Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

October 4, 2016

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

RE: **Notice of Exempt Modification for AT&T/ LTE 3C Crown Site BU: 876310**
AT&T Site ID: CT2154
925 East Center Street, Wallingford, CT 06492
Latitude: 41° 26' 37.36" / Longitude: -72° 47' 46.56"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 112-foot level of the existing 148-foot monopole tower at 925 East Center Street in Wallingford, CT. The tower is owned by Crown Castle. The property is owned by Albert William Beaumont. AT&T now intends to remove three (3) Powerwave antennas and replace three (3) KMW antennas with CCI antennas. These antennas would be installed at the 112-foot level of the tower. AT&T also intends to add three (3) RRU12/A2s and remove three (3) RRU11s, six (6) coax, twelve (12) TMS's and six (6) diplexers.

This facility was approved by the Wallingford Planning & Zoning Commission on September 8, 1997. This approval was given without conditions.

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.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable William W. Dickinson, Jr., Mayor, Town of Wallingford, as well as the property owner, and Crown Castle is the tower owner.

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

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

3. The proposed modification 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 Communication 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-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. William W. Dickinson, Jr., Mayor
Town of Wallingford
45 South Main Street, Room 310
Wallingford, CT 06492

Albert William Beaumont
925 East Center Street
Wallingford, CT 06492

HARRIS
BEACH &
WILCOX
A LIMITED LIABILITY PARTNERSHIP

ATTORNEYS AT LAW

147 NORTH BROAD STREET
P.O. BOX 112
MILFORD, CONNECTICUT 06460-0112
(203) 877-8000
(203) 878-9800 (Fax)

MEMO

To : Steve Paisner, Sprint Spectrum L.P.
From : Lewis A. Hurwitz, Esq., Harris Beach & Wiclox
Date : 9/9/97
Re : Wallingford, Sites 008 and 009
cc : Steve Crotty, Steve Kotfila, Christine Rosenthal, Jennifer Charland, Scott Chasse, Kate Peabody, Tom Flynn

Please be advised that on September 8, 1997, the Wallingford Zoning Board approved our applications to construct monopoles at Beaumont's Farm and the Suzio property. There were conditions in regard to the Beaumont Farm application, details of which will be supplied in the letter of approval. However, it should be noted that a second row of 20' trees is being required. In addition, the Board reserved the right to inform us as to what color to paint the tower. We should have a response from them in a very short period of time in regard to this issue.

This was a very difficult and hard fight. The Beaumont Farm vote was three to two and without the conditions I do not believe we would have prevailed.

End of Memo

ClibPDF - www.fastio.com

Kotfila, Steve

From: Chasse, Scott
Sent: Monday, September 29, 1997 7:57 AM
To: Rosenthal, Christine
Cc: Kotfila, Steve
Subject: RE: 008 Lawsuit
Importance: High

PostHC is not necessary at this time. Lets accumulate information first.

From: Rosenthal, Christine
Sent: Monday, September 29, 1997 7:47 AM
To: Chasse, Scott
Cc: Charland, Jennifer
Subject: RE: 008 Lawsuit

At the public hearing, the change in the *application* was cited as being our agreement to maintain the trees as screening. Lew Hurwitz pointed out right then and there that that was a private matter and did not affect our *application* as it stood. Is that was you are asking about? You should bring Lew in on dissecting the lawsuit because he would know how defendable each point is. I don't think that we changed the site plan until after the entire application was heard and decided upon. Confirm with Jenn. Shall I organize a Post-Hearing Conference on this one?

From: Chasse, Scott
Sent: Monday, September 29, 1997 7:40 AM
To: Charland, Jennifer; Flynn, Tom; Johnson, Karen; Knuff, John; Rosenthal, Christine
Subject: 008 Lawsuit
Importance: High

One of the items in the lawsuit against us states that our site plan was changed at the Sept. 8, 1997 hearing. Was this due to the tower foundation size being larger than expected and therefore, necessitating that we move the tower within the compound? If so, at who's direction was this done **prior** to getting the zoning approval? Something as mundane as moving the tower within the compound should have waited until after the approval, then **amend** the site plans of record to conform with the realities of construction.

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MEMORANDUM

TO: JEN CHARLAND

FROM: TOM FLYNN

RE: 03-008 BEAUMONT FARM

DATE: SEPT. 10, 1997

AS YOU KNOW, THE ABOVE NOTED SPECIAL PERMIT APPLICATION WAS APPROVED ON MONDAY, SEPTEMBER 8, 1997. THERE ARE SEVERAL CONDITIONS THAT WILL EFFECT THE PROCESS OF OBTAINING A BUILDING PERMIT.

1. THE TOWN HAS REQUIRED A $1000.00 SEDIMENTATION AND EROSION CONTROL BOND. THIS BOND MAY BE IN THE FORM OF CASH, A SURETY BOND OR LETTER OF CREDIT, WHICHEVER IS MOST CONVENIENT FOR SPRINT TO OBTAIN.

2. THE TOWN HAS REQUIRED A REVISED LANDSCAPE PLAN THAT SHOWS A LINE OF EVERGREEN TREES (3 DIFFERENT SPECIES AND AT LEAST 20' TALL AT PLANTING) ON THE PERIMETER OF THE LEASE AREA.

3. I WILL NEED A MYLAR FOR RECORDING AND 5 CLEAN COPIES OF THE PLANS, INCLUDING THE REVISED LANDSCAPE PLANS, FOR DELIVERY TO THE PLANNING OFFICE PRIOR TO ISSUANCE OF THE BUILDING PERMIT.

4. WE CAN MAKE APPLICATION FOR THE BUILDING PERMIT PRIOR THE END OF THE APPEAL PERIOD, BUT WILL NEED THE ABOVE NOTED ITEMS PRIOR TO ANY SIGN OFF BY THE PZC.

C\O
SPRINT PCS 9 BARNES INDUSTRIAL ROAD WALLINGFORD, CT. 06429 203-294-5620

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Kotfila, Steve

From: Paisner, Steven
Sent: Thursday, November 20, 1997 2:04 PM
To: Lindblad, Ernest; Kotfila, Steve
Subject: Couple of Items

I spoke to Lew Hurwitz...

1). WESTBROOK - He agrees that any attorney that tries to exclude another attorney (i.e. Westbrook not allowing Lew to attend today) is up to something no good and non attendance is the way to go.

2). WALLINGFORD - Beaumont appeal. KC agrees to stall as long as necessary and make it as tough as possbile/expensive on the citizen appeal. Hence, Lew has filed to transfer the case from Superior court to Federal Distrcit court...probably the first of several such requests. In the meantime, we are on the air...Ok aside from having to pay more legal bills ourselves.

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Kotfila, Steve

From: Kotfila, Steve
Sent: Friday, May 22, 1998 7:05 AM
To: Carrozzella, Bill
Cc: Cashin, Julie; Gelinas, Chris
Subject: RE: Wallingford # 008 - Beaumont
Importance: High

So long as this language does not prohibit us from doing a structural replacement. For that to take place there will be a short period where there would be 2 towers in the compound, but only long enough to effect the swap over of antennas, pulling of a demo permit and dismantling of the old tower. 90 days should cover this evolution.

From: Carrozzella, Bill
Sent: Thursday, May 21, 1998 11:03 AM
To: Kotfila, Steve
Cc: Cashin, Julie; Gelinas, Chris
Subject: Wallingford # 008 - Beaumont

In my discussions with Bill Beaumont he has requested that Sprint not install a second tower within the lease area. Please let me know if it is OK to agree to that.

If we do I will have included in the lease amendment that Sprint still retains the right to replace the existing tower even with a taller tower.

Please advise.

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PINNACLE
Site Development

Memo

To: Julie Cashin

From: Bill Carrozzella

CC: C. Gelinas; S. Kotfila

Date: May 20, 1998

Re: Wallingford - Beaumont Farm # 008

Julie, I have reviewed the Owner Consent and Lease Amendment for the Bell/SNET sublease. Can you please make the following revisions:

Owner Consent:

Can the references (and exhibits) to the BANM and SNET Subleases be eliminated ? These subleases may not be signed for several weeks or months in the case of Bell. I would like to have the landlord consent finalized ASAP so the additional rent does not go up while we wait for the Bell and SNET agreements to be signed.

Amendment to Lease:

Please add a temporary construction easement to this amendment. Bell and SNET may have to access the site for construction over other land owned by landlord as opposed to the existing access easement afforded Sprint. I'd suggest making this temp construction easement broad such as "Landlord shall grant to Subtenants a temporary access easement for the purposes of installing its equipment. This easement shall allow access to the Site through Landlord's adjacent land surrounding the Site in an area to be mutually agreed upon by Landlord and each Subtenant."

Please let me know if you have any questions.

Thanks for your help.

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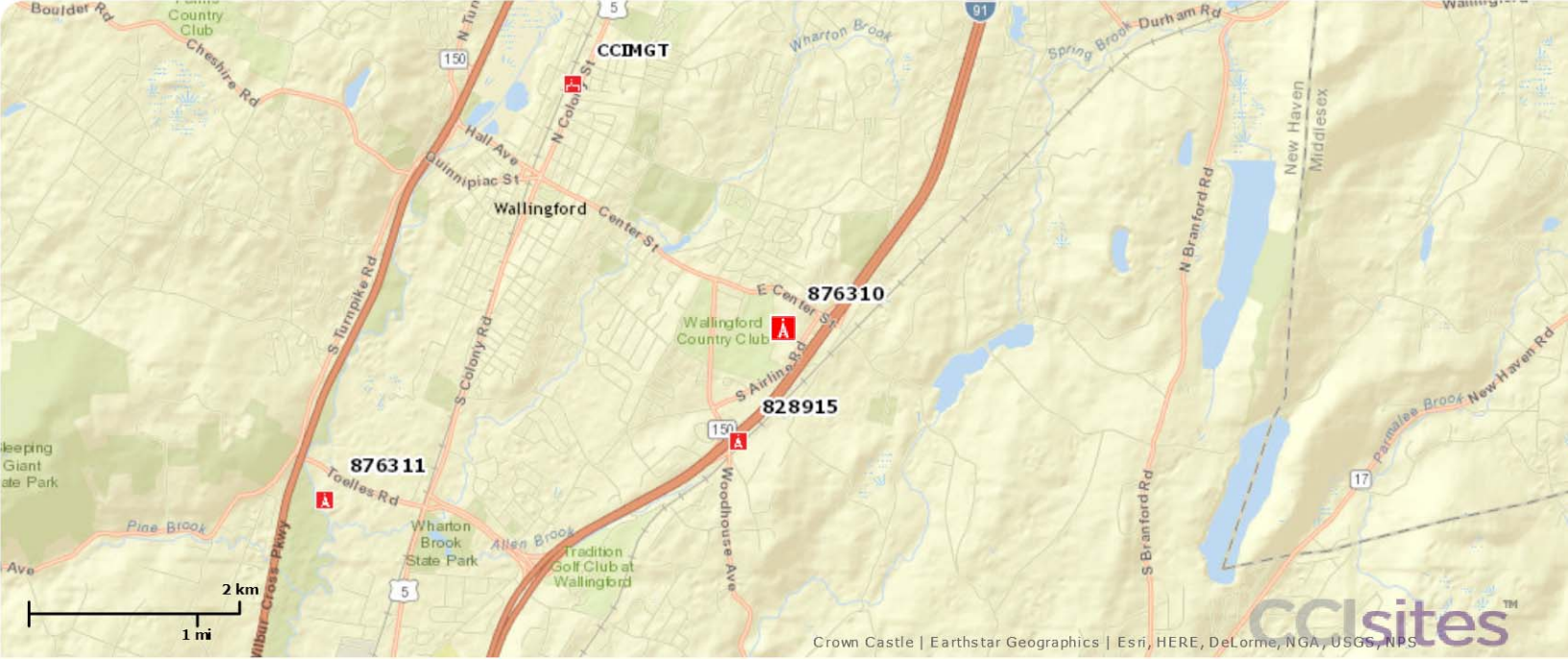

CCIMGT
876310
828915
876311
Wallingford
Wallingford Country Club
Tradition Golf Club at Wallingford
Wharton Brook State Park
Pine Brook
Allen Brook
Parmalee Brook
Spring Brook
Wharton Brook
Quinnipiac St
Hall Ave
Center St
E Center St
S Airline Rd
Toelles Rd
Cheshire Rd
Boulder Rd
Country Club
S Turnpike Rd
S Colony Rd
N Colony St
Woodhouse Ave
N Branford Rd
S Branford Rd
New Haven
Middlesex
New Haven Rd
Durham Rd
Wilbur Cross Pkwy
2 km
1 mi
Crown Castle | Earthstar Geographics | Esri, HERE, DeLorme, NGA, USGS, NPS
CCIsites™

WIRELESS COMMUNICATIONS FACILITY

CT2154 - LTE 2C

WALLINGFORD

CROWN SITE NO. : 876310

945 EAST CENTER STREET

WALLINGFORD, CT 06492

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2005 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT, 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

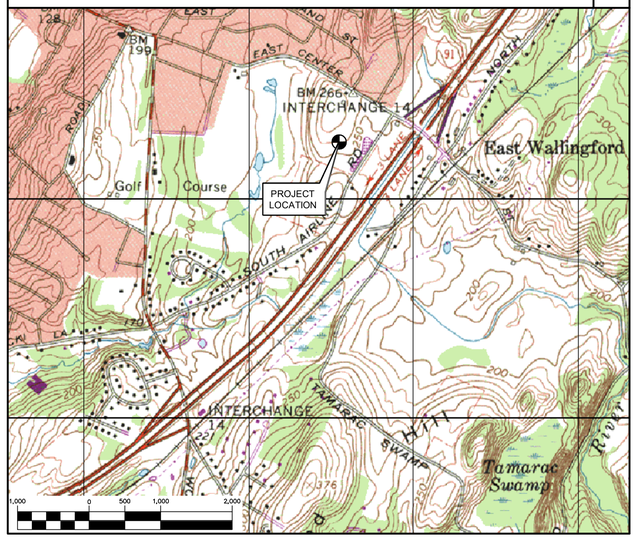
TO: 945 EAST CENTER STREET
WALLINGFORD, CT 06492

1.	Depart Enterprise Dr toward Capitol Blvd	0.4 mi
2.	Turn left onto Capitol Blvd	0.2 mi
3.	Turn left onto West St	0.3 mi
4.	Take ramp left for I-91 South,	16.0 mi
5.	At exit 14, take ramp right for E. Center St toward Wallingford	0.2 mi
6.	Turn right onto E Center St,	0.1 mi
	Arrive at 945 E Center St, Town of Wallingford, CT 06492	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

A. REMOVE AND REPLACE EXISTING POSITION 3 LTE ANTENNA FOR PROPOSED TWELVE-PORT ANTENNA, (1) PER SECTOR.

B. INSTALL (3) NEW RRUS-12+A2 BEHIND EXISTING ANTENNAS WITHIN EXISTING TOWER MOUNT.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT2154
AT&T SITE NAME:	WALLINGFORD
SITE ADDRESS:	CROWN CASTLE SITE NO.: 876310 945 EAST CENTER STREET WALLINGFORD, CT 06492
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°-26'-37.32"N LONGITUDE: 72°-47'-46.68"W GROUND ELEVATION: ±260' AMSL GROUND ELEVATION REFERENCED FROM GOOGLE EARTH. COORDINATES REFERENCED FROM RFDS DOCUMENTS.

SHEET INDEX

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	09/19/16	CAG	HMR	CONSTRUCTION DOCUMENTS - REV'D TO MATCH CCI STRUCT.
0	06/14/16	LGL	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

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
WALLINGFORD
CT2154 - LTE 2C
945 EAST CENTER STREET
WALLINGFORD, CT 06492

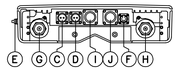
DATE: 05/14/16
SCALE: AS NOTED
JOB NO. 16071.19

TITLE SHEET

T-1

Sheet No. 1 of 7

SIDE PANEL

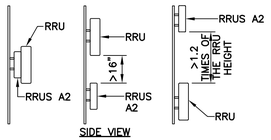


BOTTOM VIEW

CONNECTION INTERFACE

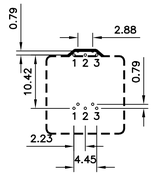
POSITION (ID)	DESCRIPTION	MARKING
A	OPTICAL INDICATORS	⁞, ⁘, ⁘, O-1,O-2
B	MAINTENANCE	🔧
C	−48V DC POWER SUPPLY	POW IN
D	−48V DC POWER SUPPLY TO RRU	POW OUT
E	GROUNDING	⏚
F	RET	RET
G	ANTENNA B	⁜ - B
H	ANTENNA A	⁜ - A
I	OPTICAL CABLE 1	O-1
J	OPTICAL CABLE 2	O-2

NOTES:
1. STACKING OF RRU's IS NOT PERMITTED.
2. NO PAINTING OF RRU OR THE SOLAR SHIELD IS ALLOWED.
3. A SINGLE RRUS A2 CAN BE INSTALLED AS A STAND ALONE UNIT OR MOUNTED TO THE BACK OF ITS ASSOCIATED RRU.



SIDE VIEW

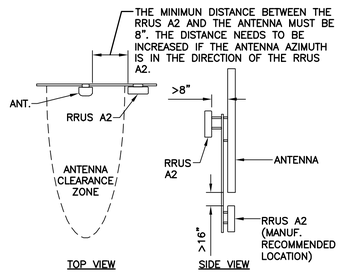
RRUS A2 MANUFACTURER INSTALLATION REQUIREMENTS



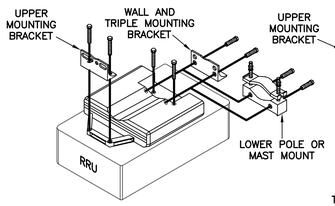
THE NUMBER OF BOLT HOLES DEPENDS ON THE WALL MATERIAL, AS SPECIFIED BY THE SITE ENGINEER. A MINIMUM OF TWO BOLT HOLES ARE RECOMMENDED FOR EACH BRACKET.

ONE OF THE FOLLOWING SOLUTIONS FOR HOLE POSITIONS MUST BE USED:
- 1, 3
- 1, 2, 3

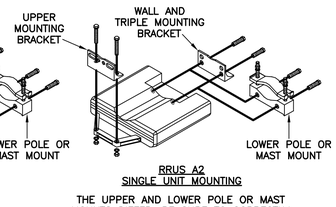
WALL MOUNTING BRACKET INSTALLATION



TOP VIEW SIDE VIEW



RRUS A2 W/ASSOCIATED RRU MOUNTING



RRUS A2 SINGLE UNIT MOUNTING

THE UPPER AND LOWER POLE OR MAST MOUNTS DIFFER, BE SURE TO CORRECTLY POSITION THE MOUNTS BEFORE INSTALLUATION.

1 / N-1 **ERICSSON RRU A2 DETAILS**

NOT TO SCALE

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 F−96 (ANTENNA MOUNTS): 85 MPH (FASTEST MILE), EQUIVALENT TO 105 MPH (3 SECOND GUST)
   - BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
   - BASIC WIND SPEED (OTHER STRUCTURE): 105 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7−02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMMENDMENT.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7−02 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

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

STRUCTURAL STEEL

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

PAINT NOTES

PAINTING SCHEDULE:

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

EXAMINATION AND PREPARATION:

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

CLEANING:

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

APPLICATION:

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

COMPLETED WORK:

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

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NOTES AND SPECIFICATIONS

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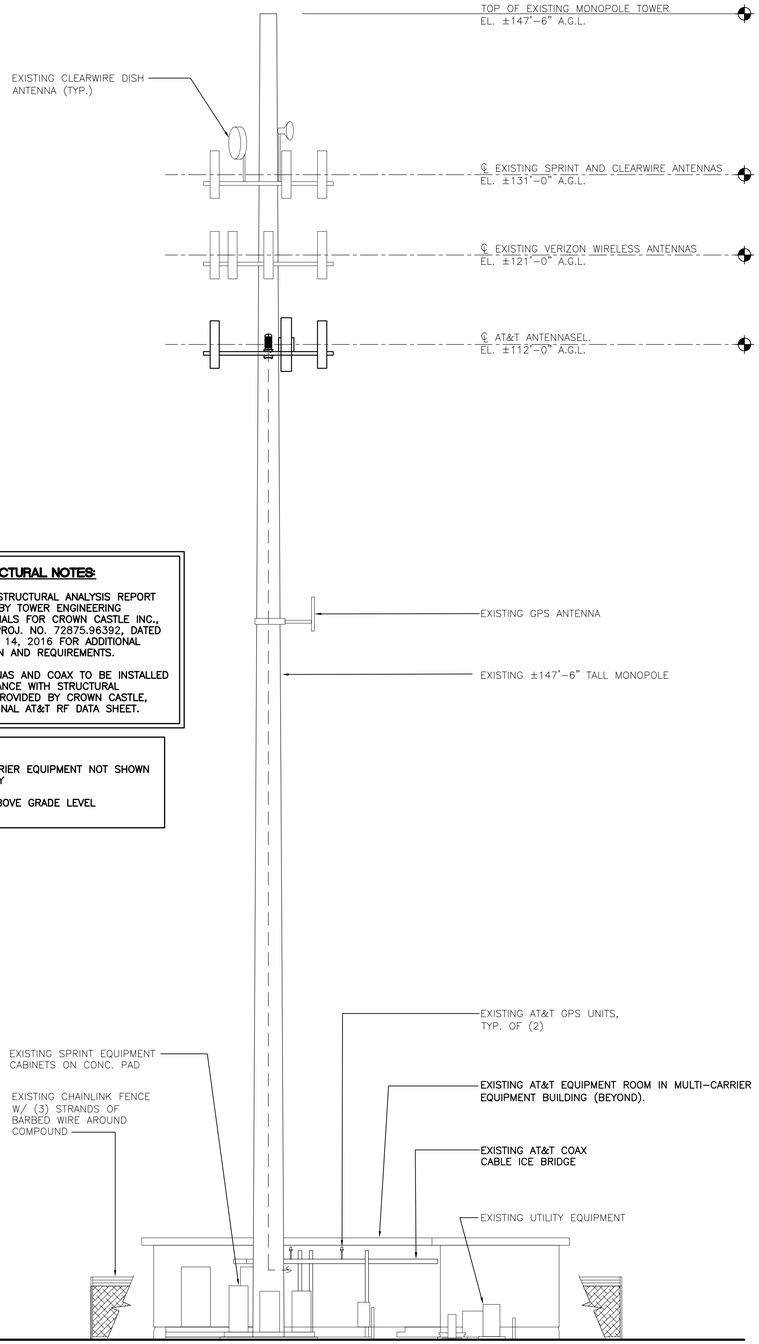


TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY TOWER ENGINEERING PROFESSIONALS FOR CROWN CASTLE INC., WITH TEP PROJ. NO. 72875.96392, DATED SEPTEMBER 14, 2016 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, INC. AND FINAL AT&T RF DATA SHEET.

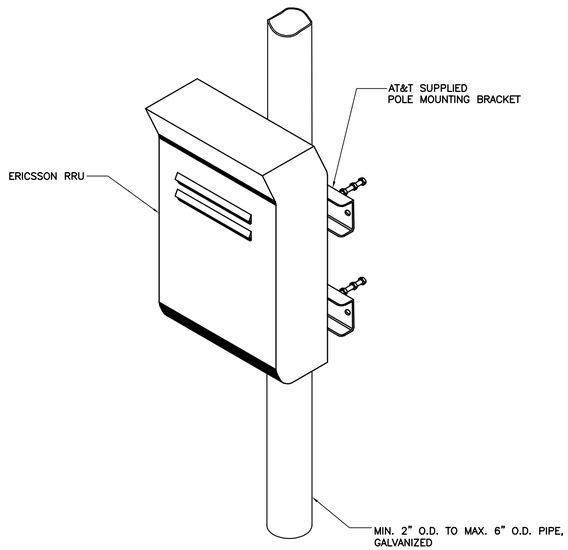
NOTES:

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

4 C-1 SOUTH ELEVATION

SCALE: 1" = 10'

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



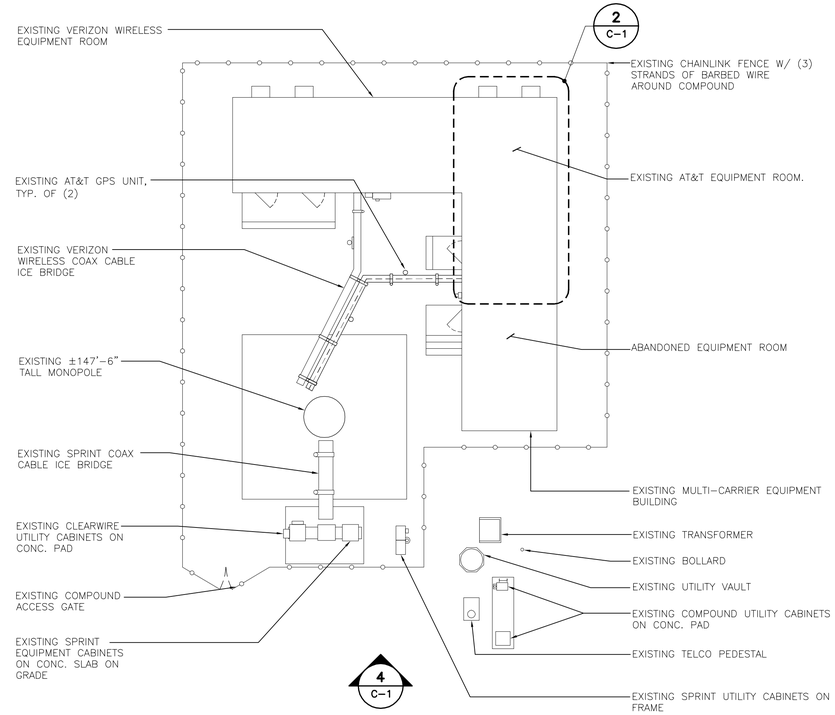
ISOMETRIC VIEW

NOTES:

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

3 C-1 TYPICAL RRUS MOUNTING DETAILS

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

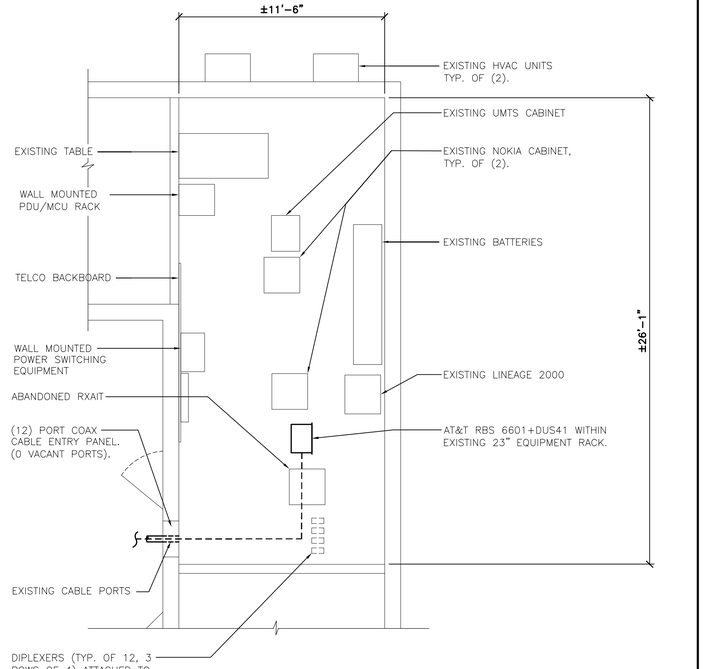


1 C-1 COMPOUND PLAN

SCALE: 1" = 10'

APPROX. NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.



2 C-1 EQUIPMENT ROOM FLOOR PLAN

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

APPROX. NORTH

GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)
1 inch = 4 ft.

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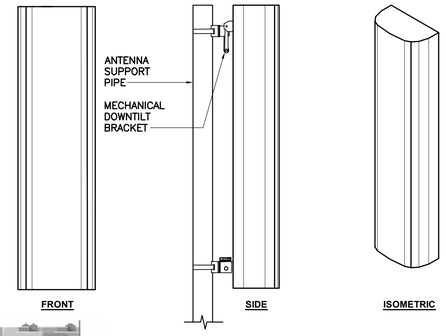
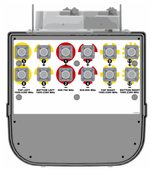
PLANS, ELEVATION AND DETAILS

C-1

Sheet No. 3 of 7



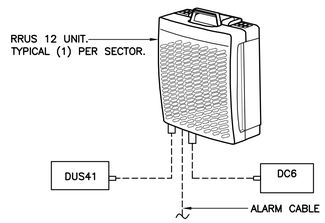

BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: TPA-65R-LCUUUU-H6	71.2"H x 11.8"W x 11.6"D	64.6-LBS

5 C-2 PROPOSED ANTENNA DETAIL

SCALE: NTS

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

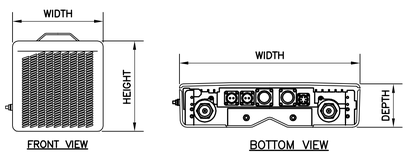


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 12	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

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

6 C-2 ERICSSON RRUS 12 DETAIL

SCALE: 1" = 1'-0"

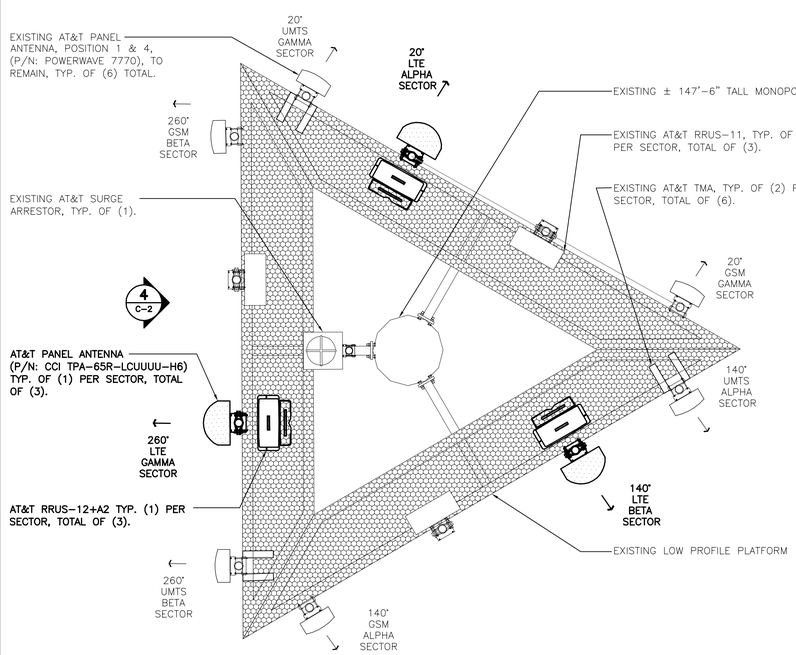


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS A2	16.42"L x 15.19"W x 3.35"D	22.05 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

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

7 C-2 ERICSSON RRUS A2 DETAIL

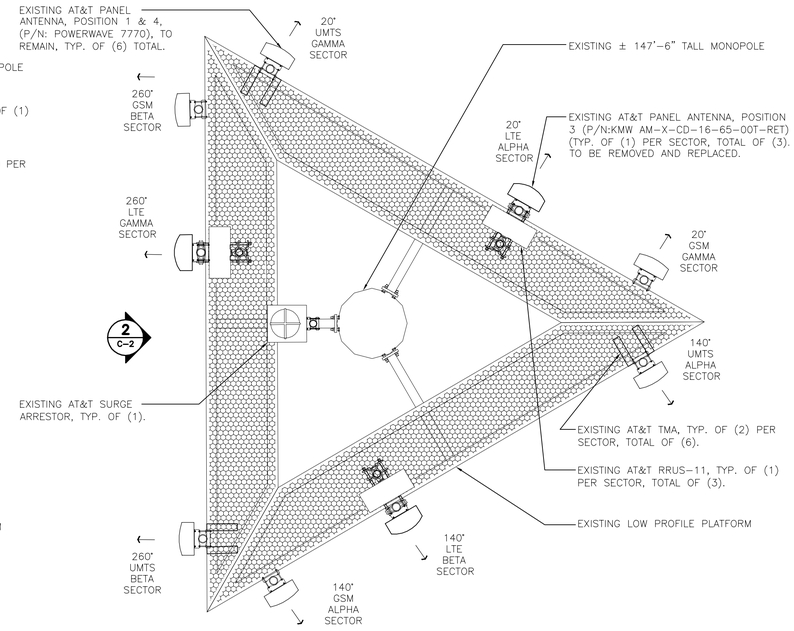
SCALE: 1" = 1'-0"



3 C-2 PROPOSED ANTENNA PLAN

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

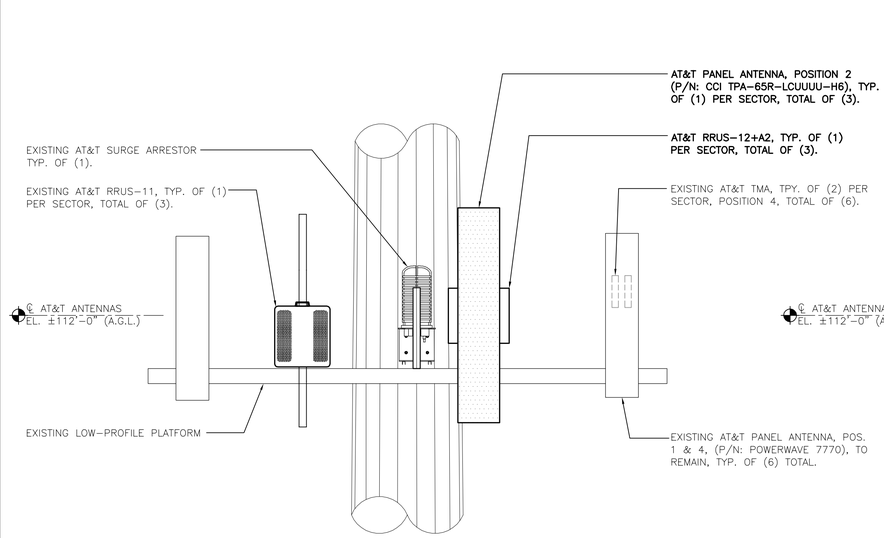
APPROX. NORTH



1 C-2 EXISTING ANTENNA PLAN

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

APPROX. NORTH



4 C-2 PROPOSED ANTENNA SECTOR ELEVATION

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

2 C-2 EXISTING ANTENNA SECTOR ELEVATION

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

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LTE EQUIPMENT DETAILS

C-2

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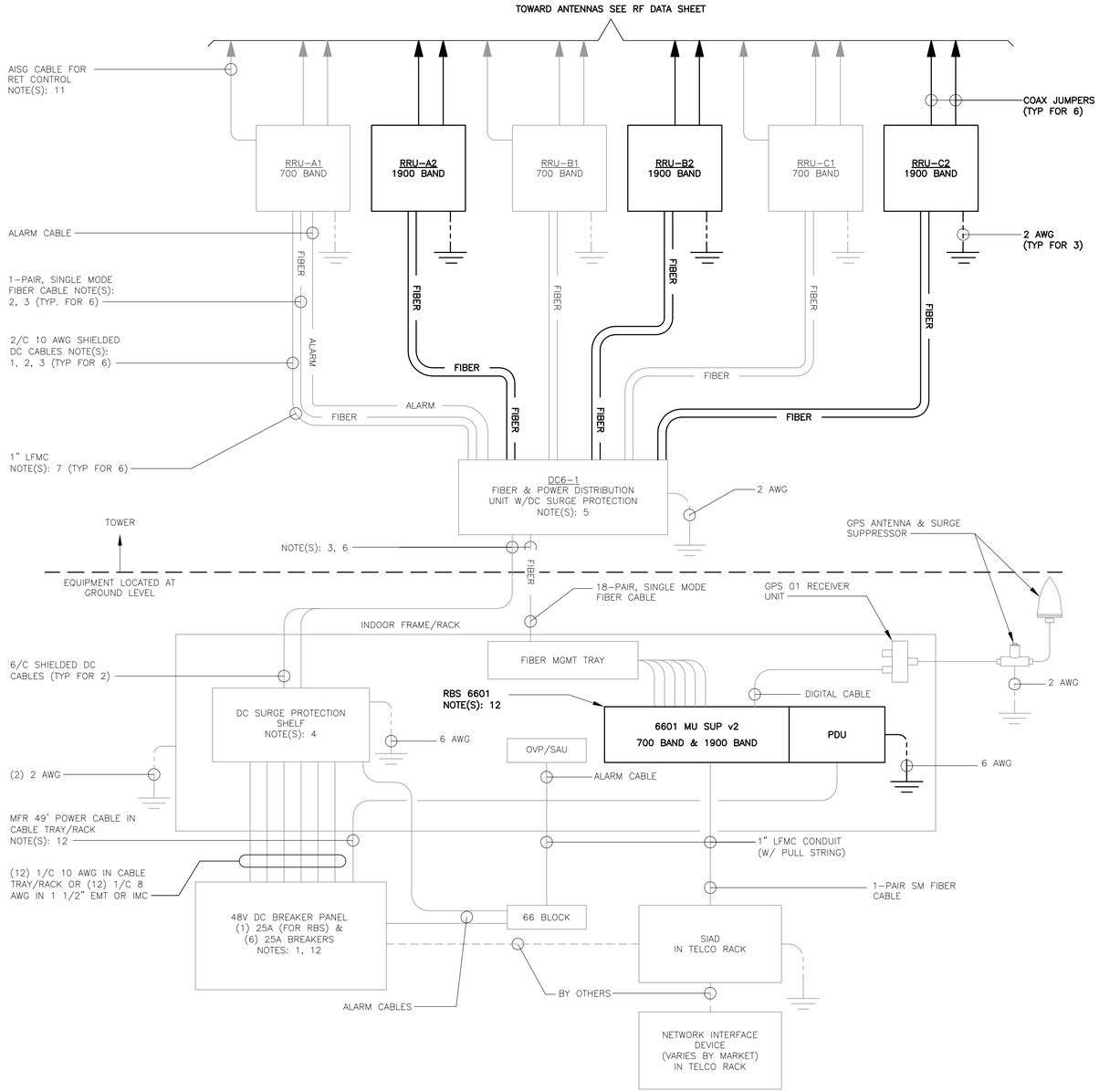

1 / E-1 LTE SCHEMATIC DIAGRAM

NOT TO SCALE

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

ELECTRICAL NOTES

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	09/19/16	CAG	HMR	CONSTRUCTION DOCUMENTS - REV'D TO MATCH CCI STRUCT.
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CT2154 - LTE 2C

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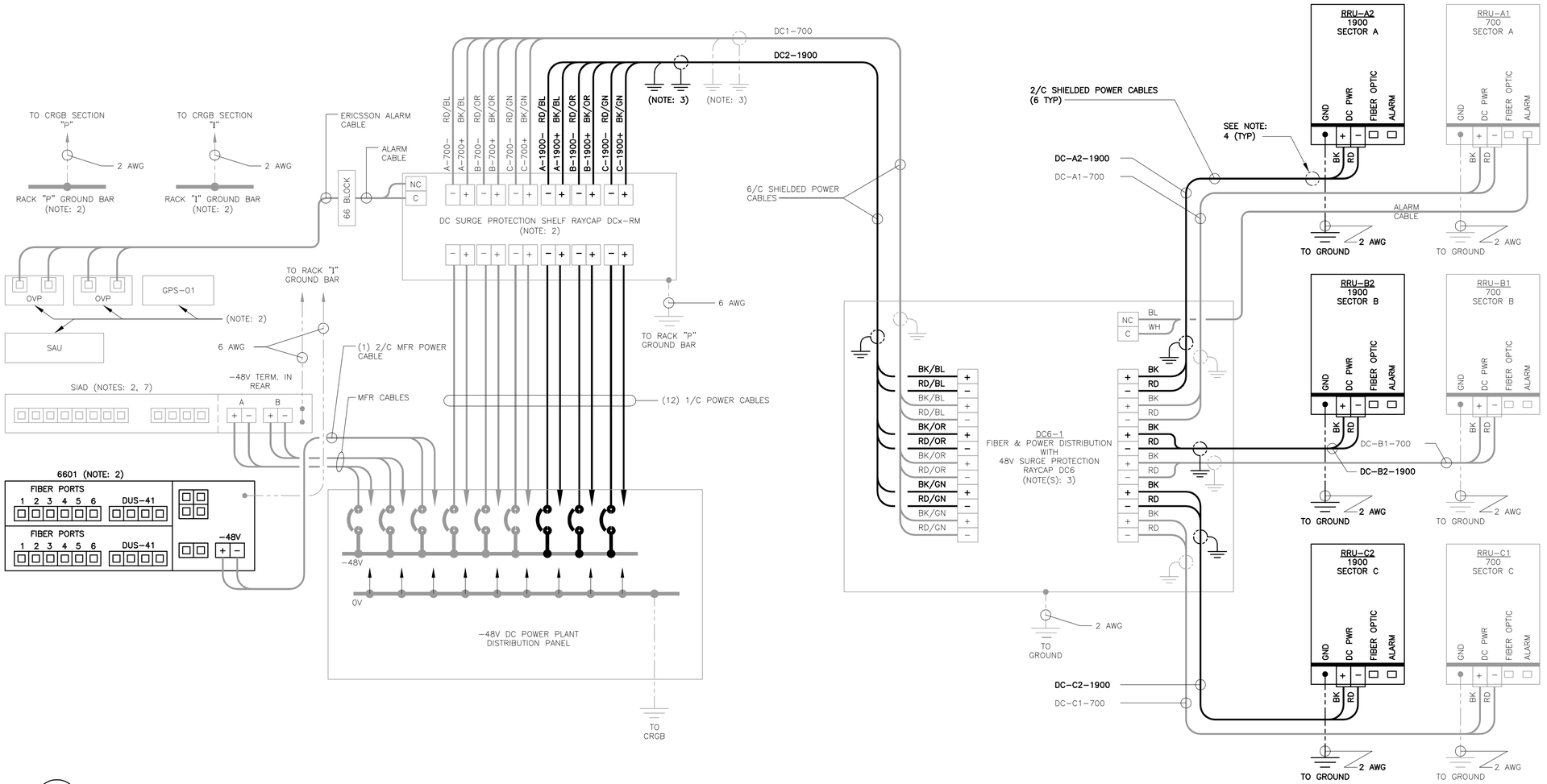
WALLINGFORD, CT 06492

DATE:	05/14/16
SCALE:	AS NOTED
JOB NO.	16071.19

LTE SCHEMATIC DIAGRAM & NOTES

E-1

Sheet No. 5 of 7



1 / E-2 LTE WIRING DIAGRAM

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

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

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CT2154 - LTE 2C

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WALLINGFORD, CT 06492

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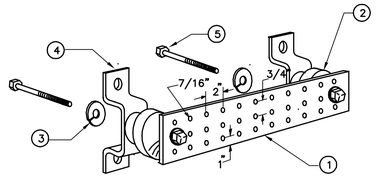
SCALE: AS NOTED
JOB NO. 16071.19

LTE WIRING DIAGRAM

E-2

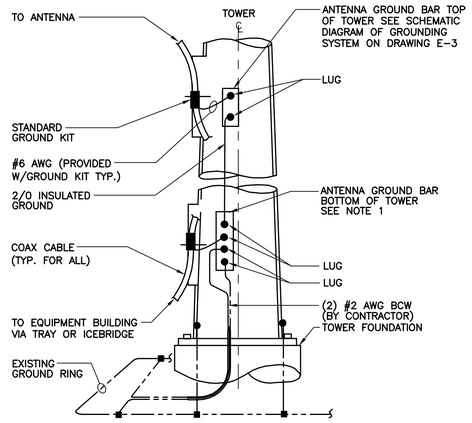
Sheet No. 6 of 7



LEGEND

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

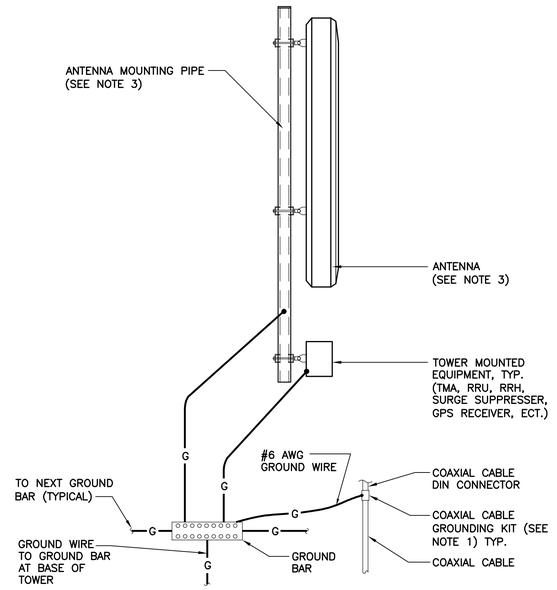
3 / E-3 **GROUND BAR DETAIL**
NOT TO SCALE



NOTES:

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

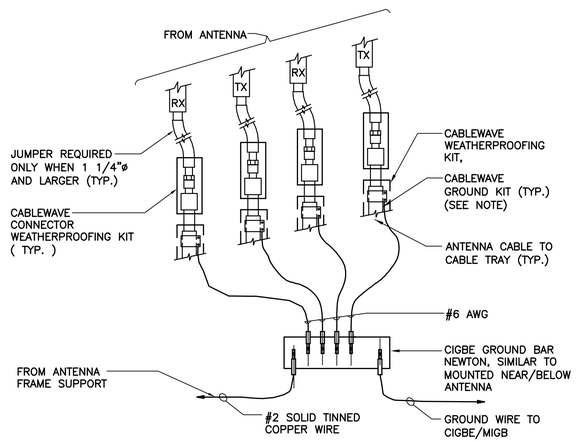
2 / E-3 **ANTENNA CABLE GROUNDING - TOWER**
NOT TO SCALE



NOTES:

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

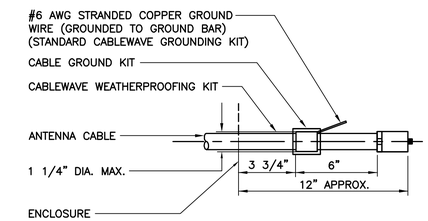
1 / E-3 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



NOTE:

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

5 / E-3 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE



NOTE:

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

4 / E-3 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE

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DATE: 05/14/16
SCALE: AS NOTED
JOB NO. 16071.19

TYPICAL ELECTRICAL DETAILS

E-3
Sheet No. 7 of 7

Date: **September 14, 2016**

Charles McGuirt
Crown Castle
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Charlotte, NC 28277
(704) 405-6607

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02154
	Carrier Site Name:	Wallingford
Crown Castle Designation:	**Crown Castle BU Number:**	876310
	Crown Castle Site Name:	Beaumont Farm
	Crown Castle JDE Job Number:	384292
	Crown Castle Work Order Number:	1296341
	Crown Castle Application Number:	345702 Rev. 3
Engineering Firm Designation:	**TEP Project Number:**	72875.96392
Site Data:	**945 East Center St., Wallingford, New Haven County, CT 06492** **Latitude *41° 26' 37.36"*, Longitude *-72° 47' 46.56"*** **147 Foot - Monopole Tower (Including 14-ft extension)**	

Dear Charles McGuirt,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 945902, in accordance with application 345702, revision 3.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, ASCE 7-05 Minimum Design Loads for Buildings and Other Structures and the 2005 Connecticut State Building Code (2006 International Building Code) based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *Crown Castle*. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Christopher D. Crook, E.I. / DTS

Respectfully submitted by:

Graham M. Andres, P.E.

STATE OF CONNECTICUT
GRAHAM M. ANDRES
29538
LICENSED
PROFESSIONAL ENGINEER

9/14/16

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TABLE OF CONTENTS

1) INTRODUCTION

This tower is 147-ft monopole tower designed by Paul J. Ford and Company in June of 1998. The tower was originally designed for a height of 133-ft for a wind speed of 90 mph per TIA/EIA-222-F for the appurtenances listed in Table 3. The tower was previously extended 14-ft, bringing the overall tower height to 147-ft per reinforcement drawings by URS Greiner Woodward Clyde AES in December of 1999. TEP did not visit the site. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch escalating ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
111.0	112.0	3	CCI Antennas	TPA-65R-LCUUUU-H6 w/ Mount Pipe	-	-	-
		3	CCI Antennas	DTMABP7819VG12A			
		3	Ericsson	RRUS12/RRUS A2			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	132.0	1	Andrew	VHLP1-23	6 3 3 1	5/16 1-1/4 1/2 7/8	1
		1	Andrew	VHLP2-23			
		1	Andrew	VHLP2.5-23			
	130.0	1	RFS Celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		1	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	Alcatel Lucent	TD-RRH8x20-25			
		6	RFS Celwave	ACU-A20-N			
		2	Alcatel Lucent	800 External Notch Filter			
		2	Alcatel Lucent	800MHZ RRH			
		2	Alcatel Lucent	1900MHz RRH (65MHz)			
		1	Tower Mounts	Miscellaneous [NA 510-1]			
		1	Tower Mounts	Platform Mount [LP 1201-1]			
	128.0	3	Argus Technologies	LLPX310R w/ Mount Pipe			
		3	Samsung Telecommunications	FDD_R6_RRH			
	127.0	1	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	Alcatel Lucent	800 External Notch Filter			
		1	Alcatel Lucent	800MHZ RRH			
		3	RFS Celwave	ACU-A20-N			
		1	Alcatel Lucent	1900MHz RRH (65MHz)			
121.0	121.0	3	Antel	BXA-171063/12CF w/ Mount Pipe	12 1	1-5/8 1-1/4	1
		2	Antel	BXA-70063/6CFx2 w/ Mount Pipe			
		1	Antel	BXA-70063/6CFx4 w/ Mount Pipe			
		2	Antel	LPA-80063/6CF w/ Mount Pipe			
		4	Antel	LPA-80080-6CF-EDIN w/ Mount Pipe			
		3	Commscope	HBX-6516DS-VTM w/ Mount Pipe			
		6	RFS Celwave	FD9R6004/2C-3L			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		3	Alcatel Lucent	RRH2X40-AWS			
		1	Tower Mounts	Platform Mount [LP 1201-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
111.0	112.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	6	1-1/4	2
		3	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
		12	Kathrein	860 10025			
		3	Ericsson	RRUS-11			
		3	Powerwave Technologies	7770.00 w/ Mount Pipe	6 2 1	1-1/4 3/4 3/8	1
		3	Ericsson	RRUS-11			
		1	Raycap	DC6-48-60-18-8F			
	111.0	1	Tower Mounts	Platform Mount [LP 1201-1]			
70.0	70.0	1	Kathrein	OG-860/1920/GPS-A	1	1/2	1
		1	Tower Mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment
2) Existing equipment to be removed; not considered in this analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130.0	130.0	12	Decibel	DB980H	-	-
110.0	110.0	12	Generic	3.9 sq.ft. Panel Antenna	-	-
95.0	95.0	12	Generic	3.9 sq.ft. Panel Antenna	-	-
70.0	70.0	1	Generic	GPS Antenna	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Dr. Clarence Welti, P.E., P.C.	1531484	CCISites
Tower Foundation Drawings	Paul J. Ford and Company	1855118	CCISites
Tower Manufacturer Drawings	Paul J. Ford and Company	1855980	CCISites
Tower Reinforcement Drawings	URS Greiner Woodward Clyde	2015154	CCISites

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ΦP_{allow} (lb)	% Capacity	Pass / Fail
L1	147 - 133	Pole	TP12.75x12.75x0.5	1	-867.088	538647.949	2.8	Pass
L2	133 - 85.5	Pole	TP29.418x19.537x0.313	2	-13173.500	1481762.739	79.2	Pass
L3	85.5 - 42.75	Pole	TP37.687x27.477x0.375	3	-20915.199	2276763.906	99.9	Pass
L4	42.75 - 0	Pole	TP45.83x35.894x0.438	4	-33230.000	3324395.222	98.7	Pass
							Summary	
						Pole (L3)	99.9	Pass
						RATING =	**99.9**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	133.0	7.5	Pass
1	Anchor Rods	-	84.4	Pass
1	Base Plate	-	93.5	Pass
1	Base Foundation Soil Interaction	-	95.6	Pass
1	Base Foundation Structural	-	28.4	Pass

Structure Rating (max from all components) =	**99.9%**

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

4.1) Recommendations

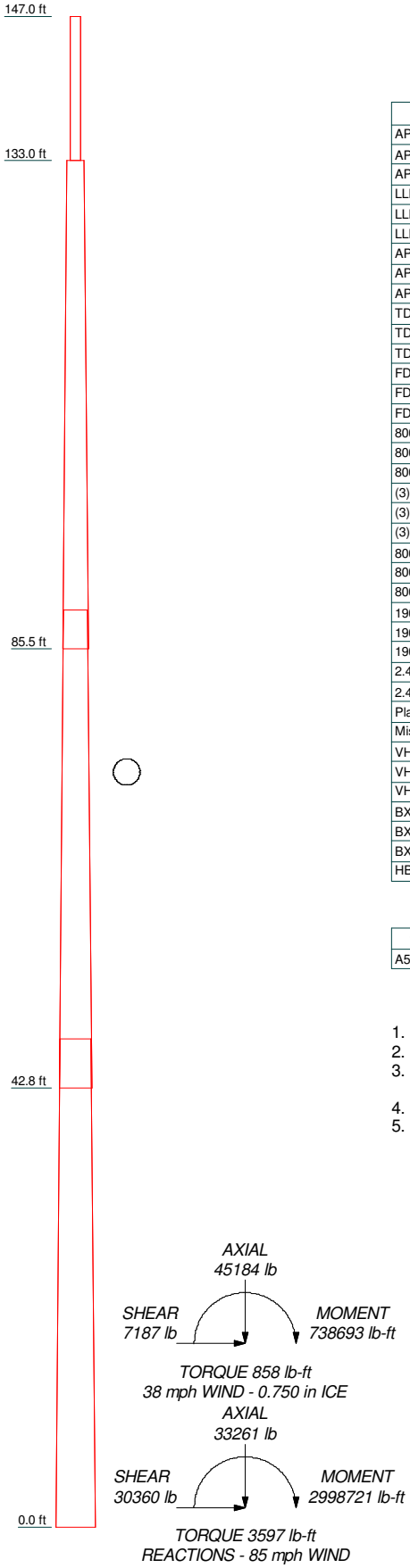
1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	14.000	47.500	46.500	47.500
Number of Sides	1	12	12	12
Thickness (in)	0.500	0.313	0.375	0.438
Socket Length (ft)		3.750	4.750	
Top Dia (in)	12.750	19.537	27.477	35.894
Bot Dia (in)	12.750	29.418	37.687	45.830
Grade	A53-B-35		A607-65	
Weight (lb)	916.7	3930.3	6153.6	9204.7

Total Weight (lb): 20205.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe	130	HBX-6516DS-VTM w/ Mount Pipe	121
APXVTM14-C-120 w/ Mount Pipe	130	HBX-6516DS-VTM w/ Mount Pipe	121
APXVTM14-C-120 w/ Mount Pipe	130	BXA-171063/12CF w/ Mount Pipe	121
LLPX310R w/ Mount Pipe	130	BXA-171063/12CF w/ Mount Pipe	121
LLPX310R w/ Mount Pipe	130	BXA-171063/12CF w/ Mount Pipe	121
LLPX310R w/ Mount Pipe	130	(2) FD9R6004/2C-3L	121
APXV9ERR18-C-A20 w/ Mount Pipe	130	(2) FD9R6004/2C-3L	121
APXVSPP18-C-A20 w/ Mount Pipe	130	(2) FD9R6004/2C-3L	121
APXVSPP18-C-A20 w/ Mount Pipe	130	DB-T1-6Z-8AB-0Z	121
TD-RRH8x20-25	130	Platform Mount [LP 1201-1]	121
TD-RRH8x20-25	130	RRH2X40-AWS	121
TD-RRH8x20-25	130	RRH2X40-AWS	121
FDD_R6_RRH	130	RRH2X40-AWS	121
FDD_R6_RRH	130	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	121
FDD_R6_RRH	130		
800 EXTERNAL NOTCH FILTER	130	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	121
800 EXTERNAL NOTCH FILTER	130		
800 EXTERNAL NOTCH FILTER	130	(2) LPA-80063/6CF w/ Mount Pipe	121
(3) ACU-A20-N	130	TPA-65R-LCUUUU-H6 w/ Mount Pipe	111
(3) ACU-A20-N	130	TPA-65R-LCUUUU-H6 w/ Mount Pipe	111
(3) ACU-A20-N	130	TPA-65R-LCUUUU-H6 w/ Mount Pipe	111
800MHZ RRH	130	RRUS-11	111
800MHZ RRH	130	RRUS-11	111
800MHZ RRH	130	RRUS-11	111
1900MHz RRH (65MHz)	130	DC6-48-60-18-8F	111
1900MHz RRH (65MHz)	130	DTMABP7819VG12A	111
1900MHz RRH (65MHz)	130	DTMABP7819VG12A	111
2.4" Dia. x 6-ft	130	DTMABP7819VG12A	111
2.4" Dia. x 6-ft	130	RRUS12/RRUS A2	111
Platform Mount [LP 1201-1]	130	RRUS12/RRUS A2	111
Miscellaneous [NA 510-1]	130	RRUS12/RRUS A2	111
VHLP1-23	130	Platform Mount [LP 1201-1]	111
VHLP2-23	130	7770.00 w/ Mount Pipe	111
VHLP2.5-23	130	7770.00 w/ Mount Pipe	111
BXA-70063/6CFx2 w/ Mount Pipe	121	7770.00 w/ Mount Pipe	111
BXA-70063/6CFx2 w/ Mount Pipe	121	Side Arm Mount [SO 701-1]	70
BXA-70063/6CFx4 w/ Mount Pipe	121	OG-860/1920/GPS-A	70
HBX-6516DS-VTM w/ Mount Pipe	121		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.9%

Tower Engineering Professionals

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job:	***Beaumont Farm (BU 876310)***		
Project:	***TEP No. 72875.96392***		
Client: Crown Castle	Drawn by: Chris D. Crook, E.I.		App'd:
Code: TIA/EIA-222-F	Date: 09/13/16		Scale: NTS
Path: C:\Users\cdcrook\Desktop\TNX Tower Run\72875\876310_LC5.eri			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °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 pole 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		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	147.000-133.000	14.000	0.000	Round	12.750	12.750	0.500		A53-B-35 (35 ksi)
L2	133.000-85.500	47.500	3.750	12	19.537	29.418	0.313	1.250	A607-65 (65 ksi)
L3	85.500-42.750	46.500	4.750	12	27.477	37.687	0.375	1.500	A607-65 (65 ksi)
L4	42.750-0.000	47.500		12	35.894	45.830	0.438	1.750	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	12.750	19.242	361.544	4.335	6.375	56.713	723.088	9.615	0.000	0
	12.750	19.242	361.544	4.335	6.375	56.713	723.088	9.615	0.000	0
L2	20.226	19.345	912.551	6.882	10.120	90.172	1849.075	9.521	4.398	14.075
	30.456	29.287	3166.774	10.420	15.239	207.814	6416.742	14.414	7.047	22.549
L3	29.299	32.726	3068.189	9.703	14.233	215.567	6216.983	16.107	6.359	16.957
	39.016	45.054	8006.057	13.358	19.522	410.107	16222.442	22.174	9.095	24.254
L4	38.189	49.949	8015.109	12.693	18.593	431.079	16240.785	24.584	8.447	19.308
	47.447	63.947	16817.916	16.251	23.740	708.423	34077.658	31.473	11.110	25.394

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 147.000-133.000				1	1	1			
L2 133.000-85.500				1	1	1			
L3 85.500-42.750				1	1	1			
L4 42.750-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
130								
7983A(1/2")	C	No	Inside Pole	130.000 - 0.000	3	No Ice	0.000	0.084
						1/2" Ice	0.000	0.084
						1" Ice	0.000	0.084
						2" Ice	0.000	0.084
						4" Ice	0.000	0.084
9207(5/16")	C	No	Inside Pole	130.000 - 0.000	6	No Ice	0.000	0.600
						1/2" Ice	0.000	0.600
						1" Ice	0.000	0.600
						2" Ice	0.000	0.600
						4" Ice	0.000	0.600
HB114-08U3M12-xxxF(	C	No	Inside Pole	130.000 - 0.000	1	No Ice	0.000	0.683

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8")						1/2" Ice	0.000	0.683
						1" Ice	0.000	0.683
						2" Ice	0.000	0.683
						4" Ice	0.000	0.683
HB114-1-0813U4-M5J(	C	No	Inside Pole	130.000 - 0.000	3	No Ice	0.000	1.200
1 1/4")						1/2" Ice	0.000	1.200
						1" Ice	0.000	1.200
						2" Ice	0.000	1.200
						4" Ice	0.000	1.200
2" Flexible Conduit	C	No	Inside Pole	130.000 - 0.000	1	No Ice	0.000	0.340
						1/2" Ice	0.000	0.340
						1" Ice	0.000	0.340
						2" Ice	0.000	0.340
						4" Ice	0.000	0.340
121								
FLC 158-50J(1-5/8")	C	No	Inside Pole	121.000 - 0.000	12	No Ice	0.000	0.920
						1/2" Ice	0.000	0.920
						1" Ice	0.000	0.920
						2" Ice	0.000	0.920
						4" Ice	0.000	0.920
LDF6-50A(1-1/4")	C	No	Inside Pole	121.000 - 0.000	1	No Ice	0.000	0.660
						1/2" Ice	0.000	0.660
						1" Ice	0.000	0.660
						2" Ice	0.000	0.660
						4" Ice	0.000	0.660
111								
FLC 114-50J(1-1/4")	C	No	Inside Pole	111.000 - 0.000	6	No Ice	0.000	0.700
						1/2" Ice	0.000	0.700
						1" Ice	0.000	0.700
						2" Ice	0.000	0.700
						4" Ice	0.000	0.700
FB-L98B-002-75000(	C	No	Inside Pole	111.000 - 0.000	1	No Ice	0.000	0.059
3/8")						1/2" Ice	0.000	0.059
						1" Ice	0.000	0.059
						2" Ice	0.000	0.059
						4" Ice	0.000	0.059
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	111.000 - 0.000	2	No Ice	0.000	0.590
						1/2" Ice	0.000	0.590
						1" Ice	0.000	0.590
						2" Ice	0.000	0.590
						4" Ice	0.000	0.590
2" Flexible Conduit	C	No	Inside Pole	111.000 - 0.000	2	No Ice	0.000	0.340
						1/2" Ice	0.000	0.340
						1" Ice	0.000	0.340
						2" Ice	0.000	0.340
						4" Ice	0.000	0.340
70								
LDF4-50A(1/2")	C	No	Inside Pole	70.000 - 0.000	1	No Ice	0.000	0.150
						1/2" Ice	0.000	0.150
						1" Ice	0.000	0.150
						2" Ice	0.000	0.150
						4" Ice	0.000	0.150
Misc								
Safety Line 3/8	A	No	CaAa (Out Of Face)	133.000 - 0.000	1	No Ice	0.037	0.220
						1/2" Ice	0.137	0.750
						1" Ice	0.238	1.280
						2" Ice	0.437	2.340
						4" Ice	0.838	4.460
Step Pegs (5/8" SR) 7-in. w/30" step	A	No	CaAa (Out Of Face)	147.000 - 0.000	1	No Ice	0.035	0.487
						1/2" Ice	0.135	1.006
						1" Ice	0.235	2.065

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						2" Ice	0.435	6.087
						4" Ice	0.835	21.462
***								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	147.000-133.000	A	0.000	0.000	0.000	0.490	6.818
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	133.000-85.500	A	0.000	0.000	0.000	3.444	33.583
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	948.512
L3	85.500-42.750	A	0.000	0.000	0.000	3.099	30.224
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	1128.139
L4	42.750-0.000	A	0.000	0.000	0.000	3.099	30.224
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	1130.464

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	147.000-133.000	A	0.892	0.000	0.000	0.000	2.988	25.713
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	133.000-85.500	A	0.865	0.000	0.000	0.000	19.873	138.478
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	948.512
L3	85.500-42.750	A	0.811	0.000	0.000	0.000	17.885	124.630
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	1128.139
L4	42.750-0.000	A	0.750	0.000	0.000	0.000	16.975	117.398
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	1130.464

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.000-133.000	0.000	-0.051	0.000	-0.239
L2	133.000-85.500	0.000	-0.105	0.000	-0.492
L3	85.500-42.750	0.000	-0.106	0.000	-0.521
L4	42.750-0.000	0.000	-0.107	0.000	-0.516

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
130									
APXVTM14-C-120 w/ Mount Pipe	A	From Centroid-Leg	4.000 -6.000 0.000	-20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.897 7.348 7.807 8.752 10.746	3.607 3.967 4.333 5.140 6.971	56.200 95.726 140.320 245.492 525.213
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Leg	4.000 -6.000 0.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.897 7.348 7.807 8.752 10.746	3.607 3.967 4.333 5.140 6.971	56.200 95.726 140.320 245.492 525.213
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Leg	4.000 -6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.897 7.348 7.807 8.752 10.746	3.607 3.967 4.333 5.140 6.971	56.200 95.726 140.320 245.492 525.213
LLPX310R w/ Mount Pipe	A	From Centroid-Leg	4.000 6.000 -2.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.982 5.376 5.780 6.618 8.437	2.874 3.398 3.937 5.125 7.894	43.868 80.948 123.321 226.550 531.242
LLPX310R w/ Mount Pipe	B	From Centroid-Leg	4.000 -2.000 -2.000	-50.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.982 5.376 5.780 6.618 8.437	2.874 3.398 3.937 5.125 7.894	43.868 80.948 123.321 226.550 531.242
LLPX310R w/ Mount Pipe	C	From Centroid-Leg	4.000 -2.000 -2.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.982 5.376 5.780 6.618 8.437	2.874 3.398 3.937 5.125 7.894	43.868 80.948 123.321 226.550 531.242
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.000 2.000 0.000	-20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	87.550 158.035 236.537 421.226 935.368
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	4.000 6.000 -3.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	82.550 150.561 226.532 405.983 908.948
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Leg	4.000 6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	82.550 150.561 226.532 405.983 908.948
TD-RRH8x20-25	A	From Centroid-Leg	4.000 -6.000 0.000	-20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	70.000 97.151 127.829 200.542 396.842

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
TD-RRH8x20-25	B	From Centroid-Leg	4.000 -6.000 0.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	70.000 97.151 127.829 200.542 396.842
TD-RRH8x20-25	C	From Centroid-Leg	4.000 -6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	70.000 97.151 127.829 200.542 396.842
FDD_R6_RRH	A	From Centroid-Leg	4.000 6.000 -2.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.778 0.918 1.067 1.391 2.143	33.000 44.505 58.310 93.602 200.352
FDD_R6_RRH	B	From Centroid-Leg	4.000 -2.000 -2.000	-50.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.778 0.918 1.067 1.391 2.143	33.000 44.505 58.310 93.602 200.352
FDD_R6_RRH	C	From Centroid-Leg	4.000 -2.000 -2.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.778 0.918 1.067 1.391 2.143	33.000 44.505 58.310 93.602 200.352
800 EXTERNAL NOTCH FILTER	A	From Centroid-Leg	4.000 2.000 0.000	-20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	11.000 16.814 24.257 44.808 114.010
800 EXTERNAL NOTCH FILTER	B	From Centroid-Leg	4.000 6.000 -3.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	11.000 16.814 24.257 44.808 114.010
800 EXTERNAL NOTCH FILTER	C	From Centroid-Leg	4.000 6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	11.000 16.814 24.257 44.808 114.010
(3) ACU-A20-N	A	From Centroid-Leg	4.000 2.000 0.000	-20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.078 0.121 0.173 0.302 0.665	0.136 0.189 0.251 0.400 0.802	1.040 2.320 4.410 11.799 44.855
(3) ACU-A20-N	B	From Centroid-Leg	4.000 6.000 -3.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.078 0.121 0.173 0.302 0.665	0.136 0.189 0.251 0.400 0.802	1.040 2.320 4.410 11.799 44.855
(3) ACU-A20-N	C	From Centroid-Leg	4.000 6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.078 0.121 0.173 0.302 0.665	0.136 0.189 0.251 0.400 0.802	1.040 2.320 4.410 11.799 44.855
800MHZ RRH	A	From Centroid-Le	4.000 2.000	-20.000	130.000	No Ice 1/2" Ice	2.490 2.706	2.068 2.271	53.000 74.187

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
		g	0.000			1" Ice	2.931	2.481	98.387
						2" Ice	3.407	2.928	156.608
						4" Ice	4.462	3.927	317.771
800MHZ RRH	B	From Centroid-Le g	4.000 6.000 -3.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	53.000 74.187 98.387 156.608 317.771
800MHZ RRH	C	From Centroid-Le g	4.000 6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	53.000 74.187 98.387 156.608 317.771
1900MHz RRH (65MHz)	A	From Centroid-Le g	4.000 2.000 0.000	-20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.698 2.936 3.183 3.703 4.846	2.771 3.011 3.260 3.784 4.935	60.000 83.902 111.077 176.024 353.751
1900MHz RRH (65MHz)	B	From Centroid-Le g	4.000 6.000 -3.000	-30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.698 2.936 3.183 3.703 4.846	2.771 3.011 3.260 3.784 4.935	60.000 83.902 111.077 176.024 353.751
1900MHz RRH (65MHz)	C	From Centroid-Le g	4.000 6.000 0.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.698 2.936 3.183 3.703 4.846	2.771 3.011 3.260 3.784 4.935	60.000 83.902 111.077 176.024 353.751
2.4" Dia. x 6-ft	A	From Centroid-Le g	4.000 -2.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	21.960 32.787 47.674 90.239 230.803
2.4" Dia. x 6-ft	C	From Centroid-Le g	4.000 2.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	21.960 32.787 47.674 90.239 230.803
Platform Mount [LP 1201-1]	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.100 26.800 30.500 37.900 52.700	23.100 26.800 30.500 37.900 52.700	2100.000 2500.000 2900.000 3700.000 5300.000
Miscellaneous [NA 510-1]	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.000 8.500 11.000 16.000 26.000	6.000 8.500 11.000 16.000 26.000	255.700 339.500 409.120 562.540 869.380
121									
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	A	From Centroid-Le g	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.560 5.102 5.608 6.648 8.832	10.740 12.002 12.981 14.993 19.232	46.215 112.725 187.098 363.031 857.357
(2) LPA-80080-6CF-EDIN w/ Mount Pipe	B	From Centroid-Le g	4.000 3.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice	4.560 5.102 5.608	10.740 12.002 12.981	46.215 112.725 187.098

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	6.648	14.993	363.031
						4" Ice	8.832	19.232	857.357
(2) LPA-80063/6CF w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.805 11.582 12.328 13.753 16.736	10.905 12.282 13.512 15.647 20.132	56.200 151.250 254.985 492.508 1125.216
BXA-70063/6CFx2 w/ Mount Pipe	A	From Centroid-Leg	4.000 -3.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.988 8.638 9.251 10.505 13.133	5.418 6.579 7.455 9.239 13.008	42.550 101.643 168.429 328.714 790.159
BXA-70063/6CFx2 w/ Mount Pipe	B	From Centroid-Leg	4.000 -6.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.988 8.638 9.251 10.505 13.133	5.418 6.579 7.455 9.239 13.008	42.550 101.643 168.429 328.714 790.159
BXA-70063/6CFx4 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.969 8.609 9.216 10.459 13.066	5.398 6.546 7.409 9.184 12.933	42.246 101.122 167.674 327.411 787.150
HBX-6516DS-VTM w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.201 4.918 5.596 6.861 9.546	3.886 5.029 6.024 7.687 11.260	39.600 79.734 126.110 241.583 600.872
HBX-6516DS-VTM w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.201 4.918 5.596 6.861 9.546	3.886 5.029 6.024 7.687 11.260	39.600 79.734 126.110 241.583 600.872
HBX-6516DS-VTM w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.201 4.918 5.596 6.861 9.546	3.886 5.029 6.024 7.687 11.260	39.600 79.734 126.110 241.583 600.872
BXA-171063/12CF w/ Mount Pipe	A	From Centroid-Leg	4.000 3.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.791 5.242 5.699 6.636 8.641	5.043 5.983 6.798 8.479 12.042	36.900 80.239 130.804 256.883 639.425
BXA-171063/12CF w/ Mount Pipe	B	From Centroid-Leg	4.000 3.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.791 5.242 5.699 6.636 8.641	5.043 5.983 6.798 8.479 12.042	36.900 80.239 130.804 256.883 639.425
BXA-171063/12CF w/ Mount Pipe	C	From Centroid-Leg	4.000 3.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.791 5.242 5.699 6.636 8.641	5.043 5.983 6.798 8.479 12.042	36.900 80.239 130.804 256.883 639.425
(2) FD9R6004/2C-3L	A	From Centroid-Leg	4.000 -6.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.085 0.136 0.196 0.343 0.740	3.100 5.399 8.787 19.608 62.872

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) FD9R6004/2C-3L	B	From Centroid-Leg	4.000 -6.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.085 0.136 0.196 0.343 0.740	3.100 5.399 8.787 19.608 62.872
(2) FD9R6004/2C-3L	C	From Centroid-Leg	4.000 -6.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.000 0.000 0.000 0.000 0.000	0.085 0.136 0.196 0.343 0.740	3.100 5.399 8.787 19.608 62.872
DB-T1-6Z-8AB-0Z	C	From Centroid-Leg	4.000 3.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	44.000 80.134 120.222 213.037 454.667
Platform Mount [LP 1201-1]	C	None		0.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.100 26.800 30.500 37.900 52.700	23.100 26.800 30.500 37.900 52.700	2100.000 2500.000 2900.000 3700.000 5300.000
119									
RRH2X40-AWS	A	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	44.000 61.396 81.692 131.758 275.237
RRH2X40-AWS	B	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	44.000 61.396 81.692 131.758 275.237
RRH2X40-AWS	C	From Centroid-Leg	4.000 0.000 0.000	30.000	121.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	44.000 61.396 81.692 131.758 275.237
111									
7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.000 -6.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	55.379 102.815 156.641 286.582 664.786
7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.000 -6.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	55.379 102.815 156.641 286.582 664.786
7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.000 -6.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	55.379 102.815 156.641 286.582 664.786
TPA-65R-LCUUUU-H6 w/ Mount Pipe	A	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.406 9.052 9.664 10.917 13.544	9.676 10.937 11.909 13.907 18.118	96.507 176.353 264.392 468.653 1023.708

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
TPA-65R-LCUUUU-H6 w/ Mount Pipe	B	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.406 9.052 9.664 10.917 13.544	9.676 10.937 11.909 13.907 18.118	96.507 176.353 264.392 468.653 1023.708
TPA-65R-LCUUUU-H6 w/ Mount Pipe	C	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.406 9.052 9.664 10.917 13.544	9.676 10.937 11.909 13.907 18.118	96.507 176.353 264.392 468.653 1023.708
RRUS-11	A	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.256 3.498 3.749 4.277 5.435	1.379 1.558 1.745 2.146 3.050	50.000 70.872 94.783 152.503 312.977
RRUS-11	B	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.256 3.498 3.749 4.277 5.435	1.379 1.558 1.745 2.146 3.050	50.000 70.872 94.783 152.503 312.977
RRUS-11	C	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.256 3.498 3.749 4.277 5.435	1.379 1.558 1.745 2.146 3.050	50.000 70.872 94.783 152.503 312.977
DC6-48-60-18-8F	A	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.467 1.667 1.878 2.333 3.378	1.467 1.667 1.878 2.333 3.378	18.900 36.615 56.825 105.337 239.015
DTMABP7819VG12A	A	From Centroid-Leg	4.000 -6.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	19.180 26.485 35.633 60.234 140.104
DTMABP7819VG12A	B	From Centroid-Leg	4.000 -6.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	19.180 26.485 35.633 60.234 140.104
DTMABP7819VG12A	C	From Centroid-Leg	4.000 -6.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	19.180 26.485 35.633 60.234 140.104
RRUS12/RRUS A2	A	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.667 3.924 4.189 4.745 5.960	2.141 2.347 2.563 3.019 4.035	71.500 98.979 129.873 202.684 397.842
RRUS12/RRUS A2	B	From Centroid-Leg	4.000 0.000 1.000	20.000	111.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.667 3.924 4.189 4.745 5.960	2.141 2.347 2.563 3.019 4.035	71.500 98.979 129.873 202.684 397.842
RRUS12/RRUS A2	C	From Centroid-Leg	4.000 0.000	20.000	111.000	No Ice 1/2" Ice	3.667 3.924	2.141 2.347	71.500 98.979

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
		g	1.000			1" Ice	4.189	2.563	129.873
						2" Ice	4.745	3.019	202.684
						4" Ice	5.960	4.035	397.842
Platform Mount [LP 1201-1]	C	None		0.000	111.000	No Ice	23.100	23.100	2100.000
						1/2" Ice	26.800	26.800	2500.000
						1" Ice	30.500	30.500	2900.000
						2" Ice	37.900	37.900	3700.000
						4" Ice	52.700	52.700	5300.000
70									
OG-860/1920/GPS-A	C	From Face	3.000	0.000	70.000	No Ice	0.144	0.144	1.650
			0.000			1/2" Ice	0.233	0.233	3.534
			0.000			1" Ice	0.333	0.333	6.435
						2" Ice	0.567	0.567	15.904
						4" Ice	1.167	1.167	53.777
Side Arm Mount [SO 701-1]	C	From Face	1.500	0.000	70.000	No Ice	0.850	1.670	65.000
			0.000			1/2" Ice	1.140	2.340	79.000
			0.000			1" Ice	1.430	3.010	93.000
						2" Ice	2.010	4.350	121.000
						4" Ice	3.170	7.030	177.000
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
130											
VHLP1-23	A	Paraboloid w/Shroud (HP)	From Centroid -Leg	4.000 -2.000 2.000	-40.000		130.000	1.275	No Ice	1.280	14.000
									1/2" Ice	1.450	19.340
									1" Ice	1.620	24.680
									2" Ice	1.960	35.360
									4" Ice	2.640	56.720
VHLP2-23	C	Paraboloid w/Shroud (HP)	From Centroid -Leg	4.000 -2.000 2.000	0.000		130.000	2.180	No Ice	3.730	31.000
									1/2" Ice	4.020	51.636
									1" Ice	4.310	72.272
									2" Ice	4.900	113.544
									4" Ice	6.060	196.088
VHLP2.5-23	C	Paraboloid w/Shroud (HP)	From Centroid -Leg	4.000 2.000 2.000	30.000		130.000	2.917	No Ice	6.680	47.600
									1/2" Ice	7.070	83.890
									1" Ice	7.460	120.170
									2" Ice	8.230	192.740
									4" Ice	9.780	337.880
***											

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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 133	42.130	30	2.292	0.016
L2	133 - 85.5	35.424	30	2.288	0.016
L3	89.25 - 42.75	16.025	30	1.765	0.005
L4	47.5 - 0	4.373	30	0.860	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.000	VHLP1-23	30	34.946	2.285	0.016	34823

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.000	APXVTM14-C-120 w/ Mount Pipe	30	33.991	2.277	0.016	23643
121.000	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	30	29.726	2.220	0.014	8737
111.000	7770.00 w/ Mount Pipe	30	25.117	2.114	0.011	5127
70.000	OG-860/1920/GPS-A	30	9.605	1.358	0.003	2495

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 133	121.440	5	6.611	0.046
L2	133 - 85.5	102.109	5	6.597	0.046
L3	89.25 - 42.75	46.211	5	5.092	0.016
L4	47.5 - 0	12.618	5	2.483	0.005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.000	VHLP1-23	5	100.731	6.588	0.045	13165
130.000	APXVTM14-C-120 w/ Mount Pipe	5	97.977	6.567	0.045	8764
121.000	(2) LPA-80080-6CF-EDIN w/ Mount Pipe	5	85.687	6.404	0.040	3148
111.000	7770.00 w/ Mount Pipe	5	72.408	6.103	0.033	1828
70.000	OG-860/1920/GPS-A	5	27.708	3.917	0.008	872

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	147 - 133 (1)	TP12.75x12.75x0.5	14.000	0.000	0.0	21.000	19.242	-867.088	404087.000	0.002
L2	133 - 85.5 (2)	TP29.418x19.537x0.313	47.500	0.000	0.0	39.000	28.503	-13173.500	1111600.000	0.012
L3	85.5 - 42.75 (3)	TP37.687x27.477x0.375	46.500	0.000	0.0	39.000	43.795	-20915.199	1708000.000	0.012
L4	42.75 - 0 (4)	TP45.83x35.894x0.438	47.500	0.000	0.0	39.000	63.947	-33230.000	2493920.000	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	147 - 133 (1)	TP12.75x12.75x0.5	3787.242	0.801	23.100	0.035	0.000	0.000	23.100	0.000
L2	133 - 85.5 (2)	TP29.418x19.537x0.313	667216.667	40.691	39.000	1.043	0.000	0.000	39.000	0.000
L3	85.5 - 42.75 (3)	TP37.687x27.477x0.375	1661233.333	51.459	39.000	1.319	0.000	0.000	39.000	0.000
L4	42.75 - 0 (4)	TP45.83x35.894x0.438	2998716.667	50.795	39.000	1.302	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	147 - 133 (1)	TP12.75x12.75x0.5	540.932	0.028	14.000	0.004	1.842	0.000	14.000	0.000
L2	133 - 85.5 (2)	TP29.418x19.537x0.313	21657.600	0.760	26.000	0.059	774.660	0.022	26.000	0.001
L3	85.5 - 42.75 (3)	TP37.687x27.477x0.375	25925.801	0.592	26.000	0.046	931.675	0.014	26.000	0.001
L4	42.75 - 0 (4)	TP45.83x35.894x0.438	30393.000	0.475	26.000	0.037	882.217	0.007	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 133 (1)	0.002	0.035	0.000	0.004	0.000	0.037	1.333	H1-3+VT
L2	133 - 85.5 (2)	0.012	1.043	0.000	0.059	0.001	1.056	1.333	H1-3+VT
L3	85.5 - 42.75 (3)	0.012	1.319	0.000	0.046	0.001	1.332	1.333	H1-3+VT
L4	42.75 - 0 (4)	0.013	1.302	0.000	0.037	0.000	1.316	1.333	H1-3+VT

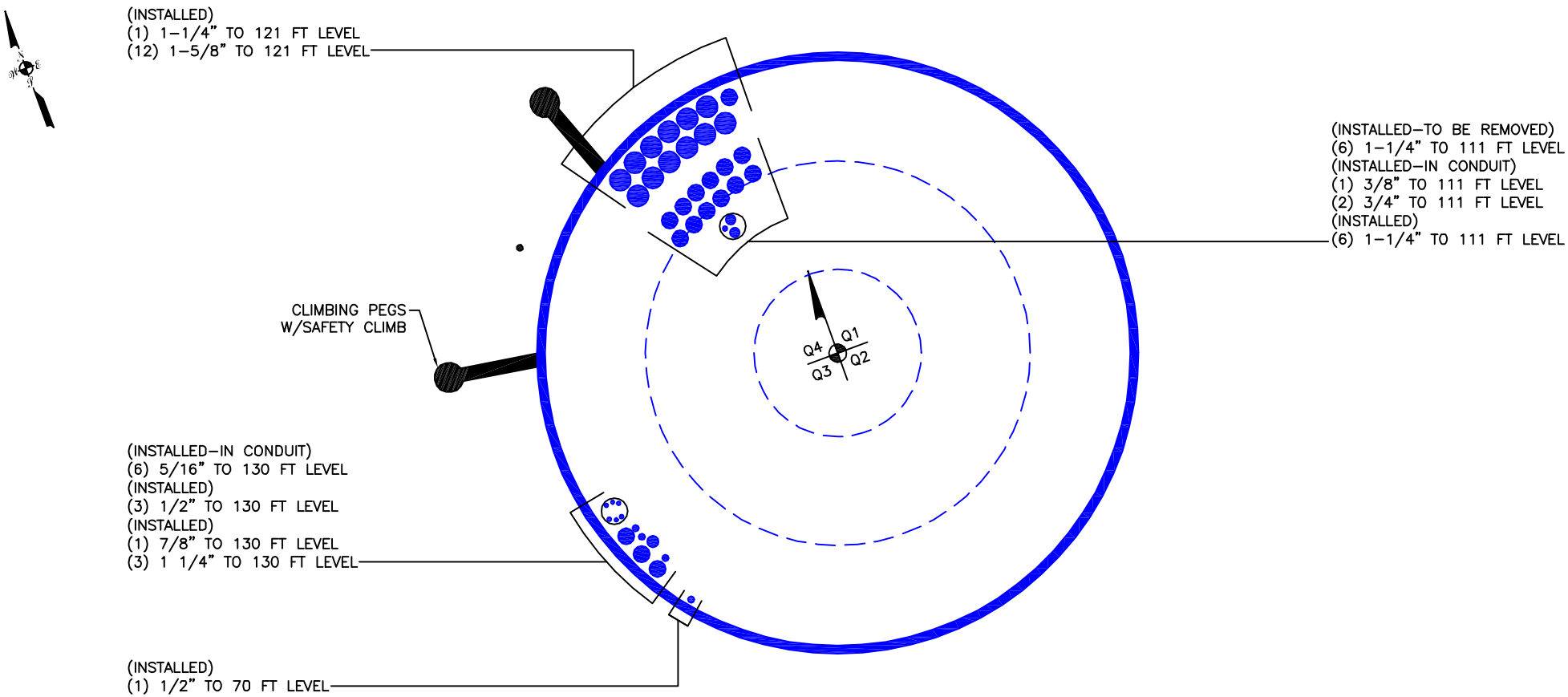
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	147 - 133	Pole	TP12.75x12.75x0.5	1	-867.088	538647.949	2.8	Pass
L2	133 - 85.5	Pole	TP29.418x19.537x0.313	2	-13173.500	1481762.739	79.2	Pass
L3	85.5 - 42.75	Pole	TP37.687x27.477x0.375	3	-20915.199	2276763.906	99.9	Pass
L4	42.75 - 0	Pole	TP45.83x35.894x0.438	4	-33230.000	3324395.22	98.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
						2		
							Summary	
						Pole (L3)	99.9	Pass
						RATING =	**99.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876310 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *876310*
Site Name: *Beaumont Farm*
App #: *345702 Rev. 3*

Pole Manufacturer:	Other

Reactions		
Moment:	3.787	ft-kips
Axial:	0.867	kips
Shear:	0.541	kips
Elevation:	133	feet

If No stiffeners, Criteria: AISC ASD <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	20		
Diameter (in.):	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	24		

Plate Data		
Diam:	28	in
Thick, t:	1	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	2.00	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	12.75	in
Thick:	0.5	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Non-Rigid
Bolt Tension Capacity, **B**:	71.98	kips	Service, ASD
Max Bolt directly applied T:	0.34	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	4.644	in	
Min PL "treq" for actual **T w/ Pry**:	0.273	in	
Min PL "t1" for actual **T w/o Pry**:	0.317	in	
T allowable with Prying:	4.49	kips	α'>1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	0.34	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	0.5%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Non-Rigid
Compression Side Plate Stress:	2.7	ksi	Service ASD
Allowable Plate Stress:	50.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	5.4%	**Pass**	Comp. Y.L. Length:
No Prying			20.33
Tension Side Stress Ratio, (treq/t)^2:	7.5%	**Pass**	

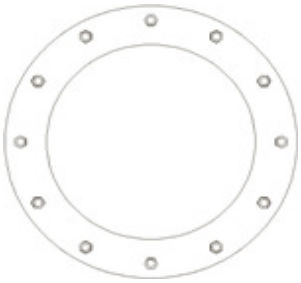
n/a

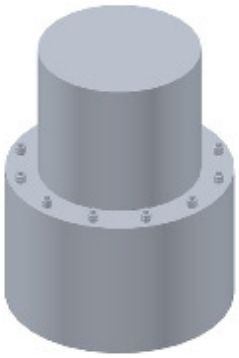
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *876310*
Site Name: *Beaumont Farm*
App #: *345702 Rev. 3*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	54	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	54	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	6	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	45.83	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2998.721	ft-kips
Unfactored Axial, P:	33.261	kips
Unfactored Shear, V:	30.36	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	164.5 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	84.4% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	46.7 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	93.5% **Pass**

PL Ref. Data
Yield Line (in):
30.54
Max PL Length:
30.54

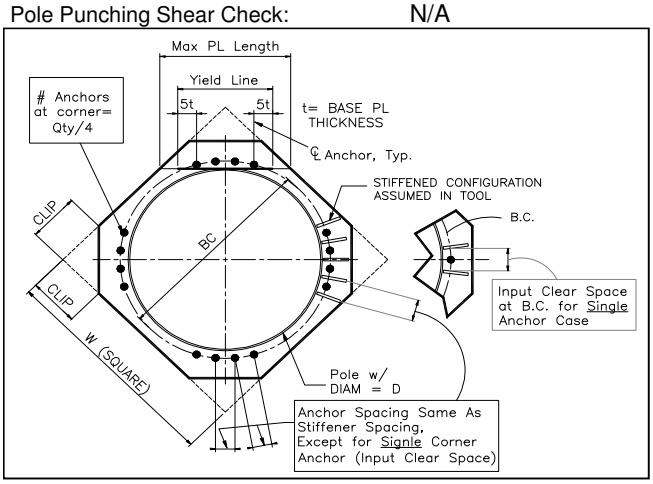
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



JOB:	Beaumont Farm (BU 876310): TEP# 72875.96392		
SHEET NUMBER:	1	OF	2
CALCULATED BY:	CDC	DATE	9/13/2016
CHECKED BY:	DTS	DATE	9/13/2016

Pad and Pier Foundation for Monopole - TIA-222-F

Q_a, ALLOWABLE SOIL PRESS. (ksf)	20
NET or GROSS	NET
SOIL DENSITY (pcf)	165

F'c (ksi)	3
F'y (ksi)	60

Base Reactions LC1: Maximum Wind

M , MOMENT (k-ft)	2998.7
P_t, TOTAL DOWNLOAD (k)	33.3
H, HORIZONTAL SHEAR (k)	30.4

Base Reaction LC 2: Ice Wind + Ice

M (k-ft)	738.7
P_t (k)	45.2
H (k)	7.2

Try:	L (ft.)	B (ft.)	t (ft.)	Soil depth to TOP of mat (ft.)	Soil depth to BOT. of mat (ft.)	Pier dia./width (ft.)	Pier Height, h (cu.ft.)	Pier Shape
	23	23	5	0	4.5	3.82	0.00	Square

W_m, Weight of Mat (k) =	396.8
W_p, Weight of Pier (k) =	0.0
Ws, WEIGHT OF SOIL (k) =	0.0

Concrete Vol. (cu ft) 97.96

CHECK DESIGN CRITERIA

CHECK STABILITY:	LC1	LC2		
Mst= P * (L/2) + (Vf+s * L/2) =	4945.1 k-ft	5082.2 k-ft		
Mot = M+H*(t+h) =	3150.5 k-ft	775 k-ft		
SF =Mot/Mst =	1.57 > 1.5	6.56 > 1.5	**Capacity:**	**95.6%**

CHECK BEARING PRESSURE	**LC1**	**LC2**		
P = P_t + Wf + Ws =	430.0 k	441.9 k		
e = M / P =	7.33 ft	1.75 ft		
L/6 =	3.83 ft	3.83 ft		
Width of Wedge, L' =	12.52 ft	23.00 ft		
0 Deg Wind: Qmax =	2.24 ksf	0.47 ksf		
45 Deg Wind: Qmax =	3.32 ksf	0.63 ksf	**Capacity:**	**16.6%**

JOB:	Beaumont Farm (BU 876310): TEP# 72875.96392		
SHEET NUMBER:	2	OF	2
CALCULATED BY:	CDC	DATE	9/13/2016
CHECKED BY:	DTS	DATE	9/13/2016

CHECK ONE WAY SHEAR

Vu = 358.0 k
Vc = 1261.3 k **Capacity:** 28.38%

CHECK TWO WAY SHEAR: PUNCHING + UNBALANCED MOMENT

v_u = 23.0 psi
φv_c = 164.3 psi **Capacity:** 13.97%

CALCULATE REINFORCING REQUIRED

F'c = 3.0 ksi F'y = 60.0 ksi

Temp & Shrinkage reinforcing, $A_{s,\,temp}$ = 0.40 in^2/ft (ACI 318 Sec. 10.5.4)

BOTTOM REINFORCING

Bar Size = 11
Bar Spacing, c-c: 12.0
d = 54.9 in.
Mu= 1057.8 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.36 in^2/ft

Check, As = 1.56 in^2/ft **Capacity:** 23.01%

TOP REINFORCING

Bar Size = 11
Bar Spacing, c-c: 12.0
d= 54.9 in.
Mu= 538.1 in-k/ft

φMn=0.9*As*Fy*d(1-0.59*As*Fy/(b*d*F'c))

Solution: As,req = 0.18 in^2/ft **As,req < As,t, Use As,t**

Bar Spacing, c-c:

Check, As = 1.56 in^2/ft **Top Reinforcing O.K.** **Capacity:** 11.66%

EBI Consulting
environmental | engineering | due diligence

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

AT&T Existing Facility

Site ID: CT2154

Wallingford
945 East Center Street
Wallingford, CT 06492

July 11, 2016

EBI Project Number: 6216003144

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	8.22 %

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

July 11, 2016

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

Emissions Analysis for Site: **CT2154 – Wallingford**

EBI Consulting was directed to analyze the proposed AT&T facility located at **945 East Center Street, Wallingford, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **945 East Center Street, Wallingford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

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

8) The antennas used in this modeling are the **Powerwave 7770 and the CCI HPA-65R-BUU-H6** for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **112 feet** above ground level (AGL) for **Sector A**, **112 feet** above ground level (AGL) for **Sector B** and **112 feet** above ground level (AGL) for Sector C.

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

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	**112 feet**	Height (AGL):	**112 feet**	Height (AGL):	**112 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,140.89	ERP (W):	2,140.89	ERP (W):	2,140.89
Antenna A1 MPE%	**0.89 %**	Antenna B1 MPE%	**0.89 %**	Antenna C1 MPE%	**0.89 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	**112 feet**	Height (AGL):	**112 feet**	Height (AGL):	**112 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,462.56	ERP (W):	5,462.56	ERP (W):	5,462.56
Antenna A2 MPE%	**2.43 %**	Antenna B2 MPE%	**2.43 %**	Antenna C2 MPE%	**2.43 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 dBd	Gain:	11.4 dBd	Gain:	11.4 dBd
Height (AGL):	**112 feet**	Height (AGL):	**112 feet**	Height (AGL):	**112 feet**
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	828.23	ERP (W):	828.23	ERP (W):	828.23
Antenna A3 MPE%	**0.47 %**	Antenna B3 MPE%	**0.47 %**	Antenna C3 MPE%	**0.47 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**3.79 %**
Verizon Wireless	3.10 %
Clearwire	0.12 %
Sprint	1.21 %
Site Total MPE %:	**8.22 %**

AT&T Sector A Total:	3.79 %
AT&T Sector B Total:	3.79 %
AT&T Sector C Total:	3.79 %
Site Total:	8.22 %

AT&T _ Max Values Per Sector	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density (μW/cm²)**	**Frequency (MHz)**	**Allowable MPE (μW/cm²)**	**Calculated % MPE**
AT&T 850 MHz UMTS	2	414.12	112	2.65	850 MHz	567	0.47 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	112	4.20	1900 MHz (PCS)	1000	0.42 %
AT&T 700 MHz LTE	2	940.05	112	6.02	700 MHz	467	1.29 %
AT&T 1900 MHz (PCS) LTE	2	1,791.23	112	11.46	1900 MHz (PCS)	1000	1.15 %
AT&T 850 MHz GSM	2	414.12	112	2.65	850 MHz	567	0.47 %
						Total:*	**3.79 %**

Note: Totals may vary by .01% due to summing of remainders

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	3.79 %
Sector B:	3.79 %
Sector C:	3.79 %
AT&T Maximum Total (per sector):	3.79 %
Site Total:	8.22 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.22 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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