QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

May 18, 2016

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T)
353 Pumpkin Hill Road, Ashford, CT 06278
N 41-50-52.38
W 72-07-17.82

Dear Ms. Bachman:

AT&T previously maintained six (6) antennas at the 197-foot level of the existing 300-foot Guyed Tower at 353 Pumpkin Hill Road, Ashford, CT. Pursuant to CSC Petition #1121, these antennas are to be moved over to the same level of the new 240-foot Self Support replacement tower owned by Cellco Partnership d/b/a Verizon Wireless. The property is owned by Irene D. Bunte and co-owned by American Tower. AT&T now intends to install three (3) new KMW antennas (AMD-X-CD-17-65-00T). These antennas would be installed at the 196-foot level of the replacement tower along with the six (6) relocated antennas from the Guyed Tower. AT&T also intends to install six (6) Ericsson RRUS-11 remote radio units and one Raycap surge arrestor.

This facility was approved as Petition #1121 by the Connecticut Siting Council on January 8, 2015. This approval included no condition(s) that could feasibly be violated by this modification, including total facility height or mounting restrictions. This modification therefore complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 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 Michael J.

Zambo, First Selectman of the Town of Ashford, as well as to the tower and property owners.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

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

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

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

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

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

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

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

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Michael J. Zambo - as elected official
Irene D. Bunte – as property owner
American Tower – as property co-owner (via e-mail)
Cellco - as tower owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0.84%
AT&T UMTS	1	283	197.5	0.0028	880	0.5867	0.05%
AT&T UMTS	4	525	197.5	0.0206	1900	1.0000	0.21%
AT&T GSM	2	565	197.5	0.0111	880	0.5867	0.19%
Site Total							1.29%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Existing values exclude LTE loading previously proposed (EM-CING-003-130214) but never installed.

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0.84%
AT&T LTE	2	1771	196	0.0176	734	0.4893	0.36%
AT&T LTE	2	875	196	0.0174	1900	1.0000	0.17%
AT&T UMTS	1	283	196	0.0028	880	0.5867	0.05%
AT&T UMTS	4	525	196	0.0209	1900	1.0000	0.21%
AT&T GSM	2	565	196	0.0113	880	0.5867	0.19%
Site Total							1.82%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

WIRELESS COMMUNICATIONS FACILITY

CT1068
ASHFORD
353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. THE CUTOVER OF EXISTING RF EQUIPMENT INSTALLED ON AN EXISTING ±300' TALL GUYED TOWER TO A ±240' TALL SELF-SUPPORTING LATTICE REPLACEMENT TOWER (INSTALLED BY OTHERS).
2. A TOTAL OF SIX (6) AT&T DIRECTIONAL PANEL ANTENNAS, SIX (6) TMAs AND SIX (6) DIPLEXERS ARE TO BE RELOCATED AND MOUNTED AT A CENTERLINE ELEVATION OF 196.2'± A.G.L. ON THE ±240' REPLACEMENT SELF-SUPPORTING LATTICE TOWER. ADDITIONALLY THREE (3) PANEL ANTENNAS, SIX (6) RRUs, ONE (1) SURGE ARRESTOR AND ASSOCIATED CABLING ARE TO BE INSTALLED ON THE REPLACEMENT TOWER.

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

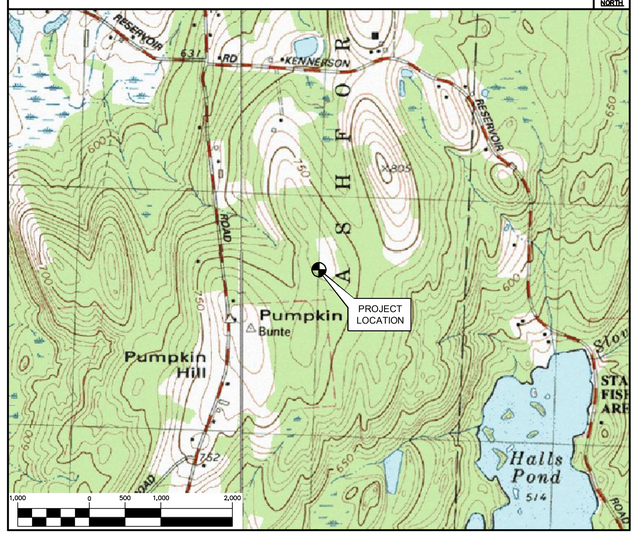
FROM: 500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

TO: 353 PUMPKIN HILL ROAD
ASHFORD, CONNECTICUT

1.	HEAD EAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.2 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.2 MI
3.	USE THE LEFT LANE TO TURN LEFT ONTO STATE HWY 411	0.2 MI
4.	TURN LEFT TO MERGE ONTO I-91 N	0.4 MI
5.	MERGE ONTO I-91 N	7.4 MI
6.	TAKE EXIT 29 TO MERGE ONTO CT-15 N/US-5 N TOWARD I-84 E/E HARTFORD/BOSTON	0.5 MI
7.	CONTINUE ONTO CT-15 N	0.8 MI
8.	USE THE LEFT 2 LANES TO MERGE ONTO I-84 E TOWARD BOSTON	19.7 MI
9.	TAKE EXIT 69 FOR CONNECTICUT 74 TOWARD U.S. 44/WILLINGTON/PUTNAM	0.3 MI
10.	TURN RIGHT ONTO CT-74 E	7.5 MI
11.	TURN LEFT ONTO US-44 E	3.1 MI
12.	TURN RIGHT ONTO PUMPKIN HILL RD, DESTINATION WILL BE ON THE LEFT	1.7 MI

VICINITY MAP

SCALE: 1" = 1000'



PROJECT INFORMATION

AT&T SITE NUMBER:	CT1068
AT&T SITE NAME:	ASHFORD
SITE ADDRESS:	353 PUMPKIN HILL ROAD ASHFORD, CT 06278
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-50'-52.136" N LONGITUDE: 72°-07'-17.777" W GROUND ELEVATION: ±760.8' A.M.S.L. (COORDINATES AND GROUND ELEVATION BASED ON FAA 1-A SURVEY CERTIFICATION AS PREPARED BY MARTINEZ COUCH AND ASSOCIATES; DATED SEPTEMBER 05, 2014, REVISED MARCH 25, 2015.)

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E-4	ELECTRICAL DETAILS	0
E-5	ELECTRICAL DETAILS	0
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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	04/29/16	KAW	CAG	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT REVIEW
1	12/15/15	CTP	CAG	CONSTRUCTION DOCUMENTS - REVISED PER CLIENT REVIEW
0	11/11/15	CTP	DMD	CONSTRUCTION DOCUMENTS - 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
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AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
ASHFORD
SITE NUMBER: CT1068
353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE: 10/21/15
SCALE: AS NOTED
JOB NO. 14273.000

TITLE SHEET

T-1

Sheet No. 1 of 14

SITE AND FOUNDATION 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 (ANTENNA MOUNTS):
     TIA/EIA-222-F-1996
     BASIC WIND SPEED (V) = 85 MPH (FASTEST MILE)
     TIA/EIA-22-F-1996 WIND SPEED CONTROLS

     2009 CT BUILDING CODE AMENDMENT APPENDIX K
     BASIC WIND SPEED (V) = 100 MPH (3-SECOND GUST)
     EQUIVALENT TO (V) = 80 MPH (FASTEST MILE)

   - SEISMIC LOAD (DOES NOT CONTROL):
     PER ASCE 7-02 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS ARE TO BE PROVIDED BY AN APPROVED AGENCY HIRED BY AT&T MOBILITY. REFER TO THE STATEMENT OF SPECIAL INSPECTIONS PREPARED BY CENTEK ENGINEERING, INC. DATED 11.11.15.

GENERAL NOTES

1. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
2. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
3. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
4. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
9. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
10. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.

EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PAQSSES OF COMPACTOR PER LIFT.
3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 ½"	100
No. 4	40-70
No. 100	5-20
No. 200	4-8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1"	100
¾"	90-100
½"	0-15
⅜"	0-5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

STRUCTURAL STEEL NOTES

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. STRUCTURAL PIPE (ROUND SHAPES)---ASTM A53 GRADE B, (Fy = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. ANCHOR RODS---ASTM F 1554
   H. REBAR---ASTM A-615 GRADE 60, (Fy = 60 KSI)
   I. WELDING ELECTRODE---ASTM E 70XX

2. EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE PLANS ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENTS ARE SUBMITTED FOR REVIEW TO THE ENGINEER.
3. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE REVIEWER'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.
4. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
5. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
6. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
7. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
8. FABRICATE BEAMS WITH MILL CAMBER UP.
9. THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER THE WORK IS FULLY COMPLETED.
10. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
11. BOLT HOLES SHALL BE PUNCHED OR DRILLED, FLAME CUT HOLES ARE NOT ACCEPTABLE.
12. 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.
13. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325-N. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
16. ALL BOLTED JOINTS SHALL BE SNUG TIGHT (ST) UNLESS OTHERWISE DESIGNATED AS PRETENSIONED (PT) OR SLIP CRITICAL (SC) ON THE DRAWINGS.
17. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
18. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.
19. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS STANDARDS. SUBMIT WELDER CERTIFICATION FOR REVIEW BY ENGINEER.
20. 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.
21. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
22. NOTIFY THE ENGINEER PRIOR TO FIELD CUTTING OR MODIFYING APPROVED FABRICATIONS.
23. 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.
24. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/11/15	CTP	DMD	CONSTRUCTION DOCUMENTS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

SAI communications

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

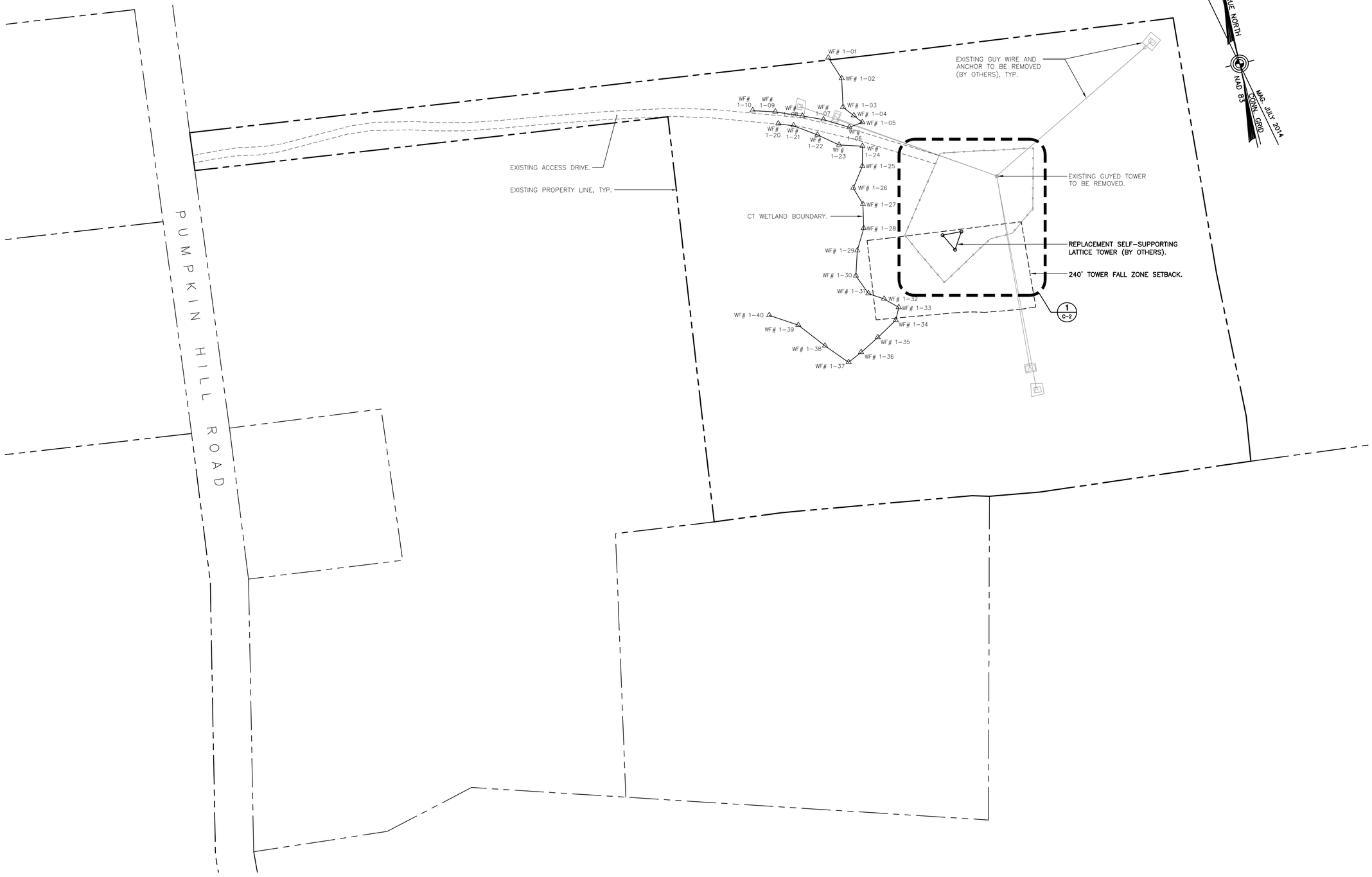
ASHFORD
SITE NUMBER: CT1068
353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE:	10/21/15
SCALE:	AS NOTED
JOB NO.	14273.000

DESIGN BASIS AND STRUCTURAL SPECIFICATIONS

N-1

Sheet No. 2 of 14



1 / C-1 **SITE LOCATION PLAN**
SCALE: 1" = 60'

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

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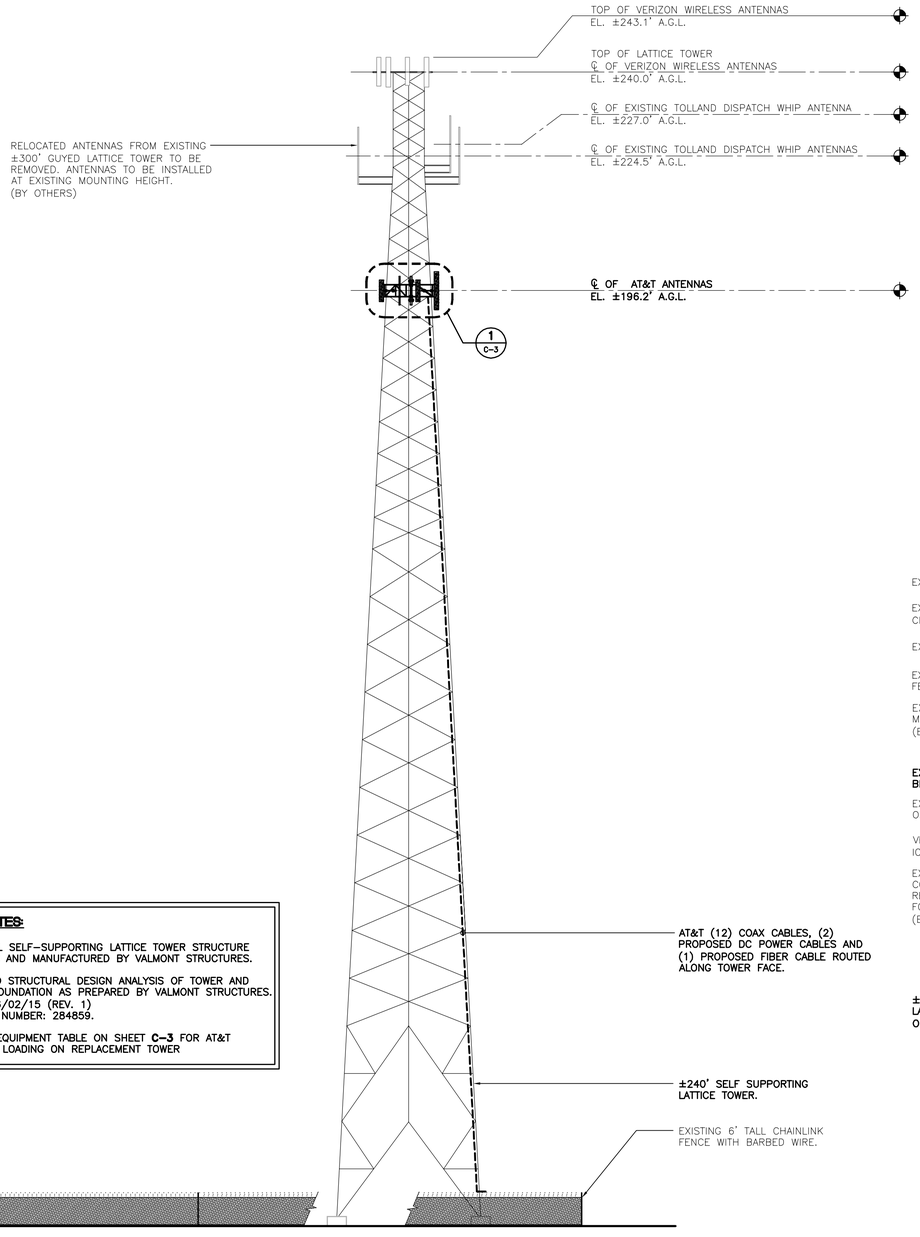
SITE
LOCATION PLAN

C-1

Sheet No. 3 of 14



TOWER NOTES:

1. 240' TALL SELF-SUPPORTING LATTICE TOWER STRUCTURE DESIGNED AND MANUFACTURED BY VALMONT STRUCTURES.
2. REFER TO STRUCTURAL DESIGN ANALYSIS OF TOWER AND TOWER FOUNDATION AS PREPARED BY VALMONT STRUCTURES. DATED 06/02/15 (REV. 1) PROJECT NUMBER: 284859.
3. SEE RF EQUIPMENT TABLE ON SHEET **C-3** FOR AT&T ANTENNA LOADING ON REPLACEMENT TOWER

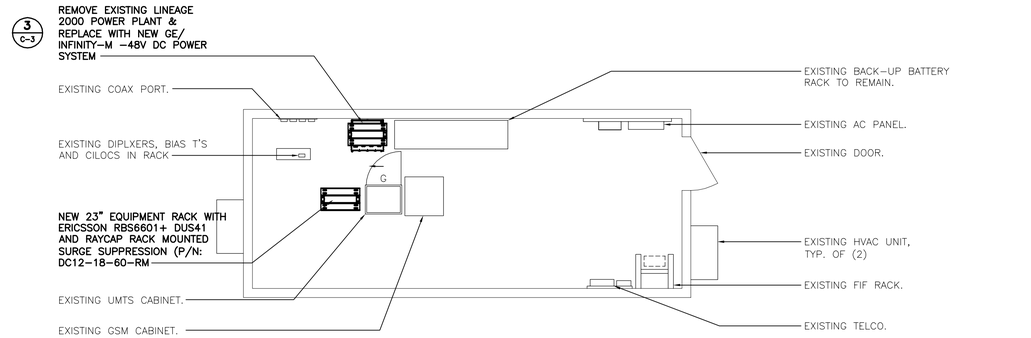
2 C-2 SOUTHWEST TOWER ELEVATION-PROPOSED

SCALE: 1" = 15'

GRAPHIC SCALE

15 0 7.5 15 30 60

(IN FEET)
1 inch = 15 ft.



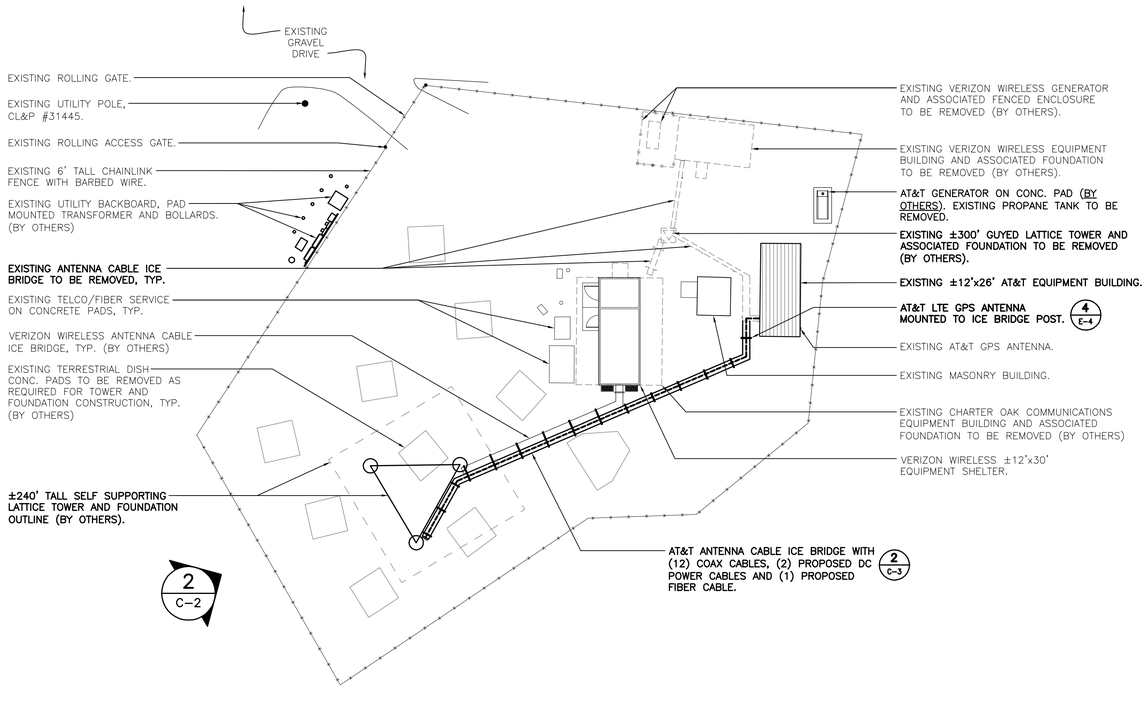
3 C-2 EQUIPMENT PLAN

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

GRAPHIC SCALE

4 0 2 4 8 16

(IN FEET)
1/4 inch = 1 ft.



1 C-2 COMPOUND PLAN

SCALE: 1" = 20'

APPROXIMATE NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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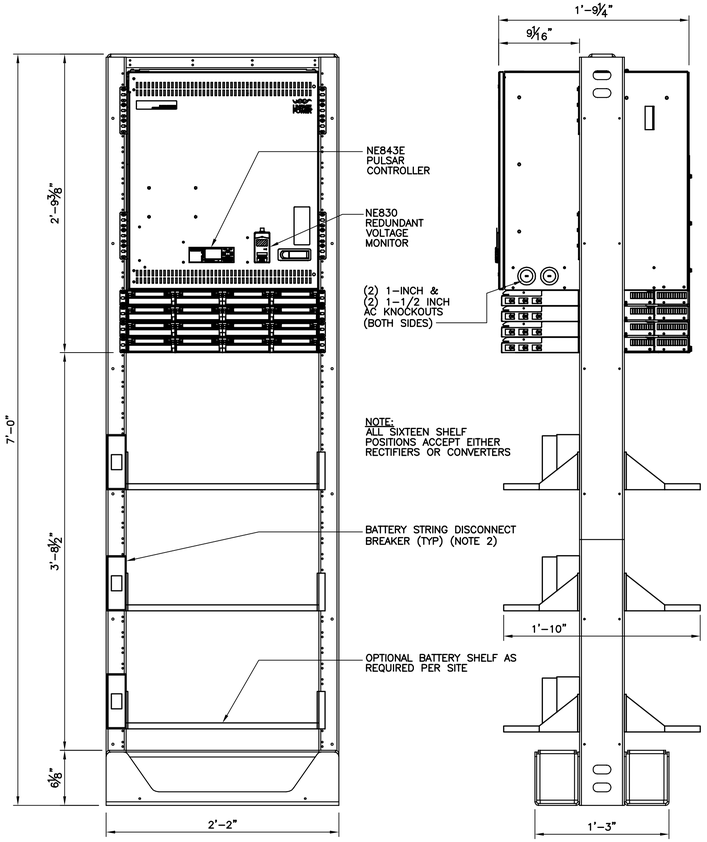
COMPOUND PLAN AND TOWER ELEVATION

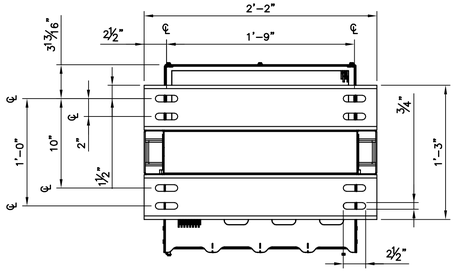
C-2

Sheet No. 4 of 14



FRONT VIEW

SIDE VIEW



BOLTING PATTERN

WEIGHT:
FRAME W/DC POWER SYSTEM AND WITHOUT BATTERIES = 435lbs

BATTERY SHELF (W/(4) 155AH BATTERIES = APPROXIMATELY 500lbs PER SHELF

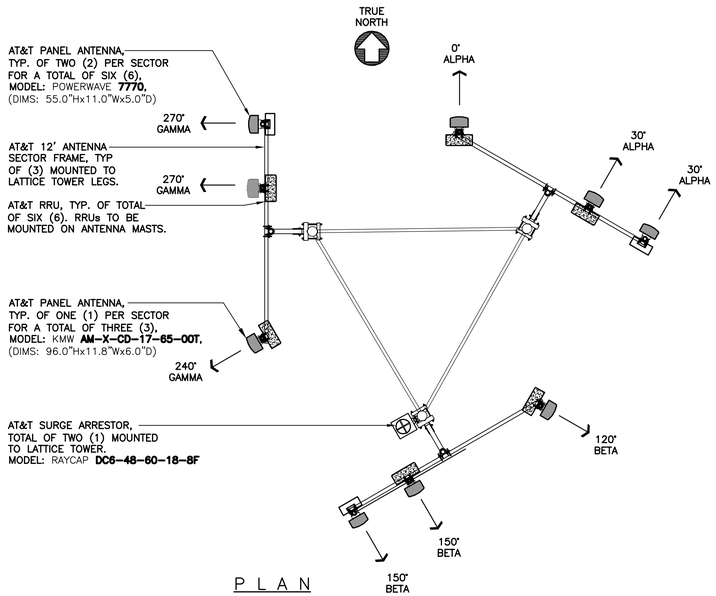
CLEARANCE:
FRONT = 36"
REAR = 6"
SIDES = 2"

3 C-3 GE/INFINITY-M DC POWER SYSTEM DETAIL

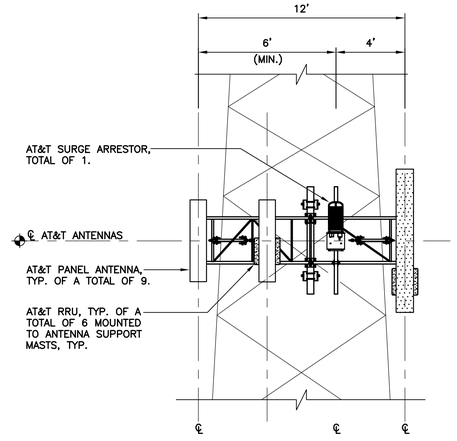
NOT TO SCALE

NOTES:

1. GE/LINEAGE FLOOR ANCHOR KIT **(P/N: 847135688)** MAY BE USED UNLESS LOCAL REQUIREMENTS GOVERN.
2. DISCONNECT MAY BE MOUNTED TO EITHER SIDE OF TRAY OR DIRECTLY TO FRAMEWORK.



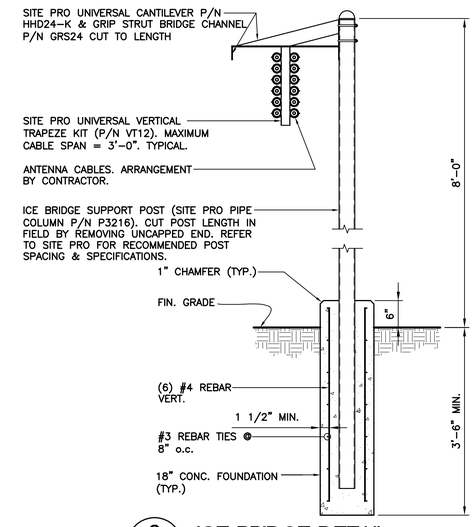
PLAN



ELEVATION

1 C-3 ANTENNA MOUNTING CONFIGURATION DETAILS

NOT TO SCALE



2 C-3 ICE BRIDGE DETAIL

NOT TO SCALE

RF EQUIPMENT TABLE

SECTOR	PANEL ANTENNAS						DIPLEXER	TMA		FROM REMOTE RADIO UNIT				REMOTE RADIO UNIT		FROM SURGE SUPPRESSOR				SURGE SUPPRESSOR	FROM SHELTER		
	AZIMUTH	EXISTING/ PROPOSED	QTY.	MAKE & MODEL	RAD CENTER (ATB)	DOWNTILT	QTY.	QTY.	MAKE & MODEL	JUMPER QTY.	JUMPER SIZE	COAX LENGTH	RET QTY.	RET SIZE	QTY.	MAKE & MODEL	DC QTY.	DC SIZE	FIBER QTY.	DC & FIBER LENGTH	QUANTITY	DC BUNDLE QTY.	FIBER TRUNK QTY.	FIBER & DC LENGTH
ALPHA	0°	PROPOSED	1	KWA AM-X-CD-17-65-00T	196.2'	0°M 0°/0°E	0	0	-	16	1/2" Ø	10' ±	0	-	2	ERICSSON RRUS-11	2	6mm² PAIR	1	15' ±	1	2	1	350'±
	30°	EXISTING	2	POWERWAVE 7770	196.2'	0°M 0°/0°E	2	2	POWERWAVE LGP 21401	4	1/2" Ø	10' ±	1	3/8" Ø	0	-								
BETA	120°	PROPOSED	1	KWA AM-X-CD-17-65-00T	196.2'	0°M 0°/0°E	0	0	-	16	1/2" Ø	10' ±	0	-	2	ERICSSON RRUS-11	2	6mm² PAIR	1	15' ±				350'±
	150°	EXISTING	2	POWERWAVE 7770	196.2'	0°M 0°/0°E	2	2	POWERWAVE LGP 21401	4	1/2" Ø	10' ±	1	3/8" Ø	0	-								
GAMMA	240°	PROPOSED	1	KWA AM-X-CD-17-65-00T	196.2'	0°M 0°/0°E	0	0	-	16	1/2" Ø	10' ±	0	-	2	ERICSSON RRUS-11	2	6mm² PAIR	1	15' ±				350'±
	270°	EXISTING	2	POWERWAVE 7770	196.2'	0°M 0°/0°E	2	2	POWERWAVE LGP 21401	4	1/2" Ø	10' ±	1	3/8" Ø	0	-								

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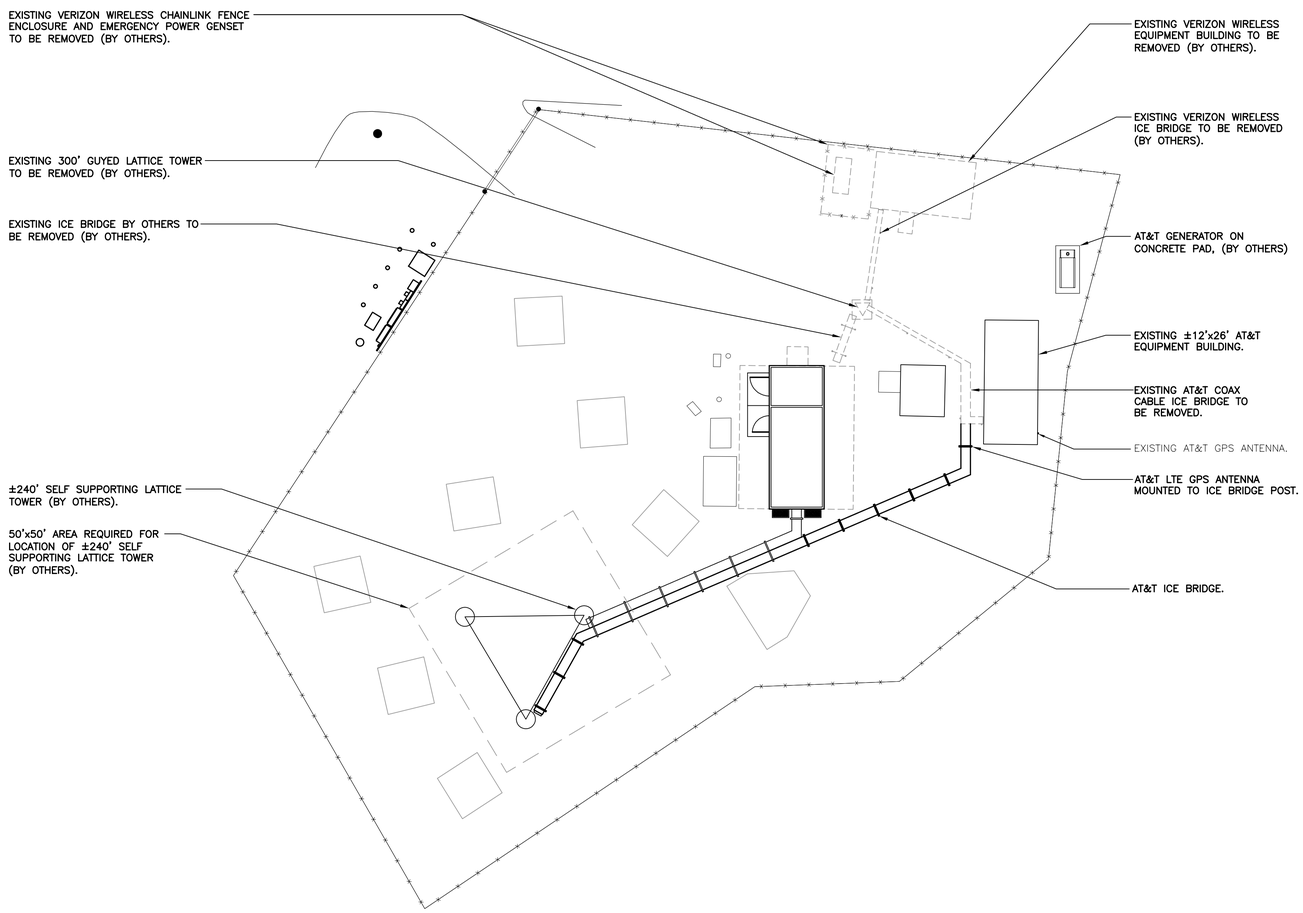
ANTENNA CONFIGURATION, RF EQUIPMENT TABLE AND DETAILS

C-3

Sheet No. 5 of 14



1 / E-1 **COMPOUND PLAN**
SCALE: 1" = 15'

NORTH

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

GENERAL NOTES

1. REFER TO CIVIL DRAWINGS FOR ACTUAL LOCATIONS OF STRUCTURES ON SITE.
2. COORDINATION, LAYOUT AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL/TELECOMMUNICATIONS SERVICES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
3. REFER TO GROUNDING PLAN FOR INFORMATION ON GROUNDING REQUIREMENTS.
4. ALL EXISTING PIPING WITHIN THE EXTENT OF WORK AREA SHALL REMAIN UNLESS NOTED OTHERWISE. THE ELECTRICAL CONTRACTOR SHALL RELOCATE/OFFSET EXISTING ELECTRICAL SYSTEMS AS REQUIRED TO ACCOMMODATE THE PROPOSED ARCHITECTURAL/HVAC/PLUMBING/FIRE PROTECTION RENOVATIONS AND ANY PROPOSED NEW CEILING HEIGHTS.
5. EXISTING RF SYSTEM, ASSOCIATED COMPONENTS, AND GROUNDING ARE TO BE REMOVED UNDER SEPARATE PROJECT AND IS NOT SHOWN FOR CLARITY. THIS INCLUDES ANTENNAS, CABLES, AMPLIFIERS, GROUNDING COMPONENTS, ICE BRIDGE COMPONENTS, MOUNTS, BRACKETS, APPURTENANCES, AND ASSOCIATED HARDWARE. COORDINATE WITH CONSTRUCTION MANAGER FOR ANY SCOPE OF WORK REQUIRED FOR REMOVAL OF EXISTING RF SYSTEM ELEMENTS ASSOCIATED WITH EXISTING TOWER SCHEDULED FOR DEMOLITION.
6. COORDINATE WITH CONSTRUCTION MANAGER FOR REQUIREMENTS OF CUTOVER FROM OLD RF SYSTEM TO NEW RF SYSTEM. PROVIDE ANY ADDITIONAL OR TEMPORARY COMPONENTS REQUIRED TO FACILITATE CUTOVER OR MINIMIZE DOWNTOWN.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	PROPERTY LINE
	GROUNDING
	EXISTING DRIVEWAY
	GROUND BAR
	CHAIN LINK FENCE
⊗	5/8" DIAMETER x 10'-0" COPPER GROUND ROD **OR** 24"x24" GROUND PLATE ABOVE MATT FOUNDATION.
⊠	5/8" DIAMETER x 10'-0" COPPER GROUND ROD WITH ACCESS.
■	EXOTHERMIC WELD TYPE "TA"
●	MECHANICAL CONNECTION

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COMPOUND PLAN AND NOTES

E-1
Sheet No. 6 of 14

GROUNDING SCHEMATIC NOTES

(1) COORDINATE WITH TOWER MFG FOR BONDING METHOD.

(2) EXISTING TO REMAIN.

(3) (2) #2/0 GREEN INSULATED.

(4) #6 AWG.

(5) INSTALL NEW GROUND BAR AT CABLE PORT AS REQUIRED PRIOR TO CUTOVER TO ACCOMMODATE BOTH NEW AND EXISTING GROUND KITS. GROUND BAR AND BONDING SHALL MATCH EXISTING AND BE BONDED TO EXISTING.

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. GROUND CONDUCTORS SHOWN SHALL BE #2 AWG SOLID TINNED BCW UNLESS OTHERWISE NOTED OR REQUIRED BY CODE.
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
6. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
7. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
8. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
9. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
10. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

CELLULAR GROUNDING NOTES

OBJECTIVE

PROVIDE A CELLULAR GROUNDING SYSTEM WITH MAXIMUM ALTERNATING CURRENT RESISTANCE OF 5 OHMS BETWEEN ANY POINT ON THE GROUNDING SYSTEM AND REFERENCE GROUND. PROVIDE EXTERIOR GROUNDING SCHEME WITH OWNER'S ENGINEER APPROVAL AS REQUIRED TO ACHIEVE DESIRED MAXIMUM AC RESISTANCE TO GROUND.

TESTING

CONTRACTOR TO PROVIDE AN INDEPENDENT TESTING CONTRACTOR TO DETERMINE THE GROUNDING SYSTEM RESISTANCE BY USE OF THE THREE POINT TEST AND AN AEMC MODEL 4500, OR APPROVED EQUAL. TEST TO BE PERFORMED PRIOR TO CONNECTION OF POWER SUPPLY TO THE CELL SITE AND CONNECTION OF THE GROUNDING SYSTEM TO THE WATER MAIN OR AC SUPPLY AS APPLICABLE. IF 5 OHM LIMIT IS EXCEEDED, CONTACT ENGINEER FOR ADDITIONAL INSTRUCTIONS TO ACHIEVE 5 OHMS OR LESS.

CONDUCTOR USED FOR CELLULAR GROUNDING SYSTEM

EGR – #2 AWG ANNEALED SOLID TINNED BARE COPPER
IGR – #2 AWG ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION
INTER-BUS EXTENSION (FROM IGR TO EGR) – SEE DETAILS
EXTERNAL BOND CONNECTIONS TO EGR – #2 ANNEALED SOLID TINNED BARE COPPER
INTERIOR BOND CONNECTIONS TO IGR – #6 ANNEALED STRANDED (7 STRAND) 'THW' GREEN COLORED INSULATION

MINIMUM BENDING RADIUS

IGR #2 : 1'-0" NOMINAL AND 8" MINIMUM
EGR #2 : 2'-0" NOMINAL AND 8" MINIMUM
CELLULAR GROUNDING CONDUCTOR SHALL BE AS STRAIGHT AS POSSIBLE WITH MINIMUM 6" BENDING RADIUS.

FASTENER FOR CELLULAR GROUNDING CONDUCTOR

USE NON-METALLIC FASTENER AND STANDOFF 'CLIC' (AVAIL. FROM NEFCO 800-969-0285) TO SURFACE SUPPORT CONDUCTOR 3" AWAY FROM SURFACES.

SPACING OF FASTENERS: 2'-0" O.C. OUTSIDE BUILDING
3'-0" O.C. INSIDE BUILDING

GROUNDING ELECTRODE

GROUNDING ELECTRODE SHALL BE 5/8" DIA. x 10'-0" I. COPPER CLAD STEEL ROD. ADJUST LOCATION OF GROUNDING ELECTRODE IF SOIL CONDITION IS NOT CONDUCTIVE (GRAVEL, SANDY SOIL, ROCKS). SPACE GROUNDING ELECTRODES 20'-0" APART (SPACING MAY BE REDUCED WHERE REQUIRED TO ACCOMMODATE FIELD CONDITIONS BUT SHALL NOT BE LESS THAN 10'-0"). ELECTRODES SHALL BE DRIVEN ONLY WITH PROPER DRIVER SLEEVE TO PREVENT MUSHROOMING TOP OF ROD. WHEN ROCK BOTTOM IS ENCOUNTERED, THE ELECTRODE SHALL BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM THE VERTICAL AWAY FROM STRUCTURES. TOP OF GROUNDING ELECTRODE SHALL BE MIN. 3'-6" BELOW FINISH GRADE.

CONNECTIONS ABOVE GRADE (MECHANICAL)

COMPRESSION LUG CONNECTOR – 15 TON COMPRESSION, 2 HOLE, LONG BARREL, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V RATED. USE 1/4" ø BOLT, 3/4" SPACING LUGS TO BOND OBJECTS FROM THE IGR. (CONNECTOR SHALL BE BURNDY HYLUG SERIES OR EQUAL.)

EXOTHERMIC WELD LUG CONNECTOR – 2 HOLE, OFFSET, ELECTRO TINNED PLATED, HIGH CONDUCTIVITY, COPPER 600V. USE 1/2"ø BOLT, 1-3/4" SPACING LUGS. CONNECTOR SHALL BE CADWELD CONNECTION STYLE (CABLE TO SURFACE) TYPE LA, LUG SIZE 1/8 x 1. EXOTHERMIC WELD TO LUG AS REQUIRED.

C-TAP COMPRESSION CONNECTOR – HIGH CONDUCTIVITY COPPER FOR MAIN TO BRANCH LINE TAPPING. (CONNECTOR SHALL BE BURNDY HYTAP SERIES OR EQUAL.)

MECHANICAL CONNECTIONS

USE MATCHING MANUFACTURER TOOL AND DIE FOR COMPRESSION CONNECTION.

APPLY ANTI-OXIDANT CONDUCTIVITY ENHANCER COMPOUND ON SURFACES THAT ARE COMPRESSED.

SURFACES INTENDED TO BE CONNECTED WITH MECHANICAL CONNECTORS SHALL BE BARE METAL TO BARE METAL. PRIME AND PAINT OVER BONDED AREA TO PREVENT CORROSION.

WHEN BONDING #2 TO #2

EXTERIOR OF BUILDING – USE EXOTHERMIC WELD CONNECTION
INTERIOR OF BUILDING – USE COMPRESSION CONNECTION ON STRANDED CONDUCTORS ONLY.
– USE EXOTHERMIC WELD CONNECTION ON SOLID CONDUCTOR.

WHEN BONDING #2 TO FENCE POST

USE EXOTHERMIC WELD (CADWELD TYPE 'VS') CONNECTION TO FENCE POST STEEL SURFACE. TEST WELD FOR POSSIBLE BURN THRU. PATCH WELDED AREA WITH GALVANIZED COATING AS REQUIRED FOR PROPER WELDED PERMANENT BOND. REFER TO MANUFACTURER'S REQUIREMENTS FOR DETAILS

GROUNDING SYSTEM INTERCONNECTION

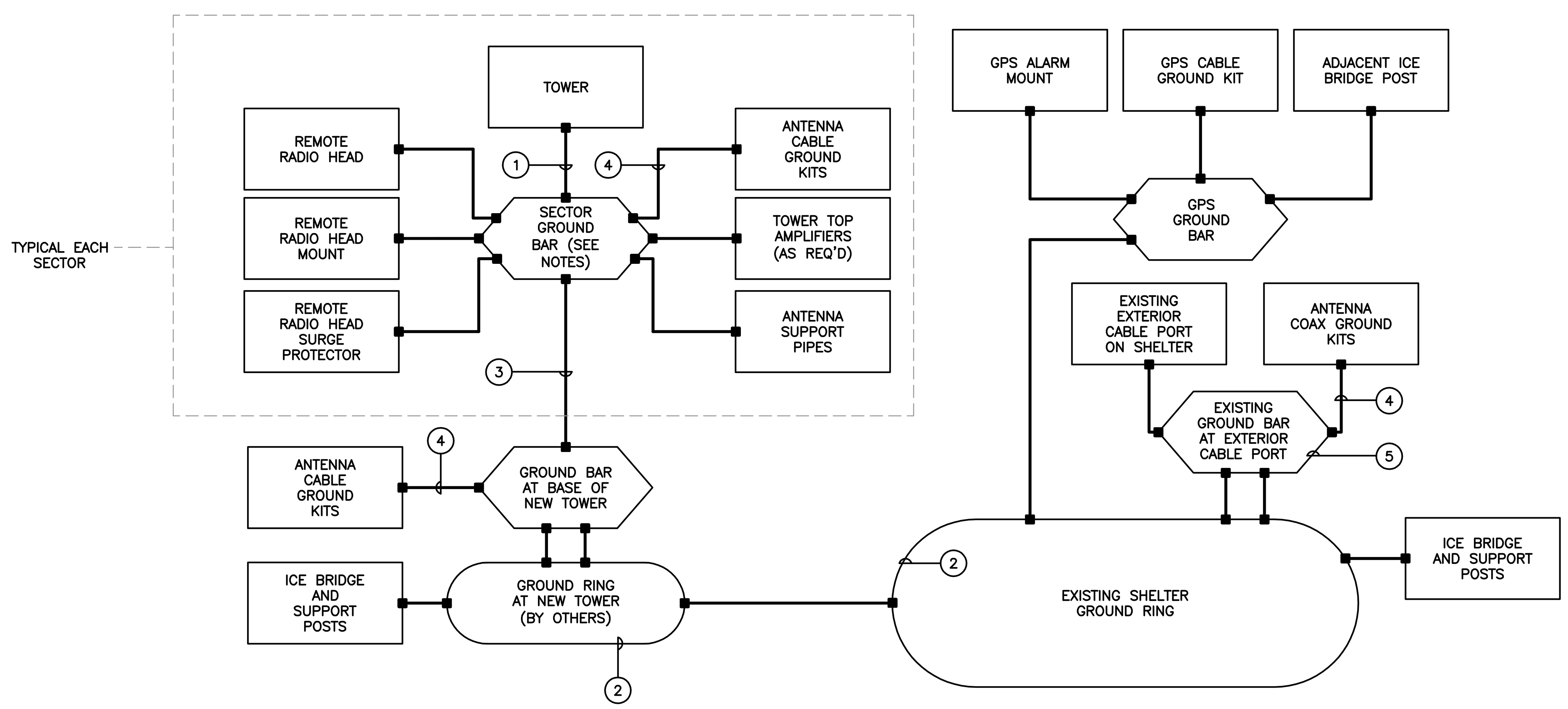
BOND THE EGR DOWN CONDUCTORS, AND/OR BURIED GROUND RING TO ANY METALLIC OBJECT OR EXISTING GROUNDING SYSTEM WITHIN 6'.

WHEN BONDING #2 TO TOWER GROUND PLATE

TOWER GROUND PLATE SHALL BE 6" x 8" x 1/4" COPPER AND BE MADE AVAILABLE TO TOWER CONTRACTOR TO BE INSTALLED DURING TOWER CONSTRUCTION. USE EXOTHERMIC WELD (CADWELD TYPE 'HS') TO TOWER GROUND PLATE TEST WELD FOR POSSIBLE BURN THRU. COORDINATE THE SIZE OF THE MOUNTING HOLE WITH TOWER CONTRACTOR.

METALLIC CONDUITS

BOND ALL STEEL CONDUITS TO PANELS AT POINT OF CONTACT WITH APPROVED GROUNDING BUSHING.



1 / E-2 **SCHEMATIC DIAGRAM-GROUNDING SYSTEM**
NOT TO SCALE

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SCHEMATIC DIAGRAM AND NOTES

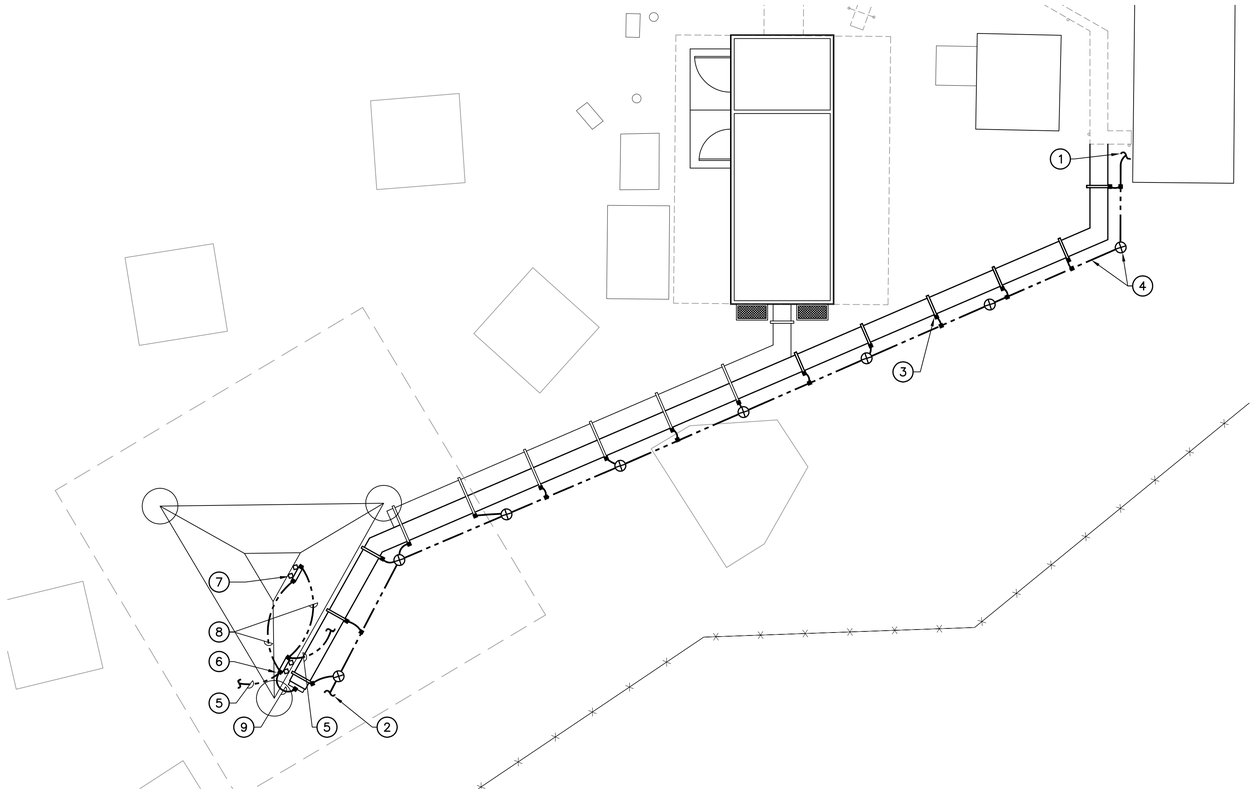
E-2

GROUNDING PLAN NOTES:

1. BOND TO EXISTING SHELTER GROUND RING.
2. BOND TO EXISTING TOWER GROUND RING.
3. BOND EACH ICE BRIDGE POST TO GROUND RING (TYPICAL).
4. GROUND ROD AND SHELTER GROUND RING EXTENSION, PER DETAILS.
5. BOND LOWER GROUND BAR TO EXISTING TOWER GROUND RING PER DETAILS. (TYPICAL OF TWO.)
6. LOWER GROUND BAR MOUNTED TO TOWER AT BOTTOM OF VERTICAL CABLE RUN.
7. SECTOR GROUND BAR MOUNTED NEAR ANTENNAS (TYPICAL).
8. BOND UPPER GROUND BAR TO LOWER GROUND BAR PER DETAILS. (TYP.)
9. PROVIDE BONDING OF FIBER DISTRIBUTION BOX AND ASSOCIATED COMPONENTS PER NEC AND MANUFACTURER SPECIFICATIONS, IF REQUIRED.

GENERAL NOTES

1. REFER TO ALL CIVIL DRAWINGS, GROUNDING DRAWINGS, DETAILS, AND NOTES FOR ADDITIONAL REQUIREMENTS.
2. ALL BONDS TO GROUND RING SHALL BE MADE BY EXOTHERMIC WELDING.



1 / E-3 **COMPOUND GROUNDING PLAN**
SCALE: 1/8" = 1'-0"

APPROXIMATE NORTH

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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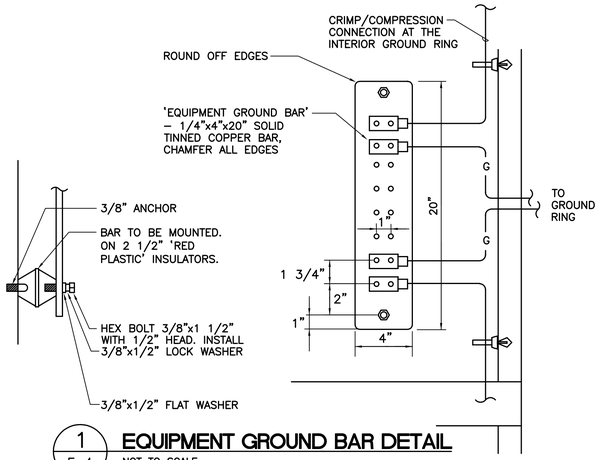
GROUNDING PLAN AND NOTES

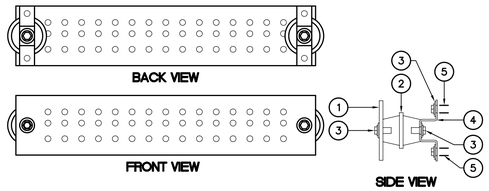
E-3

Sheet No. 11 of 14



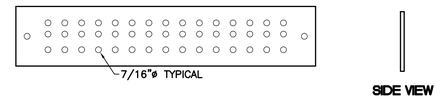
1 E-4 EQUIPMENT GROUND BAR DETAIL

NOT TO SCALE



TYPICAL GROUND BAR ASSEMBLY

N.T.S.

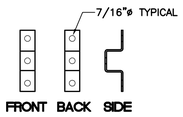


TYPICAL GROUND BAR - DIMENSIONS

N.T.S.

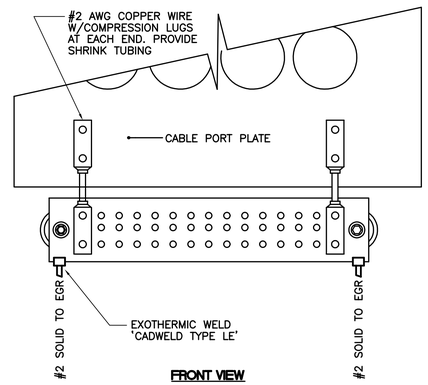
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE – 3/8"ø EXPANSION BOLT FOR CONCRETE.



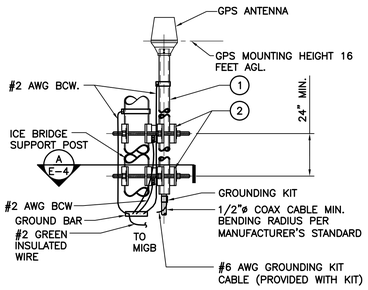
BRACKET FOR GROUND BAR-DIMENSIONS

N.T.S.

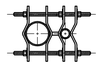


3 E-4 CABLEPORT GROUND BAR LUG CONNECTION

NOT TO SCALE



GPS ANTENNA MOUNTING BRACKET



A E-4 SECTION

NOT TO SCALE

BILL OF MATERIALS

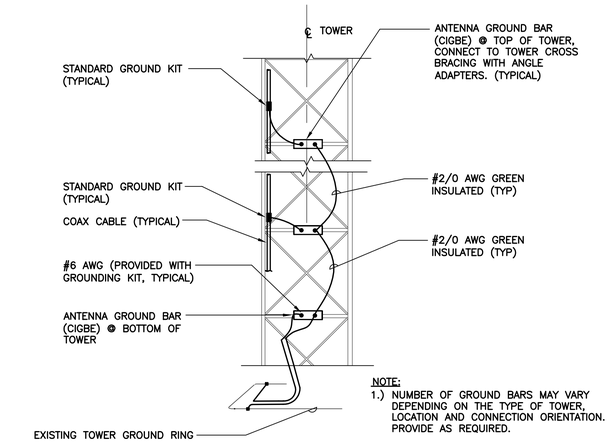
ITEM	DESCRIPTION	QUANTITY
1	2-1/2"ø SCH. 40 x 8'-0" LG. MAX SS OR GALV. PIPE	1
2	UNIVERSAL CLAMP SET.	2

NOTES

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 2-1/2" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 24 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.

4 E-4 GPS GROUNDING/MOUNTING BRACKET DETAIL

NOT TO SCALE

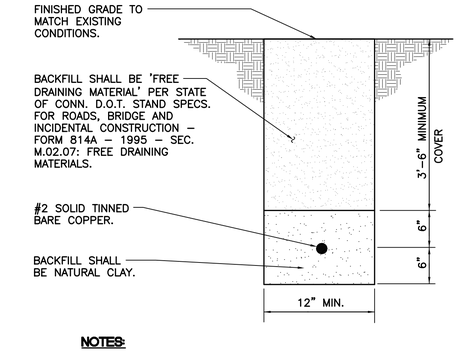


2 E-4 MASTER/EQUIPMENT GROUND BAR DETAILS

N.T.S.

5 E-4 ANTENNA CABLE GROUNDING - LATTICE TOWER

NOT TO SCALE

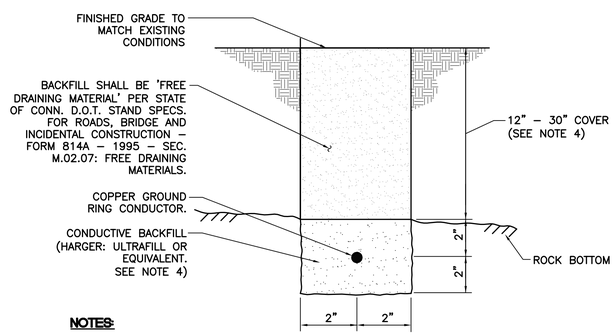


NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN NATURAL CLAY BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.

6 E-4 EGR TRENCH/BACKFILL DETAIL

NOT TO SCALE

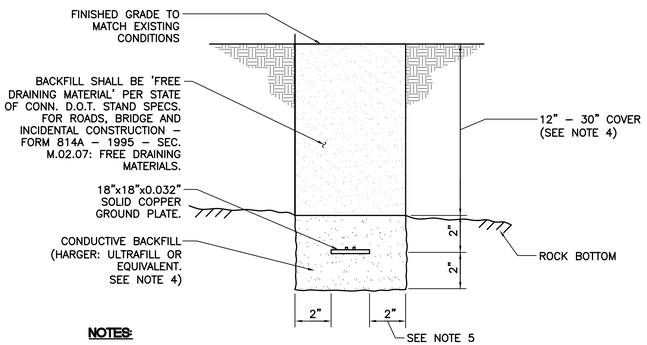


NOTES:

1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.

7 E-4 EGR TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)

NOT TO SCALE



NOTES:

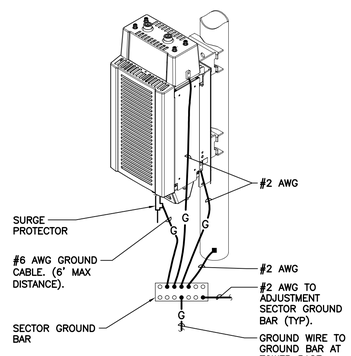
1. ENGINEER SHALL INSPECT PLACEMENT OF EGR CONDUCTOR PRIOR TO BACKFILLING.
2. MAINTAIN MIN. 2'-0" LINEAR CLEARANCE BETWEEN BACKFILL AND THE FOLLOWING: FOUNDATION, UNDERGROUND PIPING/CONDUIT, UNDERGROUND SERVICES. IN THE CLEARANCE AREAS, USE EARTH BACKFILL INSTEAD.
3. EXERCISE HANDLING AND USE PRECAUTION OF BACKFILL MATERIAL PER MFR'S REQUIREMENTS.
4. FOR LOCATIONS WHERE ROCK BOTTOM DEPTH IS LESS THAN 12" CONDUCTIVE CONCRETE SHALL BE USED INSTEAD OF CONDUCTIVE BACKFILL.
5. PROVIDE MIN 2" CLEARANCE ON ALL SIDES OF GROUND PLATE.

8 E-4 GROUND PLATE TRENCH/BACKFILL DETAIL (SHALLOW TOPSOIL)

NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



9 E-4 RRH POLE MOUNT GROUNDING

NOT TO SCALE

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ASHFORD, CT 06278

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JOB NO.	14273.000

ELECTRICAL DETAILS

E-4

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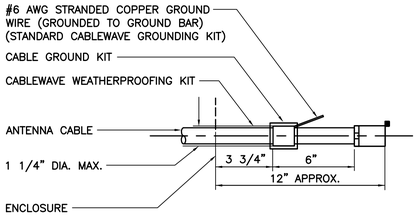
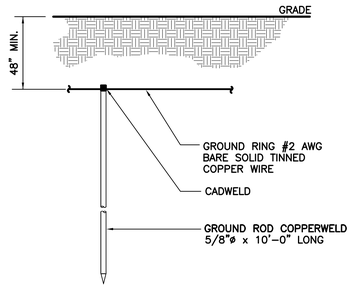


NOTE:

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

1 E-5 ANTENNA CABLE GROUNDING DETAIL

NOT TO SCALE

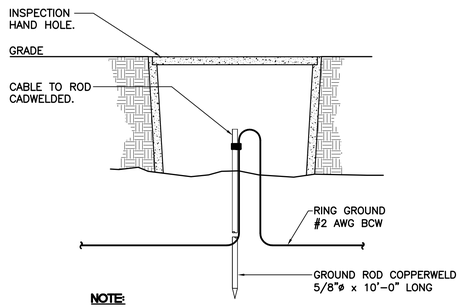


NOTE:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

2 E-5 GROUND ROD DETAIL

NOT TO SCALE

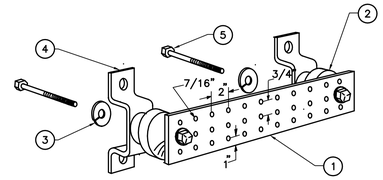


NOTE:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

3 E-5 GROUND ROD WITH ACCESS DETAIL

NOT TO SCALE

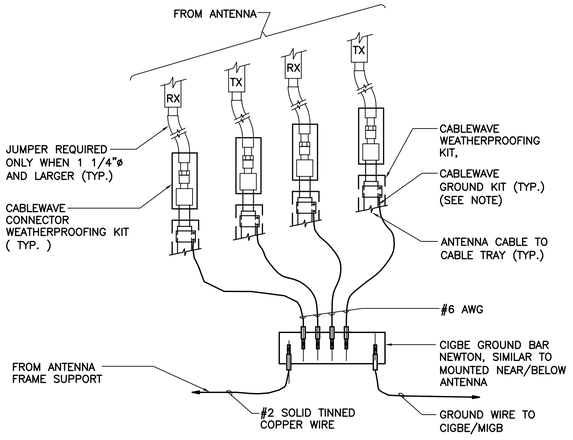


NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

4 E-5 GROUND BAR DETAIL

NOT TO SCALE

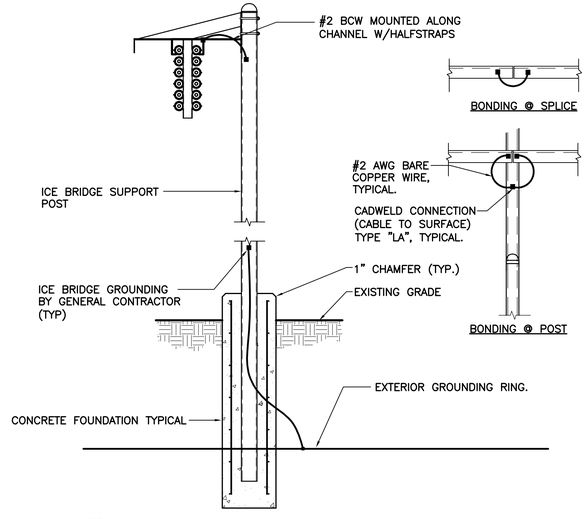


NOTE:

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

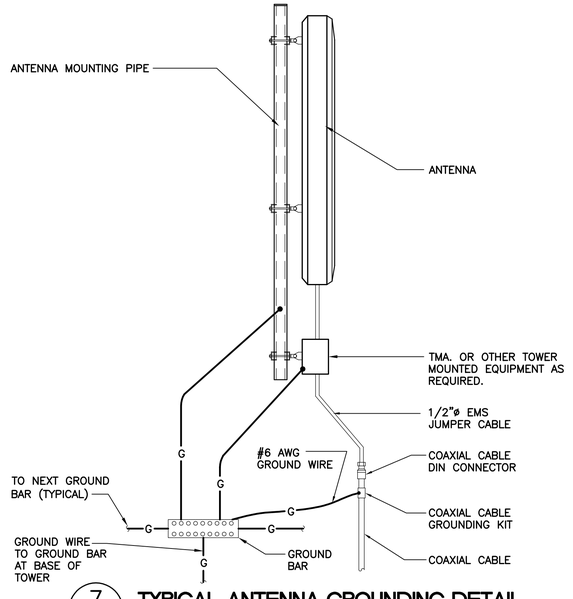
5 E-5 CONNECTION OF GROUND WIRES TO GROUND BAR

NOT TO SCALE



6 E-5 ICE BRIDGE BONDING DETAIL

NOT TO SCALE



7 E-5 TYPICAL ANTENNA GROUNDING DETAIL

NOT TO SCALE

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ELECTRICAL DETAILS

E-5

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, INTERIOR GROUNDING RING, GROUND BARS, ETC.

1.02. GENERAL REQUIREMENTS

A. 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.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. 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.

G. 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.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

O. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". ALL CONDUIT RUNS LOCATED WITHIN THE OWNER'S EQUIPMENT ROOM SHALL ORIGINATE FROM THE WIREWAY AND RUN VERTICALLY TO ITS DESTINATION. NO BENDS WILL BE ACCEPTED. CONDUITS SHALL BE PROPERLY FASTENED TO THE WALLS AND CEILINGS AS REQUIRED BY THE N.E.C.

CONDUIT MATERIAL SHALL BE AS FOLLOWS:

1. ELECTRIC METALLIC TUBING (EMT) – BRANCH CIRCUITS INSIDE WIRELESS ROOM

2. GALVANIZED RIGID CONDUIT (GRC) – FEEDERS AND CIRCUITS EXPOSED TO EXTERIOR & UNDERGROUND.

3. LIQUID TIGHT FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT (HVAC UNITS, MOTORS, ETC.) IN WET LOCATIONS.

4. FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT IN DRY LOCATIONS.

5. PVC CONDUIT – WHERE SHOWN ON GROUNDING DETAILS.

SECTION 16123

1.01. CONDUCTORS

A. 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:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GRAY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16450

1.01. GROUNDING

A. 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.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. REFER TO PANEL SCHEDULE "BRANCH CIRCUIT" DATA FOR EQUIPMENT GROUND CONDUCTOR SIZE FOR EACH BRANCH CIRCUIT.

4. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

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).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. INTERIOR GROUND RING
3. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
4. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S WIRELESS PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16960

1.01. 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: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: 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. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S 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.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

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WIRELESS COMMUNICATIONS FACILITY

ASHFORD

SITE NUMBER: CT1068

353 PUMPKIN HILL ROAD
ASHFORD, CT 06278

DATE:	10/21/15
SCALE:	AS NOTED
JOB NO.	14273.000

ELECTRICAL SPECIFICATIONS

E-6

Sheet No. 14 of 14

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Structural Analysis Report

240' Existing Lattice Tower

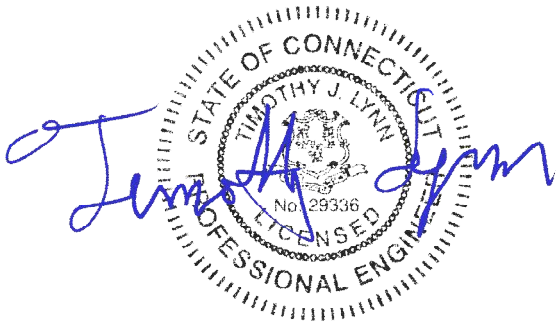
Proposed AT&T Mobility
Antenna Upgrade

AT&T Site Ref: CT1068

353 Pumpkin Hill Road
Ashford, CT

Centek Project No. 14273.000

Date: May 12, 2016



Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

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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 lattice tower located in Ashford, CT.

The host tower is a 240-ft, three legged, lattice tower. The tower geometry, structure member sizes and foundation system information were taken from the original design documents prepared by Sabre job no.; 128805 dated September 23, 2015.

Antenna and appurtenance information were obtained from the aforementioned Sabre design documents, visual verification from grade conducted by Centek personnel on May 3, 2016 and a AT&T RF data sheet.

The tower consists of twelve (12) vertical sections consisting of pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of steel angles 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 5-ft at the top and 25-ft at the base.

AT&T proposes the installation of three (3) panel antennas, six (6) remote radio heads and one (1) surge arrestor mounted to the three (3) existing V-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:

- VERIZON (PROPOSED):
  Antennas: Six (6) Andrew HBXX-6517DS panel antennas, six (6) Andrew LNX-6514DS panel antennas, three (3) Alcatel-Lucent RRH2x60-PCS remote radio heads, three (3) Alcatel-Lucent RRH2x60-AWS remote radio heads and two (2) RFS DB-T1-6Z-8AB-0Z main distribution boxes mounted on three (3) 12-ft V-Frames with a RAD center elevation of 240-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and two (2) 1-5/8" ∅ fiber cables running inside the monopole.
- UNKOWN (EXISTING/RESERVED):
  Antennas: One (1) 12-ft Omni-directional whip mounted on one (1) 6-ft side arm with an elevation of 221-ft above grade.
  Coax Cables: One (1) 1-5/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- UNKOWN (EXISTING/RESERVED):
  Antennas: Two (2) 12-ft Omni-directional whips mounted on two (2) 6-ft side arms with an elevation of 218-ft above grade.
  Coax Cables: Two (2) 1-5/8" ∅ 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: Six (6) Powerwave 7770 panel antennas, six (6) Powerwave LGP21401 TMAs, six (6) Powerwave LGP21901 diplexers and six (6) 7020 RETs mounted on three (3) 12-ft V-Frames with a RAD center elevation of 196.2-ft above grade.
  Coax Cables: Twelve (12) 2-1/4" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **AT&T (PROPOSED):**
  Antennas: Three (3) KMW AM-X-CD-17-65-00T panel antennas, six (6) Ericsson RRUS-11 remote radio heads one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) 12-ft V-Frames with a RAD center elevation of 196.2-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.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower 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.

Tower Loading

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:	Windham; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Ashford; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed controls.	
Load Cases:	Load Case 1; 85 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; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 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 1, per tnxTower "Section Capacity Table", this tower was found to be at **90.0%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T2)	200'-0"-220'-0"	74.3%	**PASS**
Leg (T6)	120'-0"-140'-0"	90.0%	**PASS**

Foundation and Anchors

The existing foundation consists of a three (3) 3.5-ft ∅ x 4.75-ft long reinforced concrete piers concentrically bearing on a 37-ft square x 1.75-ft thick reinforced concrete mat. The sub grade conditions used in the foundation analysis were derived from the aforementioned design documents. The base of the tower is connected to the foundation by means of (6) 1.5"∅, ASTM F1554-105 anchor bolts per leg embedded 4-ft 10-in into the concrete foundation structure.

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

Load Effect	Proposed Tower Reactions
Leg Shear	33 kips
Leg Compression	374 kips
Leg Tension	330 kips
Base Moment	7651 ft-kips
Base Shear	59 kips

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

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	55.7%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[1]	Proposed Loading (FS)[1]	Result
Reinforced Concrete Pad and Piers	Overturning	2.00	2.30	**PASS**

Note 1: FS denotes Factor of Safety

C o n c l u s i o n

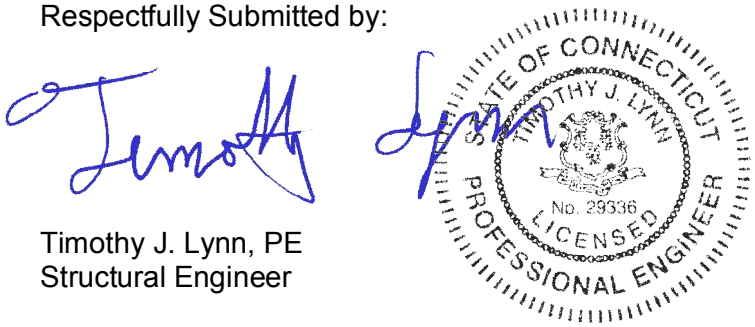
This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration with the below recommendations.

- **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.

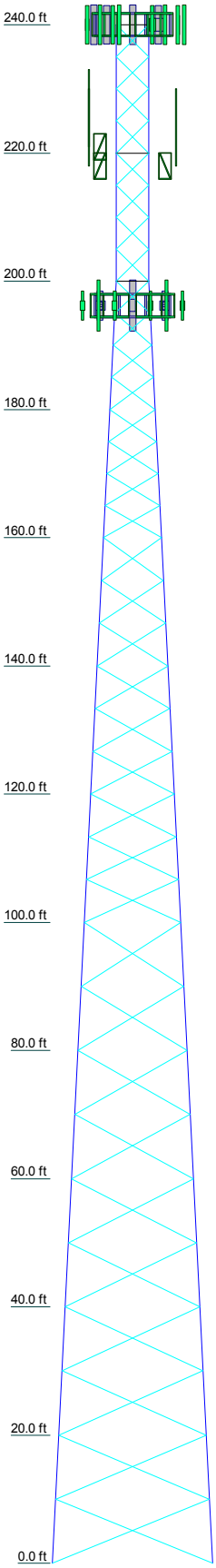
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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:

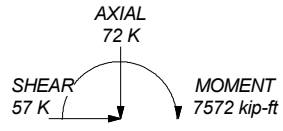
- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). 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	T11	T12		
Legs	P2x.218	P3x.3	P4x.337	P5x.375	P5x0.5	P8x.322	P8x.5				P10x.5			
Leg Grade	A500-50						A572-50							
Diagonals	L2x2x1/8	L2x2x5/16	L2x2x1/4	L2 1/2x2 1/2x1/4		L3x3x3/16	L3x3x1/4	L3 1/2x3 1/2x1/4	L4x3 1/2x1/4	L4x4x1/4		L4x4x5/16		
Diagonal Grade	A36													
Top Girts	L2x2x1/8	L2x2x5/16	L2x2x1/4	N.A.										
Face Width (ft)	5			7	9	11	13	15	17	19	21	23	25	
# Panels @ (ft)	16 @ 5					9 @ 6.66667				10 @ 10				
Weight (K)	0.5	1.2	1.4	2.0	2.4	2.5	3.8	3.8	4.0	4.9	5.5	5.6	37.5	

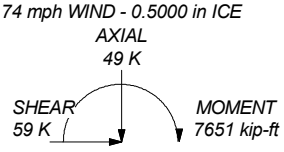


MAX. CORNER REACTIONS AT BASE:
DOWN: 374 K
SHEAR: 29 K

UPLIFT: -330 K
SHEAR: 33 K



TORQUE 86 kip-ft
74 mph WIND - 0.5000 in ICE



TORQUE 84 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
HBXX-6517DS (Verizon - Existing)	240	(2) LGP21401 TMA (ATI - Existing)	196.2
LNX-6514DS-VTM (Verizon - Existing)	240	(2) LGP21401 TMA (ATI - Existing)	196.2
HBXX-6517DS (Verizon - Existing)	240	(2) LGP21401 TMA (ATI - Existing)	196.2
LNX-6514DS-VTM (Verizon - Existing)	240	(2) LGP21901 Diplexer (ATI - Existing)	196.2
HBXX-6517DS (Verizon - Existing)	240	(2) LGP21901 Diplexer (ATI - Existing)	196.2
LNX-6514DS-VTM (Verizon - Existing)	240	(2) LGP21901 Diplexer (ATI - Existing)	196.2
HBXX-6517DS (Verizon - Existing)	240	(2) 7020 Dual Band RET (ATI - Existing)	196.2
LNX-6514DS-VTM (Verizon - Existing)	240		
HBXX-6517DS (Verizon - Existing)	240	(2) 7020 Dual Band RET (ATI - Existing)	196.2
LNX-6514DS-VTM (Verizon - Existing)	240		
HBXX-6517DS (Verizon - Existing)	240	(2) 7020 Dual Band RET (ATI - Existing)	196.2
LNX-6514DS-VTM (Verizon - Existing)	240		
RRH2x60-AWS (Verizon - Existing)	240	(2) RRUS-11 (ATI - Proposed)	196.2
RRH2x60-AWS (Verizon - Existing)	240	(2) RRUS-11 (ATI - Proposed)	196.2
RRH2x60-AWS (Verizon - Existing)	240	(2) RRUS-11 (ATI - Proposed)	196.2
RRH2x60-PCS (Verizon - Existing)	240	DC6-48-60-18-8F Surge Arrestor (ATI - Proposed)	196.2
RRH2x60-PCS (Verizon - Existing)	240	12' V-Frame (ATI - Existing)	196.2
RRH2x60-PCS (Verizon - Existing)	240	12' V-Frame (ATI - Existing)	196.2
DB-T1-6Z-8AB-0Z (Verizon - Existing)	240	12' V-Frame (ATI - Existing)	196.2
DB-T1-6Z-8AB-0Z (Verizon - Existing)	240	(2) 7770.00 (ATI - Existing)	196.2
12' V-Frame (Verizon - Existing)	240	(2) 7770.00 (ATI - Existing)	196.2
12' V-Frame (Verizon - Existing)	240	(2) 7770.00 (ATI - Existing)	196.2
12' V-Frame (Verizon - Existing)	240	AM-X-CD-17-65-00T-RET (ATI - Proposed)	196.2
12' x 3" Dia Omni	221		
ROHN 6-ft Side Arm	221	AM-X-CD-17-65-00T-RET (ATI - Proposed)	196.2
12' x 3" Dia Omni	218		
12' x 3" Dia Omni	218	AM-X-CD-17-65-00T-RET (ATI - Proposed)	196.2
ROHN 6-ft Side Arm	218		
ROHN 6-ft Side Arm	218		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A572-50	50 ksi	65 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 90%

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63-2 North Branford Rd.
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FAX: (203) 488-8587

Job: **14273.000 - CT1068**			
Project: **240-ft Lattice Tower - 353 Pumpkin Hill Rd Ashford, CT**			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/12/16	Scale: NTS	
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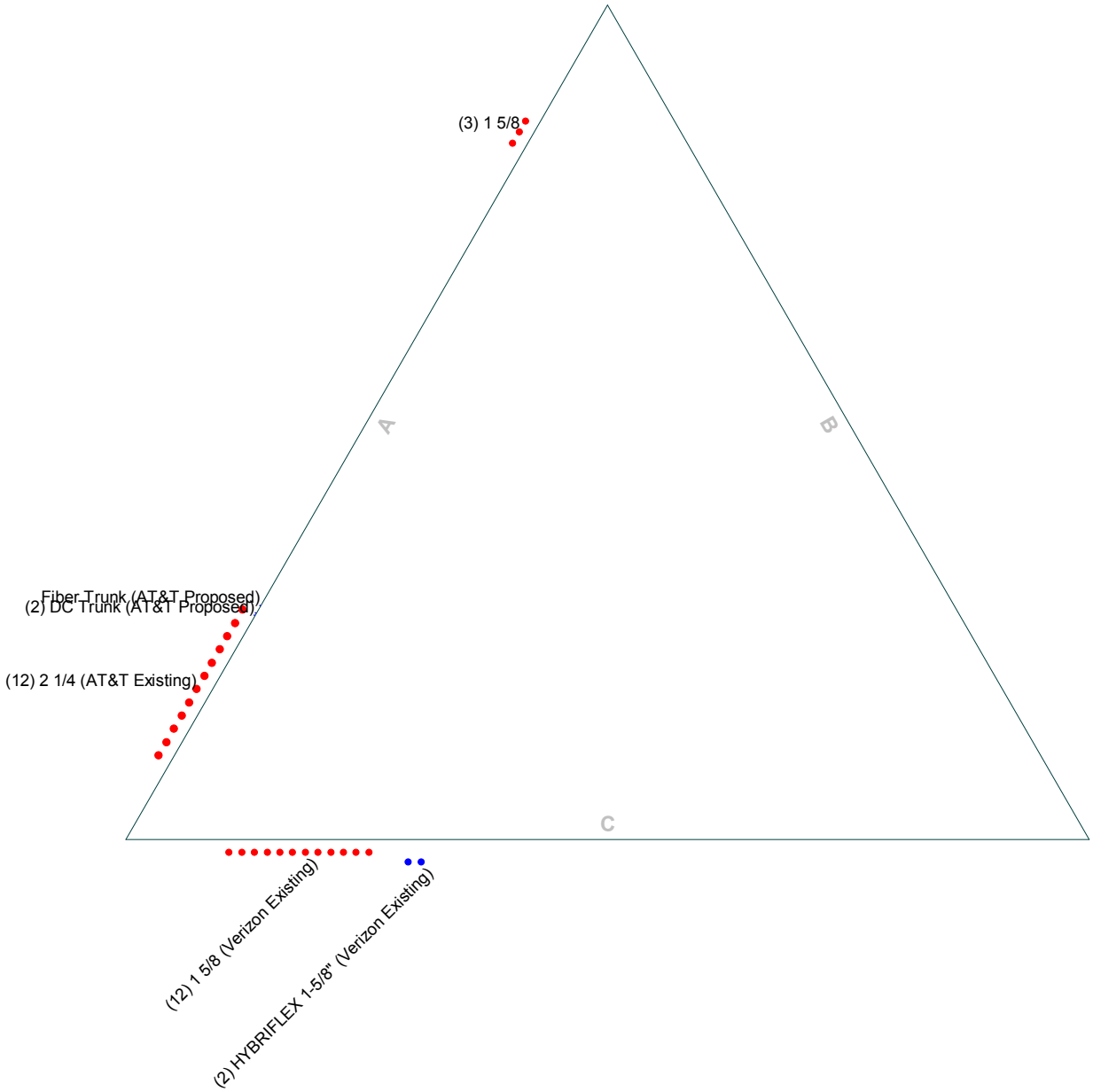
Feed Line Plan

Round Flat App In Face App Out Face



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Code: TIA/EIA-222-F	Date: 05/12/16	Scale: NTS	
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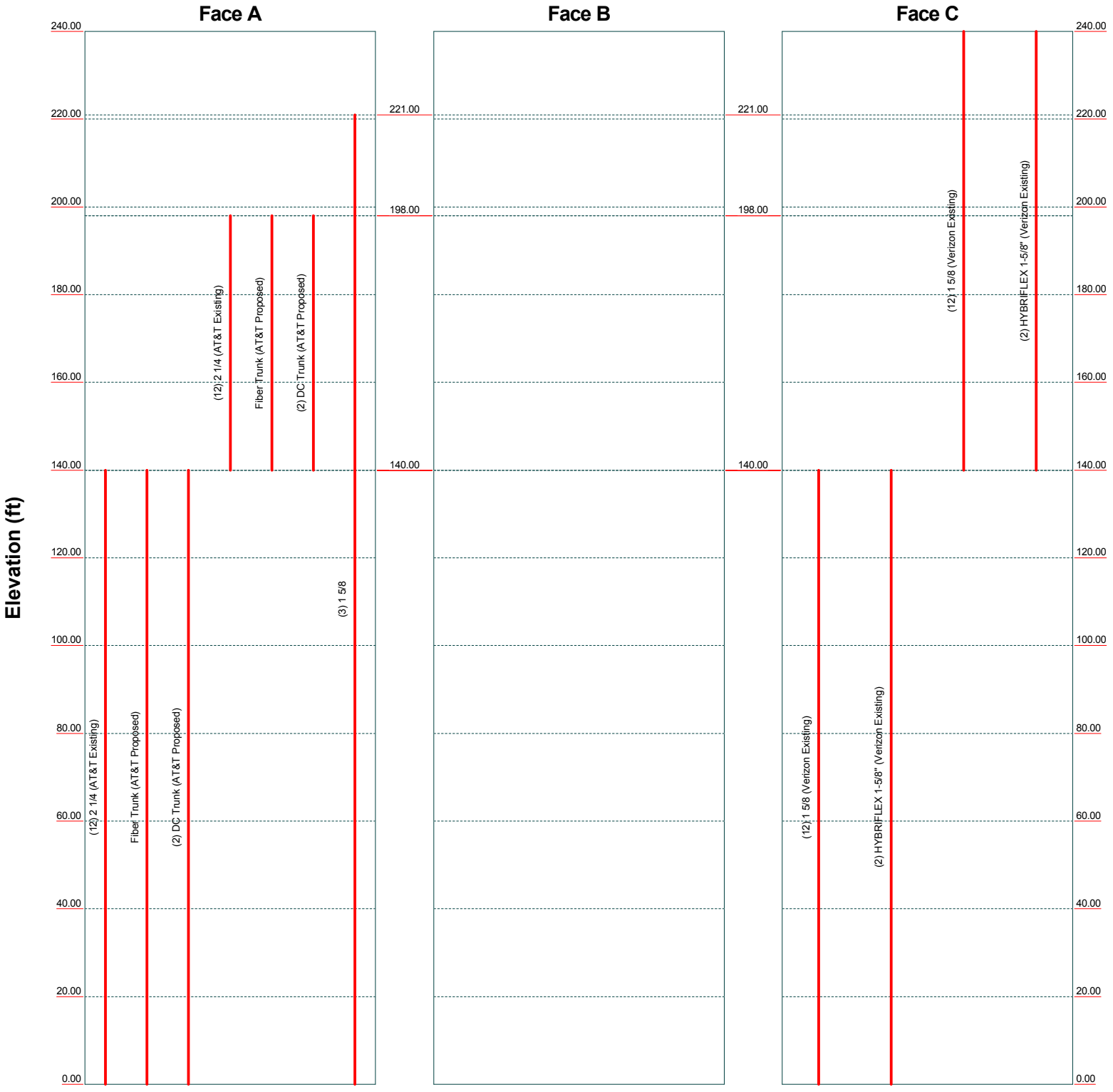
Feed Line Distribution Chart
0' - 240'

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



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Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 05/12/16	Scale: NTS	
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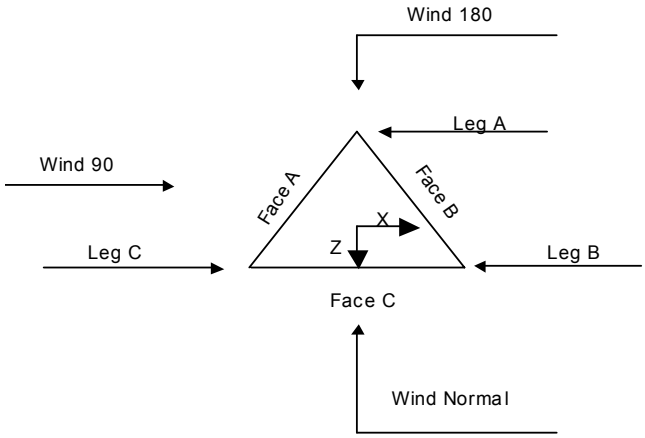
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 240.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 25.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	240.00-220.00			5.00	1	20.00
T2	220.00-200.00			5.00	1	20.00
T3	200.00-180.00			5.00	1	20.00
T4	180.00-160.00			7.00	1	20.00
T5	160.00-140.00			9.00	1	20.00
T6	140.00-120.00			11.00	1	20.00
T7	120.00-100.00			13.00	1	20.00
T8	100.00-80.00			15.00	1	20.00
T9	80.00-60.00			17.00	1	20.00
T10	60.00-40.00			19.00	1	20.00
T11	40.00-20.00			21.00	1	20.00
T12	20.00-0.00			23.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	240.00-220.00	5.00	X Brace	No	Yes	0.0000	0.0000
T2	220.00-200.00	5.00	X Brace	No	Yes	0.0000	0.0000
T3	200.00-180.00	5.00	X Brace	No	Yes	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T4	180.00-160.00	5.00	X Brace	No	No	0.0000	0.0000
T5	160.00-140.00	6.67	X Brace	No	No	0.0000	0.0000
T6	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T7	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T8	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T9	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T10	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T11	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T12	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 240.00-220.00	Pipe	P2x.218	A500-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 220.00-200.00	Pipe	P3x.3	A500-50 (50 ksi)	Equal Angle	L2x2x5/16	A36 (36 ksi)
T3 200.00-180.00	Pipe	P4x.337	A500-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T4 180.00-160.00	Pipe	P5x.375	A500-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 160.00-140.00	Pipe	P5x0.5	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T6 140.00-120.00	Pipe	P8x.322	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 120.00-100.00	Pipe	P8x.5	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T8 100.00-80.00	Pipe	P8x.5	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 80.00-60.00	Pipe	P8x.5	A572-50 (50 ksi)	Single Angle	L4x3 1/2x1/4	A36 (36 ksi)
T10 60.00-40.00	Pipe	P10x.5	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T11 40.00-20.00	Pipe	P10x.5	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)
T12 20.00-0.00	Pipe	P10x.5	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	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 240.00-220.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 220.00-200.00	Equal Angle	L2x2x5/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T3 200.00-180.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 240.00-220.00	0.00	0.5000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 220.00-200.00	0.00	0.5000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 200.00-180.00	0.00	0.5000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 180.00-160.00	0.00	0.5000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 160.00-140.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 140.00-120.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 120.00-100.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 100.00-80.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 80.00-60.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 60.00-40.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 40.00-20.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 20.00-0.00	0.00	0.6250	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft																	
T1 240.00-220.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 220.00-200.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 200.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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
100.00-80.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 240.00-220.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 220.00-200.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 200.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 240.00-220.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T2 220.00-200.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T3 200.00-180.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T4 180.00-160.00	5.0000	10.7500	5.0000	10.7500	0.0000	0.0000	0.0000	0.0000
T5 160.00-140.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T6 140.00-120.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T7 120.00-100.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T8 100.00-80.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T9 80.00-60.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T10 60.00-40.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T11 40.00-20.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000
T12 20.00-0.00	5.0000	11.5000	5.0000	11.5000	0.0000	0.0000	0.0000	0.0000

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 240.00-220.00	Flange	0.7500 A325N	6	0.6250 A325X	1	0.6250 A325X	1	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T2 220.00-200.00	Flange	1.0000 A325N	6	0.6250 A325X	1	0.6250 A325X	1	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T3 200.00-180.00	Flange	1.0000 A325N	6	0.6250 A325X	1	0.6250 A325X	1	1.0000 A325N	0	1.0000 A325N	1	1.0000 A325N	0	1.0000 A325N	0
T4 180.00-160.00	Flange	1.0000 A325N	6	0.6250 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T5 160.00-140.00	Flange	1.2500 A325N	6	0.6250 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T6 140.00-120.00	Flange	1.2500 A325N	6	0.6250 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T7 120.00-100.00	Flange	1.2500 A325N	6	0.7500 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T8 100.00-80.00	Flange	1.2500 A325N	6	0.7500 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T9 80.00-60.00	Flange	1.5000 A325N	8	0.7500 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T10 60.00-40.00	Flange	1.5000 A325N	8	0.7500 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0
T11 40.00-20.00	Flange	1.5000 A325N	8	0.7500 A325X	1	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T12 20.00-0.00	Flange	1.5000 F1554-105	6	0.6250 A325X	2	0.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0	1.0000 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon Existing)	C	Yes	Ar (CfAe)	140.00 - 0.00	3.0000	0.32	12	12	1.9800	1.9800		1.04
HYBRIFLEX 1-5/8" (Verizon Existing)	C	Yes	Ar (CaAa)	140.00 - 0.00	6.0000	0.2	2	2	1.9800	1.9800		1.90
2 1/4 (AT&T Proposed)	A	Yes	Ar (CfAe)	140.00 - 0.00	3.0000	-0.32	12	12	2.3800	2.3800		1.16
Fiber Trunk (AT&T Proposed)	A	Yes	Ar (CaAa)	140.00 - 0.00	0.0000	-0.22	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T Proposed)	A	Yes	Ar (CaAa)	140.00 - 0.00	0.0000	-0.23	2	2	0.4000	0.4000		0.11
1 5/8 (Verizon Existing)	C	Yes	Ar (CfAe)	240.00 - 140.00	3.0000	0.2	12	12	1.9800	1.9800		1.04
HYBRIFLEX 1-5/8" (Verizon Existing)	C	Yes	Ar (CaAa)	240.00 - 140.00	0.0000	0.14	2	2	1.9800	1.9800		1.90
2 1/4 (AT&T Proposed)	A	Yes	Ar (CfAe)	198.00 - 140.00	3.0000	-0.2	12	12	2.3800	2.3800		1.16
Fiber Trunk (AT&T Proposed)	A	Yes	Ar (CaAa)	198.00 - 140.00	0.0000	-0.14	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T Proposed)	A	Yes	Ar (CaAa)	198.00 - 140.00	0.0000	-0.13	2	2	0.4000	0.4000		0.11
1 5/8	A	Yes	Ar (CfAe)	221.00 - 0.00	3.0000	0.34	3	3	1.9800	1.9800		1.04

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	240.00-220.00	A	0.495	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33

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
T2	220.00-200.00	A	9.900	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T3	200.00-180.00	A	52.740	0.000	2.160	0.000	0.33
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T4	180.00-160.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T5	160.00-140.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T6	140.00-120.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T7	120.00-100.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T8	100.00-80.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T9	80.00-60.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T10	60.00-40.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T11	40.00-20.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33
T12	20.00-0.00	A	57.500	0.000	2.400	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	39.600	0.000	7.920	0.000	0.33

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	240.00-220.00	A	0.500	0.745	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T2	220.00-200.00	A	0.500	14.900	0.000	0.000	0.000	0.15
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T3	200.00-180.00	A	0.500	75.740	0.000	7.440	0.000	0.83
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T4	180.00-160.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T5	160.00-140.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T6	140.00-120.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T7	120.00-100.00	A	0.500	82.500	0.000	8.267	0.000	0.91

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T8	100.00-80.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T9	80.00-60.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T10	60.00-40.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T11	40.00-20.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75
T12	20.00-0.00	A	0.500	82.500	0.000	8.267	0.000	0.91
		B		0.000	0.000	0.000	0.000	0.00
		C		59.600	0.000	11.920	0.000	0.75

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	240.00-220.00	A	0.000	0.038	0.051	0.076
		B	0.000	0.000	0.000	0.000
		C	0.000	3.568	4.741	7.135
T2	220.00-200.00	A	0.000	0.764	1.016	1.529
		B	0.000	0.000	0.000	0.000
		C	0.000	3.568	4.741	7.135
T3	200.00-180.00	A	0.000	3.875	5.209	7.750
		B	0.000	0.000	0.000	0.000
		C	0.000	3.321	4.413	6.641
T4	180.00-160.00	A	0.000	3.485	5.858	8.713
		B	0.000	0.000	0.000	0.000
		C	0.000	2.738	4.548	6.846
T5	160.00-140.00	A	0.000	2.662	4.475	6.656
		B	0.000	0.000	0.000	0.000
		C	0.000	2.092	3.474	5.229
T6	140.00-120.00	A	0.000	2.533	5.108	7.598
		B	0.000	0.000	0.000	0.000
		C	0.000	1.990	3.966	5.970
T7	120.00-100.00	A	0.000	2.451	4.944	7.354
		B	0.000	0.000	0.000	0.000
		C	0.000	1.926	3.839	5.778
T8	100.00-80.00	A	0.000	1.740	4.094	6.090
		B	0.000	0.000	0.000	0.000
		C	0.000	1.367	3.179	4.785
T9	80.00-60.00	A	0.000	1.688	4.539	6.751
		B	0.000	0.000	0.000	0.000
		C	0.000	1.326	3.524	5.304
T10	60.00-40.00	A	0.000	1.649	4.436	6.597
		B	0.000	0.000	0.000	0.000
		C	0.000	1.296	3.444	5.184
T11	40.00-20.00	A	0.000	1.620	4.358	6.482
		B	0.000	0.000	0.000	0.000
		C	0.000	1.273	3.384	5.093

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T12	20.00-0.00	A	0.000	1.598	4.298	6.392
		B	0.000	0.000	0.000	0.000
		C	0.000	1.256	3.337	5.022

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	240.00-220.00	-4.3001	7.6845	-4.1996	7.5071
T2	220.00-200.00	-4.1881	4.7684	-4.2066	4.7948
T3	200.00-180.00	-9.5335	3.8187	-9.0402	3.7036
T4	180.00-160.00	-11.5211	4.3842	-11.2267	4.3610
T5	160.00-140.00	-14.3927	5.5071	-14.1263	5.5053
T6	140.00-120.00	-18.1223	8.1069	-18.7066	8.4117
T7	120.00-100.00	-20.4583	9.1505	-21.1579	9.5063
T8	100.00-80.00	-23.6458	10.5724	-24.7718	11.1175
T9	80.00-60.00	-24.9974	11.1776	-26.4688	11.8764
T10	60.00-40.00	-25.2746	11.3007	-27.3095	12.2489
T11	40.00-20.00	-27.1559	12.1411	-29.3934	13.1795
T12	20.00-0.00	-28.9436	12.9397	-31.3801	14.0666

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
HBXX-6517DS	A	From Leg	3.00	0.0000	240.00	No Ice	8.74	5.24	0.05
(Verizon - Existing)			-6.00			1/2" Ice	9.31	5.71	0.10
			0.00						
LNX-6514DS-VTM	A	From Leg	3.00	0.0000	240.00	No Ice	8.41	5.41	0.04
(Verizon - Existing)			-4.00			1/2" Ice	8.96	5.86	0.09
			0.00						
HBXX-6517DS	A	From Leg	3.00	0.0000	240.00	No Ice	8.74	5.24	0.05
(Verizon - Existing)			0.00			1/2" Ice	9.31	5.71	0.10
			0.00						
LNX-6514DS-VTM	A	From Leg	3.00	0.0000	240.00	No Ice	8.41	5.41	0.04
(Verizon - Existing)			4.00			1/2" Ice	8.96	5.86	0.09
			0.00						
HBXX-6517DS	B	From Leg	3.00	0.0000	240.00	No Ice	8.74	5.24	0.05
(Verizon - Existing)			-6.00			1/2" Ice	9.31	5.71	0.10
			0.00						
LNX-6514DS-VTM	B	From Leg	3.00	0.0000	240.00	No Ice	8.41	5.41	0.04
(Verizon - Existing)			-4.00			1/2" Ice	8.96	5.86	0.09
			0.00						
HBXX-6517DS	B	From Leg	3.00	0.0000	240.00	No Ice	8.74	5.24	0.05
(Verizon - Existing)			0.00			1/2" Ice	9.31	5.71	0.10
			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
LNX-6514DS-VTM	B	From Leg	3.00	0.0000	240.00	No Ice	8.41	5.41	0.04
(Verizon - Existing)			4.00			1/2" Ice	8.96	5.86	0.09
			0.00						
HBXX-6517DS	C	From Leg	3.00	0.0000	240.00	No Ice	8.74	5.24	0.05
(Verizon - Existing)			-6.00			1/2" Ice	9.31	5.71	0.10
			0.00						
LNX-6514DS-VTM	C	From Leg	3.00	0.0000	240.00	No Ice	8.41	5.41	0.04
(Verizon - Existing)			-4.00			1/2" Ice	8.96	5.86	0.09
			0.00						
HBXX-6517DS	C	From Leg	3.00	0.0000	240.00	No Ice	8.74	5.24	0.05
(Verizon - Existing)			0.00			1/2" Ice	9.31	5.71	0.10
			0.00						
LNX-6514DS-VTM	C	From Leg	3.00	0.0000	240.00	No Ice	8.41	5.41	0.04
(Verizon - Existing)			4.00			1/2" Ice	8.96	5.86	0.09
			0.00						
RRH2x60-AWS	A	From Leg	3.00	0.0000	240.00	No Ice	3.78	2.07	0.06
(Verizon - Existing)			-4.00			1/2" Ice	4.09	2.35	0.08
			0.00						
RRH2x60-AWS	B	From Leg	3.00	0.0000	240.00	No Ice	3.78	2.07	0.06
(Verizon - Existing)			-4.00			1/2" Ice	4.09	2.35	0.08
			0.00						
RRH2x60-AWS	C	From Leg	3.00	0.0000	240.00	No Ice	3.78	2.07	0.06
(Verizon - Existing)			-4.00			1/2" Ice	4.09	2.35	0.08
			0.00						
RRH2x60-PCS	A	From Leg	3.00	0.0000	240.00	No Ice	2.51	1.55	0.06
(Verizon - Existing)			4.00			1/2" Ice	2.73	1.74	0.07
			0.00						
RRH2x60-PCS	B	From Leg	3.00	0.0000	240.00	No Ice	2.51	1.55	0.06
(Verizon - Existing)			4.00			1/2" Ice	2.73	1.74	0.07
			0.00						
RRH2x60-PCS	C	From Leg	3.00	0.0000	240.00	No Ice	2.51	1.55	0.06
(Verizon - Existing)			4.00			1/2" Ice	2.73	1.74	0.07
			0.00						
DB-T1-6Z-8AB-0Z	A	From Leg	3.00	0.0000	240.00	No Ice	5.60	2.33	0.04
(Verizon - Existing)			4.00			1/2" Ice	5.92	2.56	0.08
			0.00						
DB-T1-6Z-8AB-0Z	B	From Leg	3.00	0.0000	240.00	No Ice	5.60	2.33	0.04
(Verizon - Existing)			4.00			1/2" Ice	5.92	2.56	0.08
			0.00						
12' V-Frame	A	From Leg	1.00	0.0000	240.00	No Ice	9.22	12.97	0.30
(Verizon - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00						
12' V-Frame	B	From Leg	1.00	0.0000	240.00	No Ice	9.22	12.97	0.30
(Verizon - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00						
12' V-Frame	C	From Leg	1.00	0.0000	240.00	No Ice	9.22	12.97	0.30
(Verizon - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00						
(2) 7770.00	A	From Leg	3.00	0.0000	196.20	No Ice	5.88	2.93	0.04
(AT&T - Existing)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00						
(2) 7770.00	B	From Leg	3.00	0.0000	196.20	No Ice	5.88	2.93	0.04
(AT&T - Existing)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00						
(2) 7770.00	C	From Leg	3.00	0.0000	196.20	No Ice	5.88	2.93	0.04
(AT&T - Existing)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AM-X-CD-17-65-00T-RET	A	From Leg	3.00	0.0000	196.20	No Ice	11.31	6.80	0.06
(AT&T - Proposed)			0.00			1/2" Ice	11.93	7.38	0.12
			0.00						
AM-X-CD-17-65-00T-RET	B	From Leg	3.00	0.0000	196.20	No Ice	11.31	6.80	0.06
(AT&T - Proposed)			0.00			1/2" Ice	11.93	7.38	0.12
			0.00						
AM-X-CD-17-65-00T-RET	C	From Leg	3.00	0.0000	196.20	No Ice	11.31	6.80	0.06
(AT&T - Proposed)			0.00			1/2" Ice	11.93	7.38	0.12
			0.00						
(2) LGP21401 TMA	A	From Leg	3.00	0.0000	196.20	No Ice	0.95	0.37	0.02
(AT&T - Existing)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LGP21401 TMA	B	From Leg	3.00	0.0000	196.20	No Ice	0.95	0.37	0.02
(AT&T - Existing)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LGP21401 TMA	C	From Leg	3.00	0.0000	196.20	No Ice	0.95	0.37	0.02
(AT&T - Existing)			0.00			1/2" Ice	1.09	0.48	0.02
			0.00						
(2) LGP21901 Diplexer	A	From Leg	3.00	0.0000	196.20	No Ice	0.23	0.12	0.01
(AT&T - Existing)			0.00			1/2" Ice	0.30	0.17	0.01
			0.00						
(2) LGP21901 Diplexer	B	From Leg	3.00	0.0000	196.20	No Ice	0.23	0.12	0.01
(AT&T - Existing)			0.00			1/2" Ice	0.30	0.17	0.01
			0.00						
(2) LGP21901 Diplexer	C	From Leg	3.00	0.0000	196.20	No Ice	0.23	0.12	0.01
(AT&T - Existing)			0.00			1/2" Ice	0.30	0.17	0.01
			0.00						
(2) 7020 Dual Band RET	A	From Leg	3.00	0.0000	196.20	No Ice	0.40	0.20	0.00
(AT&T - Existing)			0.00			1/2" Ice	0.49	0.27	0.01
			0.00						
(2) 7020 Dual Band RET	B	From Leg	3.00	0.0000	196.20	No Ice	0.40	0.20	0.00
(AT&T - Existing)			0.00			1/2" Ice	0.49	0.27	0.01
			0.00						
(2) 7020 Dual Band RET	C	From Leg	3.00	0.0000	196.20	No Ice	0.40	0.20	0.00
(AT&T - Existing)			0.00			1/2" Ice	0.49	0.27	0.01
			0.00						
(2) RRUS-11	A	From Leg	3.00	0.0000	196.20	No Ice	2.99	1.25	0.05
(AT&T - Proposed)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00						
(2) RRUS-11	B	From Leg	3.00	0.0000	196.20	No Ice	2.99	1.25	0.05
(AT&T - Proposed)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00						
(2) RRUS-11	C	From Leg	3.00	0.0000	196.20	No Ice	2.99	1.25	0.05
(AT&T - Proposed)			0.00			1/2" Ice	3.23	1.41	0.07
			0.00						
DC6-48-60-18-8F Surge	A	From Leg	3.00	0.0000	196.20	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						
12' V-Frame	A	From Leg	1.00	0.0000	196.20	No Ice	9.22	12.97	0.30
(AT&T - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00						
12' V-Frame	B	From Leg	1.00	0.0000	196.20	No Ice	9.22	12.97	0.30
(AT&T - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00						
12' V-Frame	C	From Leg	1.00	0.0000	196.20	No Ice	9.22	12.97	0.30
(AT&T - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
12' x 3" Dia Omni	C	From Leg	5.00 0.00 6.00	0.0000	221.00	No Ice 1/2" Ice	3.60 4.83	3.60 4.83	0.04 0.06
ROHN 6-ft Side Arm	C	From Leg	3.00 0.00 0.00	0.0000	221.00	No Ice 1/2" Ice	6.68 10.00	6.68 10.00	0.08 0.10
12' x 3" Dia Omni	B	From Leg	5.00 0.00 6.00	0.0000	218.00	No Ice 1/2" Ice	3.60 4.83	3.60 4.83	0.04 0.06
12' x 3" Dia Omni	C	From Leg	5.00 0.00 6.00	0.0000	218.00	No Ice 1/2" Ice	3.60 4.83	3.60 4.83	0.04 0.06
ROHN 6-ft Side Arm	B	From Leg	3.00 0.00 0.00	0.0000	218.00	No Ice 1/2" Ice	6.68 10.00	6.68 10.00	0.08 0.10
ROHN 6-ft Side Arm	C	From Leg	3.00 0.00 0.00	0.0000	218.00	No Ice 1/2" Ice	6.68 10.00	6.68 10.00	0.08 0.10

Tower Pressures - No Ice

$G_H = 1.102$

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	230.00	1.741	32	103.958	A	7.761	8.412	7.917	48.95	0.000	0.000
240.00-220.00					B	7.812	7.917		50.33	0.000	0.000
					C	3.071	47.517		15.65	7.920	0.000
T2	210.00	1.697	31	105.833	A	6.796	21.567	11.667	41.13	0.000	0.000
220.00-200.00					B	7.812	11.667		59.89	0.000	0.000
					C	3.071	51.267		21.47	7.920	0.000
T3	190.00	1.649	30	127.509	A	3.491	67.765	15.025	21.09	2.160	0.000
200.00-180.00					B	8.700	15.025		63.33	0.000	0.000
					C	4.288	54.625		25.50	7.920	0.000
T4	170.00	1.597	30	169.283	A	6.617	76.074	18.574	22.46	2.400	0.000
180.00-160.00					B	12.474	18.574		59.82	0.000	0.000
					C	7.926	58.174		28.10	7.920	0.000
T5	150.00	1.541	29	209.283	A	7.994	76.074	18.574	22.09	2.400	0.000
160.00-140.00					B	12.469	18.574		59.83	0.000	0.000
					C	8.994	58.174		27.65	7.920	0.000
T6	130.00	1.48	27	254.393	A	12.372	86.298	28.798	29.19	2.400	0.000
140.00-120.00					B	17.481	28.798		62.23	0.000	0.000
					C	13.514	68.398		35.16	7.920	0.000
T7	110.00	1.411	26	294.393	A	15.187	86.298	28.798	28.38	2.400	0.000
120.00-100.00					B	20.132	28.798		58.86	0.000	0.000
					C	16.292	68.398		34.00	7.920	0.000
T8	90.00	1.332	25	334.393	A	15.515	86.298	28.798	28.28	2.400	0.000
100.00-80.00					B	19.610	28.798		59.49	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
					C	16.431	68.398		33.95	7.920	0.000
T9 80.00-60.00	70.00	1.24	23	374.393	A	20.149	86.298	28.798	27.05	2.400	0.000
					B	24.688	28.798		53.84	0.000	0.000
					C	21.164	68.398		32.15	7.920	0.000
T10 60.00-40.00	50.00	1.126	21	417.939	A	22.601	93.393	35.893	30.94	2.400	0.000
					B	27.036	35.893		57.04	0.000	0.000
					C	23.592	75.493		36.22	7.920	0.000
T11 40.00-20.00	30.00	1	18	457.939	A	25.081	93.393	35.893	30.30	2.400	0.000
					B	29.439	35.893		54.94	0.000	0.000
					C	26.055	75.493		35.35	7.920	0.000
T12 20.00-0.00	10.00	1	18	497.939	A	27.586	93.393	35.893	29.67	2.400	0.000
					B	31.884	35.893		52.96	0.000	0.000
					C	28.547	75.493		34.50	7.920	0.000

Tower Pressure - With Ice

$G_H = 1.102$

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 240.00-220.00	230.00	1.741	24	0.5000	105.625	A	7.736	15.863	11.250	47.67	0.000	0.000
						B	7.812	15.156		48.98	0.000	0.000
						C	0.677	71.188		15.65	11.920	0.000
T2 220.00-200.00	210.00	1.697	24	0.5000	107.500	A	6.283	33.042	15.000	38.14	0.000	0.000
						B	7.812	18.906		56.14	0.000	0.000
						C	0.677	74.938		19.84	11.920	0.000
T3 200.00-180.00	190.00	1.649	23	0.5000	129.178	A	0.951	94.579	18.364	19.22	7.440	0.000
						B	8.700	22.714		58.46	0.000	0.000
						C	2.059	78.993		22.66	11.920	0.000
T4 180.00-160.00	170.00	1.597	22	0.5000	170.952	A	3.761	105.918	21.913	19.98	8.267	0.000
						B	12.474	26.903		55.65	0.000	0.000
						C	5.629	83.765		24.51	11.920	0.000
T5 160.00-140.00	150.00	1.541	22	0.5000	210.952	A	5.813	106.738	21.913	19.47	8.267	0.000
						B	12.469	26.901		55.66	0.000	0.000
						C	7.240	84.409		23.91	11.920	0.000
T6 140.00-120.00	130.00	1.48	21	0.5000	256.062	A	9.883	117.931	32.137	25.14	8.267	0.000
						B	17.481	37.964		57.96	0.000	0.000
						C	11.511	95.574		30.01	11.920	0.000
T7 120.00-100.00	110.00	1.411	20	0.5000	296.062	A	12.777	118.896	32.137	24.41	8.267	0.000
						B	20.132	38.847		54.49	0.000	0.000
						C	14.353	96.521		28.98	11.920	0.000
T8 100.00-80.00	90.00	1.332	19	0.5000	336.062	A	13.520	118.500	32.137	24.34	8.267	0.000
						B	19.610	37.740		56.04	0.000	0.000
						C	14.825	95.972		29.00	11.920	0.000
T9 80.00-60.00	70.00	1.24	17	0.5000	376.062	A	17.937	119.121	32.137	23.45	8.267	0.000
						B	24.688	38.309		51.01	0.000	0.000
						C	19.384	96.583		27.71	11.920	0.000
T10 60.00-40.00	50.00	1.126	16	0.5000	419.608	A	20.439	126.842	39.232	26.64	8.267	0.000
						B	27.036	45.991		53.72	0.000	0.000
						C	21.853	104.295		31.10	11.920	0.000
T11 40.00-20.00	30.00	1	14	0.5000	459.608	A	22.957	127.471	39.232	26.08	8.267	0.000
						B	29.439	46.592		51.60	0.000	0.000
						C	24.346	104.918		30.35	11.920	0.000
T12 20.00-0.00	10.00	1	14	0.5000	499.608	A	25.491	128.105	39.232	25.54	8.267	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
						B	31.884	47.203		49.61	0.000	0.000
						C	26.861	105.547		29.63	11.920	0.000

Tower Pressure - Service

$G_H = 1.102$

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	230.00	1.741	11	103.958	A	7.761	8.412	7.917	48.95	0.000	0.000
240.00-220.00					B	7.812	7.917		50.33	0.000	0.000
					C	3.071	47.517		15.65	7.920	0.000
T2	210.00	1.697	11	105.833	A	6.796	21.567	11.667	41.13	0.000	0.000
220.00-200.00					B	7.812	11.667		59.89	0.000	0.000
					C	3.071	51.267		21.47	7.920	0.000
T3	190.00	1.649	11	127.509	A	3.491	67.765	15.025	21.09	2.160	0.000
200.00-180.00					B	8.700	15.025		63.33	0.000	0.000
					C	4.288	54.625		25.50	7.920	0.000
T4	170.00	1.597	10	169.283	A	6.617	76.074	18.574	22.46	2.400	0.000
180.00-160.00					B	12.474	18.574		59.82	0.000	0.000
					C	7.926	58.174		28.10	7.920	0.000
T5	150.00	1.541	10	209.283	A	7.994	76.074	18.574	22.09	2.400	0.000
160.00-140.00					B	12.469	18.574		59.83	0.000	0.000
					C	8.994	58.174		27.65	7.920	0.000
T6	130.00	1.48	9	254.393	A	12.372	86.298	28.798	29.19	2.400	0.000
140.00-120.00					B	17.481	28.798		62.23	0.000	0.000
					C	13.514	68.398		35.16	7.920	0.000
T7	110.00	1.411	9	294.393	A	15.187	86.298	28.798	28.38	2.400	0.000
120.00-100.00					B	20.132	28.798		58.86	0.000	0.000
					C	16.292	68.398		34.00	7.920	0.000
T8	90.00	1.332	9	334.393	A	15.515	86.298	28.798	28.28	2.400	0.000
100.00-80.00					B	19.610	28.798		59.49	0.000	0.000
					C	16.431	68.398		33.95	7.920	0.000
T9 80.00-60.00	70.00	1.24	8	374.393	A	20.149	86.298	28.798	27.05	2.400	0.000
					B	24.688	28.798		53.84	0.000	0.000
					C	21.164	68.398		32.15	7.920	0.000
T10	50.00	1.126	7	417.939	A	22.601	93.393	35.893	30.94	2.400	0.000
60.00-40.00					B	27.036	35.893		57.04	0.000	0.000
					C	23.592	75.493		36.22	7.920	0.000
T11	30.00	1	6	457.939	A	25.081	93.393	35.893	30.30	2.400	0.000
40.00-20.00					B	29.439	35.893		54.94	0.000	0.000
					C	26.055	75.493		35.35	7.920	0.000
T12 20.00-0.00	10.00	1	6	497.939	A	27.586	93.393	35.893	29.67	2.400	0.000
					B	31.884	35.893		52.96	0.000	0.000
					C	28.547	75.493		34.50	7.920	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	0.33	0.53	A	0.156	2.751	0.582	1	1	12.660	2.72	136.23	C
240.00-220.00			B	0.151	2.767	0.582	1	1	12.417			
			C	0.487	1.918	0.691	1	1	35.894			
T2	0.39	1.17	A	0.268	2.385	0.607	1	1	19.879	2.83	141.29	C
220.00-200.00			B	0.184	2.65	0.587	1	1	14.664			
			C	0.513	1.883	0.704	1	1	39.186			
T3	0.66	1.40	A	0.559	1.835	0.729	1	1	52.910	3.60	180.11	A
200.00-180.00			B	0.186	2.643	0.588	1	1	17.530			
			C	0.462	1.954	0.679	1	1	41.371			
T4	0.69	1.98	A	0.488	1.915	0.692	1	1	59.236	4.03	201.50	A
180.00-160.00			B	0.183	2.652	0.587	1	1	23.380			
			C	0.39	2.083	0.648	1	1	45.609			
T5	0.69	2.35	A	0.402	2.061	0.652	1	1	57.617	4.05	202.69	A
160.00-140.00			B	0.148	2.778	0.581	1	1	23.265			
			C	0.321	2.242	0.623	1	1	45.210			
T6	0.69	2.50	A	0.388	2.089	0.647	1	1	68.183	4.61	230.26	A
140.00-120.00			B	0.182	2.658	0.587	1	1	34.381			
			C	0.322	2.239	0.623	1	1	56.118			
T7	0.69	3.79	A	0.345	2.184	0.631	1	1	69.607	4.67	233.34	A
120.00-100.00			B	0.166	2.713	0.584	1	1	36.952			
			C	0.288	2.329	0.612	1	1	58.166			
T8	0.69	3.77	A	0.304	2.284	0.617	1	1	68.785	4.55	227.27	A
100.00-80.00			B	0.145	2.791	0.581	1	1	36.332			
			C	0.254	2.427	0.603	1	1	57.662			
T9	0.69	3.98	A	0.284	2.339	0.611	1	1	72.897	4.57	228.39	A
80.00-60.00			B	0.143	2.798	0.58	1	1	41.402			
			C	0.239	2.47	0.599	1	1	62.147			
T10	0.69	4.90	A	0.278	2.357	0.609	1	1	79.503	4.54	226.91	A
60.00-40.00			B	0.151	2.769	0.582	1	1	47.910			
			C	0.237	2.477	0.599	1	1	68.787			
T11	0.69	5.46	A	0.259	2.412	0.604	1	1	81.503	4.22	210.81	A
40.00-20.00			B	0.143	2.799	0.58	1	1	50.270			
			C	0.222	2.525	0.595	1	1	70.979			
T12	0.69	5.64	A	0.243	2.459	0.6	1	1	83.632	4.40	220.07	A
20.00-0.00			B	0.136	2.823	0.579	1	1	52.682			
			C	0.209	2.566	0.592	1	1	73.258			
Sum Weight:	7.59	37.47						OTM	5435.92 kip-ft	48.78		

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	0.33	0.53	A	0.156	2.751	0.582	0.8	1	11.107	2.68	134.14	C
240.00-220.00			B	0.151	2.767	0.582	0.8	1	10.855			
			C	0.487	1.918	0.691	0.8	1	35.280			
T2	0.39	1.17	A	0.268	2.385	0.607	0.8	1	18.520	2.79	139.29	C
220.00-200.00			B	0.184	2.65	0.587	0.8	1	13.101			
			C	0.513	1.883	0.704	0.8	1	38.571			
T3	0.66	1.40	A	0.559	1.835	0.729	0.8	1	52.212	3.56	177.96	A
200.00-180.00			B	0.186	2.643	0.588	0.8	1	15.790			
			C	0.462	1.954	0.679	0.8	1	40.513			
T4	0.69	1.98	A	0.488	1.915	0.692	0.8	1	57.913	3.95	197.37	A
180.00-160.00			B	0.183	2.652	0.587	0.8	1	20.885			

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	0.39	2.083	0.648	0.8	1	44.024			
T5	0.69	2.35	A	0.402	2.061	0.652	0.8	1	56.018	3.95	197.51	A
160.00-140.00			B	0.148	2.778	0.581	0.8	1	20.771			
			C	0.321	2.242	0.623	0.8	1	43.411			
T6	0.69	2.50	A	0.388	2.089	0.647	0.8	1	65.709	4.45	222.47	A
140.00-120.00			B	0.182	2.658	0.587	0.8	1	30.885			
			C	0.322	2.239	0.623	0.8	1	53.415			
T7	0.69	3.79	A	0.345	2.184	0.631	0.8	1	66.570	4.48	223.80	A
120.00-100.00			B	0.166	2.713	0.584	0.8	1	32.926			
			C	0.288	2.329	0.612	0.8	1	54.907			
T8	0.69	3.77	A	0.304	2.284	0.617	0.8	1	65.682	4.35	217.65	A
100.00-80.00			B	0.145	2.791	0.581	0.8	1	32.410			
			C	0.254	2.427	0.603	0.8	1	54.376			
T9	0.69	3.98	A	0.284	2.339	0.611	0.8	1	68.867	4.33	216.49	A
80.00-60.00			B	0.143	2.798	0.58	0.8	1	36.465			
			C	0.239	2.47	0.599	0.8	1	57.914			
T10	0.69	4.90	A	0.278	2.357	0.609	0.8	1	74.983	4.29	214.69	A
60.00-40.00			B	0.151	2.769	0.582	0.8	1	42.503			
			C	0.237	2.477	0.599	0.8	1	64.069			
T11	0.69	5.46	A	0.259	2.412	0.604	0.8	1	76.487	3.97	198.49	A
40.00-20.00			B	0.143	2.799	0.58	0.8	1	44.383			
			C	0.222	2.525	0.595	0.8	1	65.768			
T12	0.69	5.64	A	0.243	2.459	0.6	0.8	1	78.114	4.12	206.24	A
20.00-0.00			B	0.136	2.823	0.579	0.8	1	46.305			
			C	0.209	2.566	0.592	0.8	1	67.549			
Sum Weight:	7.59	37.47						OTM	5282.56 kip-ft	46.92		

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	0.33	0.53	A	0.156	2.751	0.582	0.85	1	11.496	2.69	134.66	C
240.00-220.00			B	0.151	2.767	0.582	0.85	1	11.245			
			C	0.487	1.918	0.691	0.85	1	35.433			
T2	0.39	1.17	A	0.268	2.385	0.607	0.85	1	18.860	2.80	139.79	C
220.00-200.00			B	0.184	2.65	0.587	0.85	1	13.492			
			C	0.513	1.883	0.704	0.85	1	38.725			
T3	0.66	1.40	A	0.559	1.835	0.729	0.85	1	52.386	3.57	178.50	A
200.00-180.00			B	0.186	2.643	0.588	0.85	1	16.225			
			C	0.462	1.954	0.679	0.85	1	40.728			
T4	0.69	1.98	A	0.488	1.915	0.692	0.85	1	58.244	3.97	198.40	A
180.00-160.00			B	0.183	2.652	0.587	0.85	1	21.509			
			C	0.39	2.083	0.648	0.85	1	44.420			
T5	0.69	2.35	A	0.402	2.061	0.652	0.85	1	56.418	3.98	198.81	A
160.00-140.00			B	0.148	2.778	0.581	0.85	1	21.394			
			C	0.321	2.242	0.623	0.85	1	43.861			
T6	0.69	2.50	A	0.388	2.089	0.647	0.85	1	66.327	4.49	224.42	A
140.00-120.00			B	0.182	2.658	0.587	0.85	1	31.759			
			C	0.322	2.239	0.623	0.85	1	54.090			
T7	0.69	3.79	A	0.345	2.184	0.631	0.85	1	67.329	4.52	226.19	A
120.00-100.00			B	0.166	2.713	0.584	0.85	1	33.932			
			C	0.288	2.329	0.612	0.85	1	55.722			
T8	0.69	3.77	A	0.304	2.284	0.617	0.85	1	66.458	4.40	220.05	A

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
100.00-80.00			B	0.145	2.791	0.581	0.85	1	33.391			
			C	0.254	2.427	0.603	0.85	1	55.198			
T9	0.69	3.98	A	0.284	2.339	0.611	0.85	1	69.874	4.39	219.46	A
80.00-60.00			B	0.143	2.798	0.58	0.85	1	37.699			
			C	0.239	2.47	0.599	0.85	1	58.972			
T10	0.69	4.90	A	0.278	2.357	0.609	0.85	1	76.113	4.35	217.74	A
60.00-40.00			B	0.151	2.769	0.582	0.85	1	43.855			
			C	0.237	2.477	0.599	0.85	1	65.248			
T11	0.69	5.46	A	0.259	2.412	0.604	0.85	1	77.741	4.03	201.57	A
40.00-20.00			B	0.143	2.799	0.58	0.85	1	45.855			
			C	0.222	2.525	0.595	0.85	1	67.071			
T12	0.69	5.64	A	0.243	2.459	0.6	0.85	1	79.494	4.19	209.70	A
20.00-0.00			B	0.136	2.823	0.579	0.85	1	47.899			
			C	0.209	2.566	0.592	0.85	1	68.976			
Sum Weight:	7.59	37.47						OTM	5320.90 kip-ft	47.39		

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	0.76	0.91	A	0.223	2.52	0.595	1	1	17.181	3.09	154.74	C
240.00-220.00			B	0.217	2.539	0.594	1	1	16.816			
			C	0.68	1.776	0.806	1	1	58.061			
T2	0.90	1.59	A	0.366	2.136	0.638	1	1	27.372	3.21	160.65	C
220.00-200.00			B	0.249	2.442	0.602	1	1	19.184			
			C	0.703	1.776	0.822	1	1	62.301			
T3	1.58	1.89	A	0.74	1.784	0.849	1	1	81.240	4.18	209.21	A
200.00-180.00			B	0.243	2.458	0.6	1	1	22.332			
			C	0.627	1.79	0.771	1	1	62.946			
T4	1.66	2.62	A	0.642	1.784	0.78	1	1	86.370	4.30	215.02	A
180.00-160.00			B	0.23	2.498	0.597	1	1	28.537			
			C	0.523	1.872	0.709	1	1	65.056			
T5	1.66	2.99	A	0.534	1.86	0.715	1	1	82.150	4.12	205.95	A
160.00-140.00			B	0.187	2.641	0.588	1	1	28.280			
			C	0.434	2	0.666	1	1	63.478			
T6	1.66	3.40	A	0.499	1.901	0.697	1	1	92.088	4.46	223.12	A
140.00-120.00			B	0.217	2.542	0.594	1	1	40.028			
			C	0.418	2.029	0.659	1	1	74.513			
T7	1.66	4.78	A	0.445	1.982	0.671	1	1	92.542	4.44	221.84	A
120.00-100.00			B	0.199	2.599	0.59	1	1	43.061			
			C	0.374	2.117	0.642	1	1	76.274			
T8	1.66	4.73	A	0.393	2.078	0.649	1	1	90.391	4.28	214.03	A
100.00-80.00			B	0.171	2.697	0.585	1	1	41.682			
			C	0.33	2.22	0.625	1	1	74.850			
T9	1.66	5.05	A	0.364	2.139	0.638	1	1	93.906	4.23	211.62	A
80.00-60.00			B	0.168	2.708	0.584	1	1	47.072			
			C	0.308	2.274	0.618	1	1	79.120			
T10	1.66	6.16	A	0.351	2.169	0.633	1	1	100.708	4.15	207.55	A
60.00-40.00			B	0.174	2.685	0.585	1	1	53.961			
			C	0.301	2.294	0.616	1	1	86.108			
T11	1.66	6.79	A	0.327	2.226	0.625	1	1	102.580	3.84	191.95	A
40.00-20.00			B	0.165	2.716	0.584	1	1	56.646			
			C	0.281	2.347	0.61	1	1	88.382			

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
T12	1.66	7.05	A	0.307	2.276	0.618	1	1	104.686	3.99	199.65	A
20.00-0.00			B	0.158	2.741	0.583	1	1	59.392			
			C	0.265	2.393	0.606	1	1	90.804			
Sum Weight:	18.16	47.98						OTM	5642.78 kip-ft	48.31		

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 ft²	F K	w plf	Ctrl. Face
T1	0.76	0.91	A	0.223	2.52	0.595	0.8	1	15.634	3.09	154.42	C
240.00-220.00			B	0.217	2.539	0.594	0.8	1	15.254			
			C	0.68	1.776	0.806	0.8	1	57.926			
T2	0.90	1.59	A	0.366	2.136	0.638	0.8	1	26.115	3.21	160.33	C
220.00-200.00			B	0.249	2.442	0.602	0.8	1	17.622			
			C	0.703	1.776	0.822	0.8	1	62.166			
T3	1.58	1.89	A	0.74	1.784	0.849	0.8	1	81.050	4.18	208.78	A
200.00-180.00			B	0.243	2.458	0.6	0.8	1	20.592			
			C	0.627	1.79	0.771	0.8	1	62.534			
T4	1.66	2.62	A	0.642	1.784	0.78	0.8	1	85.617	4.27	213.36	A
180.00-160.00			B	0.23	2.498	0.597	0.8	1	26.042			
			C	0.523	1.872	0.709	0.8	1	63.930			
T5	1.66	2.99	A	0.534	1.86	0.715	0.8	1	80.988	4.07	203.37	A
160.00-140.00			B	0.187	2.641	0.588	0.8	1	25.786			
			C	0.434	2	0.666	0.8	1	62.030			
T6	1.66	3.40	A	0.499	1.901	0.697	0.8	1	90.112	4.38	218.83	A
140.00-120.00			B	0.217	2.542	0.594	0.8	1	36.531			
			C	0.418	2.029	0.659	0.8	1	72.210			
T7	1.66	4.78	A	0.445	1.982	0.671	0.8	1	89.986	4.33	216.32	A
120.00-100.00			B	0.199	2.599	0.59	0.8	1	39.034			
			C	0.374	2.117	0.642	0.8	1	73.404			
T8	1.66	4.73	A	0.393	2.078	0.649	0.8	1	87.687	4.17	208.25	A
100.00-80.00			B	0.171	2.697	0.585	0.8	1	37.760			
			C	0.33	2.22	0.625	0.8	1	71.885			
T9	1.66	5.05	A	0.364	2.139	0.638	0.8	1	90.318	4.09	204.28	A
80.00-60.00			B	0.168	2.708	0.584	0.8	1	42.135			
			C	0.308	2.274	0.618	0.8	1	75.243			
T10	1.66	6.16	A	0.351	2.169	0.633	0.8	1	96.620	4.00	199.84	A
60.00-40.00			B	0.174	2.685	0.585	0.8	1	48.554			
			C	0.301	2.294	0.616	0.8	1	81.738			
T11	1.66	6.79	A	0.327	2.226	0.625	0.8	1	97.988	3.68	184.05	A
40.00-20.00			B	0.165	2.716	0.584	0.8	1	50.759			
			C	0.281	2.347	0.61	0.8	1	83.513			
T12	1.66	7.05	A	0.307	2.276	0.618	0.8	1	99.588	3.81	190.69	A
20.00-0.00			B	0.158	2.741	0.583	0.8	1	53.016			
			C	0.265	2.393	0.606	0.8	1	85.432			
Sum Weight:	18.16	47.98						OTM	5566.74 kip-ft	47.25		

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 ft²	F K	w plf	Ctrl. Face
T1	0.76	0.91	A	0.223	2.52	0.595	0.85	1	16.021	3.09	154.50	C
240.00-220.00			B	0.217	2.539	0.594	0.85	1	15.645			
			C	0.68	1.776	0.806	0.85	1	57.960			
T2	0.90	1.59	A	0.366	2.136	0.638	0.85	1	26.429	3.21	160.41	C
220.00-200.00			B	0.249	2.442	0.602	0.85	1	18.012			
			C	0.703	1.776	0.822	0.85	1	62.200			
T3	1.58	1.89	A	0.74	1.784	0.849	0.85	1	81.098	4.18	208.89	A
200.00-180.00			B	0.243	2.458	0.6	0.85	1	21.027			
			C	0.627	1.79	0.771	0.85	1	62.637			
T4	1.66	2.62	A	0.642	1.784	0.78	0.85	1	85.805	4.28	213.78	A
180.00-160.00			B	0.23	2.498	0.597	0.85	1	26.666			
			C	0.523	1.872	0.709	0.85	1	64.212			
T5	1.66	2.99	A	0.534	1.86	0.715	0.85	1	81.279	4.08	204.02	A
160.00-140.00			B	0.187	2.641	0.588	0.85	1	26.410			
			C	0.434	2	0.666	0.85	1	62.392			
T6	1.66	3.40	A	0.499	1.901	0.697	0.85	1	90.606	4.40	219.90	A
140.00-120.00			B	0.217	2.542	0.594	0.85	1	37.405			
			C	0.418	2.029	0.659	0.85	1	72.786			
T7	1.66	4.78	A	0.445	1.982	0.671	0.85	1	90.625	4.35	217.70	A
120.00-100.00			B	0.199	2.599	0.59	0.85	1	40.041			
			C	0.374	2.117	0.642	0.85	1	74.121			
T8	1.66	4.73	A	0.393	2.078	0.649	0.85	1	88.363	4.19	209.70	A
100.00-80.00			B	0.171	2.697	0.585	0.85	1	38.740			
			C	0.33	2.22	0.625	0.85	1	72.626			
T9	1.66	5.05	A	0.364	2.139	0.638	0.85	1	91.215	4.12	206.11	A
80.00-60.00			B	0.168	2.708	0.584	0.85	1	43.369			
			C	0.308	2.274	0.618	0.85	1	76.212			
T10	1.66	6.16	A	0.351	2.169	0.633	0.85	1	97.642	4.04	201.77	A
60.00-40.00			B	0.174	2.685	0.585	0.85	1	49.906			
			C	0.301	2.294	0.616	0.85	1	82.830			
T11	1.66	6.79	A	0.327	2.226	0.625	0.85	1	99.136	3.72	186.03	A
40.00-20.00			B	0.165	2.716	0.584	0.85	1	52.230			
			C	0.281	2.347	0.61	0.85	1	84.730			
T12	1.66	7.05	A	0.307	2.276	0.618	0.85	1	100.862	3.86	192.93	A
20.00-0.00			B	0.158	2.741	0.583	0.85	1	54.610			
			C	0.265	2.393	0.606	0.85	1	86.775			
Sum Weight:	18.16	47.98						OTM	5585.75 kip-ft	47.51		

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	0.33	0.53	A	0.156	2.751	0.582	1	1	12.660	0.94	47.14	C
240.00-220.00			B	0.151	2.767	0.582	1	1	12.417			
			C	0.487	1.918	0.691	1	1	35.894			
T2	0.39	1.17	A	0.268	2.385	0.607	1	1	19.879	0.98	48.89	C
220.00-200.00			B	0.184	2.65	0.587	1	1	14.664			
			C	0.513	1.883	0.704	1	1	39.186			
T3	0.66	1.40	A	0.559	1.835	0.729	1	1	52.910	1.25	62.32	A
200.00-180.00			B	0.186	2.643	0.588	1	1	17.530			
			C	0.462	1.954	0.679	1	1	41.371			
T4	0.69	1.98	A	0.488	1.915	0.692	1	1	59.236	1.39	69.72	A

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
180.00-160.00			B	0.183	2.652	0.587	1	1	23.380			
			C	0.39	2.083	0.648	1	1	45.609			
T5	0.69	2.35	A	0.402	2.061	0.652	1	1	57.617	1.40	70.13	A
160.00-140.00			B	0.148	2.778	0.581	1	1	23.265			
			C	0.321	2.242	0.623	1	1	45.210			
T6	0.69	2.50	A	0.388	2.089	0.647	1	1	68.183	1.59	79.67	A
140.00-120.00			B	0.182	2.658	0.587	1	1	34.381			
			C	0.322	2.239	0.623	1	1	56.118			
T7	0.69	3.79	A	0.345	2.184	0.631	1	1	69.607	1.61	80.74	A
120.00-100.00			B	0.166	2.713	0.584	1	1	36.952			
			C	0.288	2.329	0.612	1	1	58.166			
T8	0.69	3.77	A	0.304	2.284	0.617	1	1	68.785	1.57	78.64	A
100.00-80.00			B	0.145	2.791	0.581	1	1	36.332			
			C	0.254	2.427	0.603	1	1	57.662			
T9	0.69	3.98	A	0.284	2.339	0.611	1	1	72.897	1.58	79.03	A
80.00-60.00			B	0.143	2.798	0.58	1	1	41.402			
			C	0.239	2.47	0.599	1	1	62.147			
T10	0.69	4.90	A	0.278	2.357	0.609	1	1	79.503	1.57	78.52	A
60.00-40.00			B	0.151	2.769	0.582	1	1	47.910			
			C	0.237	2.477	0.599	1	1	68.787			
T11	0.69	5.46	A	0.259	2.412	0.604	1	1	81.503	1.46	72.95	A
40.00-20.00			B	0.143	2.799	0.58	1	1	50.270			
			C	0.222	2.525	0.595	1	1	70.979			
T12	0.69	5.64	A	0.243	2.459	0.6	1	1	83.632	1.52	76.15	A
20.00-0.00			B	0.136	2.823	0.579	1	1	52.682			
			C	0.209	2.566	0.592	1	1	73.258			
Sum Weight:	7.59	37.47						OTM	1880.94 kip-ft	16.88		

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 ft²	F K	w plf	Ctrl. Face
T1	0.33	0.53	A	0.156	2.751	0.582	0.8	1	11.107	0.93	46.42	C
240.00-220.00			B	0.151	2.767	0.582	0.8	1	10.855			
			C	0.487	1.918	0.691	0.8	1	35.280			
T2	0.39	1.17	A	0.268	2.385	0.607	0.8	1	18.520	0.96	48.20	C
220.00-200.00			B	0.184	2.65	0.587	0.8	1	13.101			
			C	0.513	1.883	0.704	0.8	1	38.571			
T3	0.66	1.40	A	0.559	1.835	0.729	0.8	1	52.212	1.23	61.58	A
200.00-180.00			B	0.186	2.643	0.588	0.8	1	15.790			
			C	0.462	1.954	0.679	0.8	1	40.513			
T4	0.69	1.98	A	0.488	1.915	0.692	0.8	1	57.913	1.37	68.29	A
180.00-160.00			B	0.183	2.652	0.587	0.8	1	20.885			
			C	0.39	2.083	0.648	0.8	1	44.024			
T5	0.69	2.35	A	0.402	2.061	0.652	0.8	1	56.018	1.37	68.34	A
160.00-140.00			B	0.148	2.778	0.581	0.8	1	20.771			
			C	0.321	2.242	0.623	0.8	1	43.411			
T6	0.69	2.50	A	0.388	2.089	0.647	0.8	1	65.709	1.54	76.98	A
140.00-120.00			B	0.182	2.658	0.587	0.8	1	30.885			
			C	0.322	2.239	0.623	0.8	1	53.415			
T7	0.69	3.79	A	0.345	2.184	0.631	0.8	1	66.570	1.55	77.44	A
120.00-100.00			B	0.166	2.713	0.584	0.8	1	32.926			
			C	0.288	2.329	0.612	0.8	1	54.907			

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
T8	0.69	3.77	A	0.304	2.284	0.617	0.8	1	65.682	1.51	75.31	A
100.00-80.00			B	0.145	2.791	0.581	0.8	1	32.410			
			C	0.254	2.427	0.603	0.8	1	54.376			
T9	0.69	3.98	A	0.284	2.339	0.611	0.8	1	68.867	1.50	74.91	A
80.00-60.00			B	0.143	2.798	0.58	0.8	1	36.465			
			C	0.239	2.47	0.599	0.8	1	57.914			
T10	0.69	4.90	A	0.278	2.357	0.609	0.8	1	74.983	1.49	74.29	A
60.00-40.00			B	0.151	2.769	0.582	0.8	1	42.503			
			C	0.237	2.477	0.599	0.8	1	64.069			
T11	0.69	5.46	A	0.259	2.412	0.604	0.8	1	76.487	1.37	68.68	A
40.00-20.00			B	0.143	2.799	0.58	0.8	1	44.383			
			C	0.222	2.525	0.595	0.8	1	65.768			
T12	0.69	5.64	A	0.243	2.459	0.6	0.8	1	78.114	1.43	71.36	A
20.00-0.00			B	0.136	2.823	0.579	0.8	1	46.305			
			C	0.209	2.566	0.592	0.8	1	67.549			
Sum Weight:	7.59	37.47						OTM	1827.88 kip-ft	16.24		

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 ft²	F K	w plf	Ctrl. Face
T1	0.33	0.53	A	0.156	2.751	0.582	0.85	1	11.496	0.93	46.60	C
240.00-220.00			B	0.151	2.767	0.582	0.85	1	11.245			
			C	0.487	1.918	0.691	0.85	1	35.433			
T2	0.39	1.17	A	0.268	2.385	0.607	0.85	1	18.860	0.97	48.37	C
220.00-200.00			B	0.184	2.65	0.587	0.85	1	13.492			
			C	0.513	1.883	0.704	0.85	1	38.725			
T3	0.66	1.40	A	0.559	1.835	0.729	0.85	1	52.386	1.24	61.76	A
200.00-180.00			B	0.186	2.643	0.588	0.85	1	16.225			
			C	0.462	1.954	0.679	0.85	1	40.728			
T4	0.69	1.98	A	0.488	1.915	0.692	0.85	1	58.244	1.37	68.65	A
180.00-160.00			B	0.183	2.652	0.587	0.85	1	21.509			
			C	0.39	2.083	0.648	0.85	1	44.420			
T5	0.69	2.35	A	0.402	2.061	0.652	0.85	1	56.418	1.38	68.79	A
160.00-140.00			B	0.148	2.778	0.581	0.85	1	21.394			
			C	0.321	2.242	0.623	0.85	1	43.861			
T6	0.69	2.50	A	0.388	2.089	0.647	0.85	1	66.327	1.55	77.65	A
140.00-120.00			B	0.182	2.658	0.587	0.85	1	31.759			
			C	0.322	2.239	0.623	0.85	1	54.090			
T7	0.69	3.79	A	0.345	2.184	0.631	0.85	1	67.329	1.57	78.27	A
120.00-100.00			B	0.166	2.713	0.584	0.85	1	33.932			
			C	0.288	2.329	0.612	0.85	1	55.722			
T8	0.69	3.77	A	0.304	2.284	0.617	0.85	1	66.458	1.52	76.14	A
100.00-80.00			B	0.145	2.791	0.581	0.85	1	33.391			
			C	0.254	2.427	0.603	0.85	1	55.198			
T9	0.69	3.98	A	0.284	2.339	0.611	0.85	1	69.874	1.52	75.94	A
80.00-60.00			B	0.143	2.798	0.58	0.85	1	37.699			
			C	0.239	2.47	0.599	0.85	1	58.972			
T10	0.69	4.90	A	0.278	2.357	0.609	0.85	1	76.113	1.51	75.34	A
60.00-40.00			B	0.151	2.769	0.582	0.85	1	43.855			
			C	0.237	2.477	0.599	0.85	1	65.248			
T11	0.69	5.46	A	0.259	2.412	0.604	0.85	1	77.741	1.39	69.75	A
40.00-20.00			B	0.143	2.799	0.58	0.85	1	45.855			

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	0.222	2.525	0.595	0.85	1	67.071			
T12	0.69	5.64	A	0.243	2.459	0.6	0.85	1	79.494	1.45	72.56	A
20.00-0.00			B	0.136	2.823	0.579	0.85	1	47.899			
			C	0.209	2.566	0.592	0.85	1	68.976			
Sum Weight:	7.59	37.47						OTM	1841.14 kip-ft	16.40		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	24.12					
Bracing Weight	13.35					
Total Member Self-Weight	37.47			17.59	34.21	
Total Weight	49.11			17.59	34.21	
Wind 0 deg - No Ice		-0.05	-58.58	-7590.25	46.41	-77.89
Wind 30 deg - No Ice		28.52	-49.51	-6465.28	-3694.59	-46.24
Wind 60 deg - No Ice		49.05	-28.32	-3699.09	-6403.26	-4.69
Wind 90 deg - No Ice		57.13	0.05	29.78	-7444.52	37.95
Wind 120 deg - No Ice		50.71	29.34	3832.07	-6548.27	72.82
Wind 150 deg - No Ice		28.61	49.56	6512.65	-3715.72	84.19
Wind 180 deg - No Ice		0.05	56.73	7472.06	22.01	74.45
Wind 210 deg - No Ice		-28.52	49.51	6500.45	3763.01	46.24
Wind 240 deg - No Ice		-50.66	29.25	3810.94	6604.49	5.07
Wind 270 deg - No Ice		-57.13	-0.05	5.39	7512.94	-37.95
Wind 300 deg - No Ice		-49.10	-28.41	-3720.21	6483.87	-69.75
Wind 330 deg - No Ice		-28.61	-49.56	-6477.48	3784.14	-84.19
Member Ice	10.51					
Total Weight Ice	72.24			39.70	82.69	
Wind 0 deg - Ice		-0.04	-56.51	-7419.02	92.19	-78.04
Wind 30 deg - Ice		27.80	-48.23	-6365.60	-3604.44	-46.66
Wind 60 deg - Ice		47.97	-27.69	-3643.41	-6296.64	-4.36
Wind 90 deg - Ice		55.67	0.04	49.20	-7308.03	39.00
Wind 120 deg - Ice		48.92	28.29	3777.28	-6372.00	73.43
Wind 150 deg - Ice		27.87	48.27	6454.50	-3620.90	85.65
Wind 180 deg - Ice		0.04	55.45	7422.37	73.19	75.84
Wind 210 deg - Ice		-27.80	48.23	6444.99	3769.82	46.66
Wind 240 deg - Ice		-48.88	28.22	3760.83	6527.88	4.61
Wind 270 deg - Ice		-55.67	-0.04	30.20	7473.40	-39.00
Wind 300 deg - Ice		-48.00	-27.76	-3659.87	6471.52	-71.48
Wind 330 deg - Ice		-27.87	-48.27	-6375.10	3786.28	-85.65
Total Weight	49.11			17.59	34.21	
Wind 0 deg - Service		-0.02	-20.27	-2631.39	4.62	-26.95
Wind 30 deg - Service		9.87	-17.13	-2242.13	-1289.85	-16.00
Wind 60 deg - Service		16.97	-9.80	-1284.97	-2227.10	-1.62
Wind 90 deg - Service		19.77	0.02	5.30	-2587.40	13.13
Wind 120 deg - Service		17.55	10.15	1320.97	-2277.28	25.20
Wind 150 deg - Service		9.90	17.15	2248.51	-1297.16	29.13
Wind 180 deg - Service		0.02	19.63	2580.48	-3.82	25.76
Wind 210 deg - Service		-9.87	17.13	2244.29	1290.64	16.00
Wind 240 deg - Service		-17.53	10.12	1313.66	2273.85	1.75
Wind 270 deg - Service		-19.77	-0.02	-3.14	2588.19	-13.13
Wind 300 deg - Service		-16.99	-9.83	-1292.28	2232.11	-24.14

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 330 deg - Service		-9.90	-17.15	-2246.35	1297.95	-29.13

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	240 - 220	Leg	Max Tension	8	24.61	0.17	-1.54
			Max. Compression	6	-26.15	-1.53	-0.55
			Max. Mx	6	-18.14	-1.94	-0.97

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-17.98	-0.01	2.17
			Max. Vy	11	1.40	-0.48	-0.05
			Max. Vx	8	-1.45	0.48	0.78
		Diagonal	Max Tension	11	3.66	0.03	-0.01
			Max. Compression	5	-3.71	0.00	0.00
			Max. Mx	7	-1.29	-0.06	0.01
			Max. My	12	-2.27	-0.06	0.02
			Max. Vy	7	0.03	0.00	0.00
			Max. Vx	12	-0.01	-0.06	0.02
		Top Girt	Max Tension	2	0.95	0.00	0.00
			Max. Compression	12	-1.03	0.00	0.00
			Max. Mx	14	0.07	-0.01	0.00
			Max. My	20	0.01	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T2	220 - 200	Leg	Max Tension	8	68.58	-0.20	2.29
			Max. Compression	6	-71.42	-2.62	-0.83
			Max. Mx	12	45.11	3.36	1.39
			Max. My	8	45.61	0.21	-3.61
			Max. Vy	6	1.32	-2.69	-1.00
			Max. Vx	2	-1.37	-0.14	2.83
		Diagonal	Max Tension	12	6.42	0.09	-0.02
			Max. Compression	19	-6.60	0.00	0.00
			Max. Mx	7	-2.04	-0.16	0.02
			Max. My	7	-3.95	-0.12	-0.05
			Max. Vy	7	0.06	0.00	0.00
			Max. Vx	7	0.02	-0.12	-0.05
		Top Girt	Max Tension	21	0.55	0.00	0.00
			Max. Compression	12	-0.56	0.00	0.00
			Max. Mx	14	0.25	-0.02	0.00
			Max. My	20	-0.15	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T3	200 - 180	Leg	Max Tension	8	103.37	0.80	0.13
			Max. Compression	6	-108.47	1.81	-0.23
			Max. Mx	12	76.21	-3.52	0.48
			Max. My	13	-3.40	-0.07	2.06
			Max. Vy	2	-2.07	3.38	0.21
			Max. Vx	13	-1.61	-0.07	2.06
		Diagonal	Max Tension	18	4.91	0.04	-0.00
			Max. Compression	5	-5.21	0.00	0.00
			Max. Mx	7	4.10	0.07	-0.01
			Max. My	24	-3.36	-0.03	0.02
			Max. Vy	7	0.03	0.07	-0.01
			Max. Vx	24	-0.01	0.00	0.00
		Top Girt	Max Tension	21	1.59	0.00	0.00
			Max. Compression	12	-1.17	0.00	0.00
			Max. Mx	14	0.59	-0.02	0.00
			Max. My	20	-0.24	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T4	180 - 160	Leg	Max Tension	8	132.67	-0.44	0.07
			Max. Compression	6	-139.92	0.57	-0.18
			Max. Mx	15	-113.46	2.26	0.16
			Max. My	20	-6.77	-0.03	-1.56
			Max. Vy	2	-0.67	2.26	0.14
			Max. Vx	26	-0.34	-0.03	1.55
		Diagonal	Max Tension	18	5.09	0.00	0.00
			Max. Compression	18	-5.09	0.00	0.00
			Max. Mx	19	2.11	0.08	-0.01
			Max. My	25	-4.73	-0.04	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	19	-0.03	0.08	-0.01
			Max. Vx	25	-0.00	0.00	0.00
T5	160 - 140	Leg	Max Tension	8	157.75	0.55	0.11
			Max. Compression	23	-168.08	1.94	0.01
			Max. Mx	15	-146.34	2.72	0.24
			Max. My	26	-8.17	0.02	1.79
			Max. Vy	19	-0.71	2.72	-0.29
			Max. Vx	26	-0.47	0.02	1.79
		Diagonal	Max Tension	18	5.48	0.00	0.00
			Max. Compression	18	-5.68	0.00	0.00
			Max. Mx	23	3.27	0.06	0.00
			Max. My	25	-5.09	-0.01	0.01
			Max. Vy	23	-0.03	0.06	0.00
			Max. Vx	25	-0.00	0.00	0.00
T6	140 - 120	Leg	Max Tension	8	182.61	-0.78	0.09
			Max. Compression	23	-197.18	2.77	0.02
			Max. Mx	19	-175.90	3.24	-0.18
			Max. My	7	-6.62	-0.01	-2.40
			Max. Vy	19	-0.63	3.24	-0.18
			Max. Vx	13	-0.42	0.03	2.28
		Diagonal	Max Tension	18	6.12	0.00	0.00
			Max. Compression	18	-6.34	0.00	0.00
			Max. Mx	23	4.37	0.08	0.00
			Max. My	25	-5.66	-0.00	0.01
			Max. Vy	23	-0.03	0.08	0.00
			Max. Vx	25	-0.00	0.00	0.00
T7	120 - 100	Leg	Max Tension	8	207.74	-1.57	0.06
			Max. Compression	23	-227.10	1.55	-0.00
			Max. Mx	23	-216.88	2.29	0.00
			Max. My	7	-7.53	-0.01	-1.93
			Max. Vy	19	-0.25	2.27	0.00
			Max. Vx	7	0.24	0.00	-1.66
		Diagonal	Max Tension	18	7.02	0.00	0.00
			Max. Compression	18	-7.02	0.00	0.00
			Max. Mx	23	4.78	0.08	0.00
			Max. My	25	-6.54	0.01	0.02
			Max. Vy	25	0.04	0.07	0.01
			Max. Vx	25	-0.00	0.00	0.00
T8	100 - 80	Leg	Max Tension	8	230.19	0.14	0.17
			Max. Compression	23	-253.60	3.55	-0.01
			Max. Mx	6	-248.52	3.59	-0.34
			Max. My	13	-9.36	-0.01	3.13
			Max. Vy	4	0.50	-3.43	0.01
			Max. Vx	13	-0.45	-0.01	3.13
		Diagonal	Max Tension	18	8.02	0.00	0.00
			Max. Compression	18	-8.22	0.00	0.00
			Max. Mx	23	6.10	0.14	-0.01
			Max. My	25	-7.03	0.03	0.03
			Max. Vy	25	0.05	0.13	0.02
			Max. Vx	25	-0.00	0.00	0.00
T9	80 - 60	Leg	Max Tension	12	254.43	-0.33	-0.08
			Max. Compression	23	-282.23	2.81	-0.01
			Max. Mx	6	-276.50	3.00	-0.23
			Max. My	13	-11.00	-0.01	2.56
			Max. Vy	6	-0.38	3.00	-0.23
			Max. Vx	7	0.36	-0.01	-2.56
		Diagonal	Max Tension	16	8.66	0.00	0.00
			Max. Compression	3	-8.88	0.00	0.00
			Max. Mx	23	6.41	0.18	-0.01
			Max. My	21	-7.86	0.04	-0.03
			Max. Vy	23	-0.06	0.18	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	21	0.00	0.00	0.00
T10	60 - 40	Leg	Max Tension	12	278.29	-1.90	-0.07
			Max. Compression	23	-311.03	1.91	-0.01
			Max. Mx	21	271.50	-4.59	-0.31
			Max. My	13	-13.76	0.08	3.29
			Max. Vy	17	0.44	-4.59	0.02
			Max. Vx	7	0.33	0.08	-3.28
		Diagonal	Max Tension	16	9.54	0.00	0.00
			Max. Compression	3	-9.62	0.00	0.00
			Max. Mx	23	7.13	0.18	-0.01
			Max. My	21	-8.45	0.09	-0.03
			Max. Vy	25	0.06	0.18	0.02
			Max. Vx	21	0.00	0.00	0.00
T11	40 - 20	Leg	Max Tension	12	301.80	-2.10	-0.00
			Max. Compression	23	-340.51	-3.18	-0.00
			Max. Mx	25	293.21	-8.16	0.07
			Max. My	13	-14.11	-0.03	2.80
			Max. Vy	17	1.02	-8.13	0.01
			Max. Vx	13	0.27	-0.16	2.43
		Diagonal	Max Tension	16	11.46	0.00	0.00
			Max. Compression	16	-10.67	0.00	0.00
			Max. Mx	23	6.66	0.23	-0.02
			Max. My	20	-6.84	0.16	-0.04
			Max. Vy	25	0.08	0.23	0.03
			Max. Vx	20	0.01	0.00	0.00
T12	20 - 0	Leg	Max Tension	12	324.50	-2.65	0.10
			Max. Compression	23	-370.06	-0.13	0.01
			Max. Mx	23	-369.08	10.15	-0.01
			Max. My	13	-17.32	-0.23	4.51
			Max. Vy	17	-1.50	-8.31	0.01
			Max. Vx	13	0.64	-0.23	4.51
		Diagonal	Max Tension	16	14.77	0.00	0.00
			Max. Compression	16	-13.23	0.00	0.00
			Max. Mx	25	2.72	0.31	0.03
			Max. My	21	-12.56	0.22	-0.05
			Max. Vy	25	0.09	0.31	0.03
			Max. Vx	21	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	23	373.79	25.28	-14.72
	Max. H_x	10	369.74	31.75	-18.46
	Max. H_z	16	-268.60	-28.64	19.63
	Min. Vert	4	-326.34	-28.67	16.68
	Min. H_x	17	-313.62	-33.76	19.60
	Min. H_z	10	369.74	31.75	-18.46
Leg B	Max. Vert	6	367.98	-32.66	-16.91
	Max. H_x	25	-321.03	34.77	18.19
	Max. H_z	25	-321.03	34.77	18.19
	Min. Vert	12	-330.07	29.63	15.24
	Min. H_x	6	367.98	-32.66	-16.91
	Min. H_z	6	367.98	-32.66	-16.91
Leg A	Max. Vert	15	368.47	-1.85	29.20
	Max. H_x	10	-160.25	3.19	-16.46

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_z	2	368.13	-1.80	36.74
	Min. Vert	8	-329.92	1.73	-33.28
	Min. H_x	4	187.79	-2.98	18.50
	Min. H_z	21	-320.48	1.73	-39.20

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	49.11	0.00	-0.00	17.59	34.22	0.00
Dead+Wind 0 deg - No Ice	49.11	-0.05	-58.58	-7615.79	47.11	-78.07
Dead+Wind 30 deg - No Ice	49.11	28.52	-49.50	-6486.49	-3708.13	-46.32
Dead+Wind 60 deg - No Ice	49.11	49.05	-28.32	-3711.32	-6425.01	-4.69
Dead+Wind 90 deg - No Ice	49.11	57.13	0.05	29.16	-7469.66	38.05
Dead+Wind 120 deg - No Ice	49.11	50.71	29.34	3845.72	-6569.89	73.03
Dead+Wind 150 deg - No Ice	49.11	28.61	49.56	6535.73	-3726.45	84.40
Dead+Wind 180 deg - No Ice	49.11	0.05	56.73	7497.31	22.50	74.61
Dead+Wind 210 deg - No Ice	49.11	-28.52	49.50	6523.04	3774.54	46.32
Dead+Wind 240 deg - No Ice	49.11	-50.66	29.25	3824.01	6626.51	5.05
Dead+Wind 270 deg - No Ice	49.11	-57.13	-0.05	4.60	7538.26	-38.05
Dead+Wind 300 deg - No Ice	49.11	-49.10	-28.41	-3732.16	6506.13	-69.92
Dead+Wind 330 deg - No Ice	49.11	-28.61	-49.56	-6498.31	3798.74	-84.40
Dead+Ice+Temp	72.24	0.00	-0.00	39.80	82.84	0.00
Dead+Wind 0 deg+Ice+Temp	72.24	-0.04	-56.51	-7456.35	93.19	-78.45
Dead+Wind 30 deg+Ice+Temp	72.24	27.80	-48.23	-6397.18	-3623.54	-46.86
Dead+Wind 60 deg+Ice+Temp	72.24	47.96	-27.69	-3661.53	-6328.55	-4.36
Dead+Wind 90 deg+Ice+Temp	72.24	55.67	0.04	48.91	-7344.92	39.21
Dead+Wind 120 deg+Ice+Temp	72.24	48.92	28.29	3797.07	-6403.68	73.85
Dead+Wind 150 deg+Ice+Temp	72.24	27.87	48.27	6488.09	-3637.50	86.14
Dead+Wind 180 deg+Ice+Temp	72.24	0.04	55.45	7459.84	73.93	76.23
Dead+Wind 210 deg+Ice+Temp	72.24	-27.80	48.23	6478.05	3787.71	46.86
Dead+Wind 240 deg+Ice+Temp	72.24	-48.88	28.22	3779.98	6560.52	4.60
Dead+Wind 270 deg+Ice+Temp	72.24	-55.67	-0.04	29.66	7510.98	-39.21
Dead+Wind 300 deg+Ice+Temp	72.24	-48.00	-27.76	-3677.73	6504.47	-71.87
Dead+Wind 330 deg+Ice+Temp	72.24	-27.87	-48.27	-6406.28	3807.04	-86.14
Dead+Wind 0 deg - Service	49.11	-0.02	-20.27	-2623.77	38.58	-27.02
Dead+Wind 30 deg - Service	49.11	9.87	-17.13	-2233.21	-1260.33	-16.03
Dead+Wind 60 deg - Service	49.11	16.97	-9.80	-1272.78	-2200.79	-1.62
Dead+Wind 90 deg - Service	49.11	19.77	0.02	21.90	-2562.31	13.18
Dead+Wind 120 deg - Service	49.11	17.55	10.15	1342.07	-2251.09	25.27
Dead+Wind 150 deg - Service	49.11	9.90	17.15	2272.78	-1267.63	29.21
Dead+Wind 180 deg - Service	49.11	0.02	19.63	2605.87	30.09	25.83
Dead+Wind 210 deg - Service	49.11	-9.87	17.13	2268.51	1328.93	16.03
Dead+Wind 240 deg - Service	49.11	-17.53	10.12	1334.69	2315.47	1.75
Dead+Wind 270 deg - Service	49.11	-19.77	-0.02	13.41	2630.93	-13.18
Dead+Wind 300 deg - Service	49.11	-16.99	-9.83	-1280.11	2273.66	-24.21
Dead+Wind 330 deg - Service	49.11	-9.90	-17.15	-2237.43	1336.34	-29.21

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	-49.11	0.00	-0.00	49.11	0.00	0.000%
2	-0.05	-49.11	-58.58	0.05	49.11	58.58	0.001%
3	28.52	-49.11	-49.51	-28.52	49.11	49.50	0.001%
4	49.05	-49.11	-28.32	-49.05	49.11	28.32	0.001%
5	57.13	-49.11	0.05	-57.13	49.11	-0.05	0.001%
6	50.71	-49.11	29.34	-50.71	49.11	-29.34	0.001%
7	28.61	-49.11	49.56	-28.61	49.11	-49.56	0.001%
8	0.05	-49.11	56.73	-0.05	49.11	-56.73	0.001%
9	-28.52	-49.11	49.51	28.52	49.11	-49.50	0.001%
10	-50.66	-49.11	29.25	50.66	49.11	-29.25	0.001%
11	-57.13	-49.11	-0.05	57.13	49.11	0.05	0.001%
12	-49.10	-49.11	-28.41	49.10	49.11	28.41	0.001%
13	-28.61	-49.11	-49.56	28.61	49.11	49.56	0.001%
14	0.00	-72.24	0.00	-0.00	72.24	0.00	0.000%
15	-0.04	-72.24	-56.51	0.04	72.24	56.51	0.001%
16	27.80	-72.24	-48.23	-27.80	72.24	48.23	0.001%
17	47.97	-72.24	-27.69	-47.96	72.24	27.69	0.001%
18	55.67	-72.24	0.04	-55.67	72.24	-0.04	0.001%
19	48.92	-72.24	28.29	-48.92	72.24	-28.29	0.001%
20	27.87	-72.24	48.27	-27.87	72.24	-48.27	0.001%
21	0.04	-72.24	55.45	-0.04	72.24	-55.45	0.001%
22	-27.80	-72.24	48.23	27.80	72.24	-48.23	0.001%
23	-48.88	-72.24	28.22	48.88	72.24	-28.22	0.001%
24	-55.67	-72.24	-0.04	55.67	72.24	0.04	0.001%
25	-48.00	-72.24	-27.76	48.00	72.24	27.76	0.001%
26	-27.87	-72.24	-48.27	27.87	72.24	48.27	0.001%
27	-0.02	-49.11	-20.27	0.02	49.11	20.27	0.001%
28	9.87	-49.11	-17.13	-9.87	49.11	17.13	0.001%
29	16.97	-49.11	-9.80	-16.97	49.11	9.80	0.001%
30	19.77	-49.11	0.02	-19.77	49.11	-0.02	0.001%
31	17.55	-49.11	10.15	-17.55	49.11	-10.15	0.001%
32	9.90	-49.11	17.15	-9.90	49.11	-17.15	0.001%
33	0.02	-49.11	19.63	-0.02	49.11	-19.63	0.001%
34	-9.87	-49.11	17.13	9.87	49.11	-17.13	0.001%
35	-17.53	-49.11	10.12	17.53	49.11	-10.12	0.001%
36	-19.77	-49.11	-0.02	19.77	49.11	0.02	0.001%
37	-16.99	-49.11	-9.83	16.99	49.11	9.83	0.001%
38	-9.90	-49.11	-17.15	9.90	49.11	17.15	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	12	0.00000001	0.00007752
2	Yes	14	0.00000001	0.00011689
3	Yes	14	0.00000001	0.00012029
4	Yes	14	0.00000001	0.00012306
5	Yes	14	0.00000001	0.00012029
6	Yes	14	0.00000001	0.00011734
7	Yes	14	0.00000001	0.00012126
8	Yes	14	0.00000001	0.00012372
9	Yes	14	0.00000001	0.00012076
10	Yes	14	0.00000001	0.00011694
11	Yes	14	0.00000001	0.00012038
12	Yes	14	0.00000001	0.00012350
13	Yes	14	0.00000001	0.00012090

14	Yes	12	0.00000001	0.00014498
15	Yes	14	0.00000001	0.00012101
16	Yes	14	0.00000001	0.00012445
17	Yes	14	0.00000001	0.00012750
18	Yes	14	0.00000001	0.00012459
19	Yes	14	0.00000001	0.00012173
20	Yes	14	0.00000001	0.00012579
21	Yes	14	0.00000001	0.00012834
22	Yes	14	0.00000001	0.00012518
23	Yes	14	0.00000001	0.00012131
24	Yes	14	0.00000001	0.00012464
25	Yes	14	0.00000001	0.00012785
26	Yes	14	0.00000001	0.00012512
27	Yes	14	0.00000001	0.00011454
28	Yes	14	0.00000001	0.00011579
29	Yes	14	0.00000001	0.00011705
30	Yes	14	0.00000001	0.00011626
31	Yes	14	0.00000001	0.00011536
32	Yes	14	0.00000001	0.00011710
33	Yes	14	0.00000001	0.00011820
34	Yes	14	0.00000001	0.00011681
35	Yes	14	0.00000001	0.00011514
36	Yes	14	0.00000001	0.00011635
37	Yes	14	0.00000001	0.00011742
38	Yes	14	0.00000001	0.00011617

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	240 - 220	10.884	35	0.4676	0.0783
T2	220 - 200	8.391	35	0.4238	0.0734
T3	200 - 180	6.262	35	0.3405	0.0620
T4	180 - 160	4.679	35	0.2790	0.0536
T5	160 - 140	3.526	35	0.2237	0.0467
T6	140 - 120	2.586	35	0.1818	0.0398
T7	120 - 100	1.855	35	0.1411	0.0317
T8	100 - 80	1.286	35	0.1145	0.0247
T9	80 - 60	0.820	35	0.0882	0.0192
T10	60 - 40	0.472	35	0.0619	0.0138
T11	40 - 20	0.226	35	0.0412	0.0087
T12	20 - 0	0.071	35	0.0205	0.0044

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
240.00	HBXX-6517DS	35	10.884	0.4676	0.0783	47599
221.00	12' x 3" Dia Omni	35	8.510	0.4271	0.0738	12668
218.00	12' x 3" Dia Omni	35	8.157	0.4167	0.0725	11380
196.20	(2) 7770.00	35	5.919	0.3267	0.0600	8291

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	240 - 220	31.154	10	1.3414	0.2450
T2	220 - 200	24.024	10	1.2125	0.2309
T3	200 - 180	17.936	10	0.9746	0.1939
T4	180 - 160	13.403	10	0.7987	0.1656
T5	160 - 140	10.103	10	0.6403	0.1427
T6	140 - 120	7.410	10	0.5203	0.1208
T7	120 - 100	5.317	10	0.4039	0.0953
T8	100 - 80	3.687	10	0.3276	0.0740
T9	80 - 60	2.353	10	0.2524	0.0573
T10	60 - 40	1.357	10	0.1770	0.0412
T11	40 - 20	0.651	10	0.1179	0.0258
T12	20 - 0	0.205	2	0.0587	0.0130

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
240.00	HBXX-6517DS	10	31.154	1.3414	0.2450	16666
221.00	12' x 3" Dia Omni	10	24.363	1.2220	0.2321	4434
218.00	12' x 3" Dia Omni	10	23.355	1.1920	0.2282	3982
196.20	(2) 7770.00	10	16.955	0.9351	0.1874	2901

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	240	Leg	A325N	0.7500	6	4.10	19.44	0.211 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	3.66	3.40	1.076 ✔	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	0.95	3.40	0.280 ✔	1.333	Member Bearing
T2	220	Leg	A325N	1.0000	6	11.43	34.56	0.331 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	6.42	8.50	0.756 ✔	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	0.55	8.50	0.065 ✔	1.333	Member Bearing
T3	200	Leg	A325N	1.0000	6	17.23	34.56	0.499 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	4.91	6.80	0.722 ✔	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	1.59	6.80	0.234 ✔	1.333	Member Bearing
T4	180	Leg	A325N	1.0000	6	22.11	34.56	0.640 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	5.09	6.80	0.749 ✔	1.333	Member Bearing
T5	160	Leg	A325N	1.2500	6	26.29	54.00	0.487 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	5.48	6.80	0.807 ✔	1.333	Member Bearing

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
T6	140	Leg	A325N	1.2500	6	30.44	54.00	0.564 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	6.12	5.10	1.200 ✔	1.333	Member Bearing
T7	120	Leg	A325N	1.2500	6	34.62	54.00	0.641 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	7.02	8.16	0.861 ✔	1.333	Member Bearing
T8	100	Leg	A325N	1.2500	6	38.37	54.00	0.711 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	8.02	8.16	0.984 ✔	1.333	Member Bearing
T9	80	Leg	A325N	1.5000	8	31.80	77.75	0.409 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	8.66	8.16	1.062 ✔	1.333	Member Bearing
T10	60	Leg	A325N	1.5000	8	34.79	77.75	0.447 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	9.54	8.16	1.170 ✔	1.333	Member Bearing
T11	40	Leg	A325N	1.5000	8	37.72	77.75	0.485 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	11.46	10.20	1.124 ✔	1.333	Member Bearing
T12	20	Leg	F1554-105	1.5000	6	54.08	72.89	0.742 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.6250	2	7.39	9.20	0.802 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	240 - 220	P2x.218	20.00	5.00	78.3 K=1.00	19.354	1.4773	-26.15	28.59	0.915 ✔
T2	220 - 200	P3x.3	20.00	5.00	52.8 K=1.00	23.908	3.0159	-71.42	72.11	0.990 ✔
T3	200 - 180	P4x.337	20.03	5.01	40.7 K=1.00	25.733	4.4074	-108.47	113.42	0.956 ✔
T4	180 - 160	P5x.375	20.03	5.01	32.7 K=1.00	26.815	6.1120	-139.92	163.89	0.854 ✔
T5	160 - 140	P5x0.5	20.03	6.68	44.5 K=1.00	25.177	7.9529	-168.08	200.23	0.839 ✔
T6	140 - 120	P8x.322	20.03	6.68	27.3 K=1.00	27.483	8.3993	-197.18	230.84	0.854 ✔
T7	120 - 100	P8x.5	20.03	6.68	27.8 K=1.00	27.415	12.7627	-227.10	349.89	0.649 ✔
T8	100 - 80	P8x.5	20.03	10.02	41.8 K=1.00	25.582	12.7627	-253.60	326.50	0.777 ✔
T9	80 - 60	P8x.5	20.03	10.02	41.8 K=1.00	25.582	12.7627	-282.23	326.50	0.864 ✔
T10	60 - 40	P10x.5	20.03	10.02	33.1 K=1.00	26.758	16.1007	-311.03	430.81	0.722

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T11	40 - 20	P10x.5	20.03	10.02	33.1 K=1.00	26.758	16.1007	-340.51	430.81	0.790 ✔
T12	20 - 0	P10x.5	20.03	10.02	33.1 K=1.00	26.758	16.1007	-370.06	430.81	0.859 ✔

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	240 - 220	L2x2x1/8	5.26	2.51	86.8 K=1.15	14.252	0.4844	-3.71	6.90	0.537 ✔
T2	220 - 200	L2x2x5/16	5.26	2.51	87.9 K=1.14	14.451	1.1500	-6.60	16.62	0.397 ✔
T3	200 - 180	L2x2x1/4	5.75	2.88	96.3 K=1.09	13.443	0.9380	-5.21	12.61	0.413 ✔
T4	180 - 160	L2 1/2x2 1/2x1/4	8.11	4.05	104.3 K=1.05	12.430	1.1900	-5.09	14.79	0.344 ✔
T5	160 - 140	L2 1/2x2 1/2x1/4	10.52	5.30	129.6 K=1.00	8.889	1.1900	-5.68	10.58	0.537 ✔
T6	140 - 120	L3x3x3/16	12.23	6.16	124.0 K=1.00	9.676	1.0900	-6.34	10.55	0.601 ✔
T7	120 - 100	L3x3x1/4	14.02	7.04	142.6 K=1.00	7.343	1.4400	-7.02	10.57	0.664 ✔
T8	100 - 80	L3 1/2x3 1/2x1/4	17.23	8.74	151.1 K=1.00	6.540	1.6900	-8.22	11.05	0.744 ✔
T9	80 - 60	L4x3 1/2x1/4	18.95	9.60	156.9 K=1.00	6.068	1.8100	-8.88	10.98	0.809 ✔
T10	60 - 40	L4x4x1/4	20.72	10.48	158.2 K=1.00	5.969	1.9400	-9.62	11.58	0.830 ✔
T11	40 - 20	L4x4x5/16	22.53	11.38	172.7 K=1.00	5.009	2.4000	-10.44	12.02	0.868 ✔
T12	20 - 0	L4x4x5/16	23.45	11.78	164.7 K=0.92	5.502	2.4000	-13.23	13.21	1.002 ✔

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	240 - 220	L2x2x1/8	5.00	4.56	137.7 K=1.00	7.873	0.4844	-1.03	3.81	0.271 ✔
T2	220 - 200	L2x2x5/16	5.00	4.56	140.4 K=1.00	7.577	1.1500	-0.56	8.71	0.064 ✔
T3	200 - 180	L2x2x1/4	5.00	4.47	137.1 K=1.00	7.939	0.9380	-1.17	7.45	0.158 ✔

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 $\frac{P}{P_a}$

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	240 - 220	P2x.218	20.00	5.00	78.3	30.000	1.4773	24.61	44.32	0.555 ✔
T2	220 - 200	P3x.3	20.00	5.00	52.8	30.000	3.0159	68.58	90.48	0.758 ✔
T3	200 - 180	P4x.337	20.03	5.01	40.7	30.000	4.4074	103.37	132.22	0.782 ✔
T4	180 - 160	P5x.375	20.03	5.01	32.7	30.000	6.1120	132.67	183.36	0.724 ✔
T5	160 - 140	P5x0.5	20.03	6.68	44.5	30.000	7.9529	157.75	238.59	0.661 ✔
T6	140 - 120	P8x.322	20.03	6.68	27.3	30.000	8.3993	182.61	251.98	0.725 ✔
T7	120 - 100	P8x.5	20.03	6.68	27.8	30.000	12.7627	207.74	382.88	0.543 ✔
T8	100 - 80	P8x.5	20.03	10.02	41.8	30.000	12.7627	230.19	382.88	0.601 ✔
T9	80 - 60	P8x.5	20.03	10.02	41.8	30.000	12.7627	254.43	382.88	0.665 ✔
T10	60 - 40	P10x.5	20.03	10.02	33.1	30.000	16.1007	278.29	483.02	0.576 ✔
T11	40 - 20	P10x.5	20.03	10.02	33.1	30.000	16.1007	301.80	483.02	0.625 ✔
T12	20 - 0	P10x.5	20.03	10.02	33.1	30.000	16.1007	324.50	483.02	0.672 ✔

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	240 - 220	L2x2x1/8	5.26	2.51	50.4	29.000	0.2930	3.66	8.50	0.430 ✔
T2	220 - 200	L2x2x5/16	5.26	2.51	52.5	29.000	0.6867	6.42	19.91	0.323 ✔
T3	200 - 180	L2x2x1/4	5.75	2.88	59.1	29.000	0.5629	4.91	16.32	0.301 ✔
T4	180 - 160	L2 1/2x2 1/2x1/4	8.11	4.05	65.1	29.000	0.7519	5.09	21.80	0.233 ✔

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	160 - 140	L2 1/2x2 1/2x1/4	10.52	5.30	84.6	29.000	0.7519	5.48	21.80	0.251 ✔
T6	140 - 120	L3x3x3/16	12.23	6.16	80.2	29.000	0.7120	6.12	20.65	0.296 ✔
T7	120 - 100	L3x3x1/4	14.02	7.04	92.5	29.000	0.9159	7.02	26.56	0.264 ✔
T8	100 - 80	L3 1/2x3 1/2x1/4	17.23	8.74	97.7	29.000	1.1034	8.02	32.00	0.251 ✔
T9	80 - 60	L4x3 1/2x1/4	18.95	9.60	108.7	29.000	1.1934	8.66	34.61	0.250 ✔
T10	60 - 40	L4x4x1/4	20.72	10.48	101.9	29.000	1.2909	9.54	37.44	0.255 ✔
T11	40 - 20	L4x4x5/16	22.53	11.38	111.5	29.000	1.5949	11.46	46.25	0.248 ✔
T12	20 - 0	L4x4x5/16	24.37	12.24	120.3	29.000	1.6242	14.77	47.10	0.314 ✔

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	240 - 220	L2x2x1/8	5.00	4.56	92.0	29.000	0.2930	0.95	8.50	0.112 ✔
T2	220 - 200	L2x2x5/16	5.00	4.56	95.9	29.000	0.6867	0.55	19.91	0.028 ✔
T3	200 - 180	L2x2x1/4	5.00	4.47	92.8	29.000	0.5629	1.59	16.32	0.097 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	240 - 220	Leg	P2x.218	2	-26.15	38.11	68.6	Pass
T2	220 - 200	Leg	P3x.3	32	-71.42	96.12	74.3	Pass
T3	200 - 180	Leg	P4x.337	62	-108.47	151.19	71.7	Pass
T4	180 - 160	Leg	P5x.375	92	-139.92	218.47	64.0	Pass
T5	160 - 140	Leg	P5x0.5	118	-168.08	266.91	63.0	Pass
T6	140 - 120	Leg	P8x.322	139	-197.18	307.70	64.1	Pass
T7	120 - 100	Leg	P8x.5	160	-227.10	466.41	48.7	Pass
T8	100 - 80	Leg	P8x.5	181	-253.60	435.22	58.3	Pass
T9	80 - 60	Leg	P8x.5	196	-282.23	435.22	64.8	Pass
T10	60 - 40	Leg	P10x.5	211	-311.03	574.28	54.2	Pass
T11	40 - 20	Leg	P10x.5	226	-340.51	574.28	59.3	Pass
T12	20 - 0	Leg	P10x.5	241	-370.06	574.28	64.4	Pass
T1	240 - 220	Diagonal	L2x2x1/8	8	-3.71	9.20	40.3 80.7 (b)	Pass
T2	220 - 200	Diagonal	L2x2x5/16	38	-6.60	22.15	29.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
							56.7 (b)	
T3	200 - 180	Diagonal	L2x2x1/4	80	-5.21	16.81	31.0	Pass
							54.2 (b)	
T4	180 - 160	Diagonal	L2 1/2x2 1/2x1/4	95	-5.09	19.72	25.8	Pass
							56.2 (b)	
T5	160 - 140	Diagonal	L2 1/2x2 1/2x1/4	122	-5.68	14.10	40.3	Pass
							60.5 (b)	
T6	140 - 120	Diagonal	L3x3x3/16	143	-6.34	14.06	45.1	Pass
							90.0 (b)	
T7	120 - 100	Diagonal	L3x3x1/4	164	-7.02	14.10	49.8	Pass
							64.6 (b)	
T8	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	185	-8.22	14.73	55.8	Pass
							73.8 (b)	
T9	80 - 60	Diagonal	L4x3 1/2x1/4	203	-8.88	14.64	60.7	Pass
							79.7 (b)	
T10	60 - 40	Diagonal	L4x4x1/4	218	-9.62	15.44	62.3	Pass
							87.7 (b)	
T11	40 - 20	Diagonal	L4x4x5/16	233	-10.44	16.02	65.1	Pass
							84.4 (b)	
T12	20 - 0	Diagonal	L4x4x5/16	254	-13.23	17.60	75.1	Pass
T1	240 - 220	Top Girt	L2x2x1/8	6	-1.03	5.08	20.3	Pass
							21.0 (b)	
T2	220 - 200	Top Girt	L2x2x5/16	35	-0.56	11.62	4.8	Pass
							4.9 (b)	
T3	200 - 180	Top Girt	L2x2x1/4	65	-1.17	9.93	11.8	Pass
							17.5 (b)	
							Summary	
						Leg (T2)	74.3	Pass
						Diagonal (T6)	90.0	Pass
						Top Girt (T1)	21.0	Pass
						Bolt Checks	90.0	Pass
						RATING =	**90.0**	**Pass**

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Subject: FOUNDATION ANALYSIS

Location: Ashford, CT

Rev. 0: 5/12/16

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 14273.000

Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 7651 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 59 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 49 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 374 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 330 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 240 \cdot ft$	(User Input)	
Tower Width =	$W_t := 25 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 1$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 1.75 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 37 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.75 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 3.5 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 5000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 1 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 9$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.128 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 18$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 3 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 10$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.27 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 70$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 10$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.27 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 70$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.3$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area =

$$A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.999 \cdot in^2$$

Pad Top Reinforcement Bar Area =

$$A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 1.267 \cdot in^2$$

Pad Bottom Reinforcement Bar Area =

$$A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 1.267 \cdot in^2$$

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 = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0.36 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.53 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.53 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 2.16 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.845 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 1.75$

$A_p := W_f \cdot T_p = 64.75$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 119.464 \cdot kip$

Weight of Concrete Pad = $WT_{pad} := \left(W_f^2 \cdot T_f\right) \cdot \gamma_c = 359.363 \cdot kip$

Weight of Concrete Piers = $WT_{pier} := 3 \cdot \left[\left(L_p \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot \gamma_c\right] = 20.565 \cdot kip$

Total Weight of Concrete = $WT_c := WT_{pad} + WT_{pier} = 380 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left(W_f^2 - 3 \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot (L_p - L_{pag} - n) \cdot \gamma_s = 523 \cdot kip$

Weight of Soil Back Face = $WT_{s2} := \left[\frac{\tan(\Phi_s) \cdot (D_f)^2}{2} \cdot W_f\right] \cdot \gamma_s = 46 \cdot kip$

Tower Offset = $X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t, X_{t1}, X_{t2}) = 7.675$

$X_{off} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 3.608$

Resisting Moment = $M_r := (WT_c + WT_{s1}) \cdot \frac{W_f}{2} + S_u \cdot \frac{T_f}{3} + WT_{s2} \cdot \left[W_f + \frac{\tan(\Phi_s) \cdot (L_p - L_{pag})}{3}\right] = 18512 \cdot ki$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 8034.5 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.3$

Factor of Safety Required = $FS_{req} := 2$

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

$OverTurning\_Moment\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 952 \cdot kip$

Area of the Mat = $A_{mat} := W_f^2 = 1.369 \times 10^3$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 8442.17 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.647 \cdot ksf$

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

$Max\_Pressure\_Check = "Okay"$

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.257 \cdot ksf$

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

$Min\_Pressure\_Check = "No Good"$

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 10.671$

Distance to Kern = $X_k := \frac{W_f}{6} = 6.167$ Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 8.443$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 1.705 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 1.705 \cdot ksf$

$Pressure\_Check := if(q_{adj} < q_s, "Okay", "No Good")$

$Pressure\_Check = "Okay"$

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 3.062 \times 10^3 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > LF \cdot C_t, "Okay", "No Good")$

$Bearing\_Check = "Okay"$

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - \frac{d_{bbot}}{2} = 17.365 \cdot in$

$FL := \frac{C_t}{W_f^2} = 0.2732 \cdot ksf$

$V_{req} := LF \cdot FL \cdot \left(X_t - 0.5 \cdot d_p - d\right) \cdot W_f = 60.332 \cdot kip$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d = 829 \cdot kip$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if\left(V_{req} < V_{Avail}, "Okay", "No\ Good"\right)$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := \left(d_p + d\right) \cdot \pi = 15.5$

Required Shear Strength = $V_{req} := LF \cdot FL \cdot \left[W_f^2 - \left(d_p + d\right)^2 \cdot \frac{\pi}{4}\right] = 491.5 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 696.4 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := if\left(V_{req} < V_{Avail}, "Okay", "No\ Good"\right)$

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

$M_u := 4647 \cdot kips \cdot ft$ (User Input)

Design Moment = $M_n := \frac{LF \cdot M_u}{\phi_m} = 6882.72 \cdot kips \cdot ft$

$$\beta := \begin{cases} 0.85 \text{ if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 \text{ if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right] \cdot 0.5\right] \text{ otherwise} \end{cases} = 0.85$$ (ACI-200810.2.7.3)

$d := T_f - Cvr_{pad} = 18 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 76.475 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot W_f} = 3.04 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 83.527 \cdot in^2$

$\rho := \frac{A_s}{W_f \cdot d} = 0.01045$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018 \qquad \text{(ACI -2008 7.12.2.1)}$$

Check Bottom Bars:

$As := \rho \cdot W_f \cdot d = 83.527 \cdot in^2$

$As_{prov} := A_{bbot} \cdot NB_{bot} = 88.7 \cdot in^2$

$Pad\_Reinforcement\_Bot := if(As_{prov} > As, "Okay", "No Good")$

Pad_Reinforcement_Bot = "Okay"

$As := \rho_{sh} \cdot (W_f \cdot T_f) = 16.8 \cdot in^2$

$As_{prov} := A_{btop} \cdot NB_{top} + A_{bbot} \cdot NB_{bot} = 177.3 \cdot in^2$

$Pad\_Reinforcement := if(As_{prov} > As, "Okay", "No Good")$

Pad_Reinforcement = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 5.06 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 2.53 \cdot in$$

Transverse Reinforcement Index =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot c,} \cdot d_{bbot} = 47 \cdot in$$

Minimum Development Length =

$L_{dbmin} := 12 \cdot in$ (ACI-2008 12.2.1)

$L_{dbtCheck} := if(L_{dbt} \geq L_{dbmin}, "Use L.dbt", "Use L.dbmin") = "Use L.dbt"$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 69 \cdot in$$

$Lpad\_Check := if(L_{Pad} > L_{dbt}, "Okay", "No Good")$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier =

$$A_p := \frac{\pi \cdot d_p^{\,2}}{4} = 1385.44 \cdot in^2$$

$$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 6.93 \cdot in^2 \qquad \text{(ACI-2008 10.8.4 \& 10.9.1)}$$

$$A_{sprov} := NB_{pier} \cdot A_{bpier} = 17.99 \cdot in^2$$

$$Steel\_Area\_Check := if\left(A_{sprov} > A_{smin}, "Okay", "No Good"\right)$$

Steel_Area_Check = "Okay"

Bar Spacing In Pier =

$$B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 6.202 \cdot in$$

Diameter of Reinforcement Cage =

$$Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 36 \cdot in$$

Maximum Moment in Pier =

$$M_p := \left[S_t \cdot \left(L_p + \frac{A_{BP}}{2}\right)\right] \cdot LF = 4797.5 \cdot in \cdot kips$$

Pier Check evaluated from outside program and results are listed below;

$$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) := \left(d_p \cdot 12 \;\; NB_{pier} \;\; BS_{pier} \;\; \frac{C_t \cdot 1.333}{kips} \;\; \frac{M_p}{in \cdot kips}\right)$$

$$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) = (42 \;\; 18 \;\; 9 \;\; 498.5 \;\; 4797.5)$$

$$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := (0 \;\; 0 \;\; 0 \;\; 0)$$

$$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := \phi P'_n\left(D, N, n, P_u, M_{xu}\right)^T$$

$$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) = (1692.8 \;\; 16290.2 \;\; -44.4 \;\; 0)$$

$$Axial\_Load\_Check := if\left(\phi P_n \geq P_u, "Okay", "No Good"\right)$$

Axial_Load_Check = "Okay"

$$Bending\_Check := if\left(\phi M_{xn} \geq M_{xu}, "Okay", "No Good"\right)$$

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 54 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 18 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 3 \cdot in$

Transverse Reinforcement =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 30.18 \cdot in$

Minimum Development Length =

$L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 14.982 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right)$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, "Okay", "No Good"\right)$

$L_{tension\_Check} = "Okay"$

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 21.402 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 20.304 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 21.402 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, "Okay", "No Good"\right)$

$L_{compression\_Check} = "Okay"$

Tie Size and Spacing in Column:

Minimum Tie Size = $Tie_{min} := if(BS_{pier} \le 10, 3, 4) = 3$

Used #3 Ties

Seismic Factor = $z := if(Z \le 2, 1, 0.5) = 1$ (ACI-2008 21.10.5)

$s_{lim1} := 16 \cdot d_{bpier} \cdot z = 18.048 \cdot in$

$s_{lim2} := \frac{48 \cdot d_{Tie}}{8} \cdot z = 18 \cdot in$

$s_{lim3} := D_f \cdot z = 72 \cdot in$

$s_{lim4} := 18in$

Maximum Spacing = $s_{tie} := \min\left(\begin{pmatrix} s_{lim1} \\ s_{lim2} \\ s_{lim3} \\ s_{lim4} \end{pmatrix}\right) = 18 \cdot in$

Number of Ties Required = $n_{tie} := \frac{L_{pier} - 3 \cdot in}{s_{tie}} + 1 = 3.833$

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT1068	DATE:	1/11/2013	RF DESIGN ENG:	Radu Alecsandru	RF PERF ENG:	Neil Alejandro
ISSUE:	Final	Approved? (Y/N):	Yes	RF DESIGN PHONE:	(860) 513-7598	RF PERF PHONE:	
REVISION:	0.1	RF MANAGER:	Cameron Syme	RF DESIGN EMAIL:	ra9161@att.com	RF PERF EMAIL:	na3839@att.com
INITIATIVE /PROJECT:	LTE Wave 4					TRIDENT:	N/A
						GSM FREQUENCY:	850
						UMTS FREQUENCY:	850/1900
						LTE FREQUENCY:	700
						I-PLAN JOB # 1:	TBD
						I-PLAN JOB # 2:	
						I-PLAN JOB # 3:	
						I-PLAN JOB # 4:	

RFDS PROGRAM TYPE:	2013 eNode B		
RFDS TECHNOLOGY:	LTE Wave 4		
State:	Planned		
Status:	In Progress		
RFDS ID:	23966		
Created By:	cb6561		
Date Created:	11/5/2012 12:00:00 AM		
Date Updated:	4/25/2013 2:57:21 PM		
Updated By:	et2267		

Section 2 - LOCATION INFORMATION

USID:	71308	FA LOCATION CODE:	10035008	LOCATION NAME:	Ashford	ORACLE PRJT # 1:	2051352400
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PRJT # 2:	
ADDRESS:	353 Pumpkin Hill Rd	CITY:	Ashford	STATE:	CT	ORACLE PRJT # 3:	
ZIP CODE:	6278	COUNTY:	Windham	MSA / RSA:	TBD	ORACLE PRJT # 4:	
LATITUDE (D-M-S):	41° 50' 52.87"	LONGITUDE (D-M-S):	72° 7' 17"	LAT (DEC. DEG.):	41.8480200	SEARCH RING NAME:	N/A
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	TBD					SEARCH RING ID:	N/A
						BTA:	TBD
						LONG (DEC. DEG.):	-72.1213900
						BORDER CELL WITH CONTOUR COORD:	TBD
						AM STUDY REQ'D (Y/N):	No
						FREQ COORD:	TBD

Section 3 - LICENSE COVERAGE/FILING INFORMATION

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

CGSA CALL SIGNS:	

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	No	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	Guyed	MKT LOCATION 850 MHZ CALL SIGN(S):	TBD
ADDITIONAL REGULATORY?:	No	HEIGHT OVERALL (ft):	TBD	FCC ASR NUMBER:	TBD	MKT LOCATION 1900 MHZ CALL SIGN(S):	TBD
SUB-LEASE RIGHTS?:	No	STRUCTURE HEIGHT (ft):	0.00			MKT LOCATION 700 MHZ CALL SIGN(S):	TBD
LIGHTING TYPE:	TBD					MKT LOCATION AWS MHZ CALL SIGN(S):	TBD

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 F								
OMNI								
SECTOR A E-911	TBD	TBD	TBD	TBD	TBD			
SECTOR B	TBD	TBD	TBD	TBD	TBD			
SECTOR C	TBD	TBD	TBD	TBD	TBD			
SECTOR D								
SECTOR E								

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	CT-TOLLAND COUNTY MUTUAL AID EMERGENCY COMMUNICATION CENTER	1401		INTRADO				
SECTOR B	CT-TOLLAND COUNTY MUTUAL AID EMERGENCY COMMUNICATION CENTER	1401		INTRADO				
SECTOR C	CT-TOLLAND COUNTY MUTUAL AID EMERGENCY COMMUNICATION CENTER	1401		INTRADO				
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
RBS ID:	RFDS_13517	RFDS_13517	RFDS_13517	RFDS_13517	RFDS_13518				RFDS_13519	
CTS COMMON ID:	319G1068	N/A	CTV1068	N/A	CTU1068				N/A	
BTA/TID:										
4-DIGIT SITE ID:	1068	1068	1068	1068	1068				1068	
COW OR TOY?:	No	No	No	No	No				No	
CELL SITE TYPE:										
SITE TYPE:	MACRO	MACRO	MACRO	MACRO	MACRO				MACRO	
BTS LOCATION ID:										
ORIGINATING CO:	ATT	ATT	ATT	ATT	ATT				ATT	
CELLULAR NETWORK:										
OPS DISTRICT:										
RF DISTRICT:										
OPS ZONE:										
RF ZONE:										
BASE STATION TYPE:										
EQUIPMENT NAME:										
DISASTER PRIORITY:	TBD	TBD	TBD	TBD	TBD				TBD	

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
RBS ID:									RFDS_37920	
CTS COMMON ID:									CTL01068	
BTA/TID:									0TBD	
4-DIGIT SITE ID:									01068	
COW OR TOY?:									No	
CELL SITE TYPE:									SECTORIZED	
SITE TYPE:									MACRO-CONVENTIONAL	
BTS LOCATION ID:										
ORIGINATING CO:									CINGULAR	
CELLULAR NETWORK:									GOLD	
OPS DISTRICT:										
RF DISTRICT:									NPO Triage	
OPS ZONE:										
RF ZONE:									Hotseat	
BASE STATION TYPE:									BASE	
EQUIPMENT NAME:									Ashford LTE	
DISASTER PRIORITY:									TBD	

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
MSC	MCT01	MCT01	TBD	TBD	TBD				N/A	
BSC/RNC/MME POOL ID										
LAC	5021	5021	TBD	TBD	TBD				N/A	
RAC	TBD	TBD	TBD	TBD	TBD				N/A	
EQUIPMENT VENDOR										
EQUIPMENT TYPE	TBD	TBD	RBS3206	RBS3206	1900 Radio Kit				N/A	
LOCATION	TBD	TBD	TBD	TBD	TBD				N/A	
CABINET LOCATION	TBD	TBD	TBD	TBD	TBD				N/A	
MARKET STATE CODE										
AGPS	Yes	Yes	Yes	Yes	Yes				Yes	
NODE B NUMBER										

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
MSC									N/A	
BSC/RNC/MME POOL ID									FF01	
LAC									00N/A	
RAC										
EQUIPMENT VENDOR									ERICSSON	
EQUIPMENT TYPE									6601 INDOOR MU	
LOCATION									N/A	
CABINET LOCATION									N/A	
MARKET STATE CODE									CT	
AGPS									Yes	
NODE B NUMBER									1068	

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 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
RBS ID:	RFDS_13517	RFDS_13517			RFDS_13517	RFDS_13517	RFDS_13518	RFDS_13518	RFDS_13518	RFDS_13518	RFDS_13518	RFDS_13519					RFDS_13519			RFDS_13519				
CELL ID/BCF:	319G1068	N/A			CTV1068	N/A	N/A	CTV1068	N/A	N/A	N/A	N/A					N/A			N/A				
CTS COMMON ID:	319G1068	N/A			CTV1068	N/A	N/A	CTU1068	N/A	N/A	N/A	N/A					N/A			N/A				

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 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
RBS ID:																	RFDS_37920							
CELL ID/BCF:																	CTL01068							
CTS COMMON ID:																	CTL01068							

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 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
USEID (excluding Hard Sector)	71308.850.25G.0	71308.1900.25G.0			71308.850.3G.1	71308.1900.3G.1	71308.850.3G.2	71308.1900.3G.2	71308.850.3G.3	71308.1900.3G.3	71308.850.3G.4	71308.1900.3G.4					71308.700.4G.0			71308.AWS.4G.0				
SECTOR A SOFT SECTOR ID	319G10681	N/A			CTV10681	N/A	N/A	CTU10687	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR B	319G10682	N/A			CTV10682	N/A	N/A	CTU10688	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR C	319G10683	N/A			CTV10683	N/A	N/A	CTU10689	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A IS MULTI CARRIER	No	No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					No			No				
SECTOR B	No	No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					No			No				
SECTOR C	No	No			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					No			No				
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A CELL NUMBER																								
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 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
USEID (excluding Hard Sector)																	71308.700.4G.1							
SECTOR A SOFT SECTOR ID																	CTL01068_7A_1							
SECTOR B																	CTL01068_7B_1							
SECTOR C																	CTL01068_7C_1							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A IS MULTI CARRIER																	No							
SECTOR B																	No							
SECTOR C																	No							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								
SECTOR A CELL NUMBER																	15							
SECTOR B																	16							
SECTOR C																	17							
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	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A CID/SAC	10681	N/A			10681	N/A	N/A	10687	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR B	10682	N/A			10682	N/A	N/A	10688	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR C	10683	N/A			10683	N/A	N/A	10689	N/A	N/A	N/A	N/A					N/A			N/A				
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	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A CID/SAC																								
SECTOR B																								
SECTOR C																								
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 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A RADIO COUNTS	2	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR B	2	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR C	2	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					N/A			N/A				
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
# 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 2ND 700	LTE 2ND 850	LTE 2ND 1900	LTE 2ND AWS
SECTOR A RADIO COUNTS	2	0			TBD	TBD	TBD	TBD	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR B	2	0			TBD	TBD	TBD	TBD	N/A	N/A	N/A	N/A					N/A			N/A				
SECTOR C	2	0			TBD	TBD	TBD	TBD	N/A	N/A	N/A	N/A					N/A			N/A				
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
# 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			7770			
ANTENNA VENDOR	Powerwave			Powerwave			
ANTENNA SIZE (H x W x D)	55X11X5			55X11X5			
ANTENNA WEIGHT	35			35			
AZIMUTH	30			30			
MAGNETIC DECLINATION	-14			-14			
RADIATION CENTER (feet)	198			198			
ANTENNA TIP HEIGHT	200			200			
MECHANICAL DOWNTILT	0			0			
FEEDER AMOUNT	2			2			
Antenna RET Motor (QTY/MODEL)	1 / Powerwave / 7020 (DB)			1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)	N/A			N/A			
TMA/LNA (TYPE/MODEL)	2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)			N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser / 1000860			N/A			
PDU FOR TMAS (QTY/MODEL)	LGP 12104 (1900 AND 850 Bypass TMA)			N/A			
SURGE ARRESTOR (QTY/MODEL)	N/A			1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave / LGP 21903			2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)	N/A			N/A			
DUPLEXER (QTY/MODEL)	N/A			N/A			
FILTER (QTY/MODEL)	N/A			N/A			
Additional Component1 (QTY/MODEL)	Powerwave			N/A			
Additional Component2 (QTY/MODEL)	N/A			N/A			
Additional Component3 (QTY/MODEL)	Daisy chain to ANT4			Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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			7770			
ANTENNA VENDOR	Powerwave			Powerwave			
ANTENNA SIZE (H x W x D)	55X11X5			55X11X5			
ANTENNA WEIGHT	35			35			
AZIMUTH	150			150			
MAGNETIC DECLINATION	-14			-14			
RADIATION CENTER (feet)	198			198			
ANTENNA TIP HEIGHT	200			200			
MECHANICAL DOWNTILT	0			0			
FEEDER AMOUNT	2			2			
Antenna RET Motor (QTY/MODEL)	1 / Powerwave / 7020 (DB)			1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)	N/A			N/A			
TMA/LNA (TYPE/MODEL)	2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)			N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser / 1000860			N/A			
PDU FOR TMAS (QTY/MODEL)	LGP 12104 (1900 AND 850 Bypass TMA)			N/A			
SURGE ARRESTOR (QTY/MODEL)	N/A			1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave / LGP 21903			2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)	N/A			N/A			
DUPLEXER (QTY/MODEL)	N/A			N/A			
FILTER (QTY/MODEL)	N/A			N/A			
Additional Component1 (QTY/MODEL)	Powerwave			N/A			
Additional Component2 (QTY/MODEL)	N/A			N/A			
Additional Component3 (QTY/MODEL)	Daisy chain to ANT4			Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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			7770			
ANTENNA VENDOR	Powerwave			Powerwave			
ANTENNA SIZE (H x W x D)	55X11X5			55X11X5			
ANTENNA WEIGHT	35			35			
AZIMUTH	270			270			
MAGNETIC DECLINATION	-14			-14			
RADIATION CENTER (feet)	198			198			
ANTENNA TIP HEIGHT	200			200			
MECHANICAL DOWNTILT	0			0			
FEEDER AMOUNT	2			2			
Antenna RET Motor (QTY/MODEL)	1 / Powerwave / 7020 (DB)			1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)	N/A			N/A			
TMA/LNA (TYPE/MODEL)	2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)			N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)	Polyphaser / 1000860			N/A			
PDU FOR TMAS (QTY/MODEL)	LGP 12104 (1900 AND 850 Bypass TMA)			N/A			
SURGE ARRESTOR (QTY/MODEL)	N/A			1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)	0 + 2 / Powerwave / LGP 21903			2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)	N/A			N/A			
DUPLEXER (QTY/MODEL)	N/A			N/A			
FILTER (QTY/MODEL)	N/A			N/A			
Additional Component1 (QTY/MODEL)	Powerwave			N/A			
Additional Component2 (QTY/MODEL)	N/A			N/A			
Additional Component3 (QTY/MODEL)	Daisy chain to ANT4			Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		8	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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
ANTENNA MAKE - MODEL	AM-X-CD-17-65-00T-RET		7770	7770			
ANTENNA VENDOR	KMW		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	96X11.8X6		55X11X5	55X11X5			
ANTENNA WEIGHT	59.5		35	35			
AZIMUTH	0		30	30			
MAGNETIC DECLINATION	-14		-14	-14			
RADIATION CENTER (feet)	198		198	198			
ANTENNA TIP HEIGHT	202		200	200			
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	1 Optic Fiber & 2 DC cables		2	2			
Antenna RET Motor (QTY/MODEL)	N/A / KMW / Built-in RET Equipment		1 / Powerwave / 7020 (DB)	1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)			N/A	N/A			
TMA/LNA (TYPE/MODEL)	N/A		2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)	N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			Polyphaser / 1000860	N/A			
PDU FOR TMAS (QTY/MODEL)			LGP 12104 (1900 AND 850 Bypass TMA)	N/A			
SURGE ARRESTOR (QTY/MODEL)			N/A	1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)			0 + 2 / Powerwave / LGP 21903	2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)			N/A	N/A			
DUPLEXER (QTY/MODEL)			N/A	N/A			
FILTER (QTY/MODEL)			N/A	N/A			
Additional Component1 (QTY/MODEL)	RRUS 11		Powerwave	N/A			
Additional Component2 (QTY/MODEL)	No CSRF		N/A	N/A			
Additional Component3 (QTY/MODEL)	RET connected to RRU for control		Daisy chain to ANT4	Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-Rx	LTE 700	AM-X-CD-17-65-00T-RET	17		10	TOP										
	PORT 2				N/A	LTE	AM-X-CD-17-65-00T-RET			0	TOP										
ANTENNA POSITION 3	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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
ANTENNA MAKE - MODEL	AM-X-CD-17-65-00T-RET		7770	7770			
ANTENNA VENDOR	KMW		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	96X11.8X6		55X11X5	55X11X5			
ANTENNA WEIGHT	59.5		35	35			
AZIMUTH	120		150	150			
MAGNETIC DECLINATION	-14		-14	-14			
RADIATION CENTER (feet)	198		198	198			
ANTENNA TIP HEIGHT	202		200	200			
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	1 Optic Fiber & 2 DC cables		2	2			
Antenna RET Motor (QTY/MODEL)	N/A / KMW / Built-in RET Equipment		1 / Powerwave / 7020 (DB)	1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)			N/A	N/A			
TMA/LNA (TYPE/MODEL)	N/A		2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)	N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			Polyphaser / 1000860	N/A			
PDU FOR TMAS (QTY/MODEL)			LGP 12104 (1900 AND 850 Bypass TMA)	N/A			
SURGE ARRESTOR (QTY/MODEL)			N/A	1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)			0 + 2 / Powerwave / LGP 21903	2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)			N/A	N/A			
DUPLEXER (QTY/MODEL)			N/A	N/A			
FILTER (QTY/MODEL)			N/A	N/A			
Additional Component1 (QTY/MODEL)	RRUS 11		Powerwave	N/A			
Additional Component2 (QTY/MODEL)	No CSRF		N/A	N/A			
Additional Component3 (QTY/MODEL)	RET connected to RRU for control		Daisy chain to ANT4	Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-Rx	LTE 700	AM-X-CD-17-65-00T-RET	17		2	TOP										
	PORT 2				N/A	LTE	AM-X-CD-17-65-00T-RET			0	TOP										
ANTENNA POSITION 3	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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
ANTENNA MAKE - MODEL	AM-X-CD-17-65-00T-RET		7770	7770			
ANTENNA VENDOR	KMW		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	96X11.8X6		55X11X5	55X11X5			
ANTENNA WEIGHT	59.5		35	35			
AZIMUTH	240		270	270			
MAGNETIC DECLINATION	-14		-14	-14			
RADIATION CENTER (feet)	198		198	198			
ANTENNA TIP HEIGHT	202		200	200			
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	1 Optic Fiber & 2 DC cables		2	2			
Antenna RET Motor (QTY/MODEL)	N/A / KMW / Built-in RET Equipment		1 / Powerwave / 7020 (DB)	1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)			N/A	N/A			
TMA/LNA (TYPE/MODEL)	N/A		2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)	N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			Polyphaser / 1000860	N/A			
PDU FOR TMAS (QTY/MODEL)			LGP 12104 (1900 AND 850 Bypass TMA)	N/A			
SURGE ARRESTOR (QTY/MODEL)			N/A	1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)			0 + 2 / Powerwave / LGP 21903	2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)			N/A	N/A			
DUPLEXER (QTY/MODEL)			N/A	N/A			
FILTER (QTY/MODEL)			N/A	N/A			
Additional Component1 (QTY/MODEL)	RRUS 11		Powerwave	N/A			
Additional Component2 (QTY/MODEL)	No CSRF		N/A	N/A			
Additional Component3 (QTY/MODEL)	RET connected to RRU for control		Daisy chain to ANT4	Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-Rx	LTE 700	AM-X-CD-17-65-00T-RET	17		2	TOP										
	PORT 2				N/A	LTE	AM-X-CD-17-65-00T-RET			0	TOP										
ANTENNA POSITION 3	PORT 1				TxRx-TxRx	UMTS 850	7770	14		8	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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	AM-X-CD-17-65-00T-RET		7770	7770			
ANTENNA VENDOR	KMW		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	96X11.8X6		55X11X5	55X11X5			
ANTENNA WEIGHT	59.5		35	35			
AZIMUTH	0		30	30			
MAGNETIC DECLINATION	-14		-14	-14			
RADIATION CENTER (feet)	198		198	198			
ANTENNA TIP HEIGHT	202		200	200			
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	1 Optic Fiber & 2 DC cables		2	2			
Antenna RET Motor (QTY/MODEL)	N/A / KMW / Built-in RET Equipment		1 / Powerwave / 7020 (DB)	1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)			N/A	N/A			
TMA/LNA (TYPE/MODEL)	N/A		2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)	N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			Polyphaser / 1000860	N/A			
PDU FOR TMAS (QTY/MODEL)			LGP 12104 (1900 AND 850 Bypass TMA)	N/A			
SURGE ARRESTOR (QTY/MODEL)			N/A	1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)			0 + 2 / Powerwave / LGP 21903	2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)			N/A	N/A			
DUPLEXER (QTY/MODEL)			N/A	N/A			
FILTER (QTY/MODEL)			N/A	N/A			
Additional Component1 (QTY/MODEL)	RRUS 11		Powerwave	N/A			
Additional Component2 (QTY/MODEL)	No CSRF		N/A	N/A			
Additional Component3 (QTY/MODEL)	RET connected to RRU for control		Daisy chain to ANT4	Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-Rx	LTE 700	AM-X-CD-17-65-00T-RET	17		10	TOP										
	PORT 2				N/A	LTE	AM-X-CD-17-65-00T-RET			0	TOP										
ANTENNA POSITION 3	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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

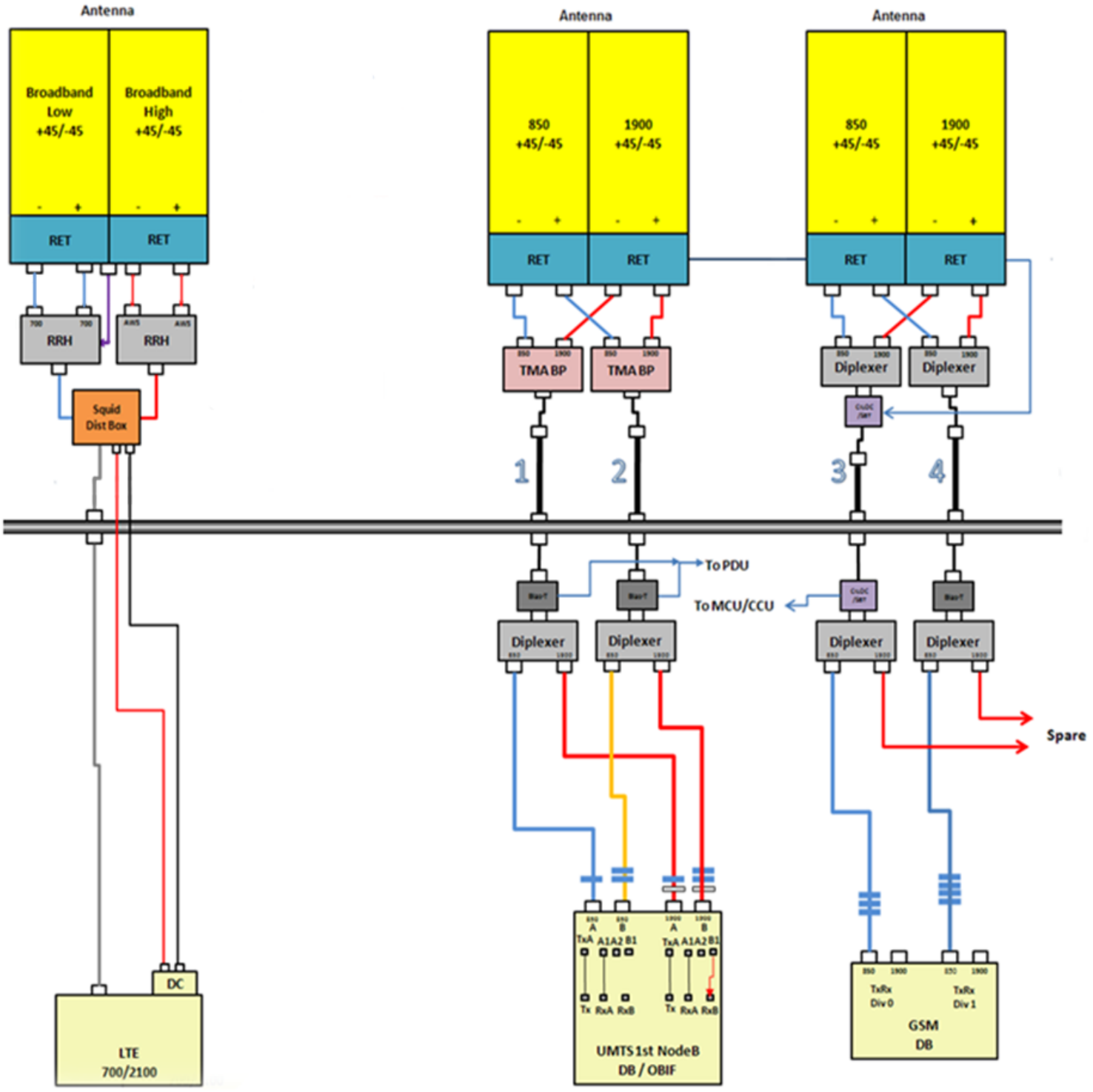
ANTENNA COMMON FIELDS	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	AM-X-CD-17-65-00T-RET		7770	7770			
ANTENNA VENDOR	KMW		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	96X11.8X6		55X11X5	55X11X5			
ANTENNA WEIGHT	59.5		35	35			
AZIMUTH	120		150	150			
MAGNETIC DECLINATION	-14		-14	-14			
RADIATION CENTER (feet)	198		198	198			
ANTENNA TIP HEIGHT	202		200	200			
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	1 Optic Fiber & 2 DC cables		2	2			
Antenna RET Motor (QTY/MODEL)	N/A / KMW / Built-in RET Equipment		1 / Powerwave / 7020 (DB)	1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)			N/A	N/A			
TMA/LNA (TYPE/MODEL)	N/A		2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)	N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			Polyphaser / 1000860	N/A			
PDU FOR TMAS (QTY/MODEL)			LGP 12104 (1900 AND 850 Bypass TMA)	N/A			
SURGE ARRESTOR (QTY/MODEL)			N/A	1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)			0 + 2 / Powerwave / LGP 21903	2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)			N/A	N/A			
DUPLEXER (QTY/MODEL)			N/A	N/A			
FILTER (QTY/MODEL)			N/A	N/A			
Additional Component1 (QTY/MODEL)	RRUS 11		Powerwave	N/A			
Additional Component2 (QTY/MODEL)	No CSRF		N/A	N/A			
Additional Component3 (QTY/MODEL)	RET connected to RRU for control		Daisy chain to ANT4	Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

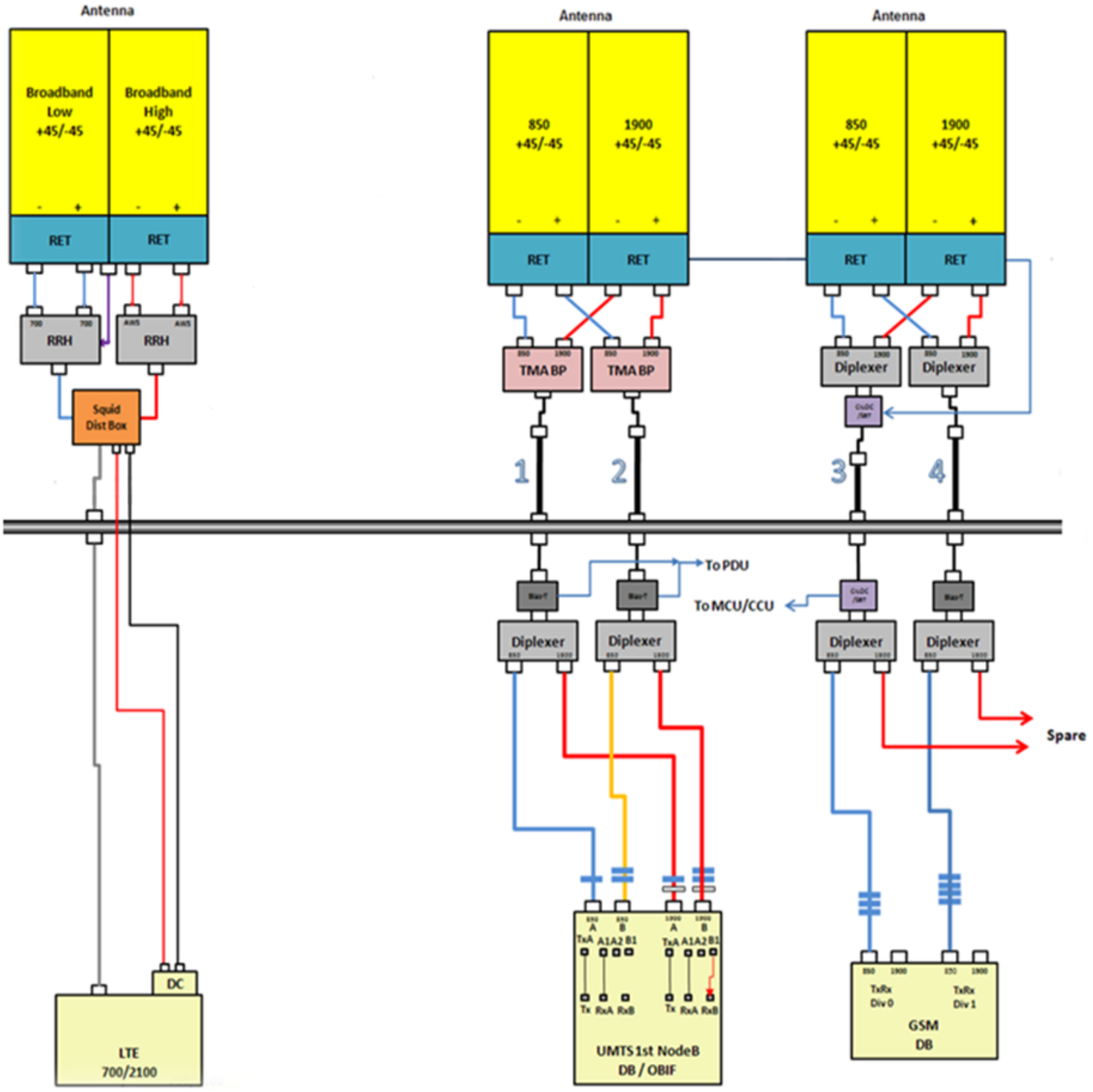
PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	TX/RX?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	Feeder Length (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Cable Number	Cable ID
ANTENNA POSITION 1	PORT 1				TxRx-Rx	LTE 700	AM-X-CD-17-65-00T-RET	17		2	TOP										
	PORT 2				N/A	LTE	AM-X-CD-17-65-00T-RET			0	TOP										
ANTENNA POSITION 3	PORT 1				TxRx-TxRx	UMTS 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				

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	AM-X-CD-17-65-00T-RET		7770	7770			
ANTENNA VENDOR	KMW		Powerwave	Powerwave			
ANTENNA SIZE (H x W x D)	96X11.8X6		55X11X5	55X11X5			
ANTENNA WEIGHT	59.5		35	35			
AZIMUTH	240		270	270			
MAGNETIC DECLINATION	-14		-14	-14			
RADIATION CENTER (feet)	198		198	198			
ANTENNA TIP HEIGHT	202		200	200			
MECHANICAL DOWNTILT	0		0	0			
FEEDER AMOUNT	1 Optic Fiber & 2 DC cables		2	2			
Antenna RET Motor (QTY/MODEL)	N/A / KMW / Built-in RET Equipment		1 / Powerwave / 7020 (DB)	1 / Powerwave / 7020 (DB)			
Antenna RET Splitter (QTY/MODEL)							
Antenna RET Earth(Grounding)Clamp (QTY/MODEL)							
Antenna RET Surge Arrestor (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)			N/A	N/A			
TMA/LNA (TYPE/MODEL)	N/A		2 / Powerwave / LGP 21401 (Dual Band - 850 Bypass)	N/A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)			Polyphaser / 1000860	N/A			
PDU FOR TMAS (QTY/MODEL)			LGP 12104 (1900 AND 850 Bypass TMA)	N/A			
SURGE ARRESTOR (QTY/MODEL)			N/A	1 / Polyphaser / 1000860			
DIPLEXER (QTY/MODEL)			0 + 2 / Powerwave / LGP 21903	2 + 2 / Powerwave / LGP 21903			
HYBRID COMBINER (QTY/MODEL)			N/A	N/A			
DUPLEXER (QTY/MODEL)			N/A	N/A			
FILTER (QTY/MODEL)			N/A	N/A			
Additional Component1 (QTY/MODEL)	RRUS 11		Powerwave	N/A			
Additional Component2 (QTY/MODEL)	No CSRF		N/A	N/A			
Additional Component3 (QTY/MODEL)	RET connected to RRU for control		Daisy chain to ANT4	Daisy chain to CILOC from ANT4			
Local Market Note1							
Local Market Note2							
Local Market Note3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	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
ANTENNA POSITION 1	PORT 1				TxRx-Rx	LTE 700	AM-X-CD-17-65-00T-RET	17		2	TOP										
	PORT 2				N/A	LTE	AM-X-CD-17-65-00T-RET			0	TOP										
ANTENNA POSITION 3	PORT 1				TxRx-TxRx	UMTS 850	7770	14		8	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				TxRx-TxRx	UMTS 1900	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
ANTENNA POSITION 4	PORT 1				TxRx-TxRx	GSM 850	7770	14		4	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				
	PORT 2				N/A	GSM	7770	17		0	N/A	1 5/8" - CommScope	270.00	No RxAIT		N/A / No LLC	NO				


Antenna
Broadband Low +45/-45
Broadband High +45/-45
RET
RET
RRH
RRH
Squid Dist Box
DC
LTE 700/2100
Antenna
850 +45/-45
1900 +45/-45
RET
RET
TMA BP
TMA BP
1
2
Antenna
850 +45/-45
1900 +45/-45
RET
RET
Diplexer
Diplexer
3
4
To PDU
To MCU/CCU
Diplexer
Diplexer
Diplexer
Diplexer
Spare
UMTS 1st NodeB DB / OBIF
GSM DB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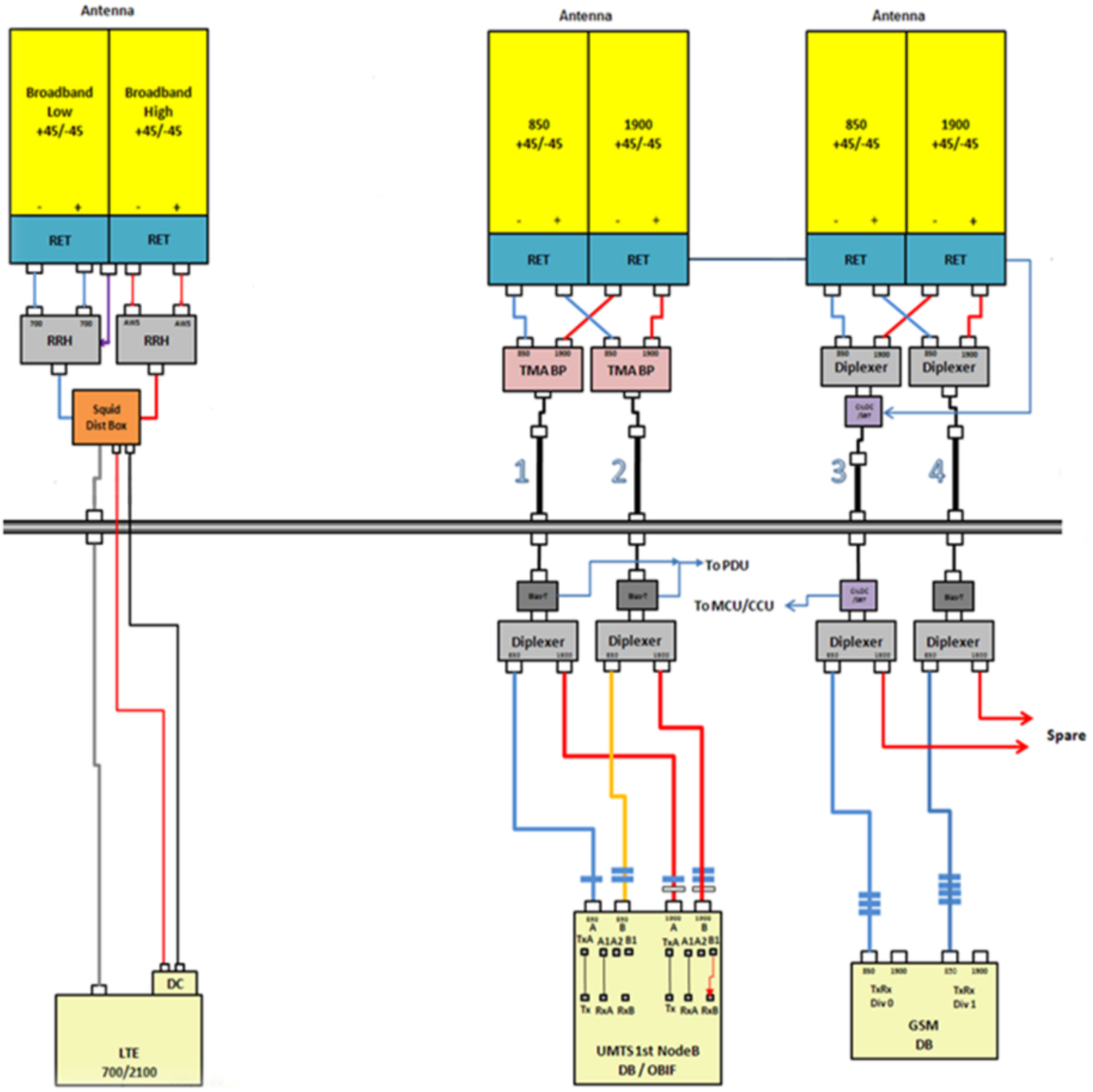
Broadband Low +45/-45
Broadband High +45/-45
RET
RET
RRH
RRH
Squid Dist Box
DC
LTE 700/2100
Antenna
850 +45/-45
1900 +45/-45
RET
RET
TMA BP
TMA BP
1
2
Antenna
850 +45/-45
1900 +45/-45
RET
RET
Diplexer
Diplexer
3
4
To PDU
To MCU/CCU
Diplexer
Diplexer
Diplexer
Diplexer
Spare
UMTS 1st NodeB DB / OBIF
GSM DB


Antenna
Broadband Low +45/-45
Broadband High +45/-45
RET
RET
RRH
RRH
Squid Dist Box
DC
LTE 700/2100
Antenna
850 +45/-45
1900 +45/-45
RET
RET
TMA BP
TMA BP
1
2
Antenna
850 +45/-45
1900 +45/-45
RET
RET
Diplexer
Diplexer
3
4
To PDU
To MCU/CCU
Diplexer
Diplexer
Diplexer
Diplexer
Spare
UMTS 1st NodeB DB / OBIF
GSM DB

AM-X-CD-17-65-00T-RET(8' 65° Dual Broadband Antenna)

Dual Band Electrical DownTilt Antenna

698 ~ 894MHz, X-pol., H65° / V8.0°

1710 ~ 2170MHz, X-pol., H65° / V7.0°

Electrical Specification

Frequency Range		698~894MHz	1710~2170MHz
Impedance		50Ω	
Polarization		Dual, Slant ±45°	
Gain		16.8dBi / 14.65dBd @ 698-806MHz 17.5dBi / 15.35dBd @ 824-894MHz	17.0dBi / 14.85dBd @ 1710-1755MHz 17.3dBi / 15.15dBd @ 1850-1900MHz 17.5dBi / 15.35dBd @ 2110-2155MHz
Beamwidth	Horizontal	68° @ 698-806MHz 63° @ 824-894MHz	67° @ 1710-1755MHz 65° @ 1850-1900MHz 62° @ 2110-2155MHz
	Vertical	9.2° @ 698-806MHz 8.0° @ 824-894MHz	7.3° @ 1710-1755MHz 7.0° @ 1850-1900MHz 6.7° @ 2110-2155MHz
VSWR		≤1.5:1	
Front-to-Back Ratio		≥27 dB	
Electrical Downtilt Range		2° ~ 16°	0° ~ 10°
Isolation Between Ports		≥30 dB	
Isolation Between Ports of Different Frequency Elements		≥35 dB	
Cross Pole Discrimination		10.0 dB @ ±60° 15.0 dBi @ 0°	
First Upper Side Lobe Suppression		16dB	
Side Lobe Suppression		> 16 dB @ 0-6° Tilt > 18 dB @ 7-12° Tilt (Up to 10° from Boresight)	> 16 dB @ 0-6° Tilt > 18 dB @ 7-10° Tilt (Up to 10° from Boresight)
Passive Intermodulation		≤ -150 dBc @ 2x20w	
Input Maximum CW Power		500 W	300 W
Environmental Compliance		IP65 for Radome IP67 for Connectors	
RET Motor Configuration		Field Replaceable RET Electronic Control Module / RET Motor is internal to antenna & not field replaceable	
Compliant with AISG 1.1 and 2.0		AISG 1.1 and 2.0	

Mechanical Specification

Dimension (W×D×H)	11.8×6.0×96 inches
Weight (Without clamp)	59.5 lbs (27.0 kg)
Connector	4 x 7/16 DIN(F), Long Neck
Max Wind Speed	150 mph
Wind Load (@150 mph)	2521 N

RRUS 11

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

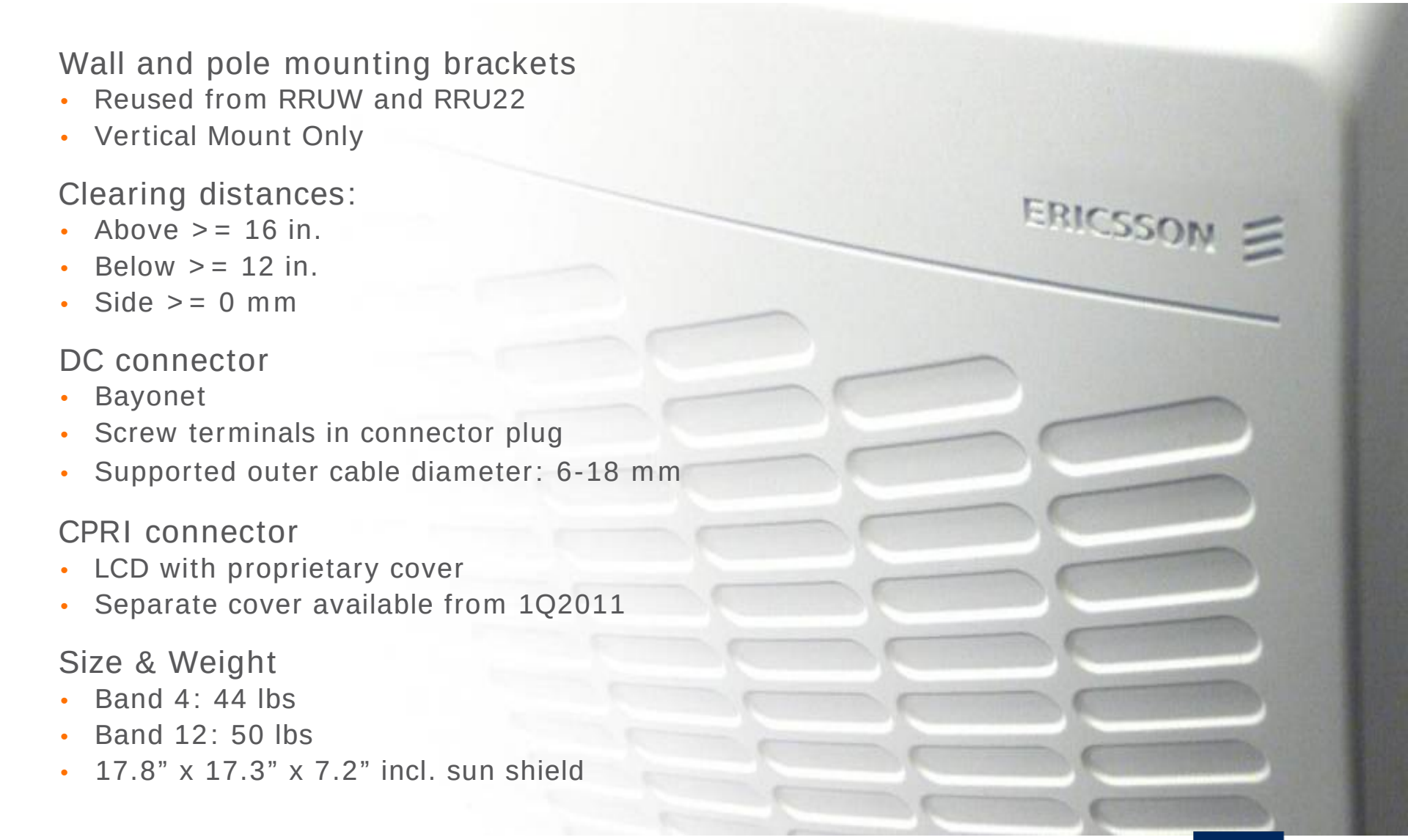
RF Characteristics
- ✓ Output power: 2x30 Watts
- ✓ 2x2 MIMO Capable
- ✓ IBW of 20 MHz
- ✓ Rx Sens.: Better than -105 dBm (5 MHz)

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

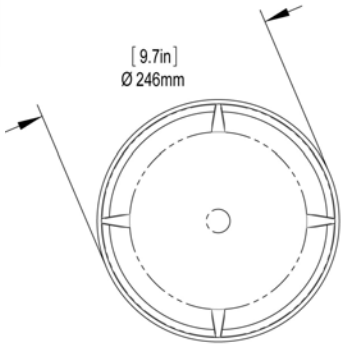
DC6-48-60-18-8F

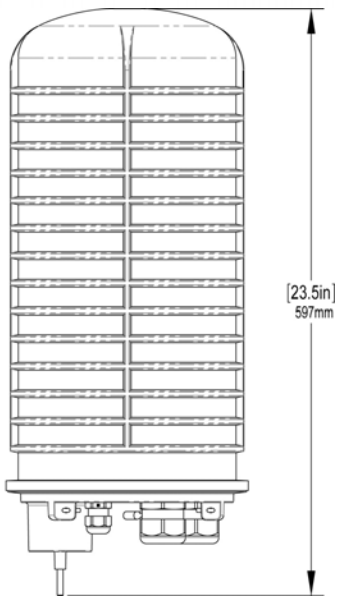
DC Surge Suppression Solution

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

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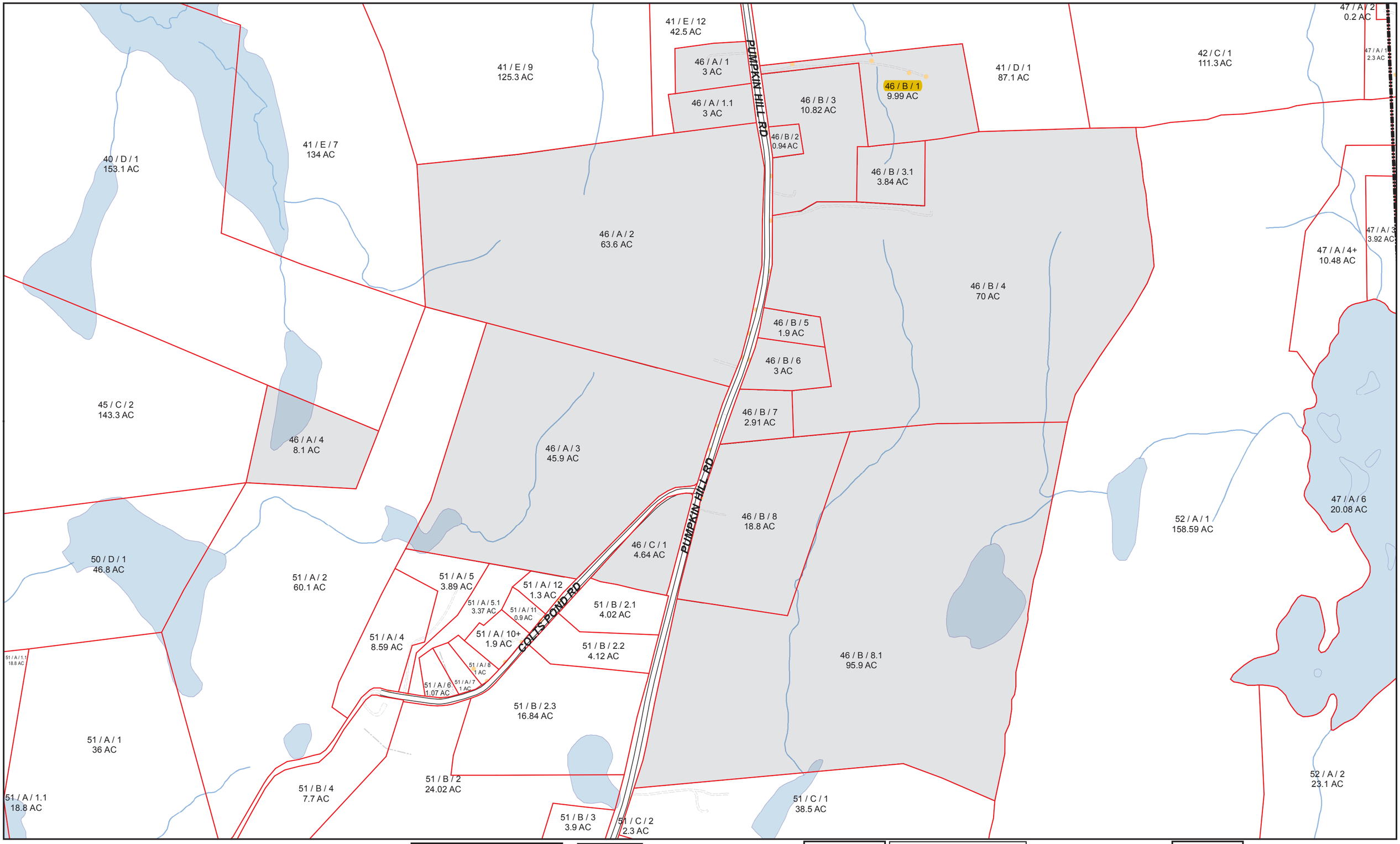


Legend

- Town Line
- Parcel Lines
- Center_Line
- Railroad
- Parcel Boundaries 041013
- Utility Poles
- Driveways
- Lakes and Ponds
- Building Polygon
- Rivers and Streams
- Parcels on this Map

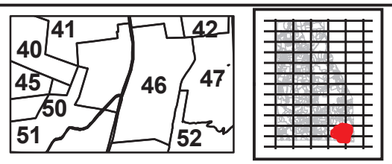
Note: The areas, boundaries, and dimensions shown on this tax map are derived from

Map
46

TOWN OF ASHFORD INC. 1714 CONNECTICUT

Created By:
Northeastern Connecticut Council of Government

Printed On: May 20, 2013



1 inch = 500 feet

0 125 250 500 Feet

353 PUMPKIN HILL RD

Location	353 PUMPKIN HILL RD	**Mblu**	46/ B/ 1/ /
Acct#	00205600	**Owner**	BUNTE IRENE D
Assessment	$299,400	**Appraisal**	$427,800
PID	1872	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$149,800	$278,000	$427,800
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$104,800	$194,600	$299,400

Owner of Record

Owner	BUNTE IRENE D	**Sale Price**	$0
Co-Owner	C/O AMERICAN TOWER CORP	**Certificate**	C
Address	ATT: LAND MANAGEMENT 10 PRESIDENTIAL WAY WOBURN, MA 01801	**Book & Page**	118/ 924
		Sale Date	11/01/1999

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
BUNTE IRENE D	$0	C	118/ 924	11/01/1999

Building Information

Building 1 : Section 1

Year Built:	1984
Living Area:	720
Replacement Cost:	$48,362
Building Percent Good:	70
Replacement Cost Less Depreciation:	$33,900

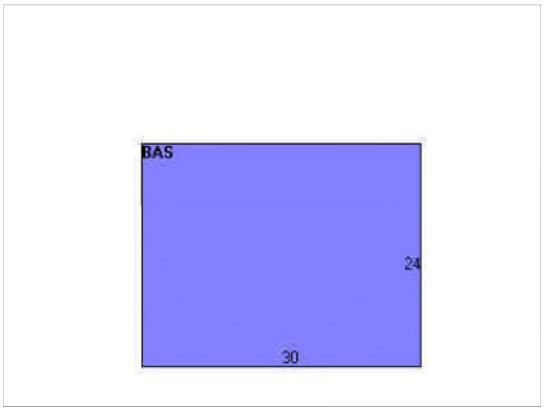
Building Attributes	
Field	**Description**
STYLE	Light Indust
MODEL	Commercial

Building Photo

Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Concrete
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Hot Air-No Duc
AC Type	Central
Bldg Use	Commercial 94
Sprinkler Type	
Sprinkler %	
Mezzanine Fin.	
Mezanine Unf.	
219	
1st Floor Use:	
Heat/AC	Heat/AC Pkg
Frame Type	Masonry
Baths/Plumbing	None
Ceiling/Walls	None
Rooms/Prtns	Average
Wall Height	10
% Comn Wall	

(http://images.vgsi.com/photos/AshfordCTPhotos//00\00\13/68.JPG)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	720	720
		720	720

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	200
Description	Commercial 94
Zone	RA
Neighborhood	C3
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	9.96
Frontage	
Depth	
Assessed Value	$194,600
Appraised Value	$278,000

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	Fence 8'			400 L.F.	$3,200	1
SHD2	Pre Cast Cell			252 S.F.	$36,100	1
SHD2	Pre Cast Cell			100 S.F.	$7,700	1
TWR1	Cell Tower			240 HEIGHT	$174,400	1