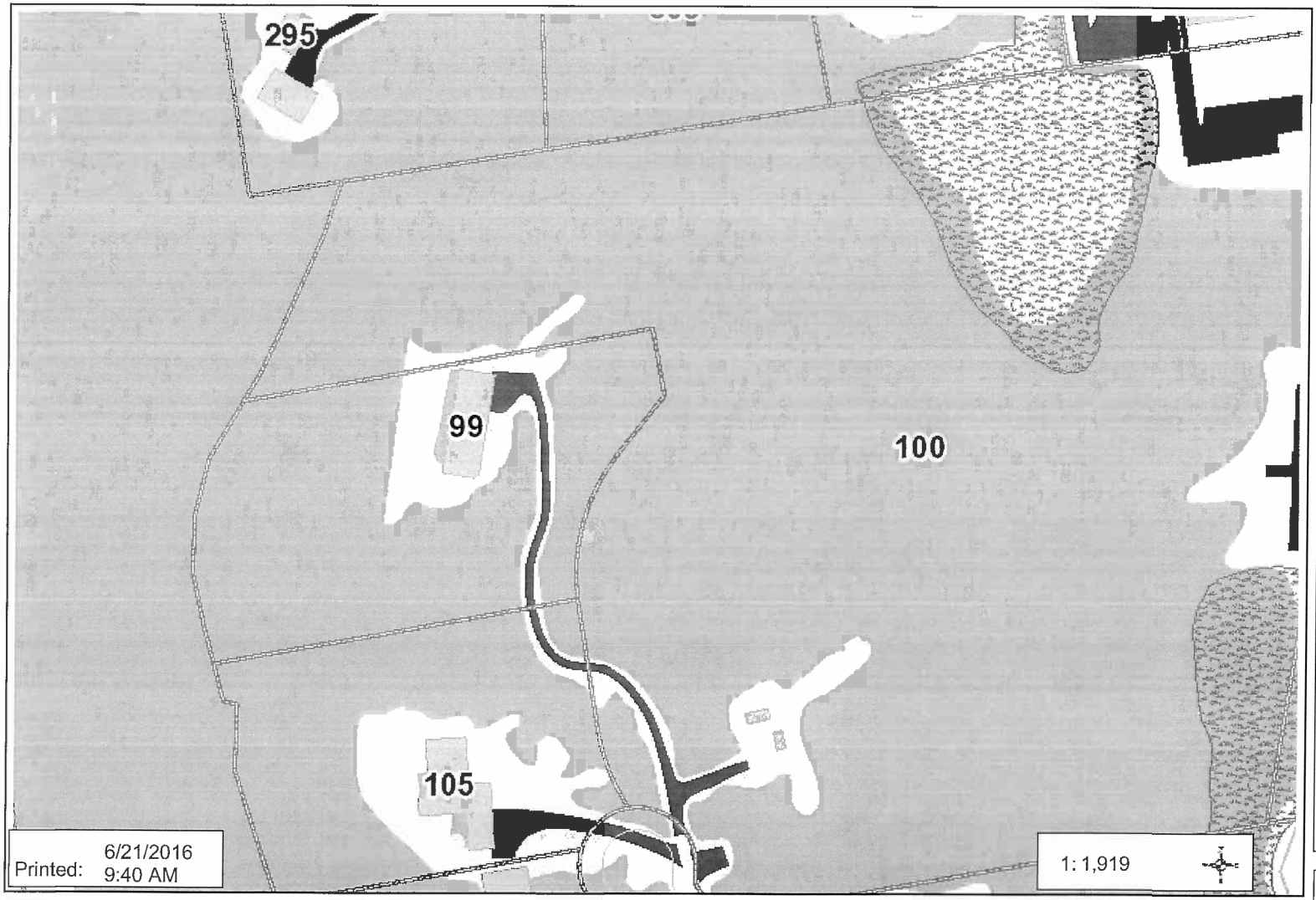
Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
CALLAHAN QUALIFIED PERSONAL RESIDENC THE	2117	550	04/01/2013		No	$0
CALLAHAN FREDERICK H III	737	309	01/02/1990		No	$0
CALLAHAN FREDERICK H JR	245	222	01/10/1974		No	$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
B-14-704	Remodel	11/06/2014		Closed	REMOVAL RADIO EQUIPMENT ADD HAMS CABLES ANTENNAS
TB-14-597		09/15/2014		Closed	Structural Modification Tower to include Plumb & Tension
B-14-541		09/05/2014		Needs Visit	INSTALL 3 RADIO HEADS
B-13-78	Remodel	03/07/2013		Closed	REPLACE ONE RADIO CABINET
76601		11/25/2008		Closed	3 ANTENNAS & 6 CABLES ON TOWER

Newington GIS Web Map



Legend

- Parcel
- Structures
  - BUILDING
  - CEMENT
  - DECK
  - FOOTBRIDGE
  - FOUNDATION
  - GREENHOUSE
  - POOL
  - STEPS
  - TANK
- Paved Areas
  - Driveway and Parking Lot
  - Sidewalk
- Rail Road Line
- Hydrography
  - Water
  - Swamp area
- Stream
- Vegetation Area

Notes

Notes

319.9 0 159.94 319.9 Feet

This map is user generated static output. This map is for reference only and should be used for REPRESENTATION ONLY. The Town of Newington refutes any liability for any actions taken or not taken based on this map.

THIS MAP IS NOT TO BE USED FOR NAVIGATION AND IS NOT CONSIDERED SURVEY QUALITY.

WIRELESS COMMUNICATIONS FACILITY
CT1145 - LTE PCS 1900 RETROFIT
NEWINGTON
99 CEDARWOOD LANE
NEWINGTON, CT 06111

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, 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

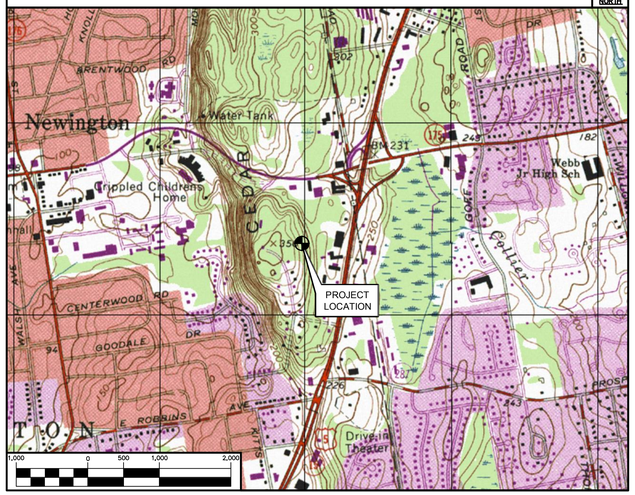
TO: 99 CERDARWOOD LANE
NEWINGTON, CT 06111

1.	TURN LEFT ONTO CAPITOL BLVD.	0.3 mi
2.	TURN LEFT ONTO WEST STREET.	0.6 mi
3.	TURN RIGHT ON TO CT-3N.	0.8 mi
4.	TURN LEFT ON TO CT-160W.	0.4 mi
5.	TURN RIGHT ON TO HAYES RD.	0.8 mi
6.	CONTINUE ON TO HIGHLAND ST.	0.6 mi
7.	CONTINUE STRAIGHT ON TO THOMBUSH RD.	0.6 mi
8.	TURN LEFT ON TO PROSPECT ST.	0.8 mi
9.	USE THE MIDDLE LANE TO TURN LEFT ON TO BERLIN TURNPIKE.	0.1 mi
10.	TURN RIGHT AT THE 1ST CROSS STREET ON TO E ROBBINS AVE.	0.2 mi
11.	TURN RIGHT ON TO GOODALE DR.	0.1 mi
12.	TURN RIGHT ON TO CEDARWOOD LANE.	0.1 mi

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 EXISTING POSITION 3 ANTENNA FOR PROPOSED (12) PORT ANTENNA, (1) PER SECTOR.
   B. REMOVE & REPLACE (3) EXISTING RRUS-11 (1900MHz WITH (3) NEW RRUS-32 B2 MOUNTED BY ANTENNA ON EXISTING TOWER.
   C. INSTALL (6) NEW TRIPLEXERS WITHIN EXISTING EQUIPMENT SHELTER.
   D. INSTALL (1) NEW RAYCAP SURGE SUPPRESSOR ON TOWER.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT1145
AT&T SITE NAME:	NEWINGTON
SITE ADDRESS:	99 CEDARWOOD LANE NEWINGTON, CT 06111
PROPERTY OWNER:	FREDRICK H. CALLAHAN, JR. 2111 BERLIN TURNPIKE NEWINGTON, CT 06111
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
CONTACT PERSON:	LAUREN GROPPI EMPIRE TELECOM, US (978)430-2534
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-41'-41.17" N LONGITUDE: 72°-42'-32.30" W GROUND ELEVATION: ±347' AMSL

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/19/16	LGL	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

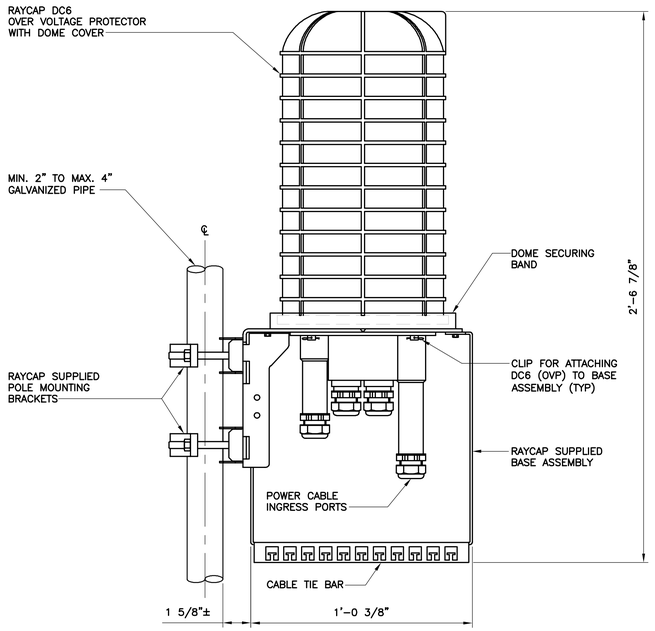
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
NEWINGTON
SITE NUMBER: CT1145
99 CEDARWOOD LANE
NEWINGTON, CT 06111

DATE: 04/14/16
SCALE: AS NOTED
JOB NO. 16002.12

TITLE SHEET

T-1

Sheet No. 1 of 5



ELEVATION

NOTES:

1. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

1 / N-1 **RAYCAP DC6 MOUNTING DETAIL**
SCALE: 3" = 1'-0"

NOTES AND SPECIFICATIONS

DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F-96 (ANTENNA MOUNTS): 80 MPH (FASTEST MILE), EQUIVALENT TO 100 MPH (3 SECOND GUST).
   - BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
   - BASIC WIND SPEED (OTHER STRUCTURE): 100 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMMENDMENT.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-02 MINIMUM DESIGN LOADS FOR BUILDINGS 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.

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NEWINGTON

SITE NUMBER: CT1145

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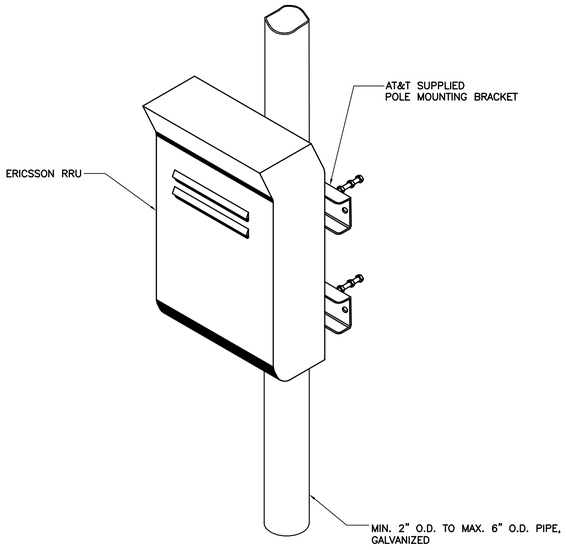
JOB NO. 16002.12

NOTES AND SPECIFICATIONS

N-1



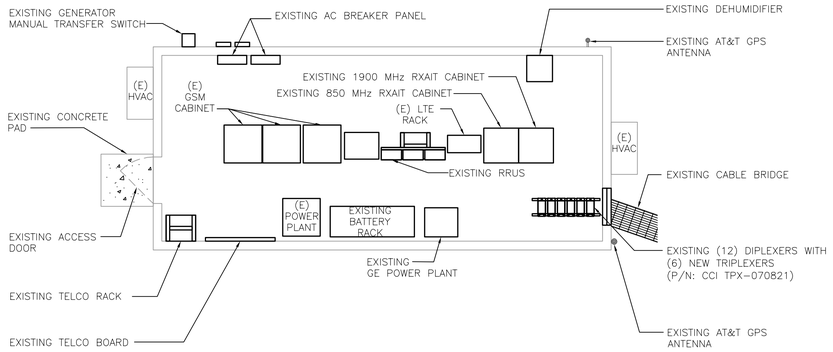
ISOMETRIC VIEW

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.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

3 C–1 TYPICAL RRU MOUNTING DETAILS

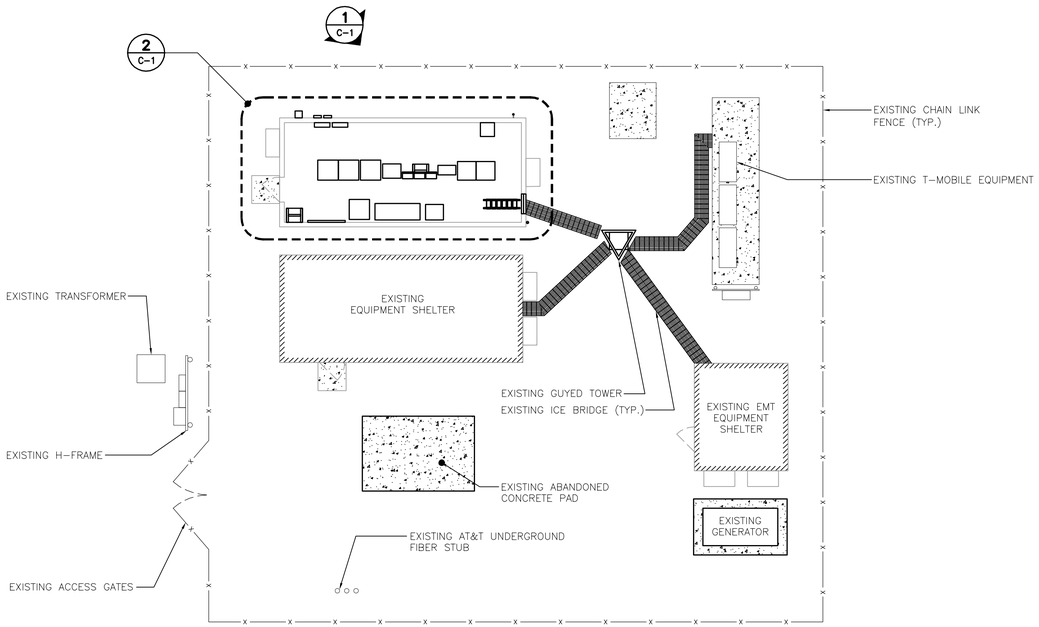
SCALE: NTS



2 C–1 EQUIPMENT BUILDING FLOOR PLAN

SCALE: 1/4" = 1'–0"

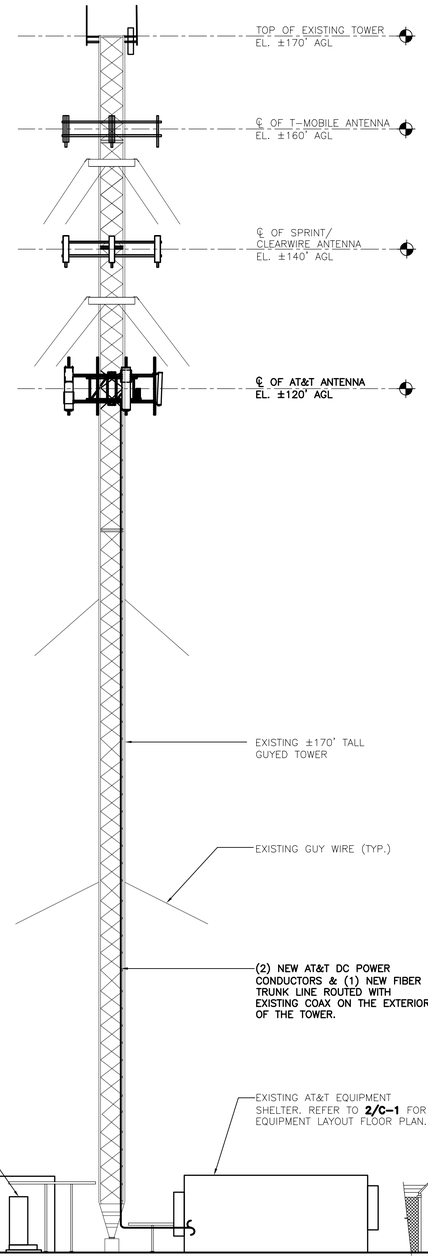
APPROX. NORTH



4 C–1 COMPOUND PLAN

SCALE: 1" = 30'–0"

APPROX. NORTH



TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENG., INC., PROJ. NO. 16002.12, DATED APRIL XX, 2016 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENG., INC. AND FINAL AT&T RF DATA SHEET.

NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY.
2. AGL = ABOVE GRADE LEVEL

1 C–1 EAST ELEVATION

SCALE: 1" = 10'–0"

GRAPHIC SCALE
15 0 7.5 15 30 60
(IN FEET)
1 inch = 15 ft.

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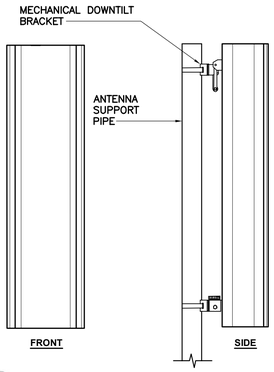
PLANS, ELEVATION AND DETAILS

C–1

Sheet No. 3 of 5



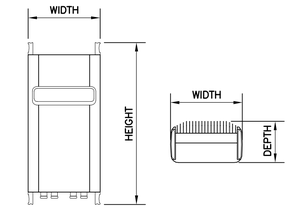
BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: QUINTEL MODEL: QS66512-2	72.0"H x 12.0"W x 9.6"D	112.0-LBS

5 / C-2 PROPOSED ANTENNA DETAIL

SCALE: NTS

NOTES:
1. INSTALL ANTENNA TO EXISTING PIPE MAST USING MANUFACTURERS SUPPLIED BRACKETS AND MOUNTING HARDWARE
2. SET MECHANICAL DOWNTILT TO VALUE SPECIFIED IN LATEST RFDS



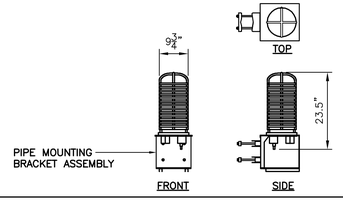
FRONT VIEW BOTTOM VIEW

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"

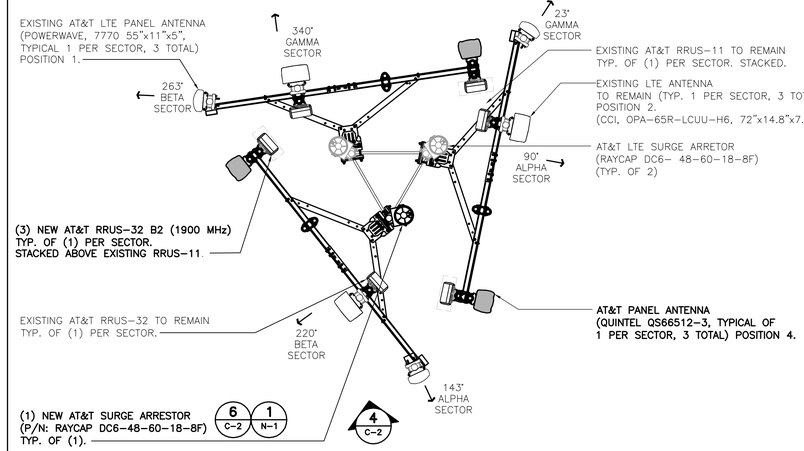


SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6-48-60-18-8F	(1) NEW	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

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.

6 / C-2 SURGE ARRESTOR DETAIL

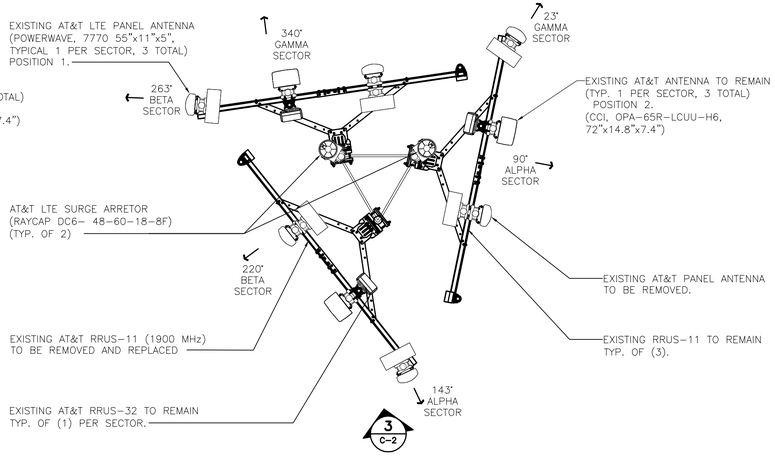
SCALE: NTS



2 / C-2 PROPOSED ANTENNA PLAN

SCALE: 1/8" = 1'-0"

NORTH



1 / C-2 EXISTING ANTENNA PLAN

SCALE: 1/8" = 1'-0"

NORTH

4 / C-2 PROPOSED ANTENNA PLAN

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

NOTE:
1. TOWER MOUNTED AMPLIFIERS (TMA), NOT SHOWN FOR CLARITY.

3 / C-2 EXISTING ANTENNA PLAN

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

NOTE:
1. TOWER MOUNTED AMPLIFIERS (TMA), NOT SHOWN FOR CLARITY.

NOTES:
1. PROVIDE MOUNTING PIPES, CROSSOVERS & ASSOCIATED HARDWARE TO COMPLETE THE PROPOSED UPGRADE.
2. REFER TO AMERICAN TOWER CORP. STRUCTURAL REPORT AND FINAL AT&T RF DATA SHEET PRIOR TO INSTALLATION OF TOWER MOUNTED LTE RELATED ANTENNAS, CABLES AND RELATED EQUIPMENT
3. COORDINATE ANTENNA CENTERLINE ELEVATION, RRU/SURGE ARRESTOR MOUNTING ELEVATION, ATTACHMENT HARDWARE WITH AMERICAN TOWER, CO.

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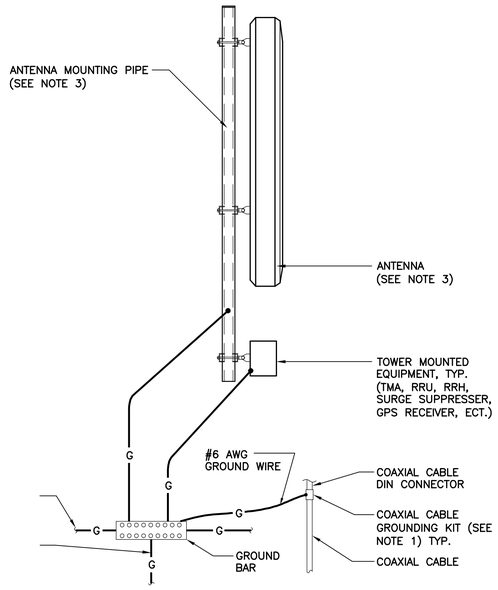
LTE BWE EQUIPMENT DETAILS AND ELEVATIONS

C-2

Sheet No. 4 of 5

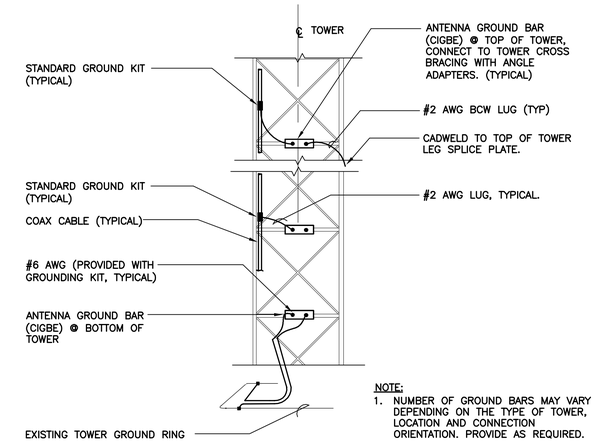


NOTES:

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.

2 / E-1 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

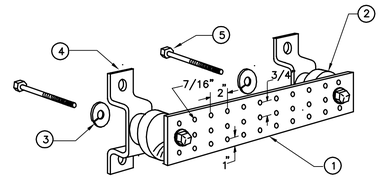


NOTE:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

1 / E-1 ANTENNA CABLE GROUNDING - LATTICE

NOT TO SCALE

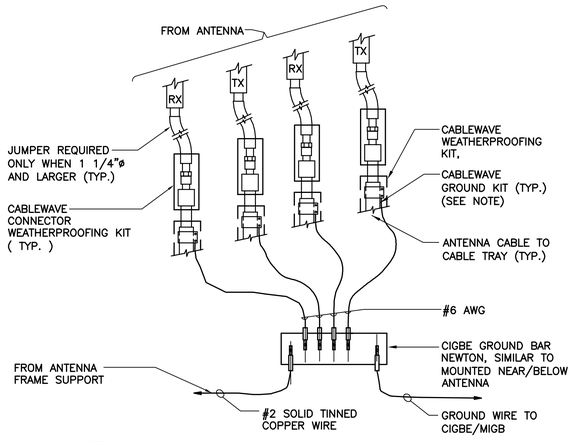


LEGEND

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-1 GROUND BAR DETAIL

NOT TO SCALE

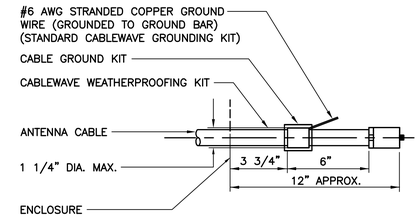


NOTE:

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

5 / E-1 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-1 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

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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TYPICAL ELECTRICAL DETAILS & NOTES

E-1

Sheet No. 5 of 5

CENTEK engineering

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Structural Analysis Report

170' Existing Guyed Lattice Tower

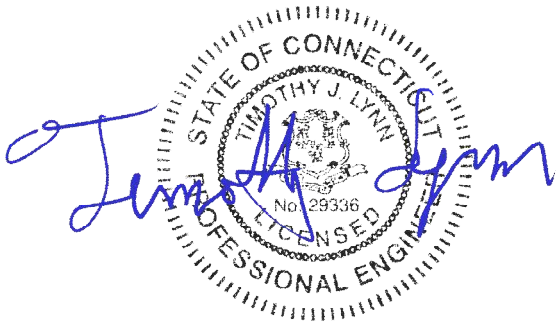
Proposed AT&T Mobility
Antenna Upgrade

AT&T Site Ref: CT1145

99 Cedarwood Lane
Newington, CT

Centek Project No. 16002.12

Date: April 26, 2016



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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 Mobility on the existing guyed lattice tower located in Newington, CT.

The host tower is a 170-ft, three legged, guyed lattice tower. The tower geometry, structure member sizes, tower reinforcement and foundation system information were taken from a previous structural reports prepared by Destek job no.; 1529180 dated December 30, 2015 and URS job no. 36931279.00000 dated August, 22, 2014.

Antenna and appurtenance information were obtained from the aforementioned Destek structural report, visual verification from grade conducted by Centek personnel on April 25, 2016 and a Verizon RF data sheet.

The tower consists of ten (10) vertical sections consisting of pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of pipe and steel angle conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 3.42-ft throughout its length with the exception of a 5' tapered base section.

AT&T proposes the removal of three (3) existing panel antennas and three (3) remote radio heads and the installation of three (3) panel antennas, three (3) remote radio heads, six (6) triplexers and one (1) surge arrestor mounted to the three (3) existing T-Frames. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

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

- UNKOWN (EXISTING):
  Antennas: Two (2) dbSpecta DS4C03F36U-D Omni-directional whips and one (1) TTA mounted on two (2) 3-ft side arms with an elevation of 175-ft above grade.
  Coax Cables: Two (2) 1-5/8" ∅ and one (1) 1/2" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: Three (3) Sinclair SC473-HF1LDF whip antennas leg mounted with an elevation of 175-ft above grade.
  Coax Cables: Three (3) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 5-ft panel antenna and one (1) TTA leg mounted with an elevation of 168-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ one (1) 1/2" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: One (1) 2-ft dish leg mounted with an elevation of 167-ft above grade.
  Coax Cables: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- T-MOBILE (EXISTING):
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas, three (3) Andrew LNX-6515DS panel antennas and six (6) TMA's mounted on three (3) 12-ft boom gates with a RAD center elevation of 163-ft above grade.
  Coax Cables: Eighteen (18) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- NEXTEL/CLEARWIRE (EXISTING):
  Antennas: Nine (9) Decibel DB844H90E-XY panel antennas, three (3) Argus LLPX310R panel antennas, three (3) remote radio heads and three (3) 2-ft microwave dishes mounted on three (3) 12-ft T-Frames with a RAD center elevation of 141.5-ft above grade.
  Coax Cables: Nine (9) 1-1/4" ∅ coax cables, three (3) 1/2" ∅ coax cables and two (2) 2" ∅ conduits running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING):
  Antennas: Two (2) GPS antennas leg mounted with an elevation of 30-ft above grade.
  Coax Cables: Two (2) 1/2" ∅ 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) Powerwave 7770 panel antennas, three (3) CCI OPA-65R-LCUU-H6 panel antennas, six (6) Powerwave LGP21401 TMAs, three (3) Ericsson RRUS-11 remote radio heads, three (3) Ericsson RRUS-32 remote radio heads and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) 14-ft T-Frames with a RAD center elevation of 120-ft above grade.
  Coax Cables: Twelve (12) 7/8" ∅ coax cables, one (1) fiber cable and two (2) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (EXISTING TO REMOVE):
  Antennas: Three (3) KMW AM-X-CD-16-65-00T-RET panel antennas and three (3) Ericsson RRUS-11 remote radio heads mounted on three (3) 14-ft T-Frames with a RAD center elevation of 120-ft above grade.
- **AT&T (PROPOSED):**
  Antennas: Three (3) Qunitel QS66512-2 panel antennas, six (6) CCI TPX-070821 triplexers, three (3) Ericsson RRUS-32 remote radio heads and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) 14-ft T-Frames with a RAD center elevation of 120-ft above grade.
  Coax Cables: One (1) fiber cable and two (2) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.

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.
- All coax cables routed as specified in Section 3 of this report.

A n a l y s i s

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 shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

T o w e r L o a d i n g

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	Hartford; v = 80 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Newington; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA and Appendix K wind speeds are equal.	
Load Cases:	Load Case 1; 80 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 69 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 69 mph wind speed velocity represents 75% of the wind pressure generated by the 80 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- 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 **99.2%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T4)	100'-0"-120'-0"	99.2%	**PASS**
Diagonal (T2)	140'-0"-155'-0"	85.3%	**PASS**
Guy A @ 106-ft radius (T7)	50'	81.5%	**PASS**

Foundation and Anchors

The existing tower base foundation consists of a 2-ft square x 1.75-ft long reinforced concrete pier on a 9.5-ft square x 2.75-ft thick reinforced concrete pad bearing directly on existing sub grade. The guy anchor foundation consists of three (3) 4.0-ft x 12-ft x 1'-10" thick concrete blocks. The sub-grade conditions used in the analysis of the existing tower base foundation and guy anchor foundations were obtained from the aforementioned structural report prepared by URS.

- The worst case tower base and guy anchor reactions developed from the governing Load Case 2 were used in the verification of the anchorage foundations:

Tower Guy Reactions	
Vector	**Proposed Reactions Guy Anchor A @ Radius of 106-ft**
Horizontal (In Plane of GW)	**44 kips**
Horizontal (Out of Plane of GW)	**1 kips**
Vertical	**50 kips**
Resultant Force at end of Guy Wire	**66 kips**
Tower Base Reactions	
Vector	**Proposed Reaction**
Horizontal Shear	**2.0 kips**
Axial Compression	**122.0 kips**
Moment	**0 kip-ft**

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]	Proposed Loading (FS)[1]	Result
Reinf. Conc. Anchor Block (A) at 106-ft radius.	Uplift	2.0	2.59	**PASS**
	Sliding	2.0	2.3	**PASS**
		Allowable	**Proposed**	
Base Foundation	Bearing	4.0 ksf	1.84 ksf	**PASS**
	Overturning	2.0	86.2	**PASS**
	Sliding	2.0	43.7	**PASS**

Note 1: FS denotes 'Factor of Safety'.

Conclusion

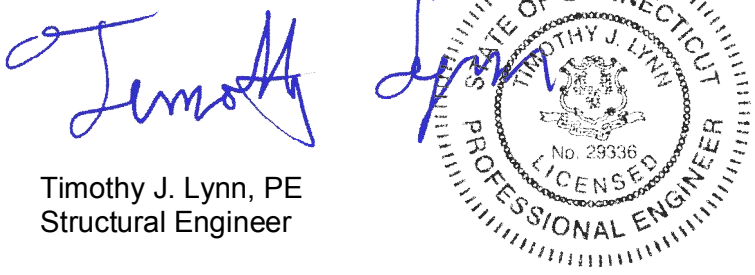
This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration with the below recommendations.

- **All coax cables routed as specified in Section 3 of this report.**

The analysis is based, in part, on the information provided to this office by AT&T Mobility. 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

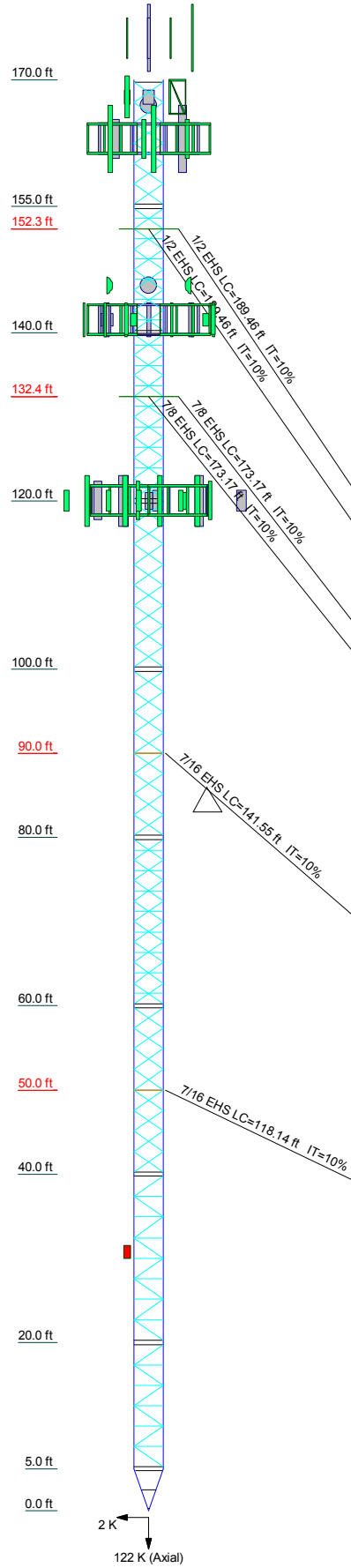
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

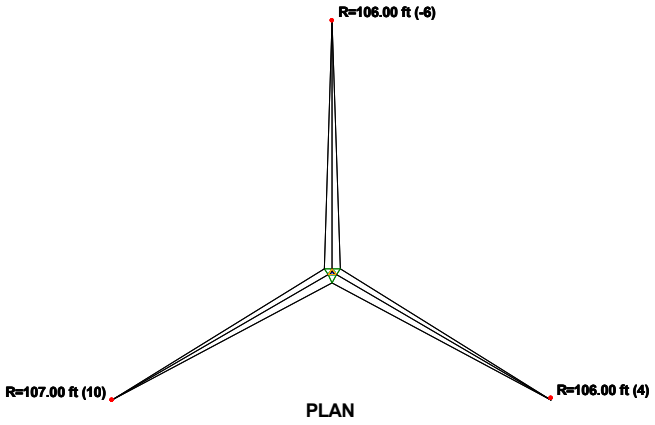
tnxTower Features:

- 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	T10
Legs	ROHN 2 STD	ROHN 2 STD	ROHN 2.0 Std. w/ 1" SR	ROHN 2 STD	ROHN 2.5 STD	A	ROHN 2.5 STD			
Leg Grade					A572-50					
Diagonals		ROHN TS1.5x16 ga	L1 3/4x1 3/4x1/4			ROHN TS1.5x16 ga				N.A.
Diagonal Grade					A36					N.A.
Top Girts		ROHN TS1.5x16 ga	L1 1/2x1 1/2x1/8			ROHN TS1.5x16 ga				3x1/4
Mid Girts			N.A.			N.A.	ROHN TS1.5x16 ga			3x1/4
Bottom Girts		ROHN TS1.5x16 ga	L1 3/4x1 3/4x1/8			ROHN TS1.5x16 ga				3x1/4
Horizontals				N.A.				SR 1		N.A.
Sec. Horizontals		SR 1	L1 3/4x1 3/4x1/4	N.A.		L2x2x3/16		N.A.		
Top Guy Pull-Offs		L2x3x3/16		N.A.	4x3/8	N.A.	4x3/8	N.A.		
Face Width (ft)	3.42									
# Panels @ (ft)	12 @ 2.41667				48 @ 2.4375				6 @ 2.41667	B
Weight (K)	0.3	0.9	1.6	0.4	0.6	0.8	0.6	0.6	0.5	0.1

6.6





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DS4C03F36U-D	175	LLPX310R (Clearwire - Existing)	141.5
DS4C03F36U-D	175	LLPX310R (Clearwire - Existing)	141.5
SC473-HF1LDF	175	RRUS-11 (Clearwire - Existing)	141.5
SC473-HF1LDF	175	Pirod 12' T-Frame Sector Mount (1) (Nextel - Existing)	141.5
SC473-HF1LDF	175		
Tower Top Amplifier	168	Pirod 12' T-Frame Sector Mount (1) (Nextel - Existing)	141.5
ROHN 3-ft Side Arm	168		
ROHN 3-ft Side Arm	168	(2) TPX-070821 (ATI - Proposed)	120
Tower Top Amplifier	168	7770.00 (ATI - Existing)	120
5' Panel Antenna	168	OPA-65R-LCUU-H6 (ATI - Existing)	120
2' Dish	167	QS66512-2 (ATI - Proposed)	120
APX16DWV-16DWVS-E-A20 (T-Mobile - Existing)	163	7770.00 (ATI - Existing)	120
LNX-6515DS (T-Mobile - Existing)	163	OPA-65R-LCUU-H6 (ATI - Existing)	120
APX16DWV-16DWVS-E-A20 (T-Mobile - Existing)	163	QS66512-2 (ATI - Proposed)	120
		7770.00 (ATI - Existing)	120
LNX-6515DS (T-Mobile - Existing)	163	OPA-65R-LCUU-H6 (ATI - Existing)	120
APX16DWV-16DWVS-E-A20 (T-Mobile - Existing)	163	QS66512-2 (ATI - Proposed)	120
		(2) LGP21401 TMA (ATI - Existing)	120
LNX-6515DS (T-Mobile - Existing)	163	(2) LGP21401 TMA (ATI - Existing)	120
(2) TMA 10"x8"x3" (T-Mobile - Existing)	163	RRUS-11 (ATI - Existing)	120
(2) TMA 10"x8"x3" (T-Mobile - Existing)	163	RRUS-11 (ATI - Existing)	120
(2) TMA 10"x8"x3" (T-Mobile - Existing)	163	RRUS-11 (ATI - Existing)	120
Rohn 6' x 12' Boom Gate (1) (T-Mobile - Existing)	163	(2) RRUS-32 (ATI - Proposed)	120
		(2) RRUS-32 (ATI - Proposed)	120
Rohn 6' x 12' Boom Gate (1) (T-Mobile - Existing)	163	(2) RRUS-32 (ATI - Proposed)	120
		DC6-48-60-18-8F Surge Arrestor (ATI - Existing)	120
Rohn 6' x 12' Boom Gate (1) (T-Mobile - Existing)	163	DC6-48-60-18-8F Surge Arrestor (ATI - Proposed)	120
VHLP2-180	145.6	14-ft T-Frame Sector Mount (ATI - Existing)	120
VHLP2-180	145.6	14-ft T-Frame Sector Mount (ATI - Existing)	120
VHLP2-180	145.6	(2) LGP21401 TMA (ATI - Existing)	120
Pirod 12' T-Frame Sector Mount (1) (Nextel - Existing)	141.5	(2) TPX-070821 (ATI - Proposed)	120
		(2) TPX-070821 (ATI - Proposed)	120
(3) DB844H90E-XY (Nextel - Existing)	141.5	14-ft T-Frame Sector Mount (ATI - Existing)	120
LLPX310R (Clearwire - Existing)	141.5		
RRUS-11 (Clearwire - Existing)	141.5	(2) GPS	30
(3) DB844H90E-XY (Nextel - Existing)	141.5		
RRUS-11 (Clearwire - Existing)	141.5		
(3) DB844H90E-XY (Nextel - Existing)	141.5		

SYMBOL LIST

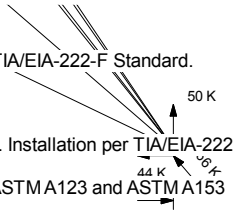
MARK	SIZE	MARK	SIZE
A	ROHN 2.0 Std. w/ 1/3 HSS3.5x.3	B	4 @ 1.125

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. Weld together tower sections have flange connections.
5. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
6. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
7. Welds are fabricated with ER-70S-6 electrodes.
8. TOWER RATING: 99.2%



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

Job: **16002.12 - CT1145**		
Project: ***170' Guyed Tower - 99 Cedarwood Ln., Newington, CT***		
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 04/26/16	Scale: NTS
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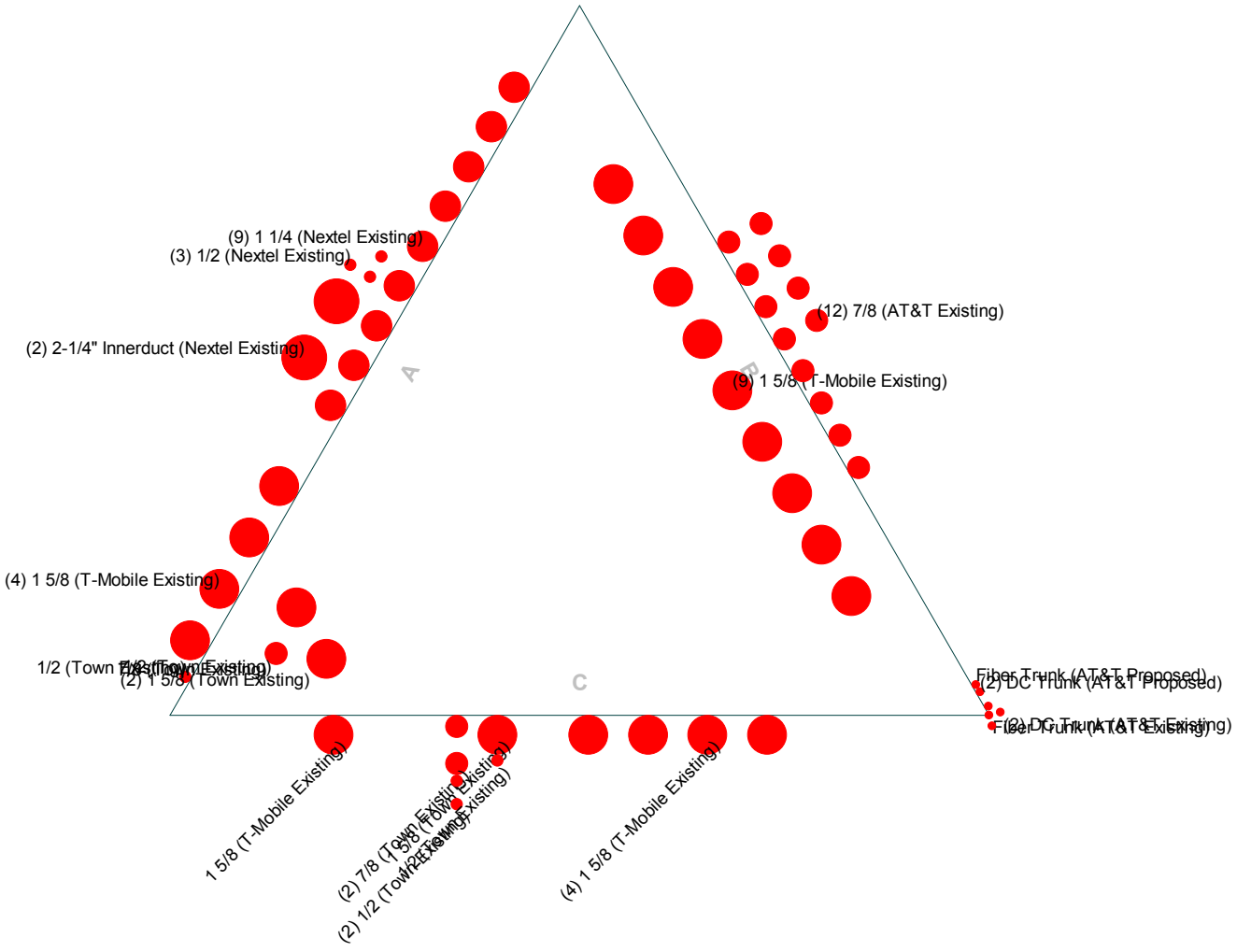
Feed Line Plan

Round Flat App In Face App Out Face



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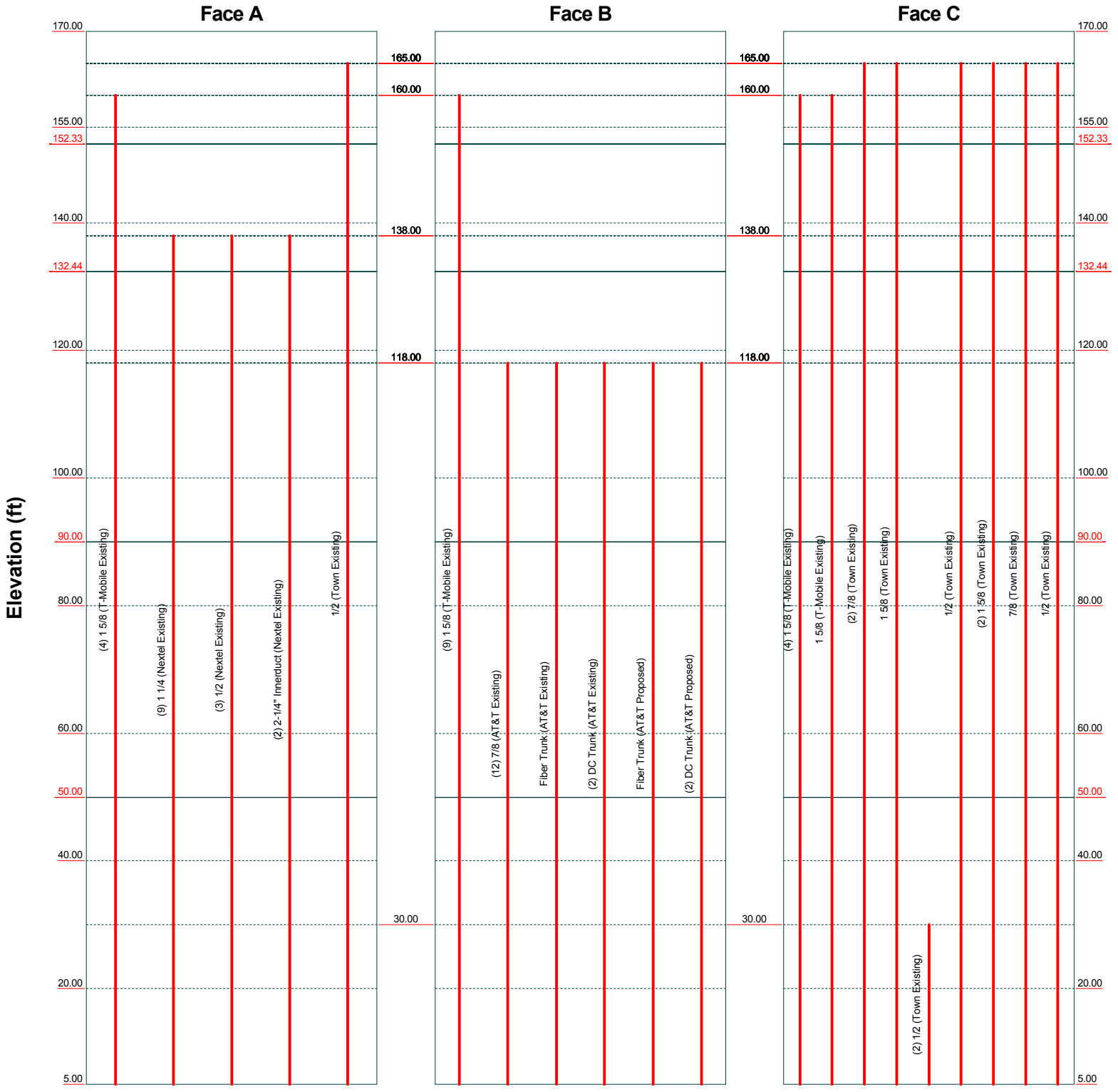
Feed Line Distribution Chart
5' - 170'

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



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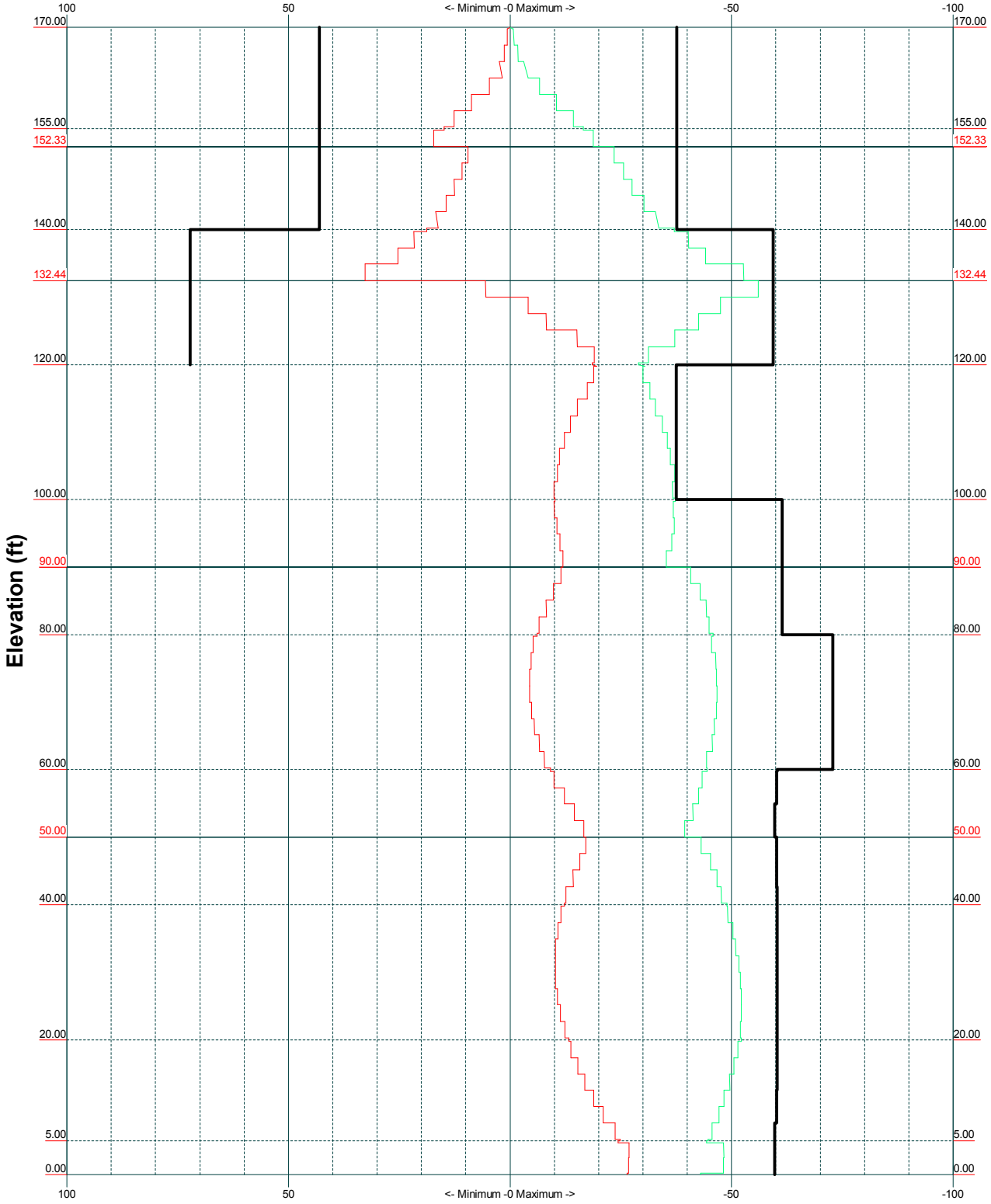
TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Leg Capacity ——— **Leg Compression (K)**



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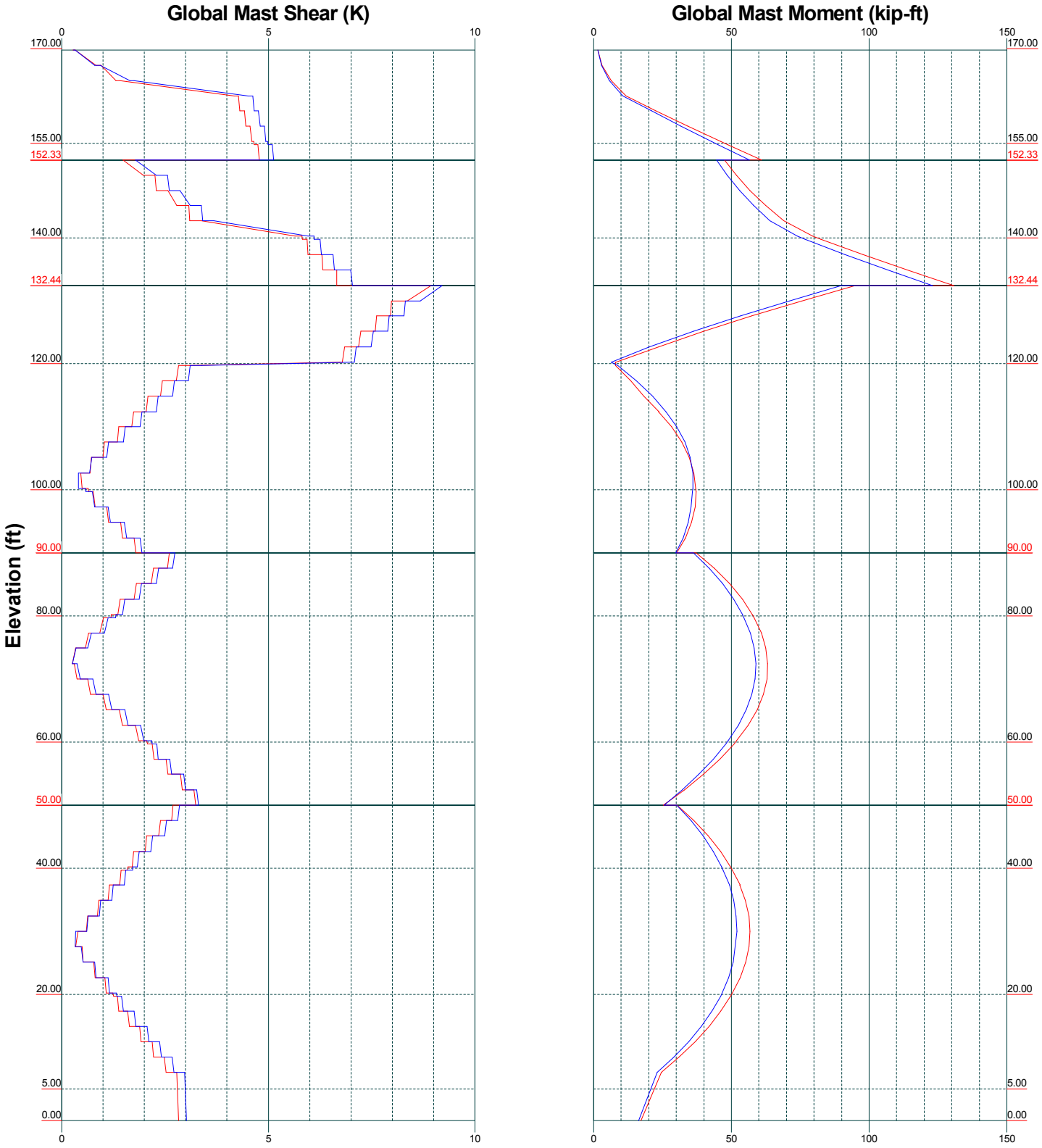
TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Vx Vz

Maximum Values

Mx Mz



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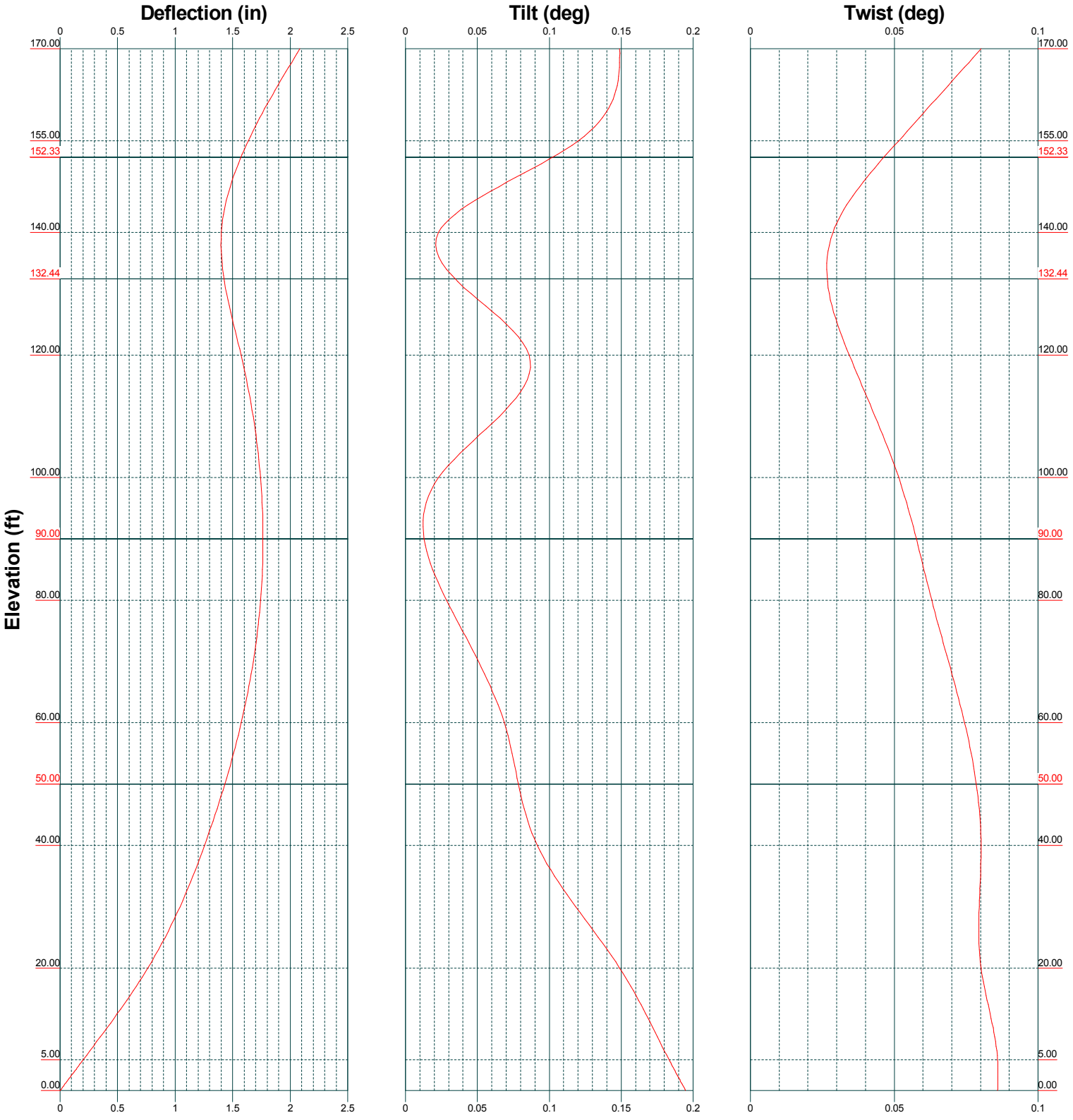
TIA/EIA-222-F - Service - 50 mph

Maximum Values



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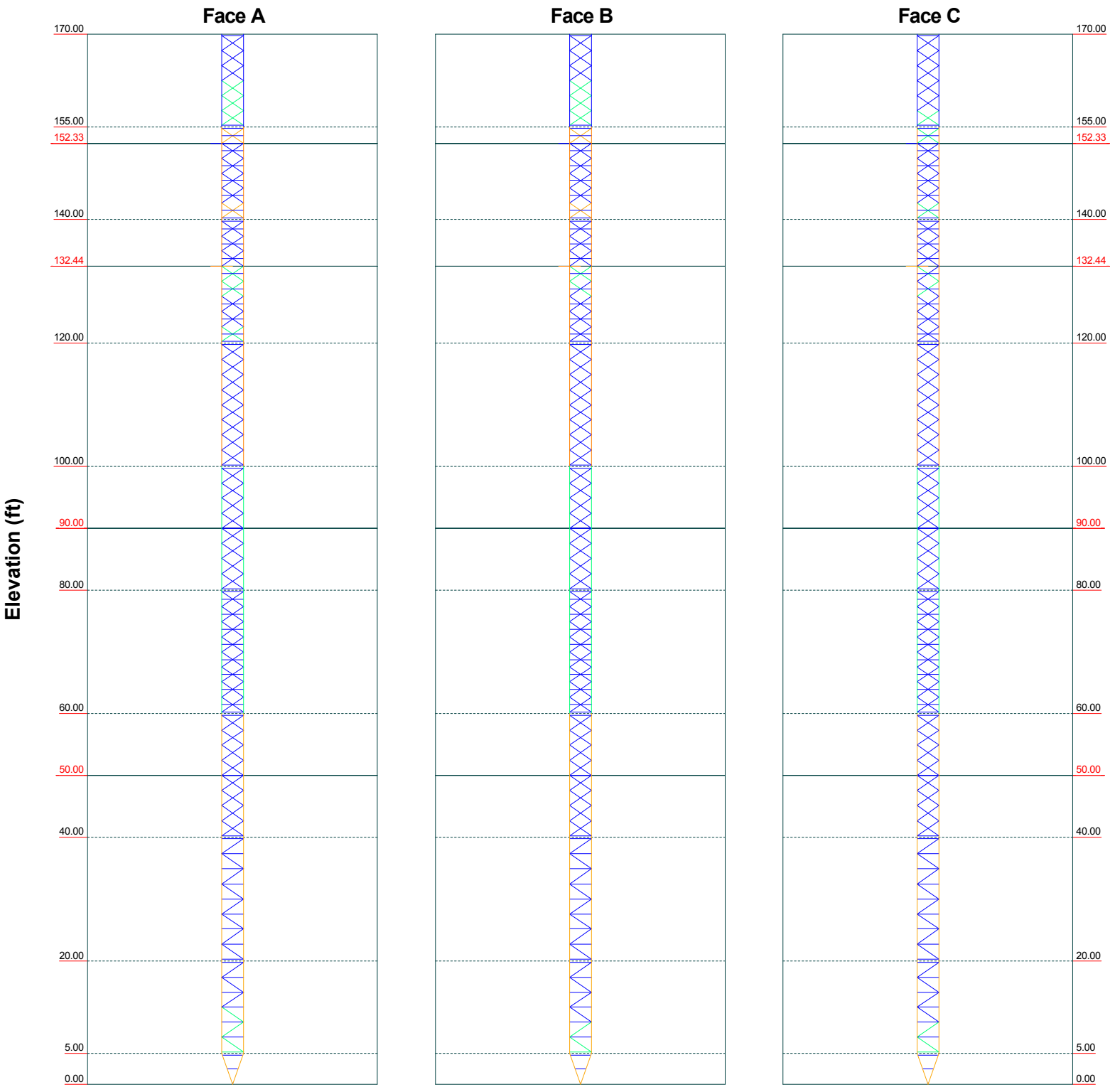
FAX: (203) 488-8587

Job: ***16002.12 - CT1145***		
Project: ***170' Guyed Tower - 99 Cedarwood Ln., Newington, CT***		
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 04/26/16	Scale: NTS
Path: J:\Jobs\16000200.WI\12. Newington - CT1145\04. Structural\Backup Documentation\Calcs\ER\170-ft Guyed Tower - Newington.eri		Dwg No. E-5

Stress Distribution Chart
0' - 170'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



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

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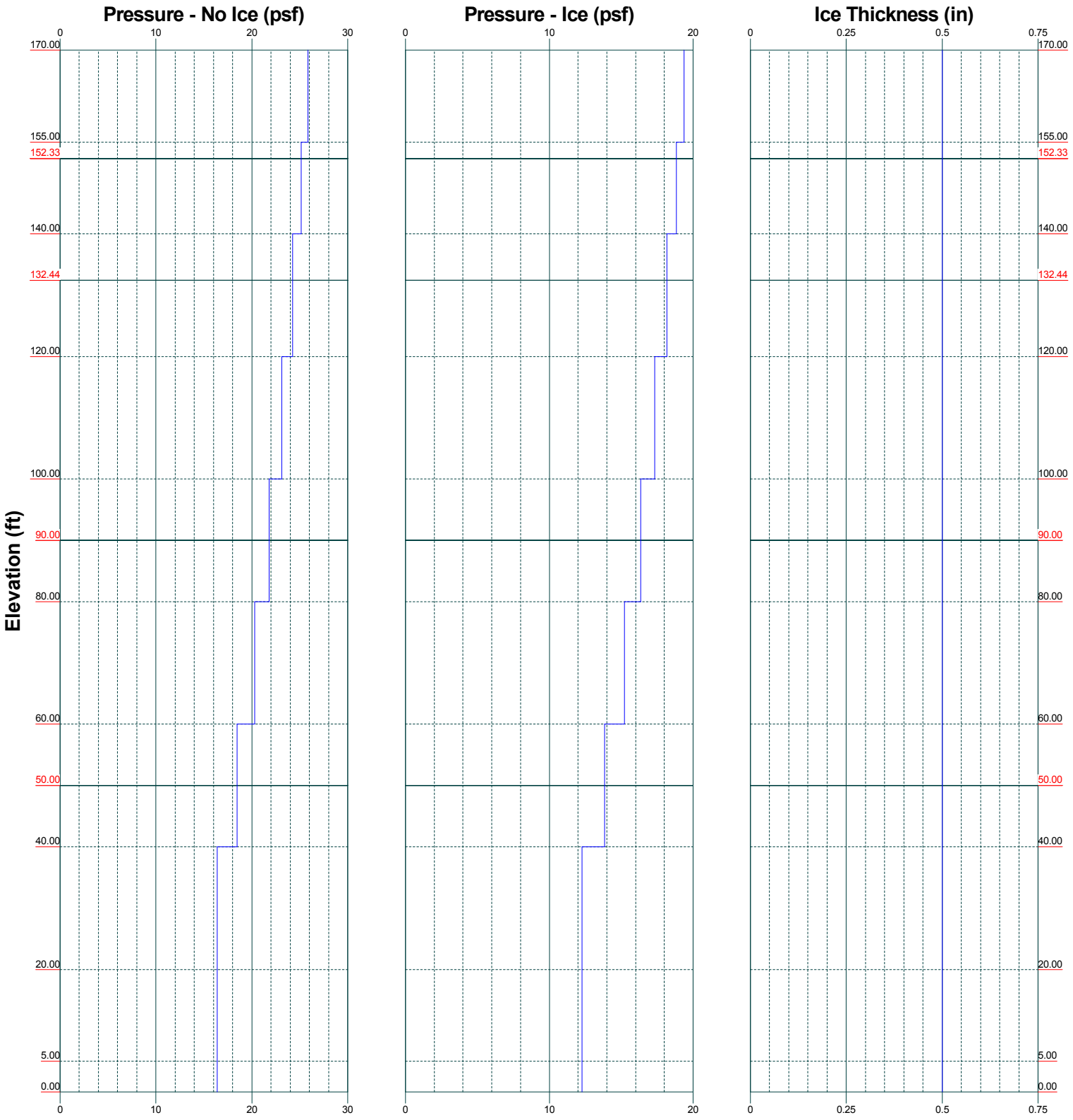
Path: J:\Jobs\16000200\Wi\12. Newington - CT1145\04. Structural\Backup Documentation\Calcs\ER\170-ft Guyed Tower - Newington.eri		Dwg No. E-8

Wind Pressures and Ice Thickness

TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice



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Path: J:\Jobs\16000200\Wi\12. Newington - CT1145\04. Structural\Backup Documentation\Calcs\ER\170-ft Guyed Tower - Newington.eri		Dwg No. E-9	

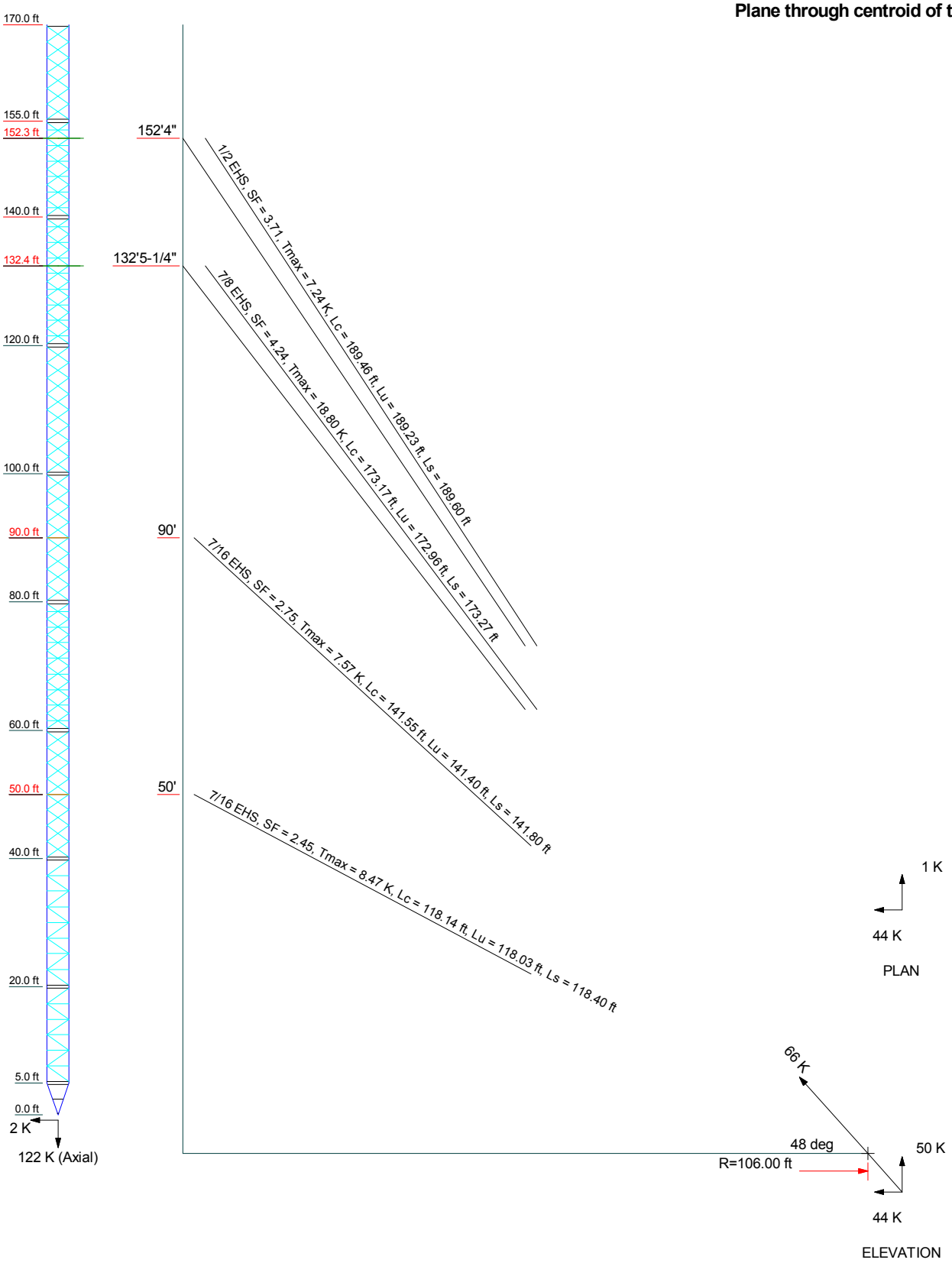
Guy Tensions and Tower Reactions

TIA/EIA-222-F - 80 mph/69 mph 0.5000 in Ice

Maximum Values

Anchor 'A'@106 ft Azimuth 0 deg Elev -6 ft

Plane through centroid of tower



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Project: ***170' Guyed Tower - 99 Cedarwood Ln., Newington, CT***		
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 04/26/16	Scale: NTS
Path: J:\Jobs\16000200.WI\12_Newington - CT1145\04_Structural\Backup Documentation\Calcs\ER\170-ft Guyed Tower - Newington.eri		Dwg No. E-6

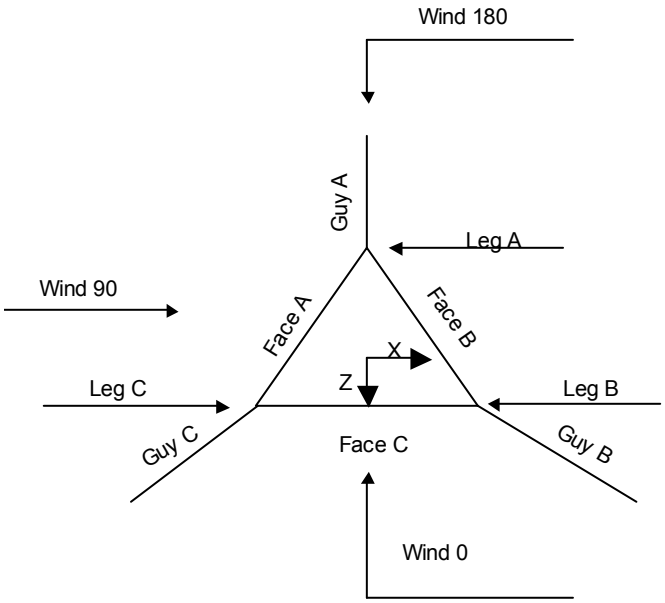
Tower Input Data

The main tower is a 3x guyed 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 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

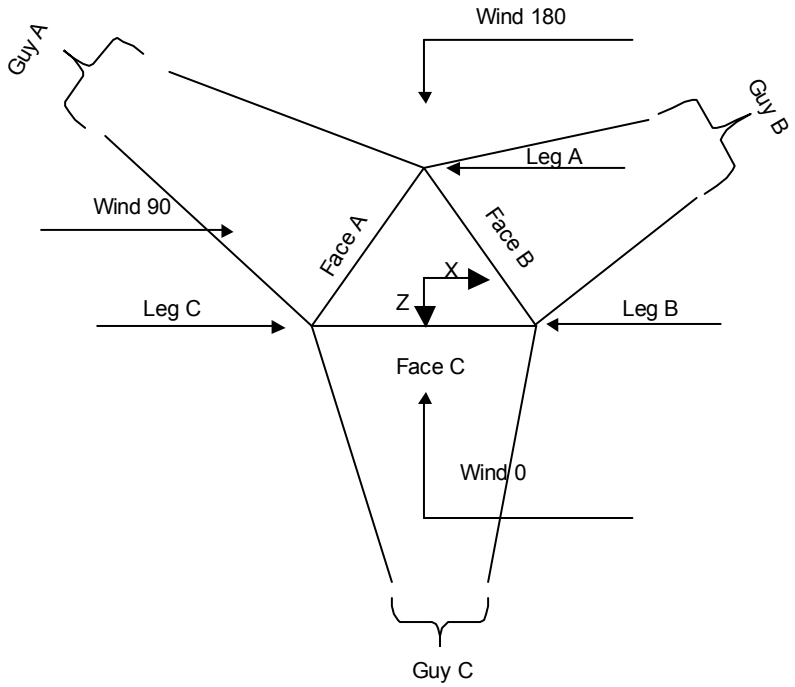
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		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				



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	170.00-155.00			3.42	1	15.00
T2	155.00-140.00			3.42	1	15.00
T3	140.00-120.00			3.42	1	20.00
T4	120.00-100.00			3.42	1	20.00
T5	100.00-80.00			3.42	1	20.00
T6	80.00-60.00			3.42	1	20.00
T7	60.00-40.00			3.42	1	20.00
T8	40.00-20.00			3.42	1	20.00
T9	20.00-5.00			3.42	1	15.00
T10	5.00-0.00			3.42	1	5.00

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	170.00-155.00	2.42	X Brace	No	No	3.0000	3.0000
T2	155.00-140.00	2.42	X Brace	No	Yes	3.0000	3.0000
T3	140.00-120.00	2.44	X Brace	No	Yes	3.0000	3.0000
T4	120.00-100.00	2.44	X Brace	No	Yes	3.0000	3.0000
T5	100.00-80.00	2.44	X Brace	No	No	3.0000	3.0000
T6	80.00-60.00	2.44	X Brace	No	Yes	3.0000	3.0000
T7	60.00-40.00	2.44	X Brace	No	No	3.0000	3.0000
T8	40.00-20.00	2.44	K Brace Right	No	Yes	3.0000	3.0000
T9	20.00-5.00	2.42	K Brace Right	No	Yes	3.0000	3.0000
T10	5.00-0.00	1.13	X Brace	No	Yes	3.0000	3.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 170.00-155.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T2 155.00-140.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T3 140.00-120.00	Arbitrary Shape	ROHN 2.0 Std. w/ 1" SR	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T4 120.00-100.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T5 100.00-80.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T6 80.00-60.00	Arbitrary Shape	ROHN 2.0 Std. w/ 1/3 HSS3.5x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T7 60.00-40.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T8 40.00-20.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T9 20.00-5.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T10 5.00-0.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 170.00-155.00	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T2 155.00-140.00	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T3 140.00-120.00	Single Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)	Single Angle	L1 3/4x1 3/4x1/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T5 100.00-80.00	Pipe	ROHN TS1.5x16 ga	A36	Pipe	ROHN TS1.5x16 ga	A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 80.00-60.00	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)
T7 60.00-40.00	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)
T8 40.00-20.00	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)
T9 20.00-5.00	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	(36 ksi) A36 (36 ksi)
T10 5.00-0.00	Flat Bar	3x1/4	(36 ksi) A36 (36 ksi)	Flat Bar	3x1/4	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T5 100.00-80.00	1	Pipe	ROHN TS1.5x16 ga	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T7 60.00-40.00	1	Pipe	ROHN TS1.5x16 ga	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T8 40.00-20.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T9 20.00-5.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T10 5.00-0.00	1	Flat Bar	3x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 155.00-140.00	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T3 140.00-120.00	Single Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T6 80.00-60.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 170.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 155.00-140.00	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 20.00-5.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 5.00-0.00	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
170.00-155.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
155.00-140.00				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 20.00-5.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 5.00-0.00	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 170.00-155.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 155.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20.00-5.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 5.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 170.00-155.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T2 155.00-140.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T5 100.00-80.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T6 80.00-60.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.7500 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T7 60.00-40.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T8 40.00-20.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T9 20.00-5.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0
T10 5.00-0.00	Flange	0.7500 A325N	4	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
152.333	EHS	A	1/2	2.69	10%	21000	0.517	189.29	106.00	0.0000	-6.00	100%
		B	1/2	2.69	10%	21000	0.517	181.03	106.00	0.0000	4.00	100%
		C	1/2	2.69	10%	21000	0.517	176.74	107.00	0.0000	10.00	100%
132.438	EHS	A	7/8	7.97	10%	19000	1.581	173.02	106.00	0.0000	-6.00	100%
		B	7/8	7.97	10%	19000	1.581	165.14	106.00	0.0000	4.00	100%
		C	7/8	7.97	10%	19000	1.581	161.17	107.00	0.0000	10.00	100%
90	EHS	A	7/16	2.08	10%	21000	0.399	141.43	106.00	0.0000	-6.00	100%
		B	7/16	2.08	10%	21000	0.399	134.86	106.00	0.0000	4.00	100%
		C	7/16	2.08	10%	21000	0.399	131.91	107.00	0.0000	10.00	100%
50	EHS	A	7/16	2.08	10%	21000	0.399	118.04	106.00	0.0000	-6.00	100%
		B	7/16	2.08	10%	21000	0.399	113.65	106.00	0.0000	4.00	100%
		C	7/16	2.08	10%	21000	0.399	112.29	107.00	0.0000	10.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
152.333	Torque Arm	7.00	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
132.438	Torque Arm	7.00	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
90	Corner						
50	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
152.33	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Single Angle	L2x3x3/16
132.44	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Flat Bar	
90.00	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Flat Bar	4x3/8
50.00	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Flat Bar	4x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
152.333	0.10	0.09	0.09		3.39 3.2 sec/pulse	3.11 3.0 sec/pulse	2.96 3.0 sec/pulse	
132.438	0.27	0.26	0.25		2.93 3.0 sec/pulse	2.67 2.8 sec/pulse	2.55 2.8 sec/pulse	
90	0.06	0.05	0.05		1.90 2.4 sec/pulse	1.73 2.3 sec/pulse	1.66 2.2 sec/pulse	
50	0.05	0.05	0.04		1.33 2.0 sec/pulse	1.23 1.9 sec/pulse	1.21 1.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
152.333	No	No	1	1	1	1	1	1
132.438	No	No	1	1	1	1	1	1
90	No	No			1	1	1	1
50	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
152.333	0.7500 A325N	8	0.0000	1	0.7500 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
132.438	0.7500 A325N	8	0.0000	1	0.7500 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
90	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
50	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
152.333	A	73.17	21	15	0.5000
	B	78.17	21	16	0.5000
	C	81.17	21	16	0.5000
132.438	A	63.22	20	15	0.5000
	B	68.22	20	15	0.5000
	C	71.22	20	15	0.5000
90	A	42.00	18	13	0.5000
	B	47.00	18	14	0.5000

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
	C	50.00	18	14	0.5000
50	A	22.00	16	12	0.5000
	B	27.00	16	12	0.5000
	C	30.00	16	12	0.5000

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft
152.333	A	104.04	158.33	3.049	3.00	2.929	3.12	2.809	3.25	2.690	3.39	2.571	3.55	2.453	3.72	2.336	3.90
	B	104.04	148.33	3.083	2.72	2.951	2.84	2.820	2.97	2.690	3.11	2.560	3.26	2.431	3.43	2.303	3.62
	C	105.04	142.33	3.110	2.57	2.969	2.69	2.829	2.82	2.690	2.96	2.552	3.12	2.414	3.30	2.278	3.49
132.438	A	104.04	138.44	9.163	2.55	8.764	2.67	8.366	2.79	7.970	2.93	7.576	3.08	7.185	3.25	6.798	3.43
	B	104.04	128.44	9.279	2.30	8.842	2.41	8.405	2.54	7.970	2.67	7.538	2.82	7.109	2.99	6.684	3.18
	C	105.04	122.44	9.372	2.17	8.902	2.28	8.435	2.41	7.970	2.55	7.508	2.70	7.050	2.88	6.597	3.07
90	A	104.03	96.00	2.578	1.54	2.411	1.64	2.245	1.76	2.080	1.90	1.916	2.06	1.755	2.25	1.596	2.47
	B	104.03	86.00	2.628	1.37	2.445	1.47	2.262	1.59	2.080	1.73	1.900	1.89	1.723	2.09	1.549	2.32
	C	105.03	80.00	2.664	1.30	2.468	1.40	2.273	1.52	2.080	1.66	1.889	1.82	1.700	2.03	1.516	2.27
50	A	104.03	56.00	2.797	0.99	2.557	1.08	2.317	1.19	2.080	1.33	1.846	1.50	1.616	1.71	1.393	1.98
	B	104.03	46.00	2.854	0.90	2.594	0.99	2.336	1.10	2.080	1.23	1.827	1.40	1.580	1.62	1.342	1.91
	C	105.03	40.00	2.888	0.87	2.617	0.96	2.347	1.07	2.080	1.21	1.816	1.38	1.559	1.61	1.312	1.91

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 5/8 (T-Mobile Existing)	A	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	-0.3	4	4	1.0000	1.9800		1.04
1 5/8 (T-Mobile Existing)	B	Yes	Ar (CfAe)	160.00 - 0.00	-2.0000	0	9	9	1.0000	1.9800		1.04
1 5/8 (T-Mobile Existing)	C	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	-0.12	4	4	1.0000	1.9800		1.04
1 5/8 (T-Mobile Existing)	C	Yes	Ar (CfAe)	160.00 - 0.00	0.0000	0.3	1	1	1.9800	1.9800		1.04
1 1/4 (Nextel Existing)	A	Yes	Ar (CfAe)	138.00 - 0.00	0.0000	0.15	9	9	0.7500	1.5500		0.66
1/2 (Nextel Existing)	A	Yes	Ar (CfAe)	138.00 - 0.00	2.0000	0.1	3	2	0.5800	0.5800		0.25
2-1/4" Innerduct (Nextel Existing)	A	Yes	Ar (CfAe)	138.00 - 0.00	2.0000	0	2	2	1.0000	2.2500		4.00
7/8 (AT&T Existing)	B	Yes	Ar (CfAe)	118.00 - 0.00	0.0000	0	12	8	0.7500	1.1100		0.54
7/8 (Town	C	Yes	Ar (CfAe)	165.00 - 0.00	0.0000	0.15	2	1	0.7500	1.1100		0.54

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
Existing) 1 5/8 (Town Existing)	C	Yes	Ar (CfAe)	165.00 - 0.00	0.0000	0.1	1	1	1.9800	1.9800		1.04
1/2 (Town Existing)	C	Yes	Ar (CfAe)	30.00 - 0.00	3.0000	0.15	2	1	0.5800	0.5800		0.25
1/2 (Town Existing)	C	Yes	Ar (CfAe)	165.00 - 0.00	2.0000	0.1	1	1	0.5800	0.5800		0.25
1/2 (Town Existing)	A	Yes	Ar (CfAe)	165.00 - 0.00	0.0000	-0.45	1	1	0.5800	0.5800		0.25
1 5/8 (Town Existing)	C	No	Ar (Leg)	165.00 - 0.00	0.0000	0.2	2	1	1.0000	1.9800		1.04
7/8 (Town Existing)	C	No	Ar (Leg)	165.00 - 0.00	0.0000	0.15	1	1	1.1100	1.1100		0.54
1/2 (Town Existing)	C	No	Ar (Leg)	165.00 - 0.00	0.0000	0.15	1	1	0.5800	0.5800		0.25
Fiber Trunk (AT&T Existing)	B	No	Ar (Leg)	118.00 - 0.00	0.0000	0	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T Existing)	B	No	Ar (Leg)	118.00 - 0.00	0.0000	-0.01	2	1	0.4000	0.4000		0.11
Fiber Trunk (AT&T Proposed)	B	No	Ar (CfAe)	118.00 - 0.00	0.0000	0.46	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T Proposed)	B	No	Ar (CfAe)	118.00 - 0.00	0.0000	0.48	2	2	0.4000	0.4000		0.11

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	170.00-155.00	A	6.842	0.000	0.000	0.000	0.02
		B	7.425	0.000	0.000	0.000	0.05
		C	10.242	0.000	0.000	0.000	0.08
T2	155.00-140.00	A	15.213	0.000	0.000	0.000	0.07
		B	22.275	0.000	0.000	0.000	0.14
		C	21.550	0.000	0.000	0.000	0.16
T3	140.00-120.00	A	49.698	0.000	0.000	0.000	0.35
		B	29.700	0.000	0.000	0.000	0.19
		C	28.733	0.000	0.000	0.000	0.21
T4	120.00-100.00	A	52.967	0.000	0.000	0.000	0.38
		B	46.020	0.000	0.000	0.000	0.35
		C	29.933	0.000	0.000	0.000	0.21
T5	100.00-80.00	A	52.967	0.000	0.000	0.000	0.38
		B	47.833	0.000	0.000	0.000	0.37
		C	30.067	0.000	0.000	0.000	0.21
T6	80.00-60.00	A	52.967	0.000	0.000	0.000	0.38
		B	47.833	0.000	0.000	0.000	0.37

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
		C	30.067	0.000	0.000	0.000	0.21
T7	60.00-40.00	A	52.967	0.000	0.000	0.000	0.38
		B	47.833	0.000	0.000	0.000	0.37
		C	30.067	0.000	0.000	0.000	0.21
T8	40.00-20.00	A	52.967	0.000	0.000	0.000	0.38
		B	47.833	0.000	0.000	0.000	0.37
		C	30.550	0.000	0.000	0.000	0.21
T9	20.00-5.00	A	39.725	0.000	0.000	0.000	0.29
		B	35.875	0.000	0.000	0.000	0.27
		C	23.275	0.000	0.000	0.000	0.16
T10	5.00-0.00	A	13.242	0.000	0.000	0.000	0.10
		B	11.958	0.000	0.000	0.000	0.09
		C	7.758	0.000	0.000	0.000	0.05

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	170.00-155.00	A	0.500	8.117	3.725	0.000	0.000	0.07
		B		1.242	9.933	0.000	0.000	0.14
		C		13.600	3.725	0.000	0.000	0.22
T2	155.00-140.00	A	0.500	14.038	11.175	0.000	0.000	0.20
		B		3.725	29.800	0.000	0.000	0.43
		C		24.125	11.175	0.000	0.000	0.44
T3	140.00-120.00	A	0.500	29.787	49.115	0.000	0.000	0.89
		B		4.967	39.733	0.000	0.000	0.58
		C		32.167	14.900	0.000	0.000	0.58
T4	120.00-100.00	A	0.500	31.017	52.917	0.000	0.000	0.95
		B		16.532	60.463	0.000	0.000	1.03
		C		36.367	14.900	0.000	0.000	0.58
T5	100.00-80.00	A	0.500	31.017	52.917	0.000	0.000	0.95
		B		17.817	62.767	0.000	0.000	1.08
		C		36.833	14.900	0.000	0.000	0.58
T6	80.00-60.00	A	0.500	31.017	52.917	0.000	0.000	0.95
		B		17.817	62.767	0.000	0.000	1.08
		C		36.833	14.900	0.000	0.000	0.58
T7	60.00-40.00	A	0.500	31.017	52.917	0.000	0.000	0.95
		B		17.817	62.767	0.000	0.000	1.08
		C		36.833	14.900	0.000	0.000	0.58
T8	40.00-20.00	A	0.500	31.017	52.917	0.000	0.000	0.95
		B		17.817	62.767	0.000	0.000	1.08
		C		38.150	14.900	0.000	0.000	0.60
T9	20.00-5.00	A	0.500	23.262	39.688	0.000	0.000	0.72
		B		13.363	47.075	0.000	0.000	0.81
		C		29.600	11.175	0.000	0.000	0.46
T10	5.00-0.00	A	0.500	7.754	13.229	0.000	0.000	0.24
		B		4.454	15.692	0.000	0.000	0.27
		C		9.867	3.725	0.000	0.000	0.15

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	170.00-155.00	A	0.526	1.457	0.000	0.000
		B	1.033	2.591	0.000	0.000
		C	0.999	2.728	0.000	0.000
T2	155.00-140.00	A	1.832	5.131	0.118	0.188
		B	3.841	10.194	0.248	0.373
		C	2.925	8.199	0.188	0.300
T3	140.00-120.00	A	0.000	8.374	9.376	14.583
		B	0.000	5.522	6.390	9.617
		C	0.000	4.441	4.866	7.734
T4	120.00-100.00	A	6.339	16.420	0.000	0.000
		B	5.821	15.198	0.000	0.000
		C	3.060	8.107	0.000	0.000
T5	100.00-80.00	A	6.632	17.482	0.781	1.214
		B	6.299	16.786	0.742	1.165
		C	3.201	8.631	0.377	0.599
T6	80.00-60.00	A	6.339	18.847	3.123	4.854
		B	6.021	18.097	2.967	4.661
		C	3.060	9.305	1.508	2.397
T7	60.00-40.00	A	6.632	17.482	0.781	1.214
		B	6.299	16.786	0.742	1.165
		C	3.201	8.631	0.377	0.599
T8	40.00-20.00	A	4.829	13.216	0.000	0.000
		B	4.586	12.690	0.000	0.000
		C	2.381	6.764	0.000	0.000
T9	20.00-5.00	A	3.713	10.124	0.000	0.000
		B	3.527	9.720	0.000	0.000
		C	1.869	5.364	0.000	0.000
T10	5.00-0.00	A	0.000	0.607	1.171	1.820
		B	0.000	0.583	1.113	1.748
		C	0.000	0.322	0.590	0.965

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	170.00-155.00	-0.9839	1.5572	-1.1620	1.4780
T2	155.00-140.00	-0.8467	1.8708	-0.9792	1.5419
T3	140.00-120.00	-1.9652	-0.1092	-1.5106	0.2996
T4	120.00-100.00	-1.0598	-0.5970	-0.3907	0.0591
T5	100.00-80.00	-0.8633	-0.5670	-0.2115	0.0920
T6	80.00-60.00	-0.8004	-0.4962	-0.1458	0.1770
T7	60.00-40.00	-0.8633	-0.5670	-0.2115	0.0920
T8	40.00-20.00	-0.9492	-0.6116	-0.3072	0.0624
T9	20.00-5.00	-0.9590	-0.5657	-0.3276	0.1317
T10	5.00-0.00	-1.0638	-0.6418	-0.4553	0.0011

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(3) DB844H90E-XY	A	From Leg	4.00	0.0000	141.50	No Ice	2.87	3.73	0.01
(Nextel - Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(3) DB844H90E-XY	B	From Leg	4.00	0.0000	141.50	No Ice	2.87	3.73	0.01
(Nextel - Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
(3) DB844H90E-XY	C	From Leg	4.00	0.0000	141.50	No Ice	2.87	3.73	0.01
(Nextel - Existing)			0.00			1/2" Ice	3.18	4.10	0.04
			0.00						
LLPX310R	A	From Leg	4.00	0.0000	141.50	No Ice	4.83	1.95	0.03
(Clearwire - Existing)			-5.00			1/2" Ice	5.18	2.21	0.05
			0.00						
LLPX310R	B	From Leg	4.00	0.0000	141.50	No Ice	4.83	1.95	0.03
(Clearwire - Existing)			-5.00			1/2" Ice	5.18	2.21	0.05
			0.00						
LLPX310R	C	From Leg	4.00	0.0000	141.50	No Ice	4.83	1.95	0.03
(Clearwire - Existing)			-5.00			1/2" Ice	5.18	2.21	0.05
			0.00						
RRUS-11	A	From Leg	3.00	0.0000	141.50	No Ice	2.99	1.25	0.05
(Clearwire - Existing)			-5.00			1/2" Ice	3.23	1.41	0.07
			0.00						
RRUS-11	B	From Leg	3.00	0.0000	141.50	No Ice	2.99	1.25	0.05
(Clearwire - Existing)			-5.00			1/2" Ice	3.23	1.41	0.07
			0.00						
RRUS-11	C	From Leg	3.00	0.0000	141.50	No Ice	2.99	1.25	0.05
(Clearwire - Existing)			-5.00			1/2" Ice	3.23	1.41	0.07
			0.00						
Pirod 12' T-Frame Sector	A	From Leg	3.00	0.0000	141.50	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Nextel - Existing)			0.00						
Pirod 12' T-Frame Sector	B	From Leg	3.00	0.0000	141.50	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Nextel - Existing)			0.00						
Pirod 12' T-Frame Sector	C	From Leg	3.00	0.0000	141.50	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Nextel - Existing)			0.00						
7770.00	A	From Leg	3.00	0.0000	120.00	No Ice	5.88	2.93	0.04
(AT&T - Existing)			-6.00			1/2" Ice	6.31	3.27	0.07
			0.00						
OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	120.00	No Ice	10.36	5.52	0.07
(AT&T - Existing)			-3.00			1/2" Ice	10.93	5.97	0.13
			0.00						
QS66512-2	A	From Leg	3.00	0.0000	120.00	No Ice	8.40	6.80	0.11
(AT&T - Proposed)			6.00			1/2" Ice	8.95	7.27	0.17
			0.00						
7770.00	B	From Leg	3.00	0.0000	120.00	No Ice	5.88	2.93	0.04
(AT&T - Existing)			-6.00			1/2" Ice	6.31	3.27	0.07
			0.00						
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	120.00	No Ice	10.36	5.52	0.07
(AT&T - Existing)			-3.00			1/2" Ice	10.93	5.97	0.13
			0.00						
QS66512-2	B	From Leg	3.00	0.0000	120.00	No Ice	8.40	6.80	0.11
(AT&T - Proposed)			6.00			1/2" Ice	8.95	7.27	0.17
			0.00						
7770.00	C	From Leg	3.00	0.0000	120.00	No Ice	5.88	2.93	0.04
(AT&T - Existing)			-6.00			1/2" Ice	6.31	3.27	0.07
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
OPA-65R-LCUU-H6	C	From Leg	3.00	0.0000	120.00	No Ice	10.36	5.52	0.07
(AT&T - Existing)			-3.00			1/2" Ice	10.93	5.97	0.13
			0.00						
QS66512-2	C	From Leg	3.00	0.0000	120.00	No Ice	8.40	6.80	0.11
(AT&T - Proposed)			6.00			1/2" Ice	8.95	7.27	0.17
			0.00						
(2) LGP21401 TMA	A	From Leg	3.00	0.0000	120.00	No Ice	0.00	0.37	0.02
(AT&T - Existing)			-6.00			1/2" Ice	0.00	0.48	0.02
			0.00						
(2) LGP21401 TMA	B	From Leg	3.00	0.0000	120.00	No Ice	0.00	0.37	0.02
(AT&T - Existing)			-6.00			1/2" Ice	0.00	0.48	0.02
			0.00						
(2) LGP21401 TMA	C	From Leg	3.00	0.0000	120.00	No Ice	0.00	0.37	0.02
(AT&T - Existing)			-6.00			1/2" Ice	0.00	0.48	0.02
			0.00						
(2) TPX-070821	A	From Leg	3.00	0.0000	120.00	No Ice	0.00	0.12	0.01
(AT&T - Proposed)			-3.00			1/2" Ice	0.00	0.17	0.01
			0.00						
(2) TPX-070821	B	From Leg	3.00	0.0000	120.00	No Ice	0.00	0.12	0.01
(AT&T - Proposed)			-3.00			1/2" Ice	0.00	0.17	0.01
			0.00						
(2) TPX-070821	C	From Leg	3.00	0.0000	120.00	No Ice	0.00	0.12	0.01
(AT&T - Proposed)			-3.00			1/2" Ice	0.00	0.17	0.01
			0.00						
RRUS-11	A	From Leg	3.00	0.0000	120.00	No Ice	0.00	1.25	0.05
(AT&T - Existing)			6.00			1/2" Ice	0.00	1.41	0.07
			0.00						
RRUS-11	B	From Leg	3.00	0.0000	120.00	No Ice	0.00	1.25	0.05
(AT&T - Existing)			6.00			1/2" Ice	0.00	1.41	0.07
			0.00						
RRUS-11	C	From Leg	3.00	0.0000	120.00	No Ice	0.00	1.25	0.05
(AT&T - Existing)			6.00			1/2" Ice	0.00	1.41	0.07
			0.00						
(2) RRUS-32	A	From Leg	3.00	0.0000	120.00	No Ice	3.87	2.76	0.08
(AT&T - Proposed)			6.00			1/2" Ice	4.15	3.02	0.10
			0.00						
(2) RRUS-32	B	From Leg	3.00	0.0000	120.00	No Ice	3.87	2.76	0.08
(AT&T - Proposed)			6.00			1/2" Ice	4.15	3.02	0.10
			0.00						
(2) RRUS-32	C	From Leg	3.00	0.0000	120.00	No Ice	3.87	2.76	0.08
(AT&T - Proposed)			6.00			1/2" Ice	4.15	3.02	0.10
			0.00						
DC6-48-60-18-8F Surge	A	From Leg	3.00	0.0000	120.00	No Ice	2.23	2.23	0.02
Arrestor			0.00			1/2" Ice	2.45	2.45	0.04
(AT&T - Existing)			0.00						
DC6-48-60-18-8F Surge	B	From Leg	3.00	0.0000	120.00	No Ice	2.23	2.23	0.02
Arrestor			0.00			1/2" Ice	2.45	2.45	0.04
(AT&T - Proposed)			0.00						
14-ft T-Frame Sector Mount	A	From Leg	2.00	0.0000	120.00	No Ice	16.30	16.30	0.51
(AT&T - Existing)			0.00			1/2" Ice	20.60	20.60	0.72
			0.00						
14-ft T-Frame Sector Mount	B	From Leg	2.00	0.0000	120.00	No Ice	16.30	16.30	0.51
(AT&T - Existing)			0.00			1/2" Ice	20.60	20.60	0.72
			0.00						
14-ft T-Frame Sector Mount	C	From Leg	2.00	0.0000	120.00	No Ice	16.30	16.30	0.51
(AT&T - Existing)			0.00			1/2" Ice	20.60	20.60	0.72
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APX16DWV-16DWVS-E-A	A	From Leg	1.00	0.0000	163.00	No Ice	7.07	2.15	0.04
20			-4.00			1/2" Ice	7.52	2.49	0.07
(T-Mobile - Existing)			0.00						
LNX-6515DS	A	From Leg	1.00	0.0000	163.00	No Ice	11.45	7.70	0.06
(T-Mobile - Existing)			4.00			1/2" Ice	12.06	8.29	0.12
			0.00						
APX16DWV-16DWVS-E-A	B	From Leg	1.00	0.0000	163.00	No Ice	7.07	2.15	0.04
20			-4.00			1/2" Ice	7.52	2.49	0.07
(T-Mobile - Existing)			0.00						
LNX-6515DS	B	From Leg	1.00	0.0000	163.00	No Ice	11.45	7.70	0.06
(T-Mobile - Existing)			4.00			1/2" Ice	12.06	8.29	0.12
			0.00						
APX16DWV-16DWVS-E-A	C	From Leg	1.00	0.0000	163.00	No Ice	7.07	2.15	0.04
20			-4.00			1/2" Ice	7.52	2.49	0.07
(T-Mobile - Existing)			0.00						
LNX-6515DS	C	From Leg	1.00	0.0000	163.00	No Ice	11.45	7.70	0.06
(T-Mobile - Existing)			4.00			1/2" Ice	12.06	8.29	0.12
			0.00						
(2) TMA 10"x8"x3"	A	From Leg	1.00	0.0000	163.00	No Ice	0.00	0.29	0.02
(T-Mobile - Existing)			-4.00			1/2" Ice	0.00	0.38	0.02
			0.00						
(2) TMA 10"x8"x3"	B	From Leg	1.00	0.0000	163.00	No Ice	0.00	0.29	0.02
(T-Mobile - Existing)			-4.00			1/2" Ice	0.00	0.38	0.02
			0.00						
(2) TMA 10"x8"x3"	C	From Leg	1.00	0.0000	163.00	No Ice	0.00	0.29	0.02
(T-Mobile - Existing)			-4.00			1/2" Ice	0.00	0.38	0.02
			0.00						
Rohn 6' x 12' Boom Gate (1)	A	From Leg	3.00	0.0000	163.00	No Ice	16.60	16.60	0.56
(T-Mobile - Existing)			0.00			1/2" Ice	19.80	19.80	0.70
			0.00						
Rohn 6' x 12' Boom Gate (1)	B	From Leg	3.00	0.0000	163.00	No Ice	16.60	16.60	0.56
(T-Mobile - Existing)			0.00			1/2" Ice	19.80	19.80	0.70
			0.00						
Rohn 6' x 12' Boom Gate (1)	C	From Leg	3.00	0.0000	163.00	No Ice	16.60	16.60	0.56
(T-Mobile - Existing)			0.00			1/2" Ice	19.80	19.80	0.70
			0.00						
DS4C03F36U-D	A	From Leg	4.00	0.0000	175.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			0.00						
Tower Top Amplifier	A	From Leg	4.00	0.0000	168.00	No Ice	3.11	1.17	0.04
			0.00			1/2" Ice	3.35	1.34	0.06
			0.00						
ROHN 3-ft Side Arm	A	From Leg	2.00	0.0000	168.00	No Ice	3.10	3.10	0.07
			0.00			1/2" Ice	5.00	5.00	0.10
			0.00						
DS4C03F36U-D	B	From Leg	4.00	0.0000	175.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			0.00						
ROHN 3-ft Side Arm	B	From Leg	2.00	0.0000	168.00	No Ice	3.10	3.10	0.07
			0.00			1/2" Ice	5.00	5.00	0.10
			0.00						
SC473-HF1LDF	A	From Leg	1.00	0.0000	175.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.74	1.74	0.03
			0.00						
SC473-HF1LDF	B	From Leg	1.00	0.0000	175.00	No Ice	1.44	1.44	0.02
			0.00			1/2" Ice	1.74	1.74	0.03
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SC473-HF1LDF	C	From Leg	1.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	1.44 1.74	1.44 1.74	0.02 0.03
Tower Top Amplifier	C	From Leg	1.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice	3.11 3.35	1.17 1.34	0.04 0.06
5' Panel Antenna	C	From Leg	1.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice	7.00 7.47	2.29 2.65	0.02 0.06
(2) GPS	C	From Leg	1.00 0.00 0.00	0.0000	30.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.01

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2-180	A	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		145.60	2.00	No Ice 1/2" Ice	3.14 3.41	0.03 0.04
VHLP2-180	B	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		145.60	2.00	No Ice 1/2" Ice	3.14 3.41	0.03 0.04
VHLP2-180	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		145.60	2.00	No Ice 1/2" Ice	3.14 3.41	0.03 0.04
2' Dish	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		167.00	2.00	No Ice 1/2" Ice	28.27 29.07	0.05 0.10

Tower Pressures - No Ice

$G_H = 1.125$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1 170.00-155.00	162.50	1.577	26	54.269	A B C	0.000 0.000 0.000	18.976 19.053 21.903	5.938	31.29 31.16 27.11	0.000 0.000 0.000	0.000 0.000 0.000
T2 155.00-140.00	147.50	1.534	25	54.269	A B C	0.419 0.290 0.349	27.652 32.706 32.897	5.938	21.15 17.99 17.86	0.000 0.000 0.000	0.000 0.000 0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T3	130.00	1.48	24	72.367	A	15.394	49.698	11.267	17.31	0.000	0.000
140.00-120.00					B	18.381	29.700		23.43	0.000	0.000
					C	19.905	28.733		23.16	0.000	0.000
T4	110.00	1.411	23	72.358	A	0.000	63.263	7.917	12.51	0.000	0.000
120.00-100.00					B	0.000	56.835		13.93	0.000	0.000
					C	0.000	43.509		18.20	0.000	0.000
T5	90.00	1.332	22	73.192	A	0.279	64.922	9.583	14.70	0.000	0.000
100.00-80.00					B	0.318	60.121		15.86	0.000	0.000
					C	0.683	45.452		20.77	0.000	0.000
T6 80.00-60.00	70.00	1.24	20	73.452	A	1.139	65.383	10.104	15.19	0.000	0.000
					B	1.296	60.567		16.33	0.000	0.000
					C	2.755	45.762		20.83	0.000	0.000
T7 60.00-40.00	50.00	1.126	18	73.192	A	0.279	64.922	9.583	14.70	0.000	0.000
					B	0.318	60.121		15.86	0.000	0.000
					C	0.683	45.452		20.77	0.000	0.000
T8 40.00-20.00	30.00	1	16	73.192	A	0.000	64.277	9.583	14.91	0.000	0.000
					B	0.000	59.386		16.14	0.000	0.000
					C	0.000	44.308		21.63	0.000	0.000
T9 20.00-5.00	12.50	1	16	54.894	A	0.000	48.241	7.188	14.90	0.000	0.000
					B	0.000	44.577		16.12	0.000	0.000
					C	0.000	33.635		21.37	0.000	0.000
T10 5.00-0.00	2.50	1	16	9.816	A	0.000	15.818	2.576	16.28	0.000	0.000
					B	0.007	14.534		17.71	0.000	0.000
					C	0.530	10.334		23.71	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.125$

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	162.50	1.577	19	0.5000	55.519	A	3.725	26.303	8.438	28.10	0.000	0.000
170.00-155.00						B	9.933	18.294		29.89	0.000	0.000
						C	3.725	30.515		24.64	0.000	0.000
T2	147.50	1.534	19	0.5000	55.519	A	11.525	32.040	8.438	19.37	0.000	0.000
155.00-140.00						B	29.965	16.665		18.09	0.000	0.000
						C	11.412	39.060		16.72	0.000	0.000
T3	130.00	1.48	18	0.5000	74.034	A	61.524	29.167	13.489	14.87	0.000	0.000
140.00-120.00						B	57.109	7.198		20.98	0.000	0.000
						C	34.158	35.479		19.37	0.000	0.000
T4	110.00	1.411	17	0.5000	74.025	A	52.917	40.378	11.250	12.06	0.000	0.000
120.00-100.00						B	60.463	27.116		12.85	0.000	0.000
						C	14.900	54.042		16.32	0.000	0.000
T5 100.00-80.00	90.00	1.332	16	0.5000	74.858	A	52.763	41.723	12.917	13.67	0.000	0.000
						B	62.662	29.219		14.06	0.000	0.000
						C	15.361	56.390		18.00	0.000	0.000
T6 80.00-60.00	70.00	1.24	15	0.5000	75.118	A	52.325	42.157	13.437	14.22	0.000	0.000
						B	62.368	29.707		14.59	0.000	0.000
						C	16.766	57.515		18.09	0.000	0.000
T7 60.00-40.00	50.00	1.126	14	0.5000	74.858	A	52.763	41.723	12.917	13.67	0.000	0.000
						B	62.662	29.219		14.06	0.000	0.000
						C	15.361	56.390		18.00	0.000	0.000
T8 40.00-20.00	30.00	1	12	0.5000	74.858	A	52.917	42.262	12.917	13.57	0.000	0.000
						B	62.767	29.588		13.99	0.000	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
						C	14.900	55.848		18.26	0.000	0.000
T9 20.00-5.00	12.50	1	12	0.5000	56.144	A	39.688	31.670	9.688	13.58	0.000	0.000
						B	47.075	22.173		13.99	0.000	0.000
						C	11.175	42.767		17.96	0.000	0.000
T10 5.00-0.00	2.50	1	12	0.5000	10.256	A	12.529	10.992	3.472	14.76	0.000	0.000
						B	15.064	7.717		15.24	0.000	0.000
						C	3.880	13.390		20.10	0.000	0.000

Tower Pressure - Service

$G_H = 1.125$

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	162.50	1.577	10	54.269	A	0.000	18.976	5.938	31.29	0.000	0.000
170.00-155.00					B	0.000	19.053		31.16	0.000	0.000
					C	0.000	21.903		27.11	0.000	0.000
T2	147.50	1.534	10	54.269	A	0.419	27.652	5.938	21.15	0.000	0.000
155.00-140.00					B	0.290	32.706		17.99	0.000	0.000
					C	0.349	32.897		17.86	0.000	0.000
T3	130.00	1.48	9	72.367	A	15.394	49.698	11.267	17.31	0.000	0.000
140.00-120.00					B	18.381	29.700		23.43	0.000	0.000
					C	19.905	28.733		23.16	0.000	0.000
T4	110.00	1.411	9	72.358	A	0.000	63.263	7.917	12.51	0.000	0.000
120.00-100.00					B	0.000	56.835		13.93	0.000	0.000
					C	0.000	43.509		18.20	0.000	0.000
T5	90.00	1.332	9	73.192	A	0.279	64.922	9.583	14.70	0.000	0.000
100.00-80.00					B	0.318	60.121		15.86	0.000	0.000
					C	0.683	45.452		20.77	0.000	0.000
T6 80.00-60.00	70.00	1.24	8	73.452	A	1.139	65.383	10.104	15.19	0.000	0.000
					B	1.296	60.567		16.33	0.000	0.000
					C	2.755	45.762		20.83	0.000	0.000
T7 60.00-40.00	50.00	1.126	7	73.192	A	0.279	64.922	9.583	14.70	0.000	0.000
					B	0.318	60.121		15.86	0.000	0.000
					C	0.683	45.452		20.77	0.000	0.000
T8 40.00-20.00	30.00	1	6	73.192	A	0.000	64.277	9.583	14.91	0.000	0.000
					B	0.000	59.386		16.14	0.000	0.000
					C	0.000	44.308		21.63	0.000	0.000
T9 20.00-5.00	12.50	1	6	54.894	A	0.000	48.241	7.188	14.90	0.000	0.000
					B	0.000	44.577		16.12	0.000	0.000
					C	0.000	33.635		21.37	0.000	0.000
T10 5.00-0.00	2.50	1	6	9.816	A	0.000	15.818	2.576	16.28	0.000	0.000
					B	0.007	14.534		17.71	0.000	0.000
					C	0.530	10.334		23.71	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	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	1	1	12.000	0.86	57.00	C
170.00-155.00			B	0.351	2.169	0.633	1	1	12.058			
			C	0.404	2.057	0.653	1	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	1	1	19.954	1.29	85.98	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	1	1	25.098			
			C	0.613	1.797	0.761	1	1	25.396			
T3	0.75	1.18	A	0.899	1.923	0.983	1	1	64.229	3.37	168.39	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	1	1	41.996			
			C	0.672	1.777	0.8	1	1	42.902			
T4	0.94	0.42	A	0.874	1.89	0.96	1	1	60.724	2.98	149.14	A
120.00-100.00			B	0.785	1.806	0.885	1	1	50.279			
			C	0.601	1.803	0.754	1	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	1	1	63.561	2.98	149.09	A
100.00-80.00			B	0.826	1.837	0.918	1	1	55.496			
			C	0.63	1.788	0.773	1	1	35.801			
T6	0.96	0.82	A	0.906	1.932	0.988	1	1	65.758	2.90	145.12	A
80.00-60.00			B	0.842	1.853	0.932	1	1	57.731			
			C	0.661	1.779	0.793	1	1	39.021			
T7	0.96	0.61	A	0.891	1.911	0.975	1	1	63.561	2.52	126.04	A
60.00-40.00			B	0.826	1.837	0.918	1	1	55.496			
			C	0.63	1.788	0.773	1	1	35.801			
T8	0.96	0.65	A	0.878	1.895	0.963	1	1	61.920	2.16	108.09	A
40.00-20.00			B	0.811	1.825	0.906	1	1	53.789			
			C	0.605	1.801	0.757	1	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	1	1	46.498	1.62	108.27	A
			B	0.812	1.825	0.906	1	1	40.401			
			C	0.613	1.797	0.761	1	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	1	1	15.818	0.36*	72.35	C
			B	1	2.1	1	1	1	14.542			
			C	1	2.1	1	1	1	10.865			
Sum Weight:	7.00	6.60			*2A_g limit					21.05		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	0.825	1	12.000	0.86	57.00	C
170.00-155.00			B	0.351	2.169	0.633	0.825	1	12.058			
			C	0.404	2.057	0.653	0.825	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	0.825	1	19.881	1.29	85.78	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	0.825	1	25.047			
			C	0.613	1.797	0.761	0.825	1	25.335			
T3	0.75	1.18	A	0.899	1.923	0.983	0.825	1	61.535	3.23	161.33	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	0.825	1	38.779			
			C	0.672	1.777	0.8	0.825	1	39.419			
T4	0.94	0.42	A	0.874	1.89	0.96	0.825	1	60.724	2.98	149.14	A
120.00-100.00			B	0.785	1.806	0.885	0.825	1	50.279			
			C	0.601	1.803	0.754	0.825	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	0.825	1	63.512	2.98	148.97	A
100.00-80.00			B	0.826	1.837	0.918	0.825	1	55.441			
			C	0.63	1.788	0.773	0.825	1	35.682			
T6	0.96	0.82	A	0.906	1.932	0.988	0.825	1	65.559	2.89	144.68	A
80.00-60.00			B	0.842	1.853	0.932	0.825	1	57.504			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.661	1.779	0.793	0.825	1	38.539			
T7	0.96	0.61	A	0.891	1.911	0.975	0.825	1	63.512	2.52	125.94	A
60.00-40.00			B	0.826	1.837	0.918	0.825	1	55.441			
			C	0.63	1.788	0.773	0.825	1	35.682			
T8	0.96	0.65	A	0.878	1.895	0.963	0.825	1	61.920	2.16	108.09	A
40.00-20.00			B	0.811	1.825	0.906	0.825	1	53.789			
			C	0.605	1.801	0.757	0.825	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	0.825	1	46.498	1.62	108.27	A
			B	0.812	1.825	0.906	0.825	1	40.401			
			C	0.613	1.797	0.761	0.825	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	0.825	1	15.818	0.36*	72.35	C
			B	1	2.1	1	0.825	1	14.540			
			C	1	2.1	1	0.825	1	10.772			
Sum Weight:	7.00	6.60			*2A_g limit					20.89		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	0.8	1	12.000	0.86	57.00	C
170.00-155.00			B	0.351	2.169	0.633	0.8	1	12.058			
			C	0.404	2.057	0.653	0.8	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	0.8	1	19.870	1.29	85.75	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	0.8	1	25.040			
			C	0.613	1.797	0.761	0.8	1	25.326			
T3	0.75	1.18	A	0.899	1.923	0.983	0.8	1	61.150	3.21	160.32	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	0.8	1	38.320			
			C	0.672	1.777	0.8	0.8	1	38.921			
T4	0.94	0.42	A	0.874	1.89	0.96	0.8	1	60.724	2.98	149.14	A
120.00-100.00			B	0.785	1.806	0.885	0.8	1	50.279			
			C	0.601	1.803	0.754	0.8	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	0.8	1	63.505	2.98	148.96	A
100.00-80.00			B	0.826	1.837	0.918	0.8	1	55.433			
			C	0.63	1.788	0.773	0.8	1	35.665			
T6	0.96	0.82	A	0.906	1.932	0.988	0.8	1	65.530	2.89	144.62	A
80.00-60.00			B	0.842	1.853	0.932	0.8	1	57.472			
			C	0.661	1.779	0.793	0.8	1	38.470			
T7	0.96	0.61	A	0.891	1.911	0.975	0.8	1	63.505	2.52	125.93	A
60.00-40.00			B	0.826	1.837	0.918	0.8	1	55.433			
			C	0.63	1.788	0.773	0.8	1	35.665			
T8	0.96	0.65	A	0.878	1.895	0.963	0.8	1	61.920	2.16	108.09	A
40.00-20.00			B	0.811	1.825	0.906	0.8	1	53.789			
			C	0.605	1.801	0.757	0.8	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	0.8	1	46.498	1.62	108.27	A
			B	0.812	1.825	0.906	0.8	1	40.401			
			C	0.613	1.797	0.761	0.8	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	0.8	1	15.818	0.36*	72.35	C
			B	1	2.1	1	0.8	1	14.540			
			C	1	2.1	1	0.8	1	10.759			
Sum Weight:	7.00	6.60			*2A_g limit					20.87		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	0.85	1	12.000	0.86	57.00	C
170.00-155.00			B	0.351	2.169	0.633	0.85	1	12.058			
			C	0.404	2.057	0.653	0.85	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	0.85	1	19.891	1.29	85.81	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	0.85	1	25.054			
			C	0.613	1.797	0.761	0.85	1	25.344			
T3	0.75	1.18	A	0.899	1.923	0.983	0.85	1	61.920	3.25	162.34	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	0.85	1	39.239			
			C	0.672	1.777	0.8	0.85	1	39.916			
T4	0.94	0.42	A	0.874	1.89	0.96	0.85	1	60.724	2.98	149.14	A
120.00-100.00			B	0.785	1.806	0.885	0.85	1	50.279			
			C	0.601	1.803	0.754	0.85	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	0.85	1	63.519	2.98	148.99	A
100.00-80.00			B	0.826	1.837	0.918	0.85	1	55.448			
			C	0.63	1.788	0.773	0.85	1	35.699			
T6	0.96	0.82	A	0.906	1.932	0.988	0.85	1	65.587	2.89	144.75	A
80.00-60.00			B	0.842	1.853	0.932	0.85	1	57.537			
			C	0.661	1.779	0.793	0.85	1	38.608			
T7	0.96	0.61	A	0.891	1.911	0.975	0.85	1	63.519	2.52	125.96	A
60.00-40.00			B	0.826	1.837	0.918	0.85	1	55.448			
			C	0.63	1.788	0.773	0.85	1	35.699			
T8	0.96	0.65	A	0.878	1.895	0.963	0.85	1	61.920	2.16	108.09	A
40.00-20.00			B	0.811	1.825	0.906	0.85	1	53.789			
			C	0.605	1.801	0.757	0.85	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	0.85	1	46.498	1.62	108.27	A
			B	0.812	1.825	0.906	0.85	1	40.401			
			C	0.613	1.797	0.761	0.85	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	0.85	1	15.818	0.36*	72.35	C
			B	1	2.1	1	0.85	1	14.541			
			C	1	2.1	1	0.85	1	10.785			
Sum Weight:	7.00	6.60			*2A_g limit					20.91		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.43	0.61	A	0.541	1.853	0.719	1	1	22.642	1.06	70.50	C
170.00-155.00			B	0.508	1.889	0.702	1	1	22.773			
			C	0.617	1.795	0.764	1	1	27.038			
T2	1.07	0.88	A	0.785	1.805	0.884	1	1	39.849	2.06	137.28	C
155.00-140.00		TA 0.59	B	0.84	1.851	0.93	1	1	45.459			
			C	0.909	1.937	0.992	1	1	50.141			
T3	2.05	1.71	A	1	2.1	1	1	1	90.691	3.03*	151.38	A
140.00-120.00		TA 0.59	B	0.869	1.883	0.955	1	1	63.982			
			C	0.941	1.987	1	1	1	69.638			
T4	2.57	0.79	A	1	2.1	1	1	1	93.295	2.89*	144.31	B
120.00-100.00			B	1	2.1	1	1	1	87.579			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.931	1.972	1	1	1	68.942			
T5	2.62	1.04	A	1	2.1	1	1	1	94.486	2.76*	137.80	B
100.00-80.00			B	1	2.1	1	1	1	91.880			
			C	0.958	2.019	1	1	1	71.751			
T6	2.62	1.50	A	1	2.1	1	1	1	94.482	2.57*	128.70	C
80.00-60.00			B	1	2.1	1	1	1	92.075			
			C	0.989	2.077	1	1	1	74.282			
T7	2.62	1.04	A	1	2.1	1	1	1	94.486	2.33*	116.50	B
60.00-40.00			B	1	2.1	1	1	1	91.880			
			C	0.958	2.019	1	1	1	71.751			
T8	2.63	0.99	A	1	2.1	1	1	1	95.179	2.07*	103.46	B
40.00-20.00			B	1	2.1	1	1	1	92.355			
			C	0.945	1.995	1	1	1	70.748			
T9 20.00-5.00	1.99	0.74	A	1	2.1	1	1	1	71.357	1.55*	103.46	B
			B	1	2.1	1	1	1	69.248			
			C	0.961	2.023	1	1	1	53.942			
T10 5.00-0.00	0.66	0.19	A	1	2.1	1	1	1	23.521	0.28*	56.70	C
			B	1	2.1	1	1	1	22.780			
			C	1	2.1	1	1	1	17.271			
Sum Weight:	19.24	10.66			*2A_g limit					20.60		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.43	0.61	A	0.541	1.853	0.719	0.825	1	21.990	1.03	68.80	C
170.00-155.00			B	0.508	1.889	0.702	0.825	1	21.034			
			C	0.617	1.795	0.764	0.825	1	26.386			
T2	1.07	0.88	A	0.785	1.805	0.884	0.825	1	37.832	1.98	131.81	C
155.00-140.00		TA 0.59	B	0.84	1.851	0.93	0.825	1	40.215			
			C	0.909	1.937	0.992	0.825	1	48.144			
T3	2.05	1.71	A	1	2.1	1	0.825	1	79.924	3.03*	151.38	A
140.00-120.00		TA 0.59	B	0.869	1.883	0.955	0.825	1	53.988			
			C	0.941	1.987	1	0.825	1	63.660			
T4	2.57	0.79	A	1	2.1	1	0.825	1	84.034	2.89*	144.31	B
120.00-100.00			B	1	2.1	1	0.825	1	76.998			
			C	0.931	1.972	1	0.825	1	66.334			
T5	2.62	1.04	A	1	2.1	1	0.825	1	85.252	2.76*	137.80	B
100.00-80.00			B	1	2.1	1	0.825	1	80.915			
			C	0.958	2.019	1	0.825	1	69.063			
T6	2.62	1.50	A	1	2.1	1	0.825	1	85.325	2.57*	128.70	B
80.00-60.00			B	1	2.1	1	0.825	1	81.161			
			C	0.989	2.077	1	0.825	1	71.348			
T7	2.62	1.04	A	1	2.1	1	0.825	1	85.252	2.33*	116.50	B
60.00-40.00			B	1	2.1	1	0.825	1	80.915			
			C	0.958	2.019	1	0.825	1	69.063			
T8	2.63	0.99	A	1	2.1	1	0.825	1	85.918	2.07*	103.46	B
40.00-20.00			B	1	2.1	1	0.825	1	81.371			
			C	0.945	1.995	1	0.825	1	68.140			
T9 20.00-5.00	1.99	0.74	A	1	2.1	1	0.825	1	64.412	1.55*	103.46	B
			B	1	2.1	1	0.825	1	61.010			
			C	0.961	2.023	1	0.825	1	51.986			
T10 5.00-0.00	0.66	0.19	A	1	2.1	1	0.825	1	21.329	0.28*	56.70	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			B	1	2.1	1	0.825	1	20.144			
			C	1	2.1	1	0.825	1	16.592			
Sum Weight:	19.24	10.66			*2A_g limit					20.49		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.43	0.61	A	0.541	1.853	0.719	0.8	1	21.897	1.03	68.56	C
170.00-155.00			B	0.508	1.889	0.702	0.8	1	20.786			
			C	0.617	1.795	0.764	0.8	1	26.293			
T2	1.07	0.88	A	0.785	1.805	0.884	0.8	1	37.544	1.97	131.03	C
155.00-140.00		TA 0.59	B	0.84	1.851	0.93	0.8	1	39.466			
			C	0.909	1.937	0.992	0.8	1	47.858			
T3	2.05	1.71	A	1	2.1	1	0.8	1	78.386	3.03*	151.38	A
140.00-120.00		TA 0.59	B	0.869	1.883	0.955	0.8	1	52.560			
			C	0.941	1.987	1	0.8	1	62.806			
T4	2.57	0.79	A	1	2.1	1	0.8	1	82.711	2.89*	144.31	B
120.00-100.00			B	1	2.1	1	0.8	1	75.486			
			C	0.931	1.972	1	0.8	1	65.962			
T5	2.62	1.04	A	1	2.1	1	0.8	1	83.933	2.76*	137.80	B
100.00-80.00			B	1	2.1	1	0.8	1	79.348			
			C	0.958	2.019	1	0.8	1	68.679			
T6	2.62	1.50	A	1	2.1	1	0.8	1	84.017	2.57*	128.70	B
80.00-60.00			B	1	2.1	1	0.8	1	79.602			
			C	0.989	2.077	1	0.8	1	70.928			
T7	2.62	1.04	A	1	2.1	1	0.8	1	83.933	2.33*	116.50	B
60.00-40.00			B	1	2.1	1	0.8	1	79.348			
			C	0.958	2.019	1	0.8	1	68.679			
T8	2.63	0.99	A	1	2.1	1	0.8	1	84.595	2.07*	103.46	B
40.00-20.00			B	1	2.1	1	0.8	1	79.802			
			C	0.945	1.995	1	0.8	1	67.768			
T9 20.00-5.00	1.99	0.74	A	1	2.1	1	0.8	1	63.420	1.55*	103.46	B
			B	1	2.1	1	0.8	1	59.833			
			C	0.961	2.023	1	0.8	1	51.707			
T10 5.00-0.00	0.66	0.19	A	1	2.1	1	0.8	1	21.015	0.28*	56.70	C
			B	1	2.1	1	0.8	1	19.768			
			C	1	2.1	1	0.8	1	16.495			
Sum Weight:	19.24	10.66			*2A_g limit					20.47		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.43	0.61	A	0.541	1.853	0.719	0.85	1	22.083	1.04	69.04	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
170.00-155.00			B	0.508	1.889	0.702	0.85	1	21.283			
			C	0.617	1.795	0.764	0.85	1	26.479			
T2	1.07	0.88	A	0.785	1.805	0.884	0.85	1	38.120	1.99	132.59	C
155.00-140.00		TA 0.59	B	0.84	1.851	0.93	0.85	1	40.964			
			C	0.909	1.937	0.992	0.85	1	48.429			
T3	2.05	1.71	A	1	2.1	1	0.85	1	81.462	3.03*	151.38	A
140.00-120.00		TA 0.59	B	0.869	1.883	0.955	0.85	1	55.416			
			C	0.941	1.987	1	0.85	1	64.514			
T4	2.57	0.79	A	1	2.1	1	0.85	1	85.357	2.89*	144.31	B
120.00-100.00			B	1	2.1	1	0.85	1	78.510			
			C	0.931	1.972	1	0.85	1	66.707			
T5	2.62	1.04	A	1	2.1	1	0.85	1	86.571	2.76*	137.80	B
100.00-80.00			B	1	2.1	1	0.85	1	82.481			
			C	0.958	2.019	1	0.85	1	69.447			
T6	2.62	1.50	A	1	2.1	1	0.85	1	86.633	2.57*	128.70	B
80.00-60.00			B	1	2.1	1	0.85	1	82.720			
			C	0.989	2.077	1	0.85	1	71.767			
T7	2.62	1.04	A	1	2.1	1	0.85	1	86.571	2.33*	116.50	B
60.00-40.00			B	1	2.1	1	0.85	1	82.481			
			C	0.958	2.019	1	0.85	1	69.447			
T8	2.63	0.99	A	1	2.1	1	0.85	1	87.241	2.07*	103.46	B
40.00-20.00			B	1	2.1	1	0.85	1	82.940			
			C	0.945	1.995	1	0.85	1	68.513			
T9 20.00-5.00	1.99	0.74	A	1	2.1	1	0.85	1	65.404	1.55*	103.46	B
			B	1	2.1	1	0.85	1	62.187			
			C	0.961	2.023	1	0.85	1	52.265			
T10 5.00-0.00	0.66	0.19	A	1	2.1	1	0.85	1	21.642	0.28*	56.70	C
			B	1	2.1	1	0.85	1	20.521			
			C	1	2.1	1	0.85	1	16.689			
Sum Weight:	19.24	10.66			*2A_g limit					20.50		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	1	1	12.000	0.33	22.27	C
170.00-155.00			B	0.351	2.169	0.633	1	1	12.058			
			C	0.404	2.057	0.653	1	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	1	1	19.954	0.50	33.59	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	1	1	25.098			
			C	0.613	1.797	0.761	1	1	25.396			
T3	0.75	1.18	A	0.899	1.923	0.983	1	1	64.229	1.32	65.78	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	1	1	41.996			
			C	0.672	1.777	0.8	1	1	42.902			
T4	0.94	0.42	A	0.874	1.89	0.96	1	1	60.724	1.17	58.26	A
120.00-100.00			B	0.785	1.806	0.885	1	1	50.279			
			C	0.601	1.803	0.754	1	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	1	1	63.561	1.16	58.24	A
100.00-80.00			B	0.826	1.837	0.918	1	1	55.496			
			C	0.63	1.788	0.773	1	1	35.801			
T6	0.96	0.82	A	0.906	1.932	0.988	1	1	65.758	1.13	56.69	A
80.00-60.00			B	0.842	1.853	0.932	1	1	57.731			
			C	0.661	1.779	0.793	1	1	39.021			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T7	0.96	0.61	A	0.891	1.911	0.975	1	1	63.561	0.98	49.23	A
60.00-40.00			B	0.826	1.837	0.918	1	1	55.496			
			C	0.63	1.788	0.773	1	1	35.801			
T8	0.96	0.65	A	0.878	1.895	0.963	1	1	61.920	0.84	42.22	A
40.00-20.00			B	0.811	1.825	0.906	1	1	53.789			
			C	0.605	1.801	0.757	1	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	1	1	46.498	0.63	42.29	A
			B	0.812	1.825	0.906	1	1	40.401			
			C	0.613	1.797	0.761	1	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	1	1	15.818	0.14*	28.26	C
			B	1	2.1	1	1	1	14.542			
			C	1	2.1	1	1	1	10.865			
Sum Weight:	7.00	6.60			*2A_g limit					8.22		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	0.825	1	12.000	0.33	22.27	C
170.00-155.00			B	0.351	2.169	0.633	0.825	1	12.058			
			C	0.404	2.057	0.653	0.825	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	0.825	1	19.881	0.50	33.51	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	0.825	1	25.047			
			C	0.613	1.797	0.761	0.825	1	25.335			
T3	0.75	1.18	A	0.899	1.923	0.983	0.825	1	61.535	1.26	63.02	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	0.825	1	38.779			
			C	0.672	1.777	0.8	0.825	1	39.419			
T4	0.94	0.42	A	0.874	1.89	0.96	0.825	1	60.724	1.17	58.26	A
120.00-100.00			B	0.785	1.806	0.885	0.825	1	50.279			
			C	0.601	1.803	0.754	0.825	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	0.825	1	63.512	1.16	58.19	A
100.00-80.00			B	0.826	1.837	0.918	0.825	1	55.441			
			C	0.63	1.788	0.773	0.825	1	35.682			
T6	0.96	0.82	A	0.906	1.932	0.988	0.825	1	65.559	1.13	56.52	A
80.00-60.00			B	0.842	1.853	0.932	0.825	1	57.504			
			C	0.661	1.779	0.793	0.825	1	38.539			
T7	0.96	0.61	A	0.891	1.911	0.975	0.825	1	63.512	0.98	49.20	A
60.00-40.00			B	0.826	1.837	0.918	0.825	1	55.441			
			C	0.63	1.788	0.773	0.825	1	35.682			
T8	0.96	0.65	A	0.878	1.895	0.963	0.825	1	61.920	0.84	42.22	A
40.00-20.00			B	0.811	1.825	0.906	0.825	1	53.789			
			C	0.605	1.801	0.757	0.825	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	0.825	1	46.498	0.63	42.29	A
			B	0.812	1.825	0.906	0.825	1	40.401			
			C	0.613	1.797	0.761	0.825	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	0.825	1	15.818	0.14*	28.26	C
			B	1	2.1	1	0.825	1	14.540			
			C	1	2.1	1	0.825	1	10.772			
Sum Weight:	7.00	6.60			*2A_g limit					8.16		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	0.8	1	12.000	0.33	22.27	C
170.00-155.00			B	0.351	2.169	0.633	0.8	1	12.058			
			C	0.404	2.057	0.653	0.8	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	0.8	1	19.870	0.50	33.50	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	0.8	1	25.040			
			C	0.613	1.797	0.761	0.8	1	25.326			
T3	0.75	1.18	A	0.899	1.923	0.983	0.8	1	61.150	1.25	62.63	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	0.8	1	38.320			
			C	0.672	1.777	0.8	0.8	1	38.921			
T4	0.94	0.42	A	0.874	1.89	0.96	0.8	1	60.724	1.17	58.26	A
120.00-100.00			B	0.785	1.806	0.885	0.8	1	50.279			
			C	0.601	1.803	0.754	0.8	1	32.823			
T5	0.96	0.61	A	0.891	1.911	0.975	0.8	1	63.505	1.16	58.19	A
100.00-80.00			B	0.826	1.837	0.918	0.8	1	55.433			
			C	0.63	1.788	0.773	0.8	1	35.665			
T6	0.96	0.82	A	0.906	1.932	0.988	0.8	1	65.530	1.13	56.49	A
80.00-60.00			B	0.842	1.853	0.932	0.8	1	57.472			
			C	0.661	1.779	0.793	0.8	1	38.470			
T7	0.96	0.61	A	0.891	1.911	0.975	0.8	1	63.505	0.98	49.19	A
60.00-40.00			B	0.826	1.837	0.918	0.8	1	55.433			
			C	0.63	1.788	0.773	0.8	1	35.665			
T8	0.96	0.65	A	0.878	1.895	0.963	0.8	1	61.920	0.84	42.22	A
40.00-20.00			B	0.811	1.825	0.906	0.8	1	53.789			
			C	0.605	1.801	0.757	0.8	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	0.8	1	46.498	0.63	42.29	A
			B	0.812	1.825	0.906	0.8	1	40.401			
			C	0.613	1.797	0.761	0.8	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	0.8	1	15.818	0.14*	28.26	C
			B	1	2.1	1	0.8	1	14.540			
			C	1	2.1	1	0.8	1	10.759			
Sum Weight:	7.00	6.60			*2A_g limit					8.15		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.15	0.32	A	0.35	2.172	0.632	0.85	1	12.000	0.33	22.27	C
170.00-155.00			B	0.351	2.169	0.633	0.85	1	12.058			
			C	0.404	2.057	0.653	0.85	1	14.305			
T2	0.36	0.51	A	0.517	1.879	0.706	0.85	1	19.891	0.50	33.52	C
155.00-140.00		TA 0.44	B	0.608	1.799	0.759	0.85	1	25.054			
			C	0.613	1.797	0.761	0.85	1	25.344			
T3	0.75	1.18	A	0.899	1.923	0.983	0.85	1	61.920	1.27	63.41	A
140.00-120.00		TA 0.44	B	0.664	1.778	0.795	0.85	1	39.239			
			C	0.672	1.777	0.8	0.85	1	39.916			
T4	0.94	0.42	A	0.874	1.89	0.96	0.85	1	60.724	1.17	58.26	A
120.00-100.00			B	0.785	1.806	0.885	0.85	1	50.279			
			C	0.601	1.803	0.754	0.85	1	32.823			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T5	0.96	0.61	A	0.891	1.911	0.975	0.85	1	63.519	1.16	58.20	A
100.00-80.00			B	0.826	1.837	0.918	0.85	1	55.448			
			C	0.63	1.788	0.773	0.85	1	35.699			
T6	0.96	0.82	A	0.906	1.932	0.988	0.85	1	65.587	1.13	56.54	A
80.00-60.00			B	0.842	1.853	0.932	0.85	1	57.537			
			C	0.661	1.779	0.793	0.85	1	38.608			
T7	0.96	0.61	A	0.891	1.911	0.975	0.85	1	63.519	0.98	49.20	A
60.00-40.00			B	0.826	1.837	0.918	0.85	1	55.448			
			C	0.63	1.788	0.773	0.85	1	35.699			
T8	0.96	0.65	A	0.878	1.895	0.963	0.85	1	61.920	0.84	42.22	A
40.00-20.00			B	0.811	1.825	0.906	0.85	1	53.789			
			C	0.605	1.801	0.757	0.85	1	33.537			
T9 20.00-5.00	0.72	0.48	A	0.879	1.895	0.964	0.85	1	46.498	0.63	42.29	A
			B	0.812	1.825	0.906	0.85	1	40.401			
			C	0.613	1.797	0.761	0.85	1	25.612			
T10 5.00-0.00	0.24	0.13	A	1	2.1	1	0.85	1	15.818	0.14*	28.26	C
			B	1	2.1	1	0.85	1	14.541			
			C	1	2.1	1	0.85	1	10.785			
Sum Weight:	7.00	6.60			*2A_g limit					8.17		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	2.74			
Bracing Weight	3.86			
Total Member Self-Weight	6.60			
Guy Weight	2.44			
Total Weight	23.42			
Wind 0 deg - No Ice		0.08	-32.52	-1.32
Wind 30 deg - No Ice		16.26	-27.95	-2.37
Wind 45 deg - No Ice		22.84	-22.76	-2.58
Wind 60 deg - No Ice		27.86	-16.08	-2.62
Wind 90 deg - No Ice		32.14	-0.04	-2.25
Wind 120 deg - No Ice		28.08	16.25	-1.43
Wind 135 deg - No Ice		22.84	22.91	-0.87
Wind 150 deg - No Ice		16.11	28.13	-0.20
Wind 180 deg - No Ice		-0.08	32.46	1.29
Wind 210 deg - No Ice		-16.26	28.22	2.45
Wind 225 deg - No Ice		-22.96	23.03	2.69
Wind 240 deg - No Ice		-28.16	16.39	2.75
Wind 270 deg - No Ice		-32.14	0.13	2.25
Wind 300 deg - No Ice		-27.77	-15.93	1.33
Wind 315 deg - No Ice		-22.73	-22.64	0.75
Wind 330 deg - No Ice		-16.11	-27.86	0.13
Member Ice	4.06			
Guy Ice	1.94			
Total Weight Ice	44.78			
Wind 0 deg - Ice		0.07	-30.53	-0.35
Wind 30 deg - Ice		15.27	-26.27	-0.86
Wind 45 deg - Ice		21.48	-21.41	-0.95
Wind 60 deg - Ice		26.21	-15.13	-1.00
Wind 90 deg - Ice		30.24	-0.04	-0.93

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Wind 120 deg - Ice		26.37	15.25	-0.73
Wind 135 deg - Ice		21.47	21.53	-0.56
Wind 150 deg - Ice		15.15	26.42	-0.32
Wind 180 deg - Ice		-0.07	30.49	0.34
Wind 210 deg - Ice		-15.26	26.48	0.91
Wind 225 deg - Ice		-21.56	21.62	1.04
Wind 240 deg - Ice		-26.43	15.37	1.08
Wind 270 deg - Ice		-30.24	0.09	0.93
Wind 300 deg - Ice		-26.14	-15.02	0.66
Wind 315 deg - Ice		-21.39	-21.32	0.47
Wind 330 deg - Ice		-15.16	-26.21	0.27
Total Weight	23.42			
Wind 0 deg - Service		0.03	-12.70	-0.51
Wind 30 deg - Service		6.35	-10.92	-0.93
Wind 45 deg - Service		8.92	-8.89	-1.01
Wind 60 deg - Service		10.88	-6.28	-1.02
Wind 90 deg - Service		12.56	-0.02	-0.88
Wind 120 deg - Service		10.97	6.35	-0.56
Wind 135 deg - Service		8.92	8.95	-0.34
Wind 150 deg - Service		6.29	10.99	-0.08
Wind 180 deg - Service		-0.03	12.68	0.50
Wind 210 deg - Service		-6.35	11.02	0.96
Wind 225 deg - Service		-8.97	9.00	1.05
Wind 240 deg - Service		-11.00	6.40	1.07
Wind 270 deg - Service		-12.56	0.05	0.88
Wind 300 deg - Service		-10.85	-6.22	0.52
Wind 315 deg - Service		-8.88	-8.84	0.29
Wind 330 deg - Service		-6.29	-10.88	0.05

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 45 deg - No Ice+Guy
5	Dead+Wind 60 deg - No Ice+Guy
6	Dead+Wind 90 deg - No Ice+Guy
7	Dead+Wind 120 deg - No Ice+Guy
8	Dead+Wind 135 deg - No Ice+Guy
9	Dead+Wind 150 deg - No Ice+Guy
10	Dead+Wind 180 deg - No Ice+Guy
11	Dead+Wind 210 deg - No Ice+Guy
12	Dead+Wind 225 deg - No Ice+Guy
13	Dead+Wind 240 deg - No Ice+Guy
14	Dead+Wind 270 deg - No Ice+Guy
15	Dead+Wind 300 deg - No Ice+Guy
16	Dead+Wind 315 deg - No Ice+Guy
17	Dead+Wind 330 deg - No Ice+Guy
18	Dead+Ice+Temp+Guy
19	Dead+Wind 0 deg+Ice+Temp+Guy
20	Dead+Wind 30 deg+Ice+Temp+Guy
21	Dead+Wind 45 deg+Ice+Temp+Guy

Comb. No.	Description
22	Dead+Wind 60 deg+Ice+Temp+Guy
23	Dead+Wind 90 deg+Ice+Temp+Guy
24	Dead+Wind 120 deg+Ice+Temp+Guy
25	Dead+Wind 135 deg+Ice+Temp+Guy
26	Dead+Wind 150 deg+Ice+Temp+Guy
27	Dead+Wind 180 deg+Ice+Temp+Guy
28	Dead+Wind 210 deg+Ice+Temp+Guy
29	Dead+Wind 225 deg+Ice+Temp+Guy
30	Dead+Wind 240 deg+Ice+Temp+Guy
31	Dead+Wind 270 deg+Ice+Temp+Guy
32	Dead+Wind 300 deg+Ice+Temp+Guy
33	Dead+Wind 315 deg+Ice+Temp+Guy
34	Dead+Wind 330 deg+Ice+Temp+Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	170 - 155	Leg	Max Tension	10	14.91	0.01	0.41
			Max. Compression	2	-16.59	0.00	0.10
			Max. Mx	13	-14.25	-0.33	0.25
			Max. My	10	14.91	0.01	0.41
			Max. Vy	13	-1.65	0.09	-0.06
			Max. Vx	10	2.11	-0.00	-0.11
		Diagonal	Max Tension	9	2.49	0.00	0.00
			Max. Compression	8	-2.54	0.00	0.00
			Max. Mx	29	2.13	-0.01	0.00
			Max. My	8	-2.25	0.00	-0.00
			Max. Vy	29	0.01	-0.01	0.00
			Max. Vx	8	0.00	0.00	-0.00
		Top Girt	Max Tension	11	0.02	0.00	0.00
			Max. Compression	32	-0.03	0.00	0.00
			Max. Mx	32	-0.03	0.00	0.00
			Max. My	23	0.00	0.00	-0.00
			Max. Vy	18	0.00	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Bottom Girt	Max Tension	10	0.67	0.00	0.00
			Max. Compression	13	-0.61	0.00	0.00
			Max. Mx	32	0.59	0.00	0.00
			Max. My	23	0.05	0.00	-0.00
			Max. Vy	32	-0.00	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T2	155 - 140	Leg	Max Tension	10	18.76	0.00	0.52
			Max. Compression	19	-37.06	-0.01	-0.67
			Max. Mx	30	-33.26	-0.58	0.35
			Max. My	19	-33.59	-0.01	-0.67
			Max. Vy	30	-2.27	-0.01	-0.02
			Max. Vx	19	-2.68	0.01	-0.00
		Diagonal	Max Tension	9	2.87	0.00	0.00
			Max. Compression	25	-3.31	0.00	0.00
			Max. Mx	19	0.76	-0.02	-0.00
			Max. My	14	-2.20	0.00	0.01
			Max. Vy	19	0.01	-0.02	-0.00
			Max. Vx	14	-0.00	0.00	0.01
		Secondary Horizontal	Max Tension	28	1.42	-0.00	0.00
			Max. Compression	9	-1.11	0.00	0.00
			Max. Mx	24	-0.91	-0.01	-0.00
			Max. My	13	-0.42	-0.00	-0.00
			Max. Vy	24	0.01	-0.01	-0.00
			Max. Vx	13	0.00	0.00	0.00
		Top Girt	Max Tension	30	0.19	0.00	0.00
			Max. Compression	10	-0.18	0.00	0.00
			Max. Mx	32	-0.15	0.00	0.00
			Max. My	23	0.01	0.00	-0.00
			Max. Vy	32	-0.00	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Bottom Girt	Max Tension	27	0.74	0.00	0.00
			Max. Compression	30	-0.48	0.00	0.00
			Max. Mx	34	0.63	0.00	0.00
			Max. Vy	34	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	7.06		
			Top Tension	27	7.24		
			Top Cable Vert	27	6.17		
			Top Cable Norm	27	3.80		
			Top Cable Tan	27	0.01		
			Bot Cable Vert	27	-5.77		
			Bot Cable Norm	27	4.08		
			Bot Cable Tan	27	0.01		
		Guy B	Bottom Tension	32	6.85		
			Top Tension	32	7.01		
			Top Cable Vert	32	5.86		
			Top Cable Norm	32	3.86		
			Top Cable Tan	32	0.01		
			Bot Cable Vert	32	-5.47		
			Bot Cable Norm	32	4.12		
			Bot Cable Tan	32	0.01		
		Guy C	Bottom Tension	22	6.81		
			Top Tension	22	6.97		
			Top Cable Vert	22	5.72		
			Top Cable Norm	22	3.98		
			Top Cable Tan	22	0.01		
			Bot Cable Vert	22	-5.34		
			Bot Cable Norm	22	4.22		
			Bot Cable Tan	22	0.01		
		Top Guy Pull-Off	Max Tension	10	2.78	0.00	0.00
			Max. Compression	13	-2.36	0.00	0.00
			Max. Mx	32	2.35	-0.01	0.00
			Max. My	23	0.13	0.00	0.00
			Max. Vy	32	0.01	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	20	3.49	0.00	0.00
			Max. Compression	11	-1.29	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	27	-0.36	-21.27	0.00
			Max. My	23	0.20	-13.07	-0.00
			Max. Vy	27	6.13	-21.27	0.00
			Max. Vx	23	-0.00	-13.07	-0.00
T3	140 - 120	Leg	Max Tension	10	32.69	-0.45	-0.03
			Max. Compression	19	-56.05	-0.46	0.08
			Max. Mx	27	2.37	0.86	0.01
			Max. My	28	-11.31	-0.53	3.77
			Max. Vy	30	-2.70	0.67	-0.05
			Max. Vx	28	-3.62	-0.53	3.77
		Diagonal	Max Tension	10	4.19	0.00	0.00
			Max. Compression	13	-4.59	0.02	-0.01
			Max. Mx	28	1.76	-0.11	0.03
			Max. My	11	-3.61	0.04	0.05
			Max. Vy	28	-0.05	0.00	0.00
			Max. Vx	11	-0.02	0.00	0.00
		Secondary Horizontal	Max Tension	28	4.05	-0.07	-0.01
			Max. Compression	11	-3.15	0.00	0.00
			Max. Mx	27	3.79	-0.08	-0.01
			Max. My	26	0.32	0.01	-0.02
			Max. Vy	27	-0.05	0.00	0.00
			Max. Vx	26	-0.01	0.01	-0.02
		Top Girt	Max Tension	24	0.91	0.00	0.00
			Max. Compression	27	-0.85	0.00	0.00
			Max. Mx	32	-0.84	-0.00	0.00
			Max. Vy	32	0.00	0.00	0.00
		Bottom Girt	Max Tension	13	1.53	0.00	0.00
			Max. Compression	10	-0.86	0.00	0.00
			Max. Mx	18	0.29	-0.00	0.00
			Max. My	13	-0.33	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	18.47		
			Top Tension	27	18.80		
			Top Cable Vert	27	15.18		
			Top Cable Norm	27	11.09		
			Top Cable Tan	27	0.01		
			Bot Cable Vert	27	-14.56		
			Bot Cable Norm	27	11.36		
			Bot Cable Tan	27	0.01		
		Guy B	Bottom Tension	33	17.97		
			Top Tension	33	18.28		
			Top Cable Vert	33	14.36		
			Top Cable Norm	33	11.31		
			Top Cable Tan	33	0.04		
			Bot Cable Vert	33	-13.76		
			Bot Cable Norm	33	11.56		
			Bot Cable Tan	33	0.06		
		Guy C	Bottom Tension	21	17.53		
			Top Tension	21	17.82		
			Top Cable Vert	21	13.68		
			Top Cable Norm	21	11.42		
			Top Cable Tan	21	0.04		
			Bot Cable Vert	21	-13.10		
			Bot Cable Norm	21	11.64		
			Bot Cable Tan	21	0.05		
		Torque Arm Top	Max Tension	3	11.85	-11.59	0.00
			Max. Compression	12	-5.87	-39.70	-0.00
			Max. Mx	27	-3.49	-49.01	0.00
			Max. My	13	4.24	-37.13	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	27	14.05	-49.01	0.00
			Max. Vx	13	0.00	-37.13	0.00
T4	120 - 100	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.26	-0.01	0.16
			Max. Mx	31	-27.65	-0.36	-0.13
			Max. My	27	-27.38	-0.00	0.41
			Max. Vy	14	2.53	-0.02	-0.05
			Max. Vx	10	-2.62	0.03	0.05
		Diagonal	Max Tension	11	1.34	0.00	0.00
			Max. Compression	12	-1.81	-0.00	-0.00
			Max. Mx	26	-0.39	-0.03	-0.00
			Max. My	11	-1.80	-0.00	-0.00
			Max. Vy	26	0.02	-0.03	-0.00
			Max. Vx	11	0.00	0.00	0.00
		Top Girt	Max Tension	22	0.77	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.46	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	29	0.45	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.30	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.84	0.01	0.09
			Max. Mx	22	-29.29	-0.27	-0.07
			Max. My	19	-22.36	0.00	0.28
			Max. Vy	30	0.75	0.18	-0.10
			Max. Vx	19	0.84	-0.01	0.21
		Diagonal	Max Tension	3	1.10	0.00	0.00
			Max. Compression	3	-1.34	0.00	0.00
			Max. Mx	28	-0.14	-0.02	-0.00
			Max. My	2	-0.31	0.00	0.00
			Max. Vy	28	0.01	-0.02	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	25	0.43	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.31	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	30	0.74	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.44	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
		Mid Girt	Max Tension	19	0.53	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.27	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	7.48		
			Top Tension	27	7.57		
			Top Cable Vert	27	5.21		
			Top Cable Norm	27	5.49		
			Top Cable Tan	27	0.00		
			Bot Cable Vert	27	-4.97		
			Bot Cable Norm	27	5.59		
			Bot Cable Tan	27	0.00		
		Guy B	Bottom Tension	32	7.35		
			Top Tension	32	7.43		
			Top Cable Vert	32	4.81		
			Top Cable Norm	32	5.67		
			Top Cable Tan	32	0.00		
			Bot Cable Vert	32	-4.59		
			Bot Cable Norm	32	5.75		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Tan	32	0.00		
		Guy C	Bottom Tension	22	7.17		
			Top Tension	22	7.25		
			Top Cable Vert	22	4.46		
			Top Cable Norm	22	5.71		
			Top Cable Tan	22	0.00		
			Bot Cable Vert	22	-4.25		
			Bot Cable Norm	22	5.77		
			Bot Cable Tan	22	0.00		
		Top Guy Pull-Off	Max Tension	19	3.03	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	1.52	0.01	0.00
			Max. My	13	1.44	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-46.77	-0.41	0.05
			Max. Mx	28	-45.68	-0.53	0.07
			Max. My	11	-31.79	-0.03	-0.15
			Max. Vy	7	-1.15	-0.03	-0.00
			Max. Vx	11	-0.50	0.05	-0.03
		Diagonal	Max Tension	9	0.53	0.01	0.00
			Max. Compression	26	-1.54	0.00	0.00
			Max. Mx	29	-0.98	-0.01	-0.00
			Max. My	2	-0.80	-0.00	0.00
			Max. Vy	29	0.01	-0.01	-0.00
			Max. Vx	2	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	29	1.05	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	29	0.62	0.02	-0.00
			Max. My	12	0.61	-0.02	-0.00
			Max. Vy	29	-0.02	0.02	-0.00
			Max. Vx	12	0.00	-0.02	-0.00
		Top Girt	Max Tension	29	0.20	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.15	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	32	0.23	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.16	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-48.93	-0.19	0.09
			Max. Mx	32	-32.83	0.35	0.12
			Max. My	19	-27.59	-0.00	0.36
			Max. Vy	14	-1.02	0.23	-0.08
			Max. Vx	2	-1.12	0.01	0.25
		Diagonal	Max Tension	9	1.33	0.00	0.00
			Max. Compression	9	-1.53	0.00	0.00
			Max. Mx	28	0.13	-0.02	0.00
			Max. My	17	-0.90	-0.01	0.00
			Max. Vy	28	0.01	-0.02	0.00
			Max. Vx	17	-0.00	0.00	0.00
		Top Girt	Max Tension	30	0.77	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.46	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Bottom Girt	Max Tension	26	0.77	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.43	0.00	0.00
			Max. My	12	0.45	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Mid Girt	Max Tension	30	0.68	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.33	0.00	0.00
			Max. My	12	0.38	0.00	0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	8.42		
			Top Tension	27	8.47		
			Top Cable Vert	27	4.07		
			Top Cable Norm	27	7.43		
			Top Cable Tan	27	0.00		
			Bot Cable Vert	27	-3.91		
			Bot Cable Norm	27	7.46		
			Bot Cable Tan	27	0.00		
		Guy B	Bottom Tension	33	8.23		
			Top Tension	33	8.28		
			Top Cable Vert	33	3.40		
			Top Cable Norm	33	7.54		
			Top Cable Tan	33	0.01		
			Bot Cable Vert	33	-3.25		
			Bot Cable Norm	33	7.56		
			Bot Cable Tan	33	0.02		
		Guy C	Bottom Tension	22	8.02		
			Top Tension	22	8.06		
			Top Cable Vert	22	2.92		
			Top Cable Norm	22	7.51		
			Top Cable Tan	22	0.00		
			Bot Cable Vert	22	-2.79		
			Bot Cable Norm	22	7.52		
			Bot Cable Tan	22	0.00		
		Top Guy Pull-Off	Max Tension	30	3.89	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	1.87	0.01	0.00
			Max. My	12	2.17	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-52.27	0.46	0.04
			Max. Mx	29	-50.56	-0.53	-0.00
			Max. My	29	-44.34	-0.22	0.47
			Max. Vy	23	-0.90	0.02	-0.18
			Max. Vx	34	0.86	-0.17	0.08
		Diagonal	Max Tension	15	0.88	0.00	0.00
			Max. Compression	23	-1.83	0.00	0.00
			Max. Mx	25	0.22	0.00	0.00
			Max. My	19	-0.76	0.00	0.00
			Max. Vy	25	-0.00	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	34	0.85	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	32	0.49	0.01	0.00
			Max. My	12	0.41	0.00	0.00
			Max. Vy	32	-0.01	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Top Girt	Max Tension	23	0.45	0.00	0.00
			Max. Compression	15	-0.28	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	22	0.18	0.00	0.00
			Max. My	12	0.35	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Bottom Girt	Max Tension	30	0.39	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.27	0.00	0.00
			Max. My	12	0.37	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
T9	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-52.21	-0.42	-0.05
			Max. Mx	31	-44.24	1.84	0.99
			Max. My	28	-44.73	-0.02	-2.12
			Max. Vy	31	-6.80	1.84	0.99
			Max. Vx	26	7.65	-0.09	-2.11
		Diagonal	Max Tension	3	2.31	0.00	0.00
			Max. Compression	12	-2.97	0.00	0.00
			Max. Mx	25	1.93	0.00	0.00
			Max. My	19	-0.23	0.00	0.00
			Max. Vy	25	-0.00	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Horizontal	Max Tension	26	0.83	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.45	0.01	0.00
			Max. My	3	0.16	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Top Girt	Max Tension	28	0.48	0.00	0.00
			Max. Compression	13	-0.04	0.00	0.00
			Max. Mx	22	0.19	0.00	0.00
			Max. My	12	-0.02	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Bottom Girt	Max Tension	28	4.12	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	3.37	0.00	0.00
			Max. My	34	4.01	0.00	-0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
T10	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-48.26	0.12	-0.01
			Max. Mx	28	-44.39	2.12	-0.02
			Max. My	13	-34.43	-0.30	-0.30
			Max. Vy	29	9.69	-0.52	-0.00
			Max. Vx	5	0.84	-0.80	-0.23
		Top Girt	Max Tension	26	6.41	-0.07	-0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	5.20	-0.23	-0.00
			Max. My	3	3.83	-0.20	-0.00
			Max. Vy	25	0.09	-0.23	-0.00
			Max. Vx	3	0.00	-0.20	-0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-3.79	-0.48	-0.00
			Max. Mx	12	-2.88	-0.56	-0.00
			Max. My	5	-2.73	-0.50	-0.00
			Max. Vy	3	3.65	-0.55	-0.00
			Max. Vx	4	0.05	-0.53	-0.00
		Mid Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-0.22	0.00	0.00
			Max. Mx	22	-0.16	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	34	-0.16	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	28	121.95	0.97	-1.60
	Max. H_x	14	91.99	2.26	-0.13
	Max. H_z	2	92.81	-0.02	2.34
	Max. M_x	1	0.00	-0.01	0.01
	Max. M_z	1	0.00	-0.01	0.01
	Max. Torsion	4	0.36	-1.49	1.64
	Min. Vert	1	79.85	-0.01	0.01
	Min. H_x	6	90.91	-2.29	-0.11
	Min. H_z	10	88.24	-0.01	-2.15
	Min. M_x	1	0.00	-0.01	0.01
	Min. M_z	1	0.00	-0.01	0.01
	Min. Torsion	11	-0.39	1.23	-1.90
Guy C @ 107 ft Elev 10 ft Azimuth 240 deg	Max. Vert	13	-1.19	-0.73	0.42
	Max. H_x	13	-1.19	-0.73	0.42
	Max. H_z	21	-43.31	-38.38	22.50
	Min. Vert	22	-43.69	-38.82	22.42
	Min. H_x	22	-43.69	-38.82	22.42
	Min. H_z	13	-1.19	-0.73	0.42
Guy B @ 106 ft Elev 4 ft Azimuth 120 deg	Max. Vert	7	-1.62	0.95	0.54
	Max. H_x	32	-45.98	38.44	22.20
	Max. H_z	33	-45.68	38.08	22.34
	Min. Vert	32	-45.98	38.44	22.20
	Min. H_x	7	-1.62	0.95	0.54
	Min. H_z	7	-1.62	0.95	0.54
Guy A @ 106 ft Elev -6 ft Azimuth 0 deg	Max. Vert	2	-2.30	0.00	-1.46
	Max. H_x	31	-27.05	1.40	-23.33
	Max. H_z	2	-2.30	0.00	-1.46
	Min. Vert	27	-49.50	0.00	-43.90
	Min. H_x	23	-27.48	-1.40	-23.70
	Min. H_z	27	-49.50	0.00	-43.90

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	79.85	0.01	-0.01	0.00	0.00	-0.01
Dead+Wind 0 deg - No	92.81	0.02	-2.34	0.00	0.00	-0.31

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice+Guy Dead+Wind 30 deg - No Ice+Guy	90.87	1.06	-2.02	0.00	0.00	-0.36
Dead+Wind 45 deg - No Ice+Guy	88.90	1.49	-1.64	0.00	0.00	-0.36
Dead+Wind 60 deg - No Ice+Guy	87.63	1.87	-1.08	0.00	0.00	-0.35
Dead+Wind 90 deg - No Ice+Guy	90.91	2.29	0.11	0.00	0.00	-0.26
Dead+Wind 120 deg - No Ice+Guy	93.92	2.04	1.17	0.00	0.00	-0.07
Dead+Wind 135 deg - No Ice+Guy	94.13	1.70	1.59	0.00	0.00	0.04
Dead+Wind 150 deg - No Ice+Guy	92.60	1.25	1.91	0.00	0.00	0.15
Dead+Wind 180 deg - No Ice+Guy	88.24	0.01	2.15	0.00	0.00	0.32
Dead+Wind 210 deg - No Ice+Guy	93.36	-1.23	1.90	0.00	0.00	0.39
Dead+Wind 225 deg - No Ice+Guy	95.41	-1.67	1.58	0.00	0.00	0.39
Dead+Wind 240 deg - No Ice+Guy	95.39	-2.01	1.17	0.00	0.00	0.37
Dead+Wind 270 deg - No Ice+Guy	91.99	-2.26	0.13	0.00	0.00	0.24
Dead+Wind 300 deg - No Ice+Guy	87.90	-1.84	-1.06	0.00	0.00	0.01
Dead+Wind 315 deg - No Ice+Guy	89.25	-1.45	-1.63	0.00	0.00	-0.10
Dead+Wind 330 deg - No Ice+Guy	91.29	-1.02	-2.01	0.00	0.00	-0.19
Dead+Ice+Temp+Guy	105.74	0.01	0.00	0.00	0.00	-0.01
Dead+Wind 0 deg+Ice+Temp+Guy	119.67	0.03	-1.95	0.00	0.00	-0.11
Dead+Wind 30 deg+Ice+Temp+Guy	120.28	0.93	-1.65	0.00	0.00	-0.04
Dead+Wind 45 deg+Ice+Temp+Guy	119.86	1.30	-1.33	0.00	0.00	-0.04
Dead+Wind 60 deg+Ice+Temp+Guy	119.47	1.61	-0.91	0.00	0.00	-0.06
Dead+Wind 90 deg+Ice+Temp+Guy	120.16	1.91	0.04	0.00	0.00	-0.08
Dead+Wind 120 deg+Ice+Temp+Guy	119.93	1.73	0.98	0.00	0.00	0.02
Dead+Wind 135 deg+Ice+Temp+Guy	121.13	1.41	1.33	0.00	0.00	0.10
Dead+Wind 150 deg+Ice+Temp+Guy	121.51	0.99	1.59	0.00	0.00	0.13
Dead+Wind 180 deg+Ice+Temp+Guy	120.33	0.01	1.81	0.00	0.00	0.11
Dead+Wind 210 deg+Ice+Temp+Guy	121.95	-0.97	1.60	0.00	0.00	0.04
Dead+Wind 225 deg+Ice+Temp+Guy	121.85	-1.38	1.34	0.00	0.00	0.04
Dead+Wind 240 deg+Ice+Temp+Guy	120.62	-1.71	1.00	0.00	0.00	0.07
Dead+Wind 270 deg+Ice+Temp+Guy	120.97	-1.87	0.06	0.00	0.00	0.06
Dead+Wind 300 deg+Ice+Temp+Guy	119.89	-1.56	-0.89	0.00	0.00	-0.07
Dead+Wind 315	120.28	-1.25	-1.31	0.00	0.00	-0.13

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
deg+Ice+Temp+Guy Dead+Wind 330	120.70	-0.88	-1.63	0.00	0.00	-0.16
deg+Ice+Temp+Guy Dead+Wind 0 deg - Service+Guy	80.66	0.01	-0.87	0.00	0.00	-0.13
Dead+Wind 30 deg - Service+Guy	80.66	0.43	-0.75	0.00	0.00	-0.15
Dead+Wind 45 deg - Service+Guy	80.65	0.60	-0.60	0.00	0.00	-0.15
Dead+Wind 60 deg - Service+Guy	80.62	0.74	-0.43	0.00	0.00	-0.14
Dead+Wind 90 deg - Service+Guy	80.47	0.86	0.00	0.00	0.00	-0.10
Dead+Wind 120 deg - Service+Guy	80.39	0.77	0.43	0.00	0.00	-0.02
Dead+Wind 135 deg - Service+Guy	80.29	0.64	0.61	0.00	0.00	0.03
Dead+Wind 150 deg - Service+Guy	80.20	0.45	0.73	0.00	0.00	0.07
Dead+Wind 180 deg - Service+Guy	80.14	0.01	0.84	0.00	0.00	0.12
Dead+Wind 210 deg - Service+Guy	80.17	-0.43	0.74	0.00	0.00	0.14
Dead+Wind 225 deg - Service+Guy	80.27	-0.62	0.61	0.00	0.00	0.13
Dead+Wind 240 deg - Service+Guy	80.36	-0.75	0.44	0.00	0.00	0.13
Dead+Wind 270 deg - Service+Guy	80.39	-0.84	0.01	0.00	0.00	0.08
Dead+Wind 300 deg - Service+Guy	80.52	-0.71	-0.42	0.00	0.00	0.00
Dead+Wind 315 deg - Service+Guy	80.57	-0.58	-0.60	0.00	0.00	-0.04
Dead+Wind 330 deg - Service+Guy	80.60	-0.40	-0.74	0.00	0.00	-0.08

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	-23.42	0.00	-0.00	23.41	0.01	0.024%
2	0.07	-23.51	-35.33	-0.07	23.50	35.30	0.073%
3	17.64	-23.39	-30.37	-17.64	23.39	30.35	0.046%
4	24.80	-23.31	-24.73	-24.80	23.31	24.72	0.029%
5	30.24	-23.28	-17.47	-30.23	23.28	17.47	0.038%
6	34.90	-23.41	-0.04	-34.89	23.40	0.04	0.036%
7	30.48	-23.54	17.66	-30.46	23.53	-17.65	0.063%
8	24.81	-23.51	24.91	-24.79	23.50	-24.89	0.059%
9	17.51	-23.43	30.57	-17.49	23.43	-30.56	0.045%
10	-0.07	-23.33	35.27	0.07	23.32	-35.25	0.040%
11	-17.64	-23.44	30.64	17.62	23.44	-30.62	0.054%
12	-24.92	-23.52	25.00	24.89	23.52	-24.99	0.072%
13	-30.55	-23.55	17.79	30.52	23.55	-17.77	0.080%
14	-34.90	-23.43	0.12	34.88	23.42	-0.11	0.047%
15	-30.17	-23.30	-17.35	30.15	23.30	17.34	0.055%
16	-24.70	-23.33	-24.63	24.70	23.32	24.62	0.034%
17	-17.51	-23.40	-30.30	17.51	23.40	30.28	0.051%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
18	0.00	-44.78	0.00	-0.01	44.78	0.03	0.062%
19	0.04	-44.96	-35.99	-0.04	44.96	35.97	0.040%
20	17.96	-44.73	-30.98	-17.96	44.73	30.97	0.028%
21	25.28	-44.57	-25.24	-25.29	44.57	25.23	0.029%
22	30.86	-44.51	-17.84	-30.82	44.50	17.83	0.068%
23	35.60	-44.76	-0.02	-35.59	44.76	0.03	0.023%
24	31.04	-45.02	18.00	-31.02	45.02	-17.99	0.037%
25	25.31	-44.96	25.41	-25.29	44.96	-25.40	0.036%
26	17.87	-44.81	31.16	-17.86	44.81	-31.16	0.029%
27	-0.04	-44.60	35.96	0.04	44.60	-35.92	0.066%
28	-17.95	-44.83	31.19	17.93	44.83	-31.18	0.034%
29	-25.37	-44.99	25.46	25.35	44.99	-25.44	0.044%
30	-31.08	-45.06	18.08	31.06	45.05	-18.06	0.047%
31	-35.60	-44.80	0.08	35.59	44.80	-0.07	0.030%
32	-30.82	-44.54	-17.77	30.80	44.54	17.77	0.038%
33	-25.22	-44.60	-25.19	25.22	44.60	25.17	0.034%
34	-17.88	-44.75	-30.95	17.88	44.75	30.94	0.031%
35	0.03	-23.45	-13.80	-0.03	23.45	13.79	0.028%
36	6.89	-23.41	-11.86	-6.89	23.41	11.85	0.033%
37	9.69	-23.38	-9.66	-9.68	23.38	9.65	0.047%
38	11.81	-23.36	-6.83	-11.81	23.36	6.82	0.034%
39	13.63	-23.41	-0.01	-13.63	23.41	0.02	0.021%
40	11.91	-23.46	6.90	-11.90	23.46	-6.90	0.025%
41	9.69	-23.45	9.73	-9.69	23.45	-9.73	0.021%
42	6.84	-23.42	11.94	-6.83	23.42	-11.94	0.028%
43	-0.03	-23.38	13.78	0.03	23.38	-13.76	0.062%
44	-6.89	-23.43	11.97	6.88	23.43	-11.96	0.034%
45	-9.73	-23.46	9.77	9.73	23.46	-9.76	0.028%
46	-11.93	-23.47	6.95	11.93	23.47	-6.94	0.035%
47	-13.63	-23.42	0.05	13.63	23.42	-0.04	0.028%
48	-11.79	-23.37	-6.78	11.78	23.37	6.77	0.043%
49	-9.65	-23.38	-9.62	9.64	23.38	9.61	0.055%
50	-6.84	-23.41	-11.84	6.84	23.41	11.83	0.038%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	9	0.00000001	0.00017652
2	Yes	15	0.00141941	0.00128968
3	Yes	15	0.00111184	0.00095972
4	Yes	15	0.00082282	0.00065295
5	Yes	11	0.00083778	0.00069646
6	Yes	16	0.00087993	0.00075684
7	Yes	16	0.00116769	0.00108122
8	Yes	16	0.00108889	0.00103318
9	Yes	16	0.00092305	0.00087580
10	Yes	12	0.00075223	0.00077467
11	Yes	16	0.00107981	0.00100206
12	Yes	16	0.00128894	0.00120270
13	Yes	16	0.00139959	0.00128156
14	Yes	16	0.00106008	0.00092985
15	Yes	11	0.00107960	0.00096675
16	Yes	15	0.00089873	0.00075657
17	Yes	15	0.00114588	0.00103193
18	Yes	6	0.00139955	0.00020051

19	Yes	15	0.00137621	0.00095645
20	Yes	15	0.00109316	0.00072655
21	Yes	14	0.00120375	0.00073459
22	Yes	10	0.00125520	0.00100245
23	Yes	16	0.00094504	0.00062235
24	Yes	16	0.00121878	0.00085982
25	Yes	16	0.00115038	0.00084594
26	Yes	16	0.00097502	0.00072157
27	Yes	11	0.00124845	0.00104396
28	Yes	16	0.00113508	0.00082494
29	Yes	16	0.00136161	0.00098699
30	Yes	16	0.00147630	0.00102528
31	Yes	16	0.00113320	0.00076703
32	Yes	11	0.00080690	0.00063801
33	Yes	14	0.00132457	0.00085372
34	Yes	15	0.00113251	0.00078695
35	Yes	11	0.00094976	0.00039170
36	Yes	10	0.00106477	0.00040840
37	Yes	9	0.00124151	0.00045348
38	Yes	9	0.00078930	0.00032040
39	Yes	11	0.00072358	0.00029236
40	Yes	12	0.00089217	0.00038321
41	Yes	12	0.00071889	0.00032400
42	Yes	11	0.00086590	0.00039525
43	Yes	9	0.00124867	0.00055458
44	Yes	11	0.00106009	0.00047940
45	Yes	12	0.00096786	0.00043139
46	Yes	12	0.00123897	0.00053274
47	Yes	11	0.00096262	0.00040220
48	Yes	9	0.00096409	0.00040237
49	Yes	9	0.00138961	0.00053140
50	Yes	10	0.00114004	0.00045658

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 155	2.084	43	0.1516	0.0775
T2	155 - 140	1.636	43	0.1196	0.0492
T3	140 - 120	1.402	43	0.0211	0.0299
T4	120 - 100	1.573	43	0.0858	0.0326
T5	100 - 80	1.742	43	0.0255	0.0521
T6	80 - 60	1.743	46	0.0280	0.0657
T7	60 - 40	1.574	46	0.0694	0.0748
T8	40 - 20	1.255	46	0.0907	0.0787
T9	20 - 5	0.763	46	0.1512	0.0830
T10	5 - 0	0.200	46	0.1845	0.0863

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	DS4C03F36U-D	43	2.084	0.1516	0.0775	34641
168.00	Tower Top Amplifier	43	2.020	0.1509	0.0735	34641

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.00	2' Dish	43	1.988	0.1503	0.0716	34641
163.00	APX16DWV-16DWVS-E-A20	43	1.862	0.1464	0.0638	24744
152.33	Guy	43	1.572	0.1023	0.0448	10057
145.60	VHLP2-180	43	1.450	0.0511	0.0353	7519
141.50	(3) DB844H90E-XY	43	1.409	0.0267	0.0311	6603
132.44	Guy	43	1.424	0.0289	0.0275	10641
120.00	7770.00	43	1.573	0.0858	0.0326	41151
90.00	Guy	45	1.758	0.0087	0.0599	21500
50.00	Guy	46	1.431	0.0764	0.0748	36370
30.00	(2) GPS	46	1.042	0.1195	0.0810	18047

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 155	6.782	27	0.4653	0.2426
T2	155 - 140	5.313	27	0.3940	0.1705
T3	140 - 120	4.597	12	0.1407	0.1279
T4	120 - 100	5.655	12	0.3581	0.1342
T5	100 - 80	6.876	13	0.1696	0.1757
T6	80 - 60	7.240	13	0.0672	0.2043
T7	60 - 40	6.693	13	0.2319	0.2209
T8	40 - 20	5.337	13	0.4116	0.2200
T9	20 - 5	3.124	13	0.6413	0.1976
T10	5 - 0	0.809	13	0.7516	0.1784

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	DS4C03F36U-D	27	6.782	0.4653	0.2426	14055
168.00	Tower Top Amplifier	27	6.576	0.4645	0.2330	14055
167.00	2' Dish	27	6.473	0.4638	0.2282	14055
163.00	APX16DWV-16DWVS-E-A20	27	6.068	0.4564	0.2089	10039
152.33	Guy	27	5.088	0.3521	0.1577	3843
145.60	VHLP2-180	28	4.649	0.2277	0.1384	2644
141.50	(3) DB844H90E-XY	12	4.579	0.1600	0.1301	2284
132.44	Guy	12	4.863	0.2142	0.1230	3438
120.00	7770.00	12	5.655	0.3581	0.1342	24888
90.00	Guy	13	7.178	0.0559	0.1916	4999
50.00	Guy	13	6.113	0.3246	0.2218	6157
30.00	(2) GPS	13	4.359	0.5281	0.2160	4674

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	Leg	A325N	0.7500	4	0.12	19.44	0.006 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.49	2.52	0.987 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.02	2.52	0.006 ✔	1.333	Member Bearing
T2	155	Leg	A325N	0.7500	4	3.73	19.41	0.192 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.87	2.52	1.137 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.19	2.52	0.077 ✔	1.333	Member Bearing
		Top Guy Pull-Off@152.333	A325N	0.7500	1	2.78	6.12	0.454 ✔	1.333	Member Bearing
		Torque Arm Top@152.333	A325N	0.7500	8	0.44	9.28	0.047 ✔	1.333	Bolt Shear
T3	140	Leg	A325N	0.7500	4	4.69	19.40	0.242 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	4.59	6.44	0.712 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	0.91	3.40	0.268 ✔	1.333	Member Bearing
		Torque Arm Top@132.438	A325N	0.7500	8	1.48	9.28	0.160 ✔	1.333	Bolt Shear
T4	120	Leg	A325N	0.7500	4	0.00	19.41	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.34	2.52	0.530 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.77	2.52	0.305 ✔	1.333	Member Bearing
T5	100	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.10	2.52	0.436 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.43	2.52	0.172 ✔	1.333	Member Bearing
T6	80	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.54	4.04	0.381 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.20	2.52	0.080 ✔	1.333	Member Bearing
T7	60	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.33	2.52	0.527 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.77	2.52	0.304 ✔	1.333	Member Bearing
T8	40	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.83	4.04	0.453 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.45	2.52	0.179 ✔	1.333	Member Bearing
T9	20	Leg	A325N	0.7500	4	0.00	19.44	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.31	2.52	0.914 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	0.48	2.52	0.190 ✔	1.333	Member Bearing
T10	5	Leg	A325N	0.7500	4	0.00	18.89	0.000 ✔	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.
T2	152.33 (A) (567)	1/2 EHS	2.69	26.90	7.24	13.45	2.000	3.715 ✔
	152.33 (A) (568)	1/2 EHS	2.69	26.90	7.22	13.45	2.000	3.726 ✔
	152.33 (B) (563)	1/2 EHS	2.69	26.90	6.92	13.45	2.000	3.887 ✔
	152.33 (B) (564)	1/2 EHS	2.69	26.90	7.01	13.45	2.000	3.835 ✔
	152.33 (C) (556)	1/2 EHS	2.69	26.90	6.97	13.45	2.000	3.860 ✔
	152.33 (C) (557)	1/2 EHS	2.69	26.90	6.90	13.45	2.000	3.899 ✔
T3	132.44 (A) (579)	7/8 EHS	7.97	79.70	18.80	39.85	2.000	4.239 ✔
	132.44 (A) (580)	7/8 EHS	7.97	79.70	18.80	39.85	2.000	4.240 ✔
	132.44 (B) (575)	7/8 EHS	7.97	79.70	18.05	39.85	2.000	4.416 ✔
	132.44 (B) (576)	7/8 EHS	7.97	79.70	18.28	39.85	2.000	4.359 ✔
	132.44 (C) (571)	7/8 EHS	7.97	79.70	17.82	39.85	2.000	4.472 ✔
	132.44 (C) (572)	7/8 EHS	7.97	79.70	17.64	39.85	2.000	4.519 ✔
T5	90.00 (A) (588)	7/16 EHS	2.08	20.80	7.57	10.40	2.000	2.748 ✔
	90.00 (B) (587)	7/16 EHS	2.08	20.80	7.43	10.40	2.000	2.798 ✔
	90.00 (C) (583)	7/16 EHS	2.08	20.80	7.25	10.40	2.000	2.871 ✔
T7	50.00 (A) (594)	7/16 EHS	2.08	20.80	8.47	10.40	2.000	2.455 ✔
	50.00 (B) (593)	7/16 EHS	2.08	20.80	8.28	10.40	2.000	2.514 ✔
	50.00 (C) (589)	7/16 EHS	2.08	20.80	8.06	10.40	2.000	2.580 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 2 STD	15.00	2.42	36.8 K=1.00	1.00	26.267	1.0745	-16.59	28.22	0.588 ✔
T2	155 - 140	ROHN 2 STD	15.00	2.42	36.8 K=1.00	1.00	26.267	1.0745	-37.06	28.22	1.313 ✔
T3	140 - 120	ROHN 2.0 Std. w/ 1" SR	20.00	2.44	47.8 K=1.00	1.00	24.690	1.8050	-56.05	44.57	1.258 ✔
T4	120 - 100	ROHN 2 STD	20.00	2.44	37.2 K=1.00	1.00	26.224	1.0745	-37.26	28.18	1.322 ✔
T5	100 - 80	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	1.00	27.044	1.7040	-45.84	46.08	0.995 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	80 - 60	ROHN 2.0 Std. w/ 1/3 HSS3.5x.3	20.00	2.44	36.7 K=1.00	1.00	26.282	2.0798	-46.77	54.66	0.856 ✔
T7	60 - 40	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	0.98	26.530	1.7040	-48.93	45.21	1.082 ✔
T8	40 - 20	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	0.98	26.555	1.7040	-52.27	45.25	1.155 ✔
T9	20 - 5	ROHN 2.5 STD	15.00	2.42	30.6 K=1.00	0.98	26.557	1.7040	-52.21	45.25	1.154 ✔
T10	5 - 0	ROHN 2.5 STD	5.38	2.42	30.6 K=1.00	0.97	26.289	1.7040	-37.86	44.80	0.845* ✔

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN TS1.5x16 ga	4.19	1.97	46.4 K=1.00	18.663	0.2627	-2.54	4.90	0.518 ✔
T2	155 - 140	ROHN TS1.5x16 ga	4.19	1.97	46.4 K=1.00	18.663	0.2627	-3.31	4.90	0.674 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	4.20	1.81	77.6 K=1.22	15.615	0.8125	-4.59	12.69	0.362 ✔
T4	120 - 100	ROHN TS1.5x16 ga	4.20	1.98	46.5 K=1.00	18.651	0.2627	-1.81	4.90	0.370 ✔
T5	100 - 80	ROHN TS1.5x16 ga	4.20	1.95	45.9 K=1.00	18.703	0.2627	-1.34	4.91	0.273 ✔
T6	80 - 60	ROHN TS1.5x16 ga	4.20	1.96	46.2 K=1.00	18.682	0.2627	-1.54	4.91	0.314 ✔
T7	60 - 40	ROHN TS1.5x16 ga	4.20	1.95	45.9 K=1.00	18.703	0.2627	-1.53	4.91	0.311 ✔
T8	40 - 20	ROHN TS1.5x16 ga	4.20	3.91	91.9 K=1.00	13.983	0.2627	-1.83	3.67	0.498 ✔
T9	20 - 5	ROHN TS1.5x16 ga	4.19	3.89	91.6 K=1.00	14.015	0.2627	-2.97	3.68	0.806 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140	1	3.42	3.22	108.3 K=0.70	12.741	0.7854	-1.11	10.01	0.111 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	3.42	3.14	95.6	13.526	0.8125	-3.15	10.99	0.286

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=1.34					✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN TS1.5x16 ga	3.42	3.22	75.8 K=1.00	15.818	0.2627	-0.03	4.16	0.006 ✔
T2	155 - 140	ROHN TS1.5x16 ga	3.42	3.22	75.8 K=1.00	15.818	0.2627	-0.18	4.16	0.044 ✔
T3	140 - 120	L1 1/2x1 1/2x1/8	3.42	2.90	118.7 K=1.01	10.465	0.3594	-0.85	3.76	0.227 ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	15.924	0.2627	-0.28	4.18	0.068 ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	15.924	0.2627	-0.04	4.18	0.009 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN TS1.5x16 ga	3.42	3.22	75.8 K=1.00	15.818	0.2627	-0.61	4.16	0.146 ✔
T2	155 - 140	ROHN TS1.5x16 ga	3.42	3.22	75.8 K=1.00	15.818	0.2627	-0.48	4.16	0.117 ✔
T3	140 - 120	L1 3/4x1 3/4x1/8	3.42	3.14	114.3 K=1.05	11.086	0.4219	-0.86	4.68	0.184 ✔
T10	5 - 0	3x1/4	0.17	0.00	0.0 K=1.00	21.600	0.7500	-3.22	16.20	0.199* ✔

* DL controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	5 - 0	3x1/4	1.71	1.47	244.5 K=1.00	2.498	0.7500	-0.22	1.87	0.119 ✔
		KL/R > 200 (C) - 553								

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140	L2x3x3/16	3.42	3.22	88.1 K=1.00	14.113	0.9020	-2.36	12.73	0.186
T5	100 - 80	4x3/8	3.42	3.18	352.6 K=1.00	21.600	1.5000	0.00	1.80	0.000*
T7	60 - 40	4x3/8	3.42	3.18	352.6 K=1.00	21.600	1.5000	0.00	1.80	0.000*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140	L2x3x3/16	-0.00	-0.045	20.869	0.002	-0.00	-0.197	20.869	0.009
T5	100 - 80	4x3/8	0.01	-0.125	27.000	0.005	0.00	0.000	27.000	0.000
T7	60 - 40	4x3/8	0.01	-0.125	27.000	0.005	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140	L2x3x3/16	0.186	0.002	0.009	0.197 ✔	1.333	H1-3 ✔
T5	100 - 80	4x3/8	0.000	0.005	0.000	0.005* ✔	1.000	H1-3 ✔
T7	60 - 40	4x3/8	0.000	0.005	0.000	0.005* ✔	1.000	H1-3 ✔

* DL controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140 (558)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-0.39	74.90	0.005
T2	155 - 140 (559)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-0.36	74.90	0.005
T2	155 - 140 (565)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-0.26	74.90	0.004
T2	155 - 140 (566)	C12x20.7	3.50	3.40	105.3	12.299	6.0900	-0.31	74.90	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140 (569)	C12x20.7	3.50	3.40	K=1.00 105.3	12.299	6.0900	-0.33	74.90	0.004
T2	155 - 140 (570)	C12x20.7	3.50	3.40	K=1.00 105.3	12.299	6.0900	-0.35	74.90	0.005
T3	140 - 120 (573)	C12x20.7	3.50	3.36	K=1.00 104.2	12.438	6.0900	-3.21	75.75	0.042
T3	140 - 120 (574)	C12x20.7	3.50	3.36	K=1.00 104.2	12.438	6.0900	-3.57	75.75	0.047
T3	140 - 120 (577)	C12x20.7	3.50	3.36	K=1.00 104.2	12.438	6.0900	-3.26	75.75	0.043
T3	140 - 120 (578)	C12x20.7	3.50	3.36	K=1.00 104.2	12.438	6.0900	-3.09	75.75	0.041
T3	140 - 120 (581)	C12x20.7	3.50	3.36	K=1.00 104.2	12.438	6.0900	-3.30	75.75	0.044
T3	140 - 120 (582)	C12x20.7	3.50	3.36	K=1.00 104.2	12.438	6.0900	-3.49	75.75	0.046
					K=1.00					

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140 (558)	C12x20.7	-19.79	-11.048	21.600	0.511	-0.00	-0.000	21.600	0.000
T2	155 - 140 (559)	C12x20.7	-21.27	-11.870	21.600	0.550	0.00	0.000	21.600	0.000
T2	155 - 140 (565)	C12x20.7	-20.16	-11.254	21.600	0.521	0.00	-0.000	21.600	0.000
T2	155 - 140 (566)	C12x20.7	-19.83	-11.067	21.600	0.512	-0.00	-0.000	21.600	0.000
T2	155 - 140 (569)	C12x20.7	-20.13	-11.233	21.600	0.520	0.00	-0.000	21.600	0.000
T2	155 - 140 (570)	C12x20.7	-21.26	-11.868	21.600	0.549	0.00	0.000	21.600	0.000
T3	140 - 120 (573)	C12x20.7	-44.08	-24.602	21.600	1.139	0.00	-0.000	21.600	0.000
T3	140 - 120 (574)	C12x20.7	-48.95	-27.322	21.600	1.265	-0.00	-0.000	21.600	0.000
T3	140 - 120 (577)	C12x20.7	-45.86	-25.599	21.600	1.185	0.00	-0.000	21.600	0.000
T3	140 - 120 (578)	C12x20.7	-44.00	-24.558	21.600	1.137	-0.00	-0.000	21.600	0.000
T3	140 - 120 (581)	C12x20.7	-46.00	-25.676	21.600	1.189	-0.00	-0.000	21.600	0.000
T3	140 - 120 (582)	C12x20.7	-49.01	-27.353	21.600	1.266	0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140 (558)	C12x20.7	0.005	0.511	0.000	0.517 ✔	1.333	H1-3 ✔
T2	155 - 140 (559)	C12x20.7	0.005	0.550	0.000	0.554 ✔	1.333	H1-3 ✔
T2	155 - 140 (565)	C12x20.7	0.004	0.521	0.000	0.524 ✔	1.333	H1-3 ✔
T2	155 - 140 (566)	C12x20.7	0.004	0.512	0.000	0.516 ✔	1.333	H1-3 ✔
T2	155 - 140 (569)	C12x20.7	0.004	0.520	0.000	0.525 ✔	1.333	H1-3 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140 (570)	C12x20.7	0.005	0.549	0.000	0.554 ✔	1.333	H1-3 ✔
T3	140 - 120 (573)	C12x20.7	0.042	1.139	0.000	1.181 ✔	1.333	H1-3 ✔
T3	140 - 120 (574)	C12x20.7	0.047	1.265	0.000	1.312 ✔	1.333	H1-3 ✔
T3	140 - 120 (577)	C12x20.7	0.043	1.185	0.000	1.228 ✔	1.333	H1-3 ✔
T3	140 - 120 (578)	C12x20.7	0.041	1.137	0.000	1.178 ✔	1.333	H1-3 ✔
T3	140 - 120 (581)	C12x20.7	0.044	1.189	0.000	1.232 ✔	1.333	H1-3 ✔
T3	140 - 120 (582)	C12x20.7	0.046	1.266	0.000	1.312 ✔	1.333	H1-3 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 2 STD	15.00	2.42	36.8	30.000	1.0745	14.91	32.24	0.463 ✔
T2	155 - 140	ROHN 2 STD	15.00	2.42	36.8	30.000	1.0745	18.76	32.24	0.582 ✔
T3	140 - 120	ROHN 2.0 Std. w/ 1" SR	20.00	2.44	47.8	30.000	1.8050	32.69	54.15	0.604 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN TS1.5x16 ga	4.19	1.97	46.4	21.600	0.2627	2.49	5.68	0.439 ✔
T2	155 - 140	ROHN TS1.5x16 ga	4.19	1.97	46.4	21.600	0.2627	2.87	5.68	0.505 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	4.20	1.81	43.7	29.000	0.4688	4.19	13.59	0.308 ✔
T4	120 - 100	ROHN TS1.5x16 ga	4.20	1.98	46.5	21.600	0.2627	1.34	5.68	0.236 ✔
T5	100 - 80	ROHN TS1.5x16 ga	4.20	1.95	45.9	21.600	0.2627	1.10	5.68	0.194 ✔
T6	80 - 60	ROHN TS1.5x16 ga	4.20	1.96	46.2	21.600	0.2627	0.53	5.68	0.094

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	60 - 40	ROHN TS1.5x16 ga	4.20	1.95	45.9	21.600	0.2627	1.33	5.68	0.234 ✔
T8	40 - 20	ROHN TS1.5x16 ga	4.20	3.91	91.9	21.600	0.2627	0.88	5.68	0.154 ✔
T9	20 - 5	ROHN TS1.5x16 ga	4.19	3.89	91.6	21.600	0.2627	2.31	5.68	0.406 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T8	40 - 20	1	3.42	3.18	152.7	30.000	0.7854	0.85	23.56	0.036 ✔
T9	20 - 5	1	3.42	3.18	152.7	30.000	0.7854	0.83	23.56	0.035 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140	1	3.42	3.22	154.7	30.000	0.7854	1.42	23.56	0.060 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	3.42	3.14	71.2	21.600	0.8125	4.05	17.55	0.231 ✔
T6	80 - 60	L2x2x3/16	3.42	3.20	62.2	21.600	0.7150	1.05	15.44	0.068 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN TS1.5x16 ga	3.42	3.22	75.8	21.600	0.2627	0.02	5.68	0.003 ✔
T2	155 - 140	ROHN TS1.5x16 ga	3.42	3.22	75.8	21.600	0.2627	0.19	5.68	0.034 ✔
T3	140 - 120	L1 1/2x1 1/2x1/8	3.42	2.90	81.0	29.000	0.1992	0.91	5.78	0.158 ✔
T4	120 - 100	ROHN TS1.5x16 ga	3.42	3.22	75.8	21.600	0.2627	0.77	5.68	0.136 ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.43	5.68	0.076

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	80 - 60	ROHN TS1.5x16 ga	3.42	3.20	75.2	21.600	0.2627	0.20	5.68	0.036 ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.77	5.68	0.135 ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.45	5.68	0.080 ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.48	5.68	0.084 ✔
T10	5 - 0	3x1/4	3.25	3.01	500.4	21.600	0.7500	5.03	16.20	0.310* ✔
		L/R > 500 (T) - 549								

* DL controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN TS1.5x16 ga	3.42	3.22	75.8	21.600	0.2627	0.67	5.68	0.118 ✔
T2	155 - 140	ROHN TS1.5x16 ga	3.42	3.22	75.8	21.600	0.2627	0.74	5.68	0.131 ✔
T3	140 - 120	L1 3/4x1 3/4x1/8	3.42	3.14	69.0	21.600	0.4219	1.53	9.11	0.167 ✔
T4	120 - 100	ROHN TS1.5x16 ga	3.42	3.22	75.8	21.600	0.2627	0.45	5.68	0.079 ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.74	5.68	0.131 ✔
T6	80 - 60	ROHN TS1.5x16 ga	3.42	3.20	75.2	21.600	0.2627	0.23	5.68	0.040 ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.77	5.68	0.135 ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	0.39	5.68	0.069 ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	74.8	21.600	0.2627	3.13	5.68	0.552* ✔

* DL controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	74.8	30.000	0.2627	0.53	7.88	0.067

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	74.8	30.000	0.2627	0.68	7.88	0.086

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140	L2x3x3/16	3.42	3.22	66.3	29.000	0.5535	2.78	16.05	0.173
T5	100 - 80	4x3/8	3.42	3.18	352.6	21.600	1.5000	3.03	32.40	0.093
T7	60 - 40	4x3/8	3.42	3.18	352.6	21.600	1.5000	3.89	32.40	0.120

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140	L2x3x3/16	-0.00	0.032	23.760	0.001	-0.00	0.296	23.760	0.012
T5	100 - 80	4x3/8	0.01	0.125	27.000	0.005	0.00	0.000	27.000	0.000
T7	60 - 40	4x3/8	0.01	0.125	27.000	0.005	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140	L2x3x3/16	0.173	0.001	0.012	0.183	1.333	H2-1
T5	100 - 80	4x3/8	0.093	0.005	0.000	0.098	1.333	H2-1
T7	60 - 40	4x3/8	0.120	0.005	0.000	0.125	1.333	H2-1

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140 (558)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	0.35	131.54	0.003
T2	155 - 140 (559)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	0.51	131.54	0.004
T2	155 - 140 (565)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	0.10	131.54	0.001
T2	155 - 140 (566)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	0.03	131.54	0.000

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	155 - 140 (569)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	0.40	131.54	0.003
T2	155 - 140 (570)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	0.47	131.54	0.004
T3	140 - 120 (573)	C12x20.7	3.50	3.36	50.5	21.600	6.0900	0.07	131.54	0.001
T3	140 - 120 (574)	C12x20.7	3.50	3.36	50.5	21.600	6.0900	1.98	131.54	0.015
T3	140 - 120 (577)	C12x20.7	3.50	3.36	50.5	21.600	6.0900	0.10	131.54	0.001
T3	140 - 120 (578)	C12x20.7	3.50	3.36	50.5	21.600	6.0900	0.24	131.54	0.002
T3	140 - 120 (581)	C12x20.7	3.50	3.36	50.5	21.600	6.0900	4.13	131.54	0.031
T3	140 - 120 (582)	C12x20.7	3.50	3.36	50.5	21.600	6.0900	2.01	131.54	0.015

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140 (558)	C12x20.7	-18.51	10.330	21.600	0.478	0.00	0.000	27.000	0.000
T2	155 - 140 (559)	C12x20.7	-20.22	11.284	21.600	0.522	0.00	0.000	27.000	0.000
T2	155 - 140 (565)	C12x20.7	-20.09	11.213	21.600	0.519	0.00	0.000	27.000	0.000
T2	155 - 140 (566)	C12x20.7	-19.74	11.019	21.600	0.510	0.00	0.000	27.000	0.000
T2	155 - 140 (569)	C12x20.7	-18.88	10.535	21.600	0.488	0.00	0.000	27.000	0.000
T2	155 - 140 (570)	C12x20.7	-20.23	11.290	21.600	0.523	0.00	0.000	27.000	0.000
T3	140 - 120 (573)	C12x20.7	-41.27	23.035	21.600	1.066	-0.00	0.000	27.000	0.000
T3	140 - 120 (574)	C12x20.7	-43.25	24.138	21.600	1.117	-0.00	0.000	27.000	0.000
T3	140 - 120 (577)	C12x20.7	-44.16	24.647	21.600	1.141	0.00	0.000	27.000	0.000
T3	140 - 120 (578)	C12x20.7	-42.22	23.565	21.600	1.091	-0.00	0.000	27.000	0.000
T3	140 - 120 (581)	C12x20.7	-35.48	19.805	21.600	0.917	0.00	0.000	27.000	0.000
T3	140 - 120 (582)	C12x20.7	-43.09	24.049	21.600	1.113	0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140 (558)	C12x20.7	0.003	0.478	0.000	0.481 ✔	1.333	H2-1 ✔
T2	155 - 140 (559)	C12x20.7	0.004	0.522	0.000	0.526 ✔	1.333	H2-1 ✔
T2	155 - 140 (565)	C12x20.7	0.001	0.519	0.000	0.520 ✔	1.333	H2-1 ✔
T2	155 - 140 (566)	C12x20.7	0.000	0.510	0.000	0.510 ✔	1.333	H2-1 ✔
T2	155 - 140 (569)	C12x20.7	0.003	0.488	0.000	0.491 ✔	1.333	H2-1 ✔
T2	155 - 140 (570)	C12x20.7	0.004	0.523	0.000	0.526 ✔	1.333	H2-1 ✔
T3	140 - 120 (573)	C12x20.7	0.001	1.066	0.000	1.067 ✔	1.333	H2-1 ✔
T3	140 - 120 (574)	C12x20.7	0.015	1.117	0.000	1.133 ✔	1.333	H2-1 ✔
T3	140 - 120 (577)	C12x20.7	0.001	1.141	0.000	1.142 ✔	1.333	H2-1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T3	140 - 120 (578)	C12x20.7	0.002	1.091	0.000	1.093 ✔	1.333	H2-1 ✔
T3	140 - 120 (581)	C12x20.7	0.031	0.917	0.000	0.948 ✔	1.333	H2-1 ✔
T3	140 - 120 (582)	C12x20.7	0.015	1.113	0.000	1.129 ✔	1.333	H2-1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	170 - 155	Leg	ROHN 2 STD	3	-16.59	37.62	44.1	Pass
T2	155 - 140	Leg	ROHN 2 STD	48	-37.06	37.62	98.5	Pass
T3	140 - 120	Leg	ROHN 2.0 Std. w/ 1" SR	111	-56.05	59.41	94.3	Pass
T4	120 - 100	Leg	ROHN 2 STD	192	-37.26	37.56	99.2	Pass
T5	100 - 80	Leg	ROHN 2.5 STD	249	-45.84	61.43	74.6	Pass
T6	80 - 60	Leg	ROHN 2.0 Std. w/ 1/3 HSS3.5x.3	309	-46.77	72.86	64.2	Pass
T7	60 - 40	Leg	ROHN 2.5 STD	390	-48.93	60.26	81.2	Pass
T8	40 - 20	Leg	ROHN 2.5 STD	450	-52.27	60.32	86.6	Pass
T9	20 - 5	Leg	ROHN 2.5 STD	504	-52.21	60.32	86.5	Pass
T10	5 - 0	Leg	ROHN 2.5 STD	546	-37.86	44.80	84.5	Pass
T1	170 - 155	Diagonal	ROHN TS1.5x16 ga	12	-2.54	6.54	38.9 74.1 (b)	Pass
T2	155 - 140	Diagonal	ROHN TS1.5x16 ga	57	-3.31	6.54	50.6 85.3 (b)	Pass
T3	140 - 120	Diagonal	L1 3/4x1 3/4x1/4	149	-4.59	16.91	27.1 53.4 (b)	Pass
T4	120 - 100	Diagonal	ROHN TS1.5x16 ga	245	-1.81	6.53	27.7 39.8 (b)	Pass
T5	100 - 80	Diagonal	ROHN TS1.5x16 ga	282	-1.34	6.55	20.4 32.7 (b)	Pass
T6	80 - 60	Diagonal	ROHN TS1.5x16 ga	318	-1.54	6.54	23.5 28.6 (b)	Pass
T7	60 - 40	Diagonal	ROHN TS1.5x16 ga	426	-1.53	6.55	23.3 39.5 (b)	Pass
T8	40 - 20	Diagonal	ROHN TS1.5x16 ga	499	-1.83	4.90	37.4	Pass
T9	20 - 5	Diagonal	ROHN TS1.5x16 ga	513	-2.97	4.91	60.5 68.6 (b)	Pass
T8	40 - 20	Horizontal	1	478	0.85	31.41	2.7	Pass
T9	20 - 5	Horizontal	1	528	0.83	31.41	2.7	Pass
T2	155 - 140	Secondary Horizontal	1	62	-1.11	13.34	8.3	Pass
T3	140 - 120	Secondary Horizontal	L1 3/4x1 3/4x1/4	170	-3.15	14.65	21.5	Pass
T6	80 - 60	Secondary Horizontal	L2x2x3/16	377	1.05	20.59	5.1	Pass
T1	170 - 155	Top Girt	ROHN TS1.5x16 ga	6	-0.03	5.54	0.5 0.5 (b)	Pass
T2	155 - 140	Top Girt	ROHN TS1.5x16 ga	49	-0.18	5.54	3.3 5.8 (b)	Pass
T3	140 - 120	Top Girt	L1 1/2x1 1/2x1/8	112	-0.85	5.01	17.0 20.1 (b)	Pass
T4	120 - 100	Top Girt	ROHN TS1.5x16 ga	194	0.77	7.57	10.2 22.9 (b)	Pass
T5	100 - 80	Top Girt	ROHN TS1.5x16 ga	252	0.43	7.57	5.7 12.9 (b)	Pass
T6	80 - 60	Top Girt	ROHN TS1.5x16 ga	311	0.20	7.57	2.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
							6.0 (b)	
T7	60 - 40	Top Girt	ROHN TS1.5x16 ga	392	0.77	7.57	10.2	Pass
							22.8 (b)	
T8	40 - 20	Top Girt	ROHN TS1.5x16 ga	451	0.45	7.57	6.0	Pass
							13.4 (b)	
T9	20 - 5	Top Girt	ROHN TS1.5x16 ga	506	0.48	7.57	6.3	Pass
							14.2 (b)	
T10	5 - 0	Top Girt	3x1/4	549	5.03	16.20	31.0	Pass
T1	170 - 155	Bottom Girt	ROHN TS1.5x16 ga	8	-0.61	5.54	10.9	Pass
T2	155 - 140	Bottom Girt	ROHN TS1.5x16 ga	52	0.74	7.57	9.8	Pass
T3	140 - 120	Bottom Girt	L1 3/4x1 3/4x1/8	115	-0.86	6.23	13.8	Pass
T4	120 - 100	Bottom Girt	ROHN TS1.5x16 ga	197	0.45	7.57	5.9	Pass
T5	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	254	0.74	7.57	9.8	Pass
T6	80 - 60	Bottom Girt	ROHN TS1.5x16 ga	315	0.23	7.57	3.0	Pass
T7	60 - 40	Bottom Girt	ROHN TS1.5x16 ga	396	0.77	7.57	10.1	Pass
T8	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	456	0.39	7.57	5.2	Pass
T9	20 - 5	Bottom Girt	ROHN TS1.5x16 ga	508	3.13	5.68	55.2	Pass
T10	5 - 0	Bottom Girt	3x1/4	552	-3.21	16.20	33.8	Pass
T5	100 - 80	Mid Girt	ROHN TS1.5x16 ga	256	0.53	10.51	5.1	Pass
T7	60 - 40	Mid Girt	ROHN TS1.5x16 ga	398	0.68	10.51	6.5	Pass
T10	5 - 0	Mid Girt	3x1/4	553	-0.22	2.50	8.9	Pass
T2	155 - 140	Guy A@152.333	1/2	567	7.24	13.45	53.8	Pass
T3	140 - 120	Guy A@132.438	7/8	579	18.80	39.85	47.2	Pass
T5	100 - 80	Guy A@90	7/16	588	7.57	10.40	72.8	Pass
T7	60 - 40	Guy A@50	7/16	594	8.47	10.40	81.5	Pass
T2	155 - 140	Guy B@152.333	1/2	564	7.01	13.45	52.1	Pass
T3	140 - 120	Guy B@132.438	7/8	576	18.28	39.85	45.9	Pass
T5	100 - 80	Guy B@90	7/16	587	7.43	10.40	71.5	Pass
T7	60 - 40	Guy B@50	7/16	593	8.28	10.40	79.6	Pass
T2	155 - 140	Guy C@152.333	1/2	556	6.97	13.45	51.8	Pass
T3	140 - 120	Guy C@132.438	7/8	571	17.82	39.85	44.7	Pass
T5	100 - 80	Guy C@90	7/16	583	7.25	10.40	69.7	Pass
T7	60 - 40	Guy C@50	7/16	589	8.06	10.40	77.5	Pass
T2	155 - 140	Top Guy Pull-Off@152.333	L2x3x3/16	561	-2.36	16.97	14.8	Pass
							34.0 (b)	
T5	100 - 80	Top Guy Pull-Off@90	4x3/8	584	3.03	43.19	7.4	Pass
T7	60 - 40	Top Guy Pull-Off@50	4x3/8	591	3.89	43.19	9.4	Pass
T2	155 - 140	Torque Arm Top@152.333	C12x20.7	559	-0.36	99.84	41.6	Pass
T3	140 - 120	Torque Arm Top@132.438	C12x20.7	582	-3.49	100.97	98.5	Pass

Summary		
Leg (T4)	99.2	Pass
Diagonal (T2)	85.3	Pass
Horizontal (T8)	2.7	Pass
Secondary Horizontal (T3)	21.5	Pass
Top Girt (T10)	31.0	Pass
Bottom Girt (T9)	55.2	Pass
Mid Girt (T10)	8.9	Pass
Guy A (T7)	81.5	Pass
Guy B (T7)	79.6	Pass
Guy C (T7)	77.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Top Guy Pull-Off (T2)	34.0	Pass
						Torque Arm Top (T3)	98.5	Pass
						Bolt Checks	85.3	Pass
						RATING =	**99.2**	**Pass**

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Branford, CT 06405 F: (203) 488-8587

Job :	AT&T ~ CT1145: 170-ft Guyed Lattice Tower	**Project No.**	16002.12	**Sheet**	1	of	2
Address:	99 Cedarwood Lane Newington, CT	**Computed by**	TJL	**Date**		4/26/16	
Description:	Guy Anchor Evaluation - 2005 CSBC 3108.4.2/TIA Req	**Checked by**	CFC	**Date**			

CHECK UPLIFT RESISTANCE

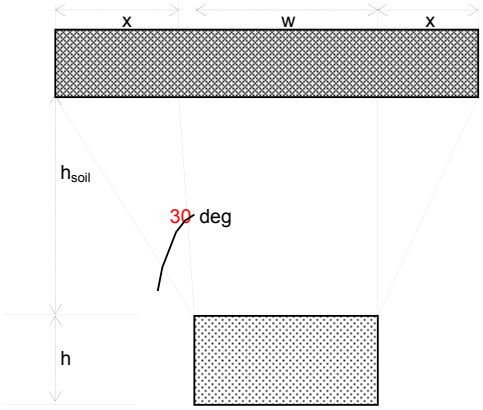
ANCHOR (A) AT 106.0ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	50	kips
Sliding =	44	kips
Wdepth =	50	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	4	ft
h =	1.833	ft
d =	12	ft
Vol. =	*87.98*	ft^3
Vol.sub =	*0.00*	ft^3
Wc =	*13.20*	kips



Foundation Section

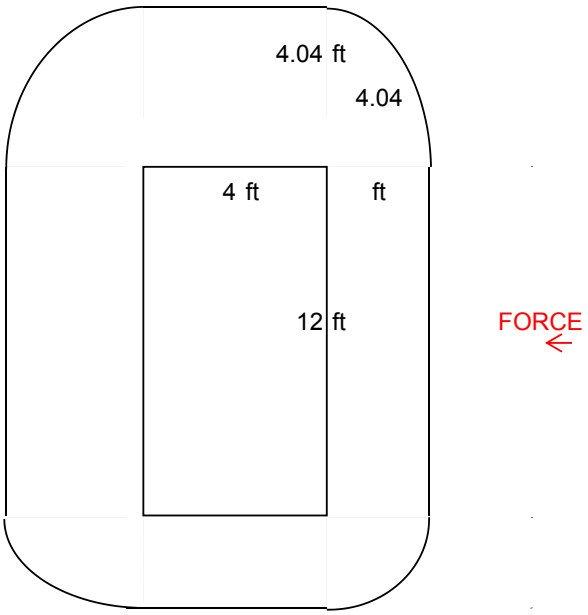
SOIL PARAMETERS:

γ_{soil} =	125	pcf
$\gamma_{soil.sub}$ =	62.6	pcf
h_{soil} =	7	ft
x =	*4.04*	ft

Soil Weight (Wr):

B1 =	48.00
B2 =	48.00
B3 =	242.66

W.soil =	116.25	kips
W.soil.sub =	0.00	kips
Total =	*116.25*	kips



Foundation Plan View

CHECK UPLIFT (PER EIA/TIA-222-F STANDARD AND 2005 CT BUILDING CODE):

SF AGAINST SLIDING

2.59 **>** *2* ***OK***

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

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Branford, CT 06405 F: (203) 488-8587

Job :	Verizon ~ Ledyard: 347-ft Guyed Lattice Tower	**Project No.**	15001.037	**Sheet**	2	of	2
Address:	889 Colonel Ledyard Rd., Ledyard, CT	**Computed by**	TJL	**Date**		4/26/16	
Description:	Guy Anchor Evaluation - 2005 CSBC 3108.4.2/TIA Req	**Checked by**	CFC	**Date**			

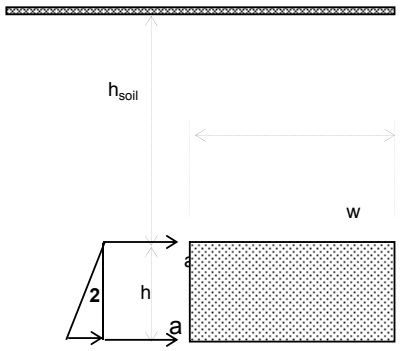
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

γ *soil* =	125	pcf
γ *soil* =	62.6	pcf
h_{soil} =	7	ft
h =	1.833	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.0	ft
h =	1.8	ft
d =	12.0	ft



Foundation Elevation View

K_p = 3.00

HORIZONTAL FORCES

	2.63	ksf
	3.31	ksf
RESIST TO SLIDING =	65.30	k

SOIL & CONCRETE WEIGHT =	Wr + Wc =	129.45	k
UPLIFT REACTIONS =		-50	k
SUM =		79.45	k

COEF. OF FRICTION, (0.45) =	35.75	k
RESIST TO SLIDING =	65.30	k
SUM =	101.05	k

SF AGAINST SLIDING

SF = 2.3 > 2 OK

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Base Foundation Analysis
Location:	170-ft Guyed Lattice Tower Newington, CT
Rev. 0: 4/26/16	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16002.12

Guyed Tower Foundation:

Input Data:

Tower Data

Shear Force =	Shear := 2·kip	(User Input from tnxTower)	
Axial Force =	Axial := 122·kip	(User Input from tnxTower)	
Axial Force =	Moment := 0·kip·ft	(User Input from tnxTower)	
Tower Height =	H_t := 170·ft	(User Input)	

Footing Data:

Overall Depth of Footing =	D_f := 3.0·ft	(User Input)	
Length of Pier =	L_p := 1.75·ft	(User Input)	
Extension of Pier Above Grade =	L_{pag} := 1.5·ft	(User Input)	
Width of Pier =	d_p := 2.0·ft	(User Input)	
Thickness of Footing =	T_f := 2.75·ft	(User Input)	
Width of Footing =	W_f := 9.5·ft	(User Input)	

Material Properties:

Concrete Compressive Strength =	f_c := 3000·psi	(User Input)	
Steel Reinforcement Yield Strength =	f_y := 60000·psi	(User Input)	
Internal Friction Angle of Soil =	Φ_s := 30·deg	(User Input)	
Allowable Soil Bearing Capacity =	q_s := 4000·psf	(User Input)	
Unit Weight of Soil =	γ_{soil} := 120·pcf	(User Input)	
Unit Weight of Concrete =	γ_{conc} := 150·pcf	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	n := 0·ft	(User Input)	
Cohesion of Clay Type Soil =	c := 0·ksf	(User Input)	(Use 0 for Sandy Soil)
Coefficient of Friction Between Concrete =	μ := 0.45	(User Input)	
Overturning/Sliding Factor of Safety Required =	FS_{req} := 2	(User Input)	

Coefficient of Lateral Soil Pressure =

$$K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$$

Load Factor =

$$LF := \begin{cases} 1.333 & \text{if } H_t \le 700\cdot ft \\ 1.7 & \text{if } H_t \ge 1200\cdot ft \\ 1.333 + \left(\frac{H_t - 700ft}{1200ft - 700ft}\right)\cdot 0.4 & \text{otherwise} \end{cases} = 1.333$$

Stability of Footing:

Adjusted Concrete Unit Weight =

$$\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150\cdot pcf$$

Adjusted Soil Unit Weight =

$$\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 120\cdot pcf$$

Passive Pressure =

$$P_{pn} := K_p\cdot\gamma_s\cdot n + c\cdot 2\cdot\sqrt{K_p} = 0\cdot ksf$$

$$P_{pt} := K_p\cdot\gamma_s\cdot(D_f - T_f) + c\cdot 2\cdot\sqrt{K_p} = 0.09\cdot ksf$$

$$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.09\cdot ksf$$

$$P_{bot} := K_p\cdot\gamma_s\cdot D_f + c\cdot 2\cdot\sqrt{K_p} = 1.08\cdot ksf$$

$$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.585\cdot ksf$$

$$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 2.75$$

$$A_p := W_f\cdot T_p = 26.125$$

Ultimate Shear =

$$S_u := P_{ave}\cdot A_p = 15.283\cdot kip$$

Weight of Concrete =

$$WT_c := \left[\left(W_f^2\cdot T_f\right) + d_p^2 L_p\right]\cdot\gamma_c = 38.28\cdot kip$$

Total Weight =

$$WT_{tot} := WT_c + Axial = 160.28\cdot kip$$

Resisting Moment =

$$M_r := \left(WT_{tot}\right)\cdot\frac{W_f}{2} + S_u\cdot\frac{T_f}{3} = 775\cdot kip\cdot ft$$

Overturning Moment =

$$M_{ot} := Moment + Shear\cdot\left(L_p + T_f\right) = 9\cdot kip\cdot ft$$

Factor of Safety Actual =

$$FS := \frac{M_r}{M_{ot}} = 86.15$$

Factor of Safety Required =

$$FS_{req} := 2$$

$$OverTurning\_Moment\_Check := if(FS \ge FS_{req}, "Okay", "No Good")$$

OverTurning_Moment_Check = "Okay"

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 72.13 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := S_u + Sl_2 = 87.41 \cdot kips$

Factor of Safety Actual = $FS := \frac{Sl_{tot}}{Shear} = 43.7$

$Sliding\_Resistance\_Check := if\left(FS \geq FS_{req}, "Okay", "No\ Good"\right)$

$Sliding\_Resistance\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Overturning Moment = $M_{ot} := Moment + Shear \cdot \left(L_p + T_f\right) = 9 \cdot kip \cdot ft$

Area of the Mat = $A_{mat} := W_f^{\,2} = 90.25$

Section Modulus of Mat = $S := \frac{W_f^{\,3}}{6} = 142.9 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.839 \cdot ksf$

$Max\_Pressure\_Check := if\left(P_{max} < q_s, "Okay", "No\ Good"\right)$

$Max\_Pressure\_Check = "Okay"$

Minimum Pressure in Mat = $P_{min} := \frac{WT_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = 1.713 \cdot ksf$

$Min\_Pressure\_Check := if\left[\left(P_{min} \geq 0\right) \cdot \left(P_{min} < q_s\right), "Okay", "No\ Good"\right]$

$Min\_Pressure\_Check = "Okay"$

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTL01145	DATE:	05/28/2015	RF DESIGN ENG:	Jobet Mariano	RF PERF ENG:		RFDS PROGRAM TYPE:	2017 Antenna Modifications
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	617-460-4072	RF PERF PHONE:		RFDS TECHNOLOGY:	4TXRX
REVISION:	Final	RF MANAGER:	CAMERON SYME	RF DESIGN EMAIL:	rx6597@att.com	RF PERF EMAIL:		State:	Final
INITIATIVE /PROJECT:	LTE PCS 1900 Retrofit					TRIDENT:		Status:	Approved
						GSM FREQUENCY:	850	RFDS ID:	998623
						UMTS FREQUENCY:	850, 1900	RFDS Version:	2.00
						LTE FREQUENCY:	700, 1900, WCS	Created By:	mm093q
								Date Created:	12/21/2015 12:43:03 PM
								Date Updated:	2/12/2016 5:11:48 PM
								Updated By:	mm093q
						I-PLAN JOB # 1:	NER-RCTB-15-04151	IPLAN PRD GRP || SUB GRP #1:	
						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:	

Section 2 - LOCATION INFORMATION

USID:	59389	FA LOCATION CODE:	10035097	LOCATION NAME:	NEWINGTON	ORACLE PTN # 1:	2051A0490S	PACE JOB # 1:	MRCTB017107
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PTN # 2:		PACE JOB # 2:	
ADDRESS:	99 CEDARWOOD LANE	CITY:	NEWINGTON	STATE:	CT	ORACLE PTN # 3:		PACE JOB # 3:	
ZIP CODE:	06111	COUNTY:	HARTFORD	MSA / RSA:		ORACLE PTN # 4:		PACE JOB # 4:	
LATITUDE (D-M-S):	41d 41m 41.172s	LONGITUDE (D-M-S):	-72d -42m -32.29596s	LAT (DEC. DEG.):	41.6947700	SEARCH RING NAME:			
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	1145 NEWINGTON CALLAHAN RT 5 15 NORTH TO RT 287 MCDONALDS ON CORNER. TURN LEFT ONTO EAST ROBBINS AVE TAKE 1ST RIGHT ONTO GOODATE DRIVE TAKE 1ST RIGHT ONTO CEDARWOOD LANE SITE AT TOP ON RIGHT COMBO 0043 & CIPHERSHELTER:GROUND LEVEL GSM 1 DHXV 238585 ET62 2 DHXV 238586 ET171 3 HCGS 717249 ET184 4 HCGS768911SN ET99UMTS:ON FIBERMETER:89-205-050					SEARCH RING ID:		CASPR INITIATIVE # 1:	
						BTA:		CASPR INITIATIVE # 2:	
						LONG (DEC. DEG.):	-72.7089711	CASPR INITIATIVE # 3:	
						BORDER CELL WITH CONTOUR COORD:		CASPR INITIATIVE # 4:	
						AM STUDY REQ'D (Y/N):	No		
						FREQ COORD:			

Section 3 - LICENSE COVERAGE/FILING INFORMATION

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

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	GUYED	MARKET LOCATION 700 MHz Band:		
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	NR	MARKET LOCATION 850 MHz Band:		
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	0.00			MARKET LOCATION 1900 MHz Band:		
LIGHTING TYPE:	NOT REQUIRED					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				INTRADO_MIAMI		0		
SECTOR B				INTRADO_MIAMI		0		
SECTOR C				INTRADO_MIAMI		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				INTRADO_MIAMI		0		
SECTOR B				INTRADO_MIAMI		0		
SECTOR C				INTRADO_MIAMI		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	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
RBS ID:	96519	96520	172517	246917					366838			
CTS COMMON ID:	032D1145	184D1145	CTU1145	CTV1145					CTL01145			
BTA/TID:	184G	184P	184V	184U					184L			
4-DIGIT SITE ID:	1145	1145	1145	1145					1145			
COW OR TOY?:	No	No	No	No					No			
CELL SITE TYPE:												
SITE TYPE:												
BTS LOCATION ID:												
ORIGINATING CO:												
CELLULAR NETWORK:												
OPS DISTRICT:	NORTH											
RF DISTRICT:	NORTH											
OPS ZONE:		NE_CT_N_HRFR_NW__CS	NE_CT_N_HRFR_NW__CS	NE_CT_N_HRFR_NW__CS								
RF ZONE:												
BASE STATION TYPE:												
EQUIPMENT NAME:	NEWINGTON	NEWINGTON	NEWINGTON	NEWINGTON					NEWINGTON			
DISASTER PRIORITY:												

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
RBS ID:	96519	96520	172517	246917					366838	RFDS_14446380		
CTS COMMON ID:	032D1145	184D1145	CTU1145	CTV1145					CTL01145	CTL00145R		
BTA/TID:	184G	184P	184V	184U					184L	184L		
4-DIGIT SITE ID:	1145	1145	1145	1145					1145	0145		
COW OR TOY?:	No	No	No	No					No	No		
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED					SECTORIZED	SECTORIZED		
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL					MACRO-CONVENTIONAL	MACRO-CONVENTIONAL		
BTS LOCATION ID:	GROUND	GROUND	INTERNAL	INTERNAL					INTERNAL	INTERNAL		
ORIGINATING CO:	CINGULAR	CINGULAR	CINGULAR	CINGULAR					CINGULAR	CINGULAR		
CELLULAR NETWORK:	GOLD	GOLD	GOLD	GOLD					GOLD	GOLD		
OPS DISTRICT:	CT-North	CT-North	CT-North	CT-North					CT-North	CT-North		
RF DISTRICT:		NPO Triage	NPO Triage	Middletown					NPO Triage	NPO Triage		
OPS ZONE:	NE_CT_N_HRFR_S_CS	NE_CT_N_HRFR_S_CS	NE_CT_N_HRFR_S_CS	NE_CT_N_HRFR_S_CS					NE_CT_N_HRFR_S_CS	NE_CT_N_HRFR_S_CS		
RF ZONE:		Hotseat	Hotseat	BCT10					Hotseat	Hotseat		
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY					BASE	OVERLAY		
EQUIPMENT NAME:	NEWINGTON	NEWINGTON	NEWINGTON	NEWINGTON					NEWINGTON	NEWINGTON		
DISASTER PRIORITY:	0	0	2	0					3	3		

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
MSC												
BSC/RNC/MME POOL ID									FF01			
LAC	05020	05020	05986	05986								
RAC												
EQUIPMENT VENDOR												
EQUIPMENT TYPE	ULTRASITE	ULTRASITE										
LOCATION												
CABINET LOCATION												
MARKET STATE CODE												
AGPS	Yes	Yes	Yes	Yes					Yes			
NODE B NUMBER	0	0	0	0					1145			
PARENT NAME	MDTWCTBSC10	MDTWCTBSC10	MDTWCTNICRBR06	MDTWCTNICRBR06					FF01			

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	UMTS 5TH RBS	UMTS 6TH RBS	LTE 1ST RBS	LTE 2ND RBS	LTE 3RD RBS	LTE 4TH RBS
MSC												
BSC/RNC/MME POOL ID	MDTWCTBSC10	MDTWCTBSC10	MDTWCTNICRBR06	MDTWCTNICRBR06					FF01	FF01		
LAC	05020	05020	05986	05986								
RAC												
EQUIPMENT VENDOR	NOKIA	NOKIA	ERICSSON	ERICSSON					ERICSSON	ERICSSON		
EQUIPMENT TYPE	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR					6601 INDOOR MU	6601 INDOOR MU		
LOCATION												
CABINET LOCATION												
MARKET STATE CODE									CT	CT		
AGPS	Yes	Yes	Yes	Yes					Yes	Yes		
NODE B NUMBER	0	0	0	0					1145	145		
PARENT NAME	MIDDLETOWN-GSM MTSO-BSC-10	MIDDLETOWN-GSM MTSO-BSC-10	MIDDLETOWN RNC06	MIDDLETOWN RNC06								

Section 8 - RBS INDIVIDUAL INFORMATION - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
RBS ID:	96519	96520			246917	172517	246917										366838		366838		366838			
CELL ID/BCF:	032D1145	032D1145			CTU1145	CTU1145	CTU1145										CTL01145		CTL01145		CTL01145			
CTS COMMON ID:	032D1145	184D1145			CTV1145	CTU1145	CTV1145										CTL01145		CTL01145		CTL01145			
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
RBS ID:																								
CELL ID/BCF:																								
CTS COMMON ID:																								

Section 8 - RBS INDIVIDUAL INFORMATION - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
RBS ID:	96519	96520			246917	172517	246917										366838		366838		366838			
CELL ID/BCF:	032D1145	032D1145			CTU1145	CTU1145	CTU1145										CTL01145		CTL01145		CTL01145			
CTS COMMON ID:	032D1145	184D1145			CTV1145	CTU1145	CTV1145										CTL01145		CTL01145		CTL01145			
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
RBS ID:																	RFDS_14446380		RFDS_14446381		RFDS_14446382			
CELL ID/BCF:																	CTL00145R		CTL00145R		CTL00145R			
CTS COMMON ID:																	CTL00145R		CTL00145R		CTL00145R			

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59389.850.25G.1	59389.1900.25G.1			59389.850.3G.1	59389.1900.3G.1	59389.850.3G.2										59389.700.4G.1		59389.1900.4G.1		59389.WCS.4G.1			
SECTOR A SOFT SECTOR ID	184G11451	184P11451			CTV11451	CTU11457	CTV1145A										CTL01145_7A_1		CTL01145_9A_1		CTL01145_3A_1			
SECTOR B	184G11452	184P11452			CTV11452	CTU11458	CTV1145B										CTL01145_7B_1		CTL01145_9B_1		CTL01145_3B_1			
SECTOR C	184G11453	184P11453			CTV11453	CTU11459	CTV1145C										CTL01145_7C_1		CTL01145_9C_1		CTL01145_3C_1			
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A SOFT SECTOR ID																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59389.850.25G.1	59389.1900.25G.1			59389.850.3G.1	59389.1900.3G.1	59389.850.3G.2										59389.700.4G.1		59389.1900.4G.1		59389.WCS.4G.1			
SECTOR A SOFT SECTOR ID	184G11451	184P11454			CTV11451	CTU11457	CTV1145A										CTL01145_7A_1		CTL01145_9A_1		CTL01145_3A_1			
SECTOR B	184G11452	184P11455			CTV11452	CTU11458	CTV1145B																	
SECTOR C	184G11453	184P11456			CTV11453	CTU11459	CTV1145C										CTL01145_7C_1		CTL01145_9C_1		CTL01145_3C_1			
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																	59389.700.4G.222		59389.1900.4G.222		59389.WCS.4G.222			
SECTOR A SOFT SECTOR ID																								
SECTOR B																	CTL00145_7B_1		CTL00145_9B_1		CTL00145_3B_1			
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR CELL NUMBER - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59389.850.25G.1	59389.1900.25G.1			59389.850.3G.1	59389.1900.3G.1	59389.850.3G.2										59389.700.4G.1		59389.1900.4G.1		59389.WCS.4G.1			
SECTOR A CELL NUMBER	0	0			0	0	0										15		8		149			
SECTOR B	0	0			0	0	0										16		9		150			
SECTOR C	0	0			0	0	0										17		10		151			
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																								
SECTOR A CELL NUMBER																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 9 - SOFT SECTOR CELL NUMBER - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
USEID (excluding Hard Sector)	59389.850.25G.1	59389.1900.25G.1			59389.850.3G.1	59389.1900.3G.1	59389.850.3G.2										59389.700.4G.1		59389.1900.4G.1		59389.WCS.4G.1			
SECTOR A CELL NUMBER	0	0			0	0	0										15		8		149			
SECTOR B	0	0			0	0	0																	
SECTOR C	0	0			0	0	0										17		10		151			
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
USEID (excluding Hard Sector)																	59389.700.4G.222		59389.1900.4G.222		59389.WCS.4G.222			
SECTOR A CELL NUMBER																								
SECTOR B																	16		9		150			
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900								
SECTOR A CID/SAC	11451	11451			11451	11457	01451																	
SECTOR B	11452	11452			11452	11458	01452																	
SECTOR C	11453	11453			11453	11459	01453																	
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - final

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900								
SECTOR A CID/SAC	11451	11451			11451	11457	01451																	
SECTOR B	11452	11452			11452	11458	01452																	
SECTOR C	11453	11453			11453	11459	01453																	
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 11 - CURRENT RADIO COUNTS existing

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
SECTOR A RADIO COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
SECTOR A RADIO COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 12 - CURRENT T1 COUNTS existing

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	UMTS 3rd Cabinet	UMTS 4th Cabinet	UMTS 5th Cabinet	UMTS 6th Cabinet	LTE 1st Cabinet	LTE 2nd Cabinet	LTE 3rd Cabinet	LTE 4th Cabinet
# T1s												
LINK PROFILE												
RF COMBINING												
FIBER or ETHERNET?												
Tx Board Model												
Tx Board QTY												
RAX/ECU Board Model												
RAX/ECU Board QTY												
BBU Board Model												
BBU Board QTY												
RRU - location												
FIBER JUMPER												
DC CABLE												
DC/Fiber Dem. Box												
Bundled Fiber Cable												
Bundled DC Cable												

Section 13 - NEW/PROPOSED RADIO COUNTS

	GSM 1ST 850	GSM 1ST 1900	GSM 2ND 850	GSM 2ND 1900	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	UMTS 3RD 850	UMTS 3RD 1900	UMTS 4TH 850	UMTS 4TH 1900	UMTS 5TH 850	UMTS 5TH 1900	UMTS 6TH 850	UMTS 6TH 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 1ST FUTURE		
SECTOR A RADIO COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
																	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 2ND FUTURE		
SECTOR A RADIO COUNTS																								
SECTOR B																								
SECTOR C																								
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 14 - NEW/PROPOSED T1 COUNTS

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	UMTS 3rd Cabinet	UMTS 4th Cabinet	UMTS 5th Cabinet	UMTS 6th Cabinet	LTE 1st Cabinet	LTE 2nd Cabinet	LTE 3rd Cabinet	LTE 4th Cabinet
# T1s												
LINK PROFILE												
RF COMBINING												
FIBER or ETHERNET?												
Tx Board Model												
Tx Board QTY												
RAX/ECU Board Model												
RAX/ECU Board QTY												
BBU Board Model												
BBU Board QTY												
RRU - location												
FIBER JUMPER												
DC CABLE												
DC/Fiber Dem. Box												
Bundled Fiber Cable												
Bundled DC Cable												

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	OPA-65R-LCUU-H6	AM-X-CD-16-65-00T-RET				
ANTENNA VENDOR	POWERWAVE	CCI Products	KMW				
ANTENNA SIZE (H x W x D)	55X11X5	72X14.8X7.4	72X11.8X5.9				
ANTENNA WEIGHT	35	73	48.5				
AZIMUTH	143	90	90				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	120	120	120				
ANTENNA TIP HEIGHT	122	123	123				
MECHANICAL DOWNTILT	3	0	0				
FEEDER AMOUNT	2	Fiber + 2 Coax					
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Built in	Built in				
SURGE ARRESTOR (QTY/MODEL)	2	DC/Fiber Squid (1) + Polyphaser 1000860 (1)	1 DC/Fiber Squid				
DIPLEXER (QTY/MODEL)	2 Kathrein / 782-10250	2 Kathrein / 782-10250					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	LTE RRH + Powerwave 7070	LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Pwav LGP21401 Single 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)	1 Powerwave LGP12104						
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1 RRUS-11				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1 RRUS-11				
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 Component1 (QTY/MODEL)		2 Pwav 1001983 (1) & 1001940 (1)					
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1							
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59389.A.850.3G.1	59389.A.850.3G.1	CTV11451	CTV11451		UMTS 850	7770.00.850.06	13.5	143	6	None	RFS 7/8 (850)	135.03		0				273.53	1	
	PORT 2	59389.A.850.3G.2	59389.A.850.3G.2	CTV11451	CTV1145A		UMTS 850	7770.00.850.06	13.5	143	6	Bottom	RFS 7/8 (850)	135.03		0				273.53	2	
	PORT 3	59389.A.1900.3G.1	59389.A.1900.3G.1	CTU11457	CTU11457		UMTS 1900	7770.00.1900.03	15.5	143	3	None	RFS 7/8 (850)	135.03		0				298.54	1	
	PORT 4	59389.A.1900.25G.1	59389.A.1900.25G.2	184P11451	184P11451		GSM 1900	7770.00.1900.03	16.79	143	3	None	RFS 7/8 (850)	135.03	RxAIT 1900	0				298.54	1	
ANTENNA POSITION 2	PORT 1	59389.A.850.25G.1	59389.A.850.25G.1	184G11451	184G11451		GSM 850	OPA-65R-LCUU-H6_849MHz_06DT	14.5	90	6	None	Andrew 7/8 (850)	135.03						273.53	4	
	PORT 3	59389.A.WCS.4G.1	59389.A.WCS.4G.1	CTL01145_3A_1	CTL01145_3A_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	90	3	Top	FIBER	0						1227.4392	3	
ANTENNA POSITION 3	PORT 1	59389.A.700.4G.1	59389.A.700.4G.1	CTL01145_7A_1	CTL01145_7A_1		LTE 700	AM-X-CD-16-65-00T-RET_725MHz_02DT	15.6	90	2	Top	FIBER	0						1119.4378	5	
	PORT 3	59389.A.1900.4G.1	59389.A.1900.4G.1	CTL01145_9A_1	CTL01145_9A_1		LTE 1900	AM-X-CD-16-65-00T-RET_1950MHz_02DT	17.29	90	2	Top	FIBER	0						2182.7299	5	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	OPA-65R-LCUU-H6	AM-X-CD-16-65-00T-RET				
ANTENNA VENDOR	POWERWAVE	CCI Products	KMW				
ANTENNA SIZE (H x W x D)	55X11X5	72X14.8X7.4	72X11.8X5.9				
ANTENNA WEIGHT	35	73	48.5				
AZIMUTH	263	220	220				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	120	120	120				
ANTENNA TIP HEIGHT	122	123	123				
MECHANICAL DOWNTILT	2	0	0				
FEEDER AMOUNT	2	Fiber + 2 Coax					
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Built in	Built in				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Kathrein / 782-10250	2 Kathrein / 782-10250					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH	LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Pwav LGP21401 Single 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1 RRUS-11				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1 RRUS-11				
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 Component1 (QTY/MODEL)		2 Pwav 1001983 (1) & 1001940 (1)					
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1							
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59389.B.850.3G.1	59389.B.850.3G.1	CTV11452	CTV11452		UMTS 850	7770.00.850.08	13.5	263	8	None	RFS 7/8 (850)	135.03		0				273.53	9	
	PORT 2	59389.B.850.3G.2	59389.B.850.3G.2	CTV11452	CTV1145B		UMTS 850	7770.00.850.08	13.5	263	8	Bottom	RFS 7/8 (850)	135.03		0				273.53	10	
	PORT 3	59389.B.1900.3G.1	59389.B.1900.3G.1	CTU11458	CTU11458		UMTS 1900	7770.00.1900.03	15.5	263	3	None	RFS 7/8 (850)	135.03		0				298.54	9	
	PORT 4	59389.B.1900.25G.1	59389.B.1900.25G.2	184P11452	184P11452		GSM 1900	7770.00.1900.03	16.79	263	3	None	RFS 7/8 (850)	135.03	RxAIT 1900	0				298.54	9	
ANTENNA POSITION 2	PORT 1	59389.B.850.25G.1	59389.B.850.25G.1	184G11452	184G11452		GSM 850	OPA-65R-LCUU-H6_849MHz_08DT	14.5	220	8	None	Andrew 7/8 (850)	135.03						273.53	12	
	PORT 3		59389.B.WCS.4G.1	CTL01145_3B_1	CTL01145_3B_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	220	3	Top	FIBER	0						1227.4392	11	
ANTENNA POSITION 3	PORT 1		59389.B.700.4G.1	CTL01145_7B_1	CTL01145_7B_1		LTE 700	AM-X-CD-16-65-00T-RET_725MHz_03DT	15.6	220	3	Top	FIBER	0						1119.4378	13	
	PORT 3		59389.B.1900.4G.1	CTL01145_9B_1	CTL01145_9B_1		LTE 1900	AM-X-CD-16-65-00T-RET_1950MHz_04DT	17.29	220	4	Top	FIBER	0						2182.7299	13	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	OPA-65R-LCUU-H6	AM-X-CD-16-65-00T-RET				
ANTENNA VENDOR	POWERWAVE	CCI Products	KMW				
ANTENNA SIZE (H x W x D)	55X11X5	72X14.8X7.4	72X11.8X5.9				
ANTENNA WEIGHT	35	73	48.5				
AZIMUTH	23	340	340				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	120	120	120				
ANTENNA TIP HEIGHT	122	123	123				
MECHANICAL DOWNTILT	4	0	0				
FEEDER AMOUNT	2	Fiber + 2 Coax					
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Built in	Built in				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Kathrein / 782-10250	2 Kathrein / 782-10250					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH	LTE RRH				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Pwav LGP21401 Single 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1 RRUS-11				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1 RRUS-11				
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 Component1 (QTY/MODEL)		2 Pwav 1001983 (1) & 1001940 (1)					
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1							
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59389.C.850.3G.1	59389.C.850.3G.1	CTV11453	CTV11453		UMTS 850	7770.00.850.00	13.5	23	0	None	RFS 7/8 (850)	135.03		0				273.53	17	
	PORT 2	59389.C.850.3G.2	59389.C.850.3G.2	CTV11453	CTV1145C		UMTS 850	7770.00.850.00	13.5	23	0	Bottom	RFS 7/8 (850)	135.03		0				273.53	18	
	PORT 3	59389.C.1900.3G.1	59389.C.1900.3G.1	CTU11459	CTU11459		UMTS 1900	7770.00.1900.03	15.5	23	3	None	RFS 7/8 (850)	135.03		0				298.54	17	
	PORT 4	59389.C.1900.25G.1	59389.C.1900.25G.2	184P11453	184P11453		GSM 1900	7770.00.1900.03	16.79	23	3	None	RFS 7/8 (850)	135.03	RxAIT 1900	0				298.54	17	
ANTENNA POSITION 2	PORT 1	59389.C.850.25G.1	59389.C.850.25G.1	184G11453	184G11453		GSM 850	OPA-65R-LCUU-H6_849MHz_00DT	14.6	340	0	None	Andrew 7/8 (850)	135.03						273.53	20	
	PORT 3	59389.C.WCS.4G.1	59389.C.WCS.4G.1	CTL01145_3C_1	CTL01145_3C_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_07DT	17.7	340	7	Top	FIBER	0						1227.4392	19	
ANTENNA POSITION 3	PORT 1	59389.C.700.4G.1	59389.C.700.4G.1	CTL01145_7C_1	CTL01145_7C_1		LTE 700	AM-X-CD-16-65-00T-RET_725MHz_11DT	15.6	340	11	Top	FIBER	0						1119.4378	21	
	PORT 3	59389.C.1900.4G.1	59389.C.1900.4G.1	CTL01145_9C_1	CTL01145_9C_1		LTE 1900	AM-X-CD-16-65-00T-RET_1950MHz_02DT	17.29	340	2	Top	FIBER	0						2182.7299	21	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?		YES					
ANTENNA MAKE - MODEL				QS66512-2			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				72X12X9.6			
ANTENNA WEIGHT				111			
AZIMUTH				90			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				120			
ANTENNA TIP HEIGHT				123			
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
Antenna RET Motor (QTY/MODEL)				Built in			
SURGE ARRESTOR (QTY/MODEL)				1 DC/Fiber Squid			
DIPLEXER (QTY/MODEL)		2 CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
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 Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	LTE 1900 Retrofit// Replace existing antenna with 6ft 12port antenna and install at position-4//Swap PCS RRU to RRUS32 B2//Add 2 triplexers to existing WCS Antenna at position-2 // Add 2nd DUS // XMU already leased in previous job // Moving Busy sector Beta to 2nd DUS.						
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3	59389.A.1900.4G.1	59389.A.1900.4G.1	CTL01145_9A_1	CTL01145_9A_1		LTE 1900	QS66512-2_1930MHz_02DT	17	90	2	Top	FIBER	0						2182.7299	8	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?		YES					
ANTENNA MAKE - MODEL				QS66512-2			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				72X12X9.6			
ANTENNA WEIGHT				111			
AZIMUTH				220			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				120			
ANTENNA TIP HEIGHT				123			
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
Antenna RET Motor (QTY/MODEL)				Built in			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)		2 CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
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 Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	LTE 1900 Retrofit// Replace existing antenna with 6ft 12port antenna and install at position-4//Swap PCS RRU to RRUS32 B2//Add 2 triplexers to existing WCS Antenna at position-2 // Add 2nd DUS // XMU already leased in previous job // Moving Busy sector Beta to 2nd DUS.						
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		59389.B.1900.4G.1	CTL00145_9B_1	CTL00145_9B_1		LTE 1900	QS66512-2_1930MHz_04DT	17.4	220	4	Top	FIBER	0						2182.7299	16	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?		YES					
ANTENNA MAKE - MODEL				QS66512-2			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				72X12X9.6			
ANTENNA WEIGHT				111			
AZIMUTH				340			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				120			
ANTENNA TIP HEIGHT				123			
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
Antenna RET Motor (QTY/MODEL)				Built in			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)		2 CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
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 Component1 (QTY/MODEL)							
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	LTE 1900 Retrofit// Replace existing antenna with 6ft 12port antenna and install at position-4//Swap PCS RRU to RRUS32 B2//Add 2 triplexers to existing WCS Antenna at position-2 // Add 2nd DUS // XMU already leased in previous job // Moving Busy sector Beta to 2nd DUS.						
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3	59389.C.1900.4G.1	59389.C.1900.4G.1	CTL01145_9C_1	CTL01145_9C_1		LTE 1900	QS66512-2_1930MHz_02DT	17	340	2	Top	FIBER	0						2182.7299	24	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	143		90				90							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	120		120				120							
ANTENNA TIP HEIGHT	122		123				123							
MECHANICAL DOWNTILT	3		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built in				Built in						
SURGE ARRESTOR (QTY/MODEL)			2	DC/Fiber Squid (1) + Polyphaser 1000860 (1)			1	DC/Fiber Squid						
DIPLEXER (QTY/MODEL)	2	Kathrein / 782-10250	4	Kathrein / 782-10250 (2) + CCI Triplexer -TPX-070821 (2)										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)			1	LTE RRH + Powerwave 7070				LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Pwav LGP21401 Single 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860												
PDU FOR TMAS (QTY/MODEL)	1	Powerwave LGP12104												
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-32 B2						
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 Component1 (QTY/MODEL)			2	Pwav 1001983 (1) & 1001940 (1)										
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1	LTE 1900 Retrofit// Replace existing antenna with 6ft 12port antenna and install at position-4//Swap PCS RRU to RRUS32 B2//Add 2 triplexers to existing WCS Antenna at position-2 // Add 2nd DUS // XMU already leased in previous job // Moving Busy sector Beta to 2nd DUS.													
Local Market Note2	Azimuths taken from Atoll													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59389.A.850.25G.1,59389.A.850.3G.1	59389.A.850.3G.1	CTV11451	CTV11451		UMTS 850	7770.00.850.06	13.5	143	6	None	RFS 7/8 (850)	135.03						273.53	1	
	PORT 2	59389.A.850.3G.2	59389.A.850.3G.2	CTV11451	CTV1145A		UMTS 850	7770.00.850.06	13.5	143	6	Bottom	RFS 7/8 (850)	135.03						273.53	1	
	PORT 3	59389.A.1900.3G.1	59389.A.1900.3G.1	CTU11457	CTU11457		UMTS 1900	7770.00.1900.03	15.5	143	3	None	RFS 7/8 (850)	135.03						298.54	2	
	PORT 4	59389.A.1900.25G.1	59389.A.1900.25G.1	184P11454	184P11454		GSM 1900	7770.00.1900.03	16.79	143	3	None	RFS 7/8 (850)	135.03	RxAIT 1900					298.54	1	
ANTENNA POSITION 2	PORT 1	59389.A.850.25G.1	59389.A.850.25G.1	184G11451	184G11451		GSM 850	OPA-65R-LCUU-H6_849MHz_06DT	14.5	90	6	None	Andrew 7/8 (850)	135.03						273.53	3	
	PORT 3	59389.A.WCS.4G.1	59389.A.WCS.4G.1	CTL01145_3A_1	CTL01145_3A_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	90	3	Top	FIBER	0						1227.4392	4	
ANTENNA POSITION 4	PORT 1	59389.A.700.4G.1	59389.A.700.4G.1	CTL01145_7A_1	CTL01145_7A_1		LTE 700	QS66512-2_719MHz_02DT	14	90	2	Top	FIBER	0						1119.4378	7	
	PORT 3	59389.A.1900.4G.1	59389.A.1900.4G.1	CTL01145_9A_1	CTL01145_9A_1		LTE 1900	QS66512-2_1930MHz_02DT	17	90	2	Top	FIBER	0						2182.7299	8	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	263		220				220							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	120		120				120							
ANTENNA TIP HEIGHT	122		123				123							
MECHANICAL DOWNTILT	2		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built in				Built in						
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	Kathrein / 782-10250	4	Kathrein / 782-10250 (2) + CCI Triplexer -TPX-070821 (2)										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH				LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Pwav LGP21401 Single 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-32 B2						
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 Component1 (QTY/MODEL)			2	Pwav 1001983 (1) & 1001940 (1)										
Additional Component2 (QTY/MODEL)														
Additional Component3 (QTY/MODEL)														
Local Market Note1	LTE 1900 Retrofit// Replace existing antenna with 6ft 12port antenna and install at position-4//Swap PCS RRU to RRUS32 B2//Add 2 triplexers to existing WCS Antenna at position-2 // Add 2nd DUS // XMU already leased in previous job // Moving Busy sector Beta to 2nd DUS.													
Local Market Note2	Azimuths taken from Atoll													
Local Market Note3														

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59389.B.850.25G.1,59389.B.850.3G.1	59389.B.850.3G.1	CTV11452	CTV11452		UMTS 850	7770.00.850.08	13.5	263	8	None	RFS 7/8 (850)	135.03						273.53	9	
	PORT 2	59389.B.850.3G.2	59389.B.850.3G.2	CTV11452	CTV1145B		UMTS 850	7770.00.850.08	13.5	263	8	Bottom	RFS 7/8 (850)	135.03						273.53	9	
	PORT 3	59389.B.1900.3G.1	59389.B.1900.3G.1	CTU11458	CTU11458		UMTS 1900	7770.00.1900.03	15.5	263	3	None	RFS 7/8 (850)	135.03						298.54	10	
	PORT 4	59389.B.1900.25G.1	59389.B.1900.25G.1	184P11455	184P11455		GSM 1900	7770.00.1900.03	16.79	263	3	None	RFS 7/8 (850)	135.03	RxAIT 1900					298.54	9	
ANTENNA POSITION 2	PORT 1	59389.B.850.25G.1	59389.B.850.25G.1	184G11452	184G11452		GSM 850	OPA-65R-LCUU-H6_849MHz_08DT	14.5	220	8	None	Andrew 7/8 (850)	135.03						273.53	11	
	PORT 3	59389.B.WCS.4G.222	59389.B.WCS.4G.1	CTL00145_3B_1	CTL00145_3B_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	220	3	Top	FIBER	0						1227.4392	12	
ANTENNA POSITION 4	PORT 1	59389.B.700.4G.222	59389.B.700.4G.1	CTL00145_7B_1	CTL00145_7B_1		LTE 700	QS66512-2_719MHz_03DT	13.9	220	3	Top	FIBER	0						1119.4378	15	
	PORT 3	59389.B.1900.4G.222	59389.B.1900.4G.1	CTL00145_9B_1	CTL00145_9B_1		LTE 1900	QS66512-2_1930MHz_04DT	17.4	220	4	Top	FIBER	0						2182.7299	16	

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

ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	OPA-65R-LCUU-H6		QS66512-2			
ANTENNA VENDOR	POWERWAVE	CCI Products		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	72X14.8X7.4		72X12X9.6			
ANTENNA WEIGHT	35	73		111			
AZIMUTH	23	340		340			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	120	120		120			
ANTENNA TIP HEIGHT	122	123		123			
MECHANICAL DOWNTILT	4	0		0			
FEEDER AMOUNT	2	Fiber + 2 Coax					
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Built in		Built in			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Kathrein / 782-10250	4 Kathrein / 782-10250 (2) + CCI Triplexer -TPX-070821 (2)					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH		LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 Pwav LGP21401 Single 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
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 Component1 (QTY/MODEL)		2 Pwav 1001983 (1) & 1001940 (1)					
Additional Component2 (QTY/MODEL)							
Additional Component3 (QTY/MODEL)							
Local Market Note1	LTE 1900 Retrofit// Replace existing antenna with 6ft 12port antenna and install at position-4//Swap PCS RRU to RRUS32 B2//Add 2 triplexers to existing WCS Antenna at position-2 // Add 2nd DUS // XMU already leased in previous job // Moving Busy sector Beta to 2nd DUS.						
Local Market Note2	Azimuths taken from Atoll						
Local Market Note3							

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)	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	59389.C.850.25G.1,59389.C.850.3G.1	59389.C.850.3G.1	CTV11453	CTV11453		UMTS 850	7770.00.850.00	13.5	23	0	None	RFS 7/8 (850)	135.03						273.53	17	
	PORT 2	59389.C.850.3G.2	59389.C.850.3G.2	CTV11453	CTV1145C		UMTS 850	7770.00.850.00	13.5	23	0	Bottom	RFS 7/8 (850)	135.03						273.53	17	
	PORT 3	59389.C.1900.3G.1	59389.C.1900.3G.1	CTU11459	CTU11459		UMTS 1900	7770.00.1900.03	15.5	23	3	None	RFS 7/8 (850)	135.03						298.54	18	
	PORT 4	59389.C.1900.25G.1	59389.C.1900.25G.1	184P11456	184P11456		GSM 1900	7770.00.1900.03	16.79	23	3	None	RFS 7/8 (850)	135.03	RxAIT 1900					298.54	17	
ANTENNA POSITION 2	PORT 1	59389.C.850.25G.1	59389.C.850.25G.1	184G11453	184G11453		GSM 850	OPA-65R-LCUU-H6_849MHz_00DT	14.6	340	0	None	Andrew 7/8 (850)	135.03						273.53	19	
	PORT 3	59389.C.WCS.4G.1	59389.C.WCS.4G.1	CTL01145_3C_1	CTL01145_3C_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_07DT	17.7	340	7	Top	FIBER	0						1227.4392	20	
ANTENNA POSITION 4	PORT 1	59389.C.700.4G.1	59389.C.700.4G.1	CTL01145_7C_1	CTL01145_7C_1		LTE 700	QS66512-2_719MHz_11DT	13.5	340	11	Top	FIBER	0						1119.4378	23	
	PORT 3	59389.C.1900.4G.1	59389.C.1900.4G.1	CTL01145_9C_1	CTL01145_9C_1		LTE 1900	QS66512-2_1930MHz_02DT	17	340	2	Top	FIBER	0						2182.7299	24	

Diagram - Sector	A	Diagram File Name - CT1145_A_C__RETROFIT_Triplexer_BrStd_Rev2.vsd					
Atoll Site Name -	CTL01145	Location Name -	NEWINGTON	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

UTMS DB – GSM 1900

Antenna 2
LTE WCS – GSM 850

Antenna 3

Antenna 4
LTE 700/PCS

Broadband Low 700/850 +45/-45 - + RET
Broadband High PCS/AWS +45/-45 - + RET
TMA BP
TMA BP

Broadband Octo Low 850 +45/-45 - + RET 5 6
Broadband Octo Low 700 +45/-45 - + RET 1 2
Broadband Octo High 4Tx/4Rx +45/-45 - + RET 3 4
Broadband Octo High 4Tx/4Rx +45/-45 - + RET 7 8
CCI Triplexer
CCI Triplexer
LTE RRUS-32 WCS

6 Feet MINIMUM SEPARATION

Broadband 12 port 700 +45/-45 - + RET 1 2
Broadband 12 port 800 +45/-45 - + RET 3 4
Broadband 12 port AWS/WCS +45/-45 - + RET 5 6
Broadband 12 port AWS/WCS +45/-45 - + RET 7 8
Broadband 12 port PCS +45/-45 - + RET 9 10
Broadband 12 port PCS +45/-45 - + RET 11 12
LTE RRUS-11 700
LTE RRUS-32 B2 PCS

SBiasT
PDU
BiasT
BiasT
Diplexer
Diplexer
MCU / CCU
SBiasT
BiasT
DIPLEXER
DIPLEXER
RMC
RKAIT

Fiber/DC Demarcation Box (Squid)
Fiber/DC Demarcation Box (Squid)
DC Plant

UMTS RRUW 850
FU
FU
RU
RU
UMTS 1st NodeB

GSM DB

CPRI MUX
LTE DUS 1
CPRI MUX
LTE DUS 2

DUS-1					
A	B	C	D	E	F
700 - A		700 - C	XMU-1 P1	XMU-1 P2	

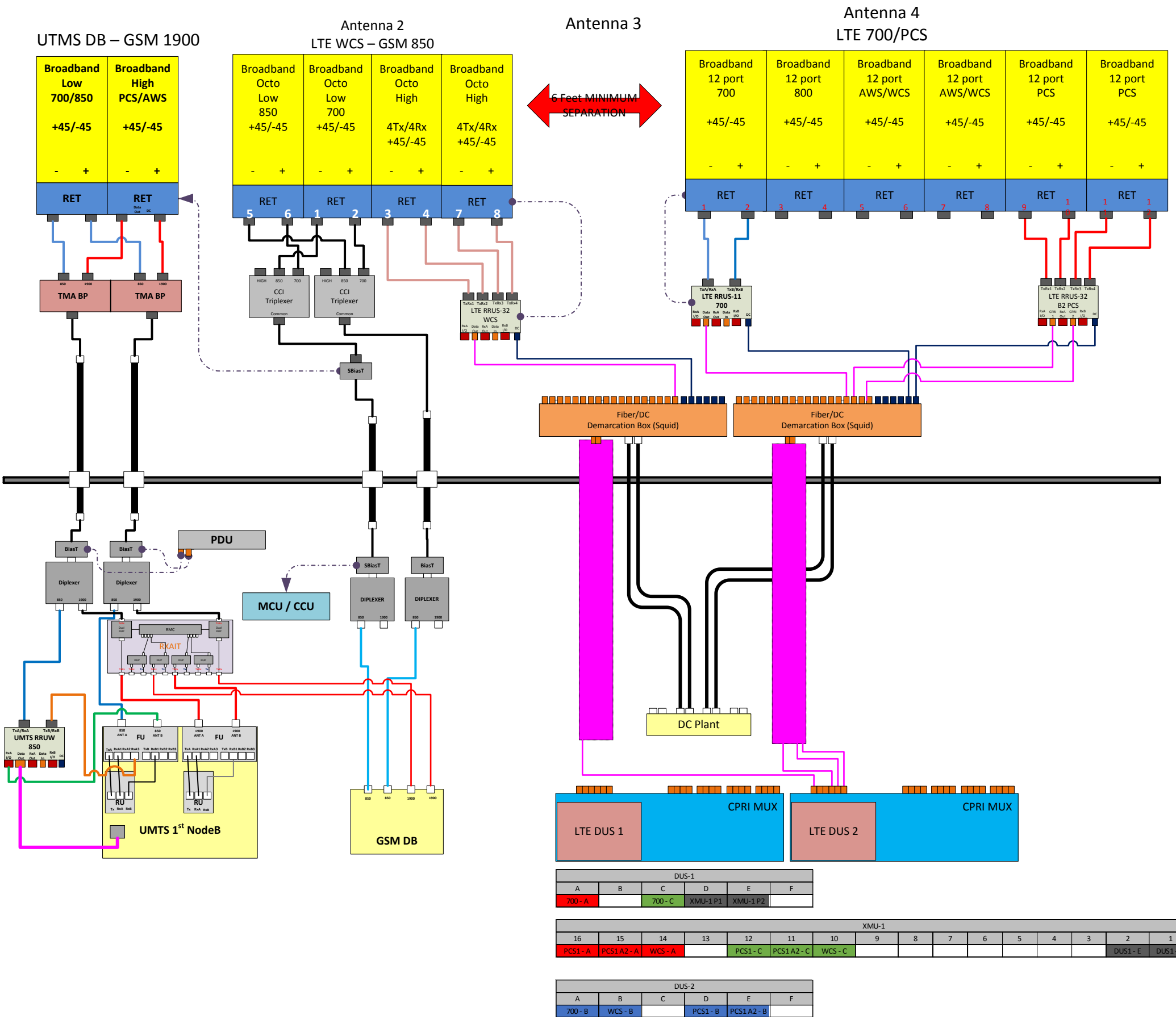
XMU-1															
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
PCS1 - A	PCS1 A2 - A	WCS - A		PCS1 - C	PCS1 A2 - C	WCS - C								DUS1 - E	DUS1 - D

DUS-2					
A	B	C	D	E	F
700 - B	WCS - B		PCS1 - B	PCS1 A2 - B	

Diagram - Sector B | Diagram File Name - CT1145_B__RETROFIT_Triplexer_BrStd_Rev2.vsd

Atoll Site Name - CTL01145 | Location Name - NEWINGTON | Market - CONNECTICUT | Market Cluster - NEW ENGLAND

Comments:



DUS-1					
A	B	C	D	E	F
700 - A		700 - C	XMU-1 P1	XMU-1 P2	

XMU-1															
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
PCS1 - A	PCS1 A2 - A	WCS - A		PCS1 - C	PCS1 A2 - C	WCS - C								DUS1 - E	DUS1 - D

DUS-2					
A	B	C	D	E	F
700 - B	WCS - B		PCS1 - B	PCS1 A2 - B	

Diagram - Sector	C	Diagram File Name - CT1145_A_C__RETROFIT_Triplexer_BrStd_Rev2.vsd					
Atoll Site Name -	CTL01145	Location Name -	NEWINGTON	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

UTMS DB – GSM 1900

Antenna 2
LTE WCS – GSM 850

Antenna 3

Antenna 4
LTE 700/PCS

6 Feet MINIMUM SEPARATION

Broadband Low 700/850 +45/-45 - + | Broadband High PCS/AWS +45/-45 - +

Broadband Octo Low 850 +45/-45 - + | Broadband Octo Low 700 +45/-45 - + | Broadband Octo High 4Tx/4Rx +45/-45 - + | Broadband Octo High 4Tx/4Rx +45/-45 - +

Broadband 12 port 700 +45/-45 - + | Broadband 12 port 800 +45/-45 - + | Broadband 12 port AWS/WCS +45/-45 - + | Broadband 12 port AWS/WCS +45/-45 - + | Broadband 12 port PCS +45/-45 - + | Broadband 12 port PCS +45/-45 - +

RET | RET

RET 5 6 | RET 1 2 | RET 3 4 | RET 7 8

RET 1 2 | RET 3 4 | RET 5 6 | RET 7 8 | RET 9 10 | RET 11 12

TMA BP | TMA BP

CCI Triplexer | CCI Triplexer

LTE RRUS-32 WCS

LTE RRUS-11 700

LTE RRUS-32 B2 PCS

SBiasT

Fiber/DC Demarcation Box (Squid) | Fiber/DC Demarcation Box (Squid)

BiasT | BiasT | SBiasT | BiasT

Diplexer | Diplexer | DIPLEXER | DIPLEXER

PDU

MCU / CCU

RMC

RKAIT

DC Plant

UMTS RRUW 850

UMTS 1st NodeB

GSM DB

LTE DUS 1 | CPRI MUX

LTE DUS 2 | CPRI MUX

DUS-1					
A	B	C	D	E	F
700 - A		700 - C	XMU-1 P1	XMU-1 P2	

XMU-1															
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
PCS1 - A	PCS1 A2 - A	WCS - A		PCS1 - C	PCS1 A2 - C	WCS - C								DUS1 - E	DUS1 - D

DUS-2					
A	B	C	D	E	F
700 - B	WCS - B		PCS1 - B	PCS1 A2 - B	

NOTES			
Date Time (Central)	Version	ATTUID	Note
2/12/2016 4:56:11 PM	2.00	mm093q	Updated to version 2,and RFDS with New XMU baseband configuration.

WORKFLOW SUMMARY						
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments
12/24/2015	Preliminary / In Progress	mm093q	Preliminary / Submitted for Approval	NA515M	Promote	LTE PCS Retrofit
01/04/2016	Preliminary / Submitted for Approval	NA515M	Preliminary / Submitted for Approval	KM8621	Re-Assign	
02/10/2016	Preliminary / Submitted for Approval	KM8621	Preliminary / Approved	BG144B	Promote	
02/12/2016	Preliminary / Approved	BG144B	Final / RF Approval	Mm093q	Promote	Promote to Final with COP
02/12/2016	Final / RF Approval	Mm093q	Final / Approved	BG144B	Promote	LTE Final RFDS with XMU.

Dual Broadband Antenna

90° 1.4 m MET Antenna

806-960/1710-2170 MHz

Part Number: 7770.00

Horizontal Beamwidth: 90°
Gain: 13.5/16 dBi

Electrical Downtilt: Adjustable
Connector Type: 7/16 female

The Powerwave dual band dual polarized broadband antenna has individual adjustable electrical downtilt per band (upgradeable to Remote Electrical Tilt (RET). Four connector ports allow separate tilts on each frequency band and ensure the use of diversity concepts. The phase shifter technology, based on a patented sliding dielectric, minimizes intermodulation distortion and maximizes efficiency. The slant +/- 45° dual polarization system provides the independent fading signals needed for achieving top-quality coverage via diversity concepts. The Powerwave Broadband antenna design is based on a patented stacked aperture-coupled patch technology, which provides high isolation performance and a wide VSWR bandwidth. The antennas have superior radiation patterns due to a unique reflector design which provides a very small variation of the –3dB horizontal beam width over the frequency band as well as a high front-to-back ratio.

Key Benefits

- Excellent broad- and multi-band capabilities
- Polarization purity makes good diversity gain
- Excellent pattern performance and high gain over frequency
- High passive intermodulation performance
- Light, slim and robust design

Preliminary

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS

806-960/1710-2170 MHz

Dual Broadband Antenna

Electrical Specifications (Preliminary)

Frequency band (MHz)	806-960		1710-2170
Gain, ± 0.5dB (dBi)	13.5		16.0
Polarization		Dual linear ±45°	
Nominal Impedance (Ohm)		50	
VSWR	1.5:1		
VSWR			1.5:1
Isolation between inputs (dB)	30		
Isolation between inputs (dB)			30
Inter band isolation (dB)		40	
Horizontal -3 dB beamwidth	85 ± 5°		85 ± 5°
Tracking, Horizontal plane, ±60° (dB)	<2.0		
Tracking, Horizontal plane, ±60° (dB)			<2.0
Electrical downtilt range (adjustable)	0° to 10°		0° to 8°
Vertical -3 dB beamwidth	14.3 ± 2.0°		6.6 ± 1°
Sidelobe suppression, Vertical 1 st upper (dB)	>17,16,15 x=0, 5, 10° MET		> 17, 16,15 x=0, 4, 8° MET
Vertical beam squint	<0.8°		<0.5°
First null-fill (dB)	<-25		<-25
Front-to-back ratio (dB)	>25		>27
Front-to-back ratio, total power (dB)	>20		>23
IM3, 2Tx@43dBm (dBc)	<-153		
IM3, 2Tx@43dBm (dBc)			<-153
IM7, 2Tx@43dBm (dBc)			<-160
Power Handling, Average per input (W)	400		250
Power Handling, Average total (W)	800		500

All specifications are subject to change without notice.
Contact your Powerwave representative for complete performance data.

Mechanical Specifications

Connector Type	4 x 7/16 DIN female
Connector Position	Bottom
Dimensions, HxWxD	1408mm x 280mm x 125mm (55”x11”x5”)
Weight Including Brackets	15.8 kg (35 lbs)
Wind Load, Frontal, 42m/s Cd=1	435N (98 lbf)
Survival Wind Speed (m/s)	70 (156mph)
Lightning Protection	DC grounded
Radome Material	GRP
Radome Color	Light Gray
Mounting	Pre-mounted Standard Brackets
Packing Size	1550mm x 355mm x 255mm (61”x14”x10”)

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Powerwave technologies

COVERAGE AND CAPACITY | TECHNOLOGY LEADERSHIP | GLOBAL PARTNER | INTEGRATED SOLUTIONS | QUALITY AND RELIABILITY

D031-08208 Rev A

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

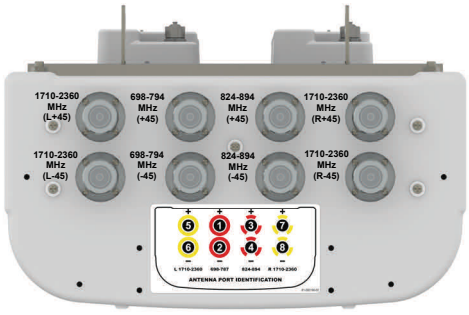
OPA-65R Multi-Band Antenna

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

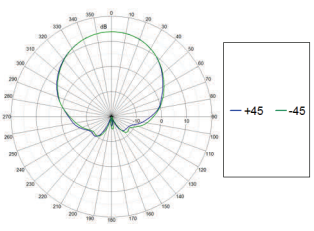
Dimensions (LxWxD)	72.0 x 14.8 x 7.4 inches (1828 x 376 x 189 mm)
Survival Wind Speed	> 150 mph
Front Wind Load	247 lbs (1099 N) @ 100 mph
Side Wind Load	142 lbs (631 N) @ 100 mph
Equivalent Flat Plate Area	9.7 ft^2 (0.9 m^2)
Weight (w/o RET/Mounting)	73 lbs (33 kg)
RET System Weight	7.0 lbs (3.0 kg)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



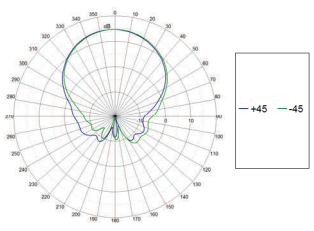
Bottom View

Rear View

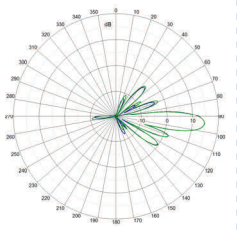
Antenna Patterns*



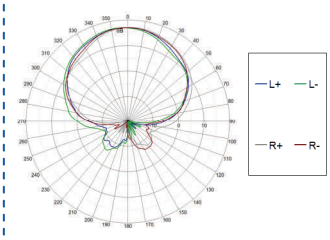
737 MHz Azimuth



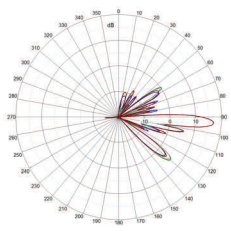
887 MHz Azimuth



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.

Quintel®
New Dimensions in Wireless™

QS66512-2

6ft 65° XXX MultiServ™ 12-Port Antenna

2x698-806*MHz / 2x824-894MHz / 4x1850-1990MHz / 4x1695-1780+2110-2400MHz

MultiServ

- Provides 12 antenna Ports in a slim-line form factor
- Optimized Azimuth patterns for Min Inter-Sector Interference
- Industry leading Minimal Wind-Load design
- 700, 850, PCS, AWS & WCS bands in one antenna
- AISG & 3GPP compliant internal remote electrical tilt (RET)
- AWS & PCS Cross band PIM >159dBc

The Quintel MultiServ™ Multiband 12 Port Antenna with patented QTilt™ technology uniquely delivers four independent services in a single slim-line antenna. This enables existing antenna network sites to be upgraded constraint free to add new services such as LTE for 700, 850, PCS, AWS and WCS bands with the replacement of one antenna. The QS66512-2 also provides 4x1695-1780+2110-2400MHz & 4x1850-1990MHz ports as two side-by-side (CLA-2X) arrays, each set of 4 ports having independent tilt for connection to 2T4R/4T4R services.

Electrical Characteristics	2x Ports 1&2	2x Ports 3&4	4x Ports 5-8			4 Ports 9-12
Operating Frequency (MHz	698-806*	824-894	1695-1780 and 2110-2400			1850-1990
	698-806	824-894	1695-1780	2110-2180	2300-2400	1850-1990
Azimuth beamwidth[1]	67°	64°	68°	63°	58°	69°
Elevation beamwidth[1]	12°	10°	6.5°	5.5°	4.5°	5.5°
Gain[1] (dBi)	13.2	13.5	16.2	16.5	17.0	16.0
Polarization	±45°	±45°	±45° ±45°			±45° ±45°
Electrical down-tilt range	2°-10°	2°-10°	2° – 7°			2° – 7°
Upper SLL (20° > mainbeam)[1]	-17dB	-19dB	-18dB	-18B	-18dB	-16dB
Front to Back Ratio(180°±10°)[1]	≥27dB	≥29dB	≥28dB	≥28dB	≥28dB	≥27dB
Port to Port isolation[1]	≥28dB	≥30dB	≥30dB	≥30dB	≥30dB	≥30dB
Return loss (VSWR)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB (1.5)	14dB(1.5)
X Polar Discrimination (at 0°)	>18dB	>16dB	>20dB	>20dB	>18dB	>20dB
Max Power handling (per any port)	500 watts	500 watts	250 watts			250 watts
Total Composite Power (all ports)	1750 watts					
PIM (3rd Order) (2x43dBm)	>153dBc	>153dBc	>153dBc			>153dBc
XBand PIM (3rd Order) (2x43dBm)			>159dBc			

[1] *Typical Performance across frequency and Downtilt. *Products Ordered after Jan 2016 will be 698-806MHz*

Mechanical Characteristics	
Dimensions	L 72"(1828mm) x W 12"(304mm) x D 9.6"(245mm)
Weight (excl mounting brackets)	111lbs (50.3kg)
No. of Connectors	12x 4.3-10.0 DIN Female Long Neck
Max Wind Speed	150mph (67m/s)
Equivalent Flat Plate Area	2.96ft² (0.275m²)
Wind Load @160km/h (45m/s)	Front: 587N (132 lbs), Side: 382N (86 lbs)
Operating Temperature	-40°C to +65°C

Fully Integrated RET Characteristics	
AISG Standards	V1.1,V 2.0 and 3GPP
Factory Default	AISG 2.0
Surge immunity	IEC 61000-4-5:2005 4KV(AISG PIN)
Device Type	SRET Type 1
AISG Data rate	9.6 kbps
No of connectors	1in/1out.
Connector type	IEC 60130-9 (Ed 3.0)
MTBF	36,000 Operational moves

All specifications are subject to change without notice. Please contact your Quintel representative for complete information.

Tower Mounted Amplifier

Dual Band 1900 MHz with 850 MHz Bypass

1900/850 MHz

Part Number:
LGP 214nn

Up-link: 1850-1910 MHz
Down-link: 1930-1990 MHz
Bypass: 824-894 MHz

Gain: 12 dB
Noise Figure: < 1.7 dB

The Powerwave® TMA-DD 1900/850 is a dual band Tower Mounted Amplifier (TMA) to be installed near the antenna. Deployed in an AMPS, GSM, GPRS, EDGE and CDMA network it will increase capacity and coverage as well as extend the battery life time for the handsets. The TMA System will provide enhanced coverage and improved up-link signal quality. Appropriate for new rollouts by optimizing coverage with a reduced number of BTSs or as an upgrade to existing BTSs for enhancing the existing coverage.

Extended band TMA facilitates simplified logistics, especially when the frequency bands are scattered. The unit comprises of high Q band-pass filters, dual balanced low noise amplifiers with circuits for active bias, supervision, alarms and lightning protection circuit. The Powerwave patented design with all active components integrated within the filter body provides an extremely reliable, compact and lightweight TMA solution. The vented enclosure design is employed to prevent the effect of condensation, thereby guaranteeing long, reliable, maintenance-free service in all environmental conditions. These TMAs offer an easy to install, maintenance free, cost effective solution for coverage enhancement and increased quality in mobile communication networks.

Key Benefits:

- 850 MHz Bypass
- Improved Network Quality
- Increased Coverage
- State of the Art Performance
- Excellent Power Handling
- Low Tx Loss
- Exceptional Reliability

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS

Powerwave technologies

Tower Mounted Amplifier

1900/850 MHz

Technical Specifications

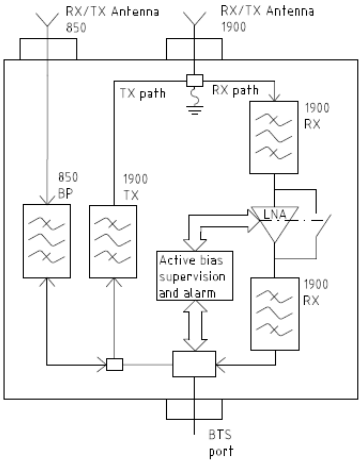
Product Number	LGP214nn	
850 MHz	Bypass (MHz)	824-894
	Return loss* (dB)	> 20
	Insertion loss* (dB)	< 0.3
1900 MHz		
Up-link	Frequency range, full band (60 MHz)	1850-1910
	Nominal gain (dB)	12
	Return loss* (dB)	> 20
	Noise figure* (dB)	< 1.7
	Output 3rd order Intercept Point* (dBm)	> +23
Down-link	Frequency range, full band (60 MHz)	1930-1990
	Insertion loss* (dB)	< 0.6
	Return loss* (dB)	> 20
Intermodulation	2 Tx@x43 dBm (dBc)	<-158
Alarm Functionality	Two levels,individually supervised LNAs	
Power Consumption	@12 VDC	1.2 W

* Typical

All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

Mechanical Specifications

Size,W x H x D (without mounting plate)	235 x 366 x 66 mm (9.2 x 14.4 x 2.6 in)
Weight	6.4 kg (14.1 lbs)
Color	Off white (NCS 1502-R)
Housing	Aluminum
RF-connectors	DIN 7/16 female.
Mounting kit	Mounting kit for pole and wall is included
Temperature range	-40 °C to +65 °C (-40 °F to +149 °F)
MTBF	>1 million hours
Safety	UL 60 950
Ingress protection, IP 65	EN 60 529
Environmental	ETS 300 019
EMC	FCC Part 15



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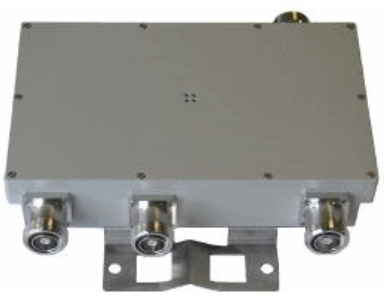
DATA SHEET

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.

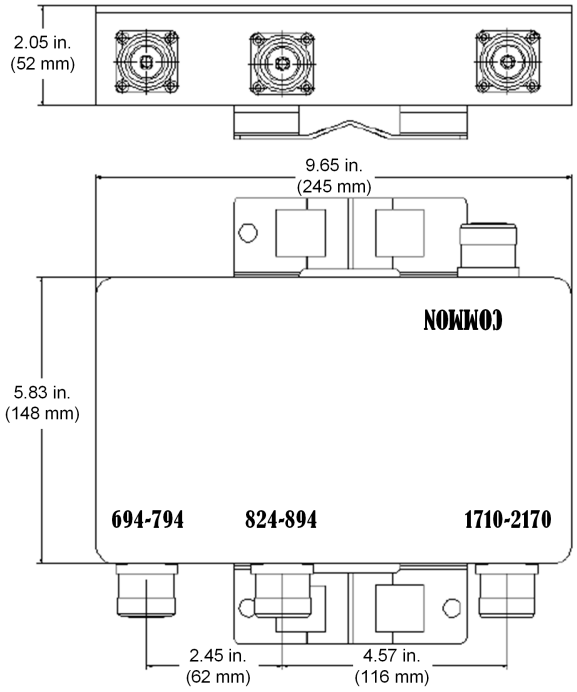
SPECIFICATIONS

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

RRUS 11

Frequency (AT&T)
- ✓ Band 12 (Lower 700 MHz)
- ✓ Band 4 (AWS, 17/2100 MHz) — 2Q2011

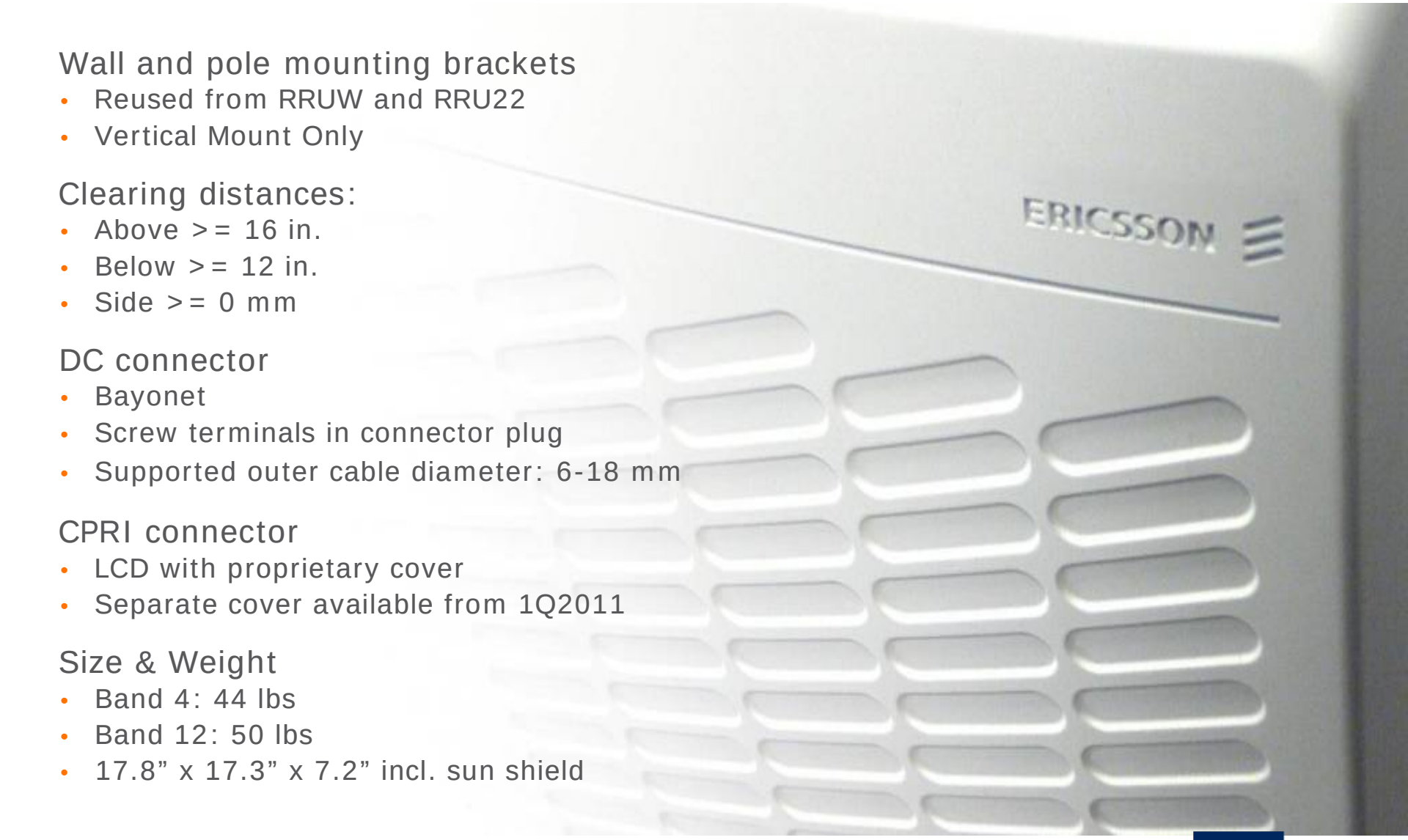
RF Characteristics
- ✓ Output power: 2x30 Watts
- ✓ 2x2 MIMO Capable
- ✓ IBW of 20 MHz
- ✓ Rx Sens.: Better than -105 dBm (5 MHz)

RET/TMA Support
- ✓ AISG 2.0 Compatible
- ✓ Via RET Port and Centre Conductor
- ✓ Cascading
- ✓ 30 VDC Bias

Environmental
- ✓ Self Convection
- ✓ Temperature -40 to 131 F

Power
- ✓ Input voltage: -48 VDC or AC (exemption)
- ✓ Fuse size: 13 – 32 A
  - Recommended: 25 A
- ✓ Power Consumption:
  - Typical 200 Watts
  - Max 310 Watts
  - Excl. RET and TMA load

RRUS 11 Mechanics



Wall and pole mounting brackets
- Reused from RRUW and RRU22
- Vertical Mount Only

Clearing distances:
- Above >= 16 in.
- Below >= 12 in.
- Side >= 0 mm

DC connector
- Bayonet
- Screw terminals in connector plug
- Supported outer cable diameter: 6-18 mm

CPRI connector
- LCD with proprietary cover
- Separate cover available from 1Q2011

Size & Weight
- Band 4: 44 lbs
- Band 12: 50 lbs
- 17.8” x 17.3” x 7.2” incl. sun shield

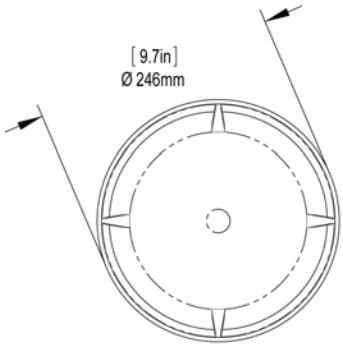
DC6-48-60-18-8F

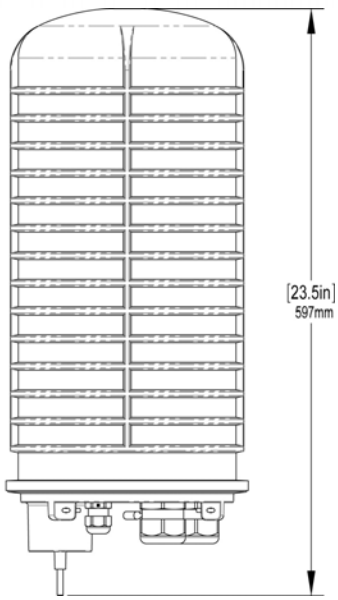
DC Surge Suppression Solution

The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.





Raycap

Phone 208.777.1166 Toll Free 800.890.2569 Fax 208.777.4466 www.raycapsurgeprotection.com

DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
Nominal Operating Voltage	48 VDC
Nominal Discharge Current (I_n)	20 kA 8/20 µs
Maximum Discharge Current (I_{max}) per NEMA LS-1	60 kA 8/20 µs
Maximum Continuous Operating Voltage (U_c)	75 VDC
Voltage Protection Rating	400 V

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
Fiber Connection Method	LC-LC Single mode duplex
Environmental Rating	IP 68, 7m 72hrs
Operating Temperature	-40° C to + 80° C
Storage Temperature	-70° C to + 80° C
Cold Temperature Cycling	IEC 61300-2-22e -30° C to + 60° C 200 hrs @ 5 psi
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
UV Protection	ISO 4892-2 Method A Xenon-Arc 2160 hrs
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 – 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)

GS-07F-0435V

Certified to ISO 9001:2000

TÜV Rheinland of North America

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

EBI Consulting
environmental | engineering | due diligence

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

AT&T Existing Facility

Site ID: CT1145

Newington
99 Cedarwood Ln
Newington, CT 06111

June 11, 2016

EBI Project Number: 6216002779

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	12.23 %

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

EBI Consulting
environmental | engineering | due diligence

June 11, 2016

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

Emissions Analysis for Site: **CT1145 – Newington**

EBI Consulting was directed to analyze the proposed AT&T facility located at **99 Cedarwood Ln, Newington, 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure 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 done for the proposed AT&T Wireless antenna facility located at **99 Cedarwood Ln, Newington, 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.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

3) 2 GSM channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (2300 MHz (WCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

9) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antennas used in this modeling are the **Kathrein 7770, CCI OPA-65R-LCUU-H6 and the Quintel QS66512-2** 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.

11) The antenna mounting height centerlines of the proposed antennas are **120 feet** above ground level (AGL) for **Sector A**, **120 feet** above ground level (AGL) for **Sector B** and **120 feet** above ground level (AGL) for Sector C.

12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Kathrein 7770	Make / Model:	Kathrein 7770	Make / Model:	Kathrein 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	3,453.54	ERP (W):	3,453.54	ERP (W):	3,453.54
Antenna A1 MPE%	**1.13 %**	Antenna B1 MPE%	**1.13 %**	Antenna C1 MPE%	**1.13 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	12.45 / 15.45 dBd	Gain:	12.45 / 15.45 dBd	Gain:	12.45 / 15.45 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	5,263.78	ERP (W):	5,263.78	ERP (W):	5,263.78
Antenna A2 MPE%	**1.68 %**	Antenna B2 MPE%	**1.68 %**	Antenna C2 MPE%	**1.68 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2
Gain:	10.85 / 13.85 dBd	Gain:	10.85 / 13.85 dBd	Gain:	10.85 / 13.85 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	4,371.36	ERP (W):	4,371.36	ERP (W):	4,371.36
Antenna A3 MPE%	**1.67 %**	Antenna B3 MPE%	**1.67 %**	Antenna C3 MPE%	**1.67 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**4.48 %**
Clearwire	0.10 %
Nextel	0.42 %
Carbones Auto Body	6.45 %
Town of Wethersfield	0.08 %
T-Mobile	0.70 %
Site Total MPE %:	**12.23 %**

AT&T Sector A Total:	4.48 %
AT&T Sector B Total:	4.48 %
AT&T Sector C Total:	4.48 %
Site Total:	12.23 %

AT&T _ Max Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	828.23	120	2.29	850 MHz	567	0.40%
AT&T 1900 MHz (PCS) UMTS	2	1,312.66	120	3.63	1900 MHz (PCS)	1000	0.36%
AT&T 1900 MHz (PCS) GSM	2	1,312.66	120	3.63	1900 MHz (PCS)	1000	0.36%
AT&T 850 MHz GSM	2	1,054.75	120	2.92	850 MHz	567	0.51%
AT&T 2300 MHz (WCS) LTE	2	4,209.02	120	11.64	2300 MHz (WCS)	1000	1.16%
AT&T 700 MHz LTE	2	1,459.42	120	4.04	700 MHz	467	0.86%
AT&T 1900 MHz (PCS) LTE	2	2,911.93	120	8.06	1900 MHz (PCS)	1000	0.81%
						Total:	4.48 %

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	4.48 %
Sector B:	4.48 %
Sector C:	4.48 %
AT&T Maximum Total (per sector):	4.48 %
Site Total:	12.23 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.23 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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