



Crown Castle
500 West Cummings Park, Suite 3600
Woburn, MA 01801

December 5, 2014

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

RE: AT&T-Exempt Modification – Crown Castle Site ID: 842423
AT&T Site ID: CT1042
Located at: 10 North Ridge Drive, Windham, CT 06256

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of AT&T. AT&T is making modifications to certain existing sites in its Connecticut system in order to maintain their LTE technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies (“R.C.S.A.”), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Ernest Eldridge, Mayor for the Town of Windham, and Ecosite Corporation, Property Owner.

Crown Castle is responsible for this wireless facility located at **10 North Ridge Drive, Windham, CT 06256**. AT&T proposes to modify their existing antenna array to include the addition of three (3) antennas, three (3) remote radio heads, and one (1) fiber cable. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to AT&T’s operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes (“C.G.S.”) § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T’s additional antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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4. A Structural Modification Report confirming that the tower and foundation can support AT&T's proposed modifications is included as Exhibit-2.
5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for AT&T's modified facility is included as Exhibit-3.

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

Sincerely,



Jeffrey Barbadora

Real Estate Specialist

Telephone: 781-970-0053

Email: jeff.barbadora@crowncastle.com

Enclosures

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: The Honorable Ernest Eldridge, Town Mayor

979 Main Street

Willimantic, CT 06226

Ecosite Corporation

323 Center Street

1800 Tower Building

Little Rock, AR 72201

PROJECT INFORMATION

SCOPE OF WORK:

- REMOVE EXISTING AT&T GSM & UMS ANTENNAS; EXISTING SECTOR MOUNTING PLATFORM TO REMAIN.
- AT&T ANTENNAS: (2) NEW LTE ANTENNAS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) NEW LTE ANTENNAS; (3) EXISTING UMS ANTENNAS & TMAs TO BE RE-USED (1 PER SECTOR)
- AT&T RRUs: (1) NEW RRU PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUs; (1) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (3) EXISTING RRUs.
- (1) NEW A2 MODULES PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) A2 MODULES.
- (1) NEW AT&T DC6 SURGE SUPPRESSORS; (1) EXISTING DC6 TO BE REUSED.
- NEW POWER PLANT.
- NEW LTE RBS-6601 & DC-DC CONVERTER INSTALLED IN EXISTING LTE RACK
- (2) NEW FIBER TRUNKS & (4) NEW DC TRUNKS TOTAL.

SITE ADDRESS: 10 NORTH RIDGE DRIVE
WINDHAM, CT 06256

LATITUDE: 41.739861 41° 44' 23.50"N
LONGITUDE: -72.172907 -72° 10' 22.47"W

USID: 84258

TOWER OWNER: CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317

TYPE OF SITE: MONOPOLE/INDOOR EQUIPMENT

MONOPOLE HEIGHT: 88'-0"±

RAD CENTER: 87'-0"± (LTE) & 85'-0"± (UMTS)

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



**at&t
MOBILITY**

FA CODE: 10065747
SITE NUMBER: CT1042
SITE NAME:
WINDHAM - NORTH RIDGE ROAD

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:

COMPANY: CROWN CASTLE
ADDRESS: 2000 CORPORATE DRIVE
CANONSBURG, PA 15317
CONTACT: TO BE PROVIDED
PHONE: TO BE PROVIDED
EMAIL: TO BE PROVIDED

ZONING:

COMPANY: CROWN CASTLE
ADDRESS: 2000 CORPORATE DRIVE
CANONSBURG, PA 15317
CONTACT: TO BE PROVIDED
PHONE: TO BE PROVIDED
EMAIL: TO BE PROVIDED

ENGINEERING:

COMPANY: COM-EX CONSULTANTS, LLC
ADDRESS: 4 SECOND AVENUE
SUITE 204
DENVER, NJ 07834
CONTACT: NICHOLAS D. BARILE, P.E.
PHONE: 862-209-4300
EMAIL: nbarile@comexconsultants.com

RF ENGINEER:

COMPANY: AT&T MOBILITY – NEW ENGLAND
ADDRESS: 550 COCHITUATE ROAD
SUITE 550 13 & 14
FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
PHONE: 508-596-7146
EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:

COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD
BILLERICA, MA 01821
CONTACT: GRZEGORZ "GREG" DORMAN
PHONE: 484-683-1750
EMAIL: gdorman@empiretelecomm.com

DRAWING INDEX

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VICINITY MAP

1. HEAD WEST ON COCHITUATE RD TOWARD BURR ST (0.3 MI). 2. TURN LEFT ONTO SHOPPERS WORLD DR (230 FT). 3. MAKE A U-TURN AT RING RD (138 FT). 4. TAKE THE 1ST RIGHT ONTO COCHITUATE RD (0.3 MI). 5. TAKE THE RAMP TO I-90 E/MASSPIKE W/SPRINGFIELD/BOSTON (0.6 MI). 6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR INTERSTATE 90 W/MASSACHUSETTS TURNPIKE/WORCESTER/SPRINGFIELD AND MERGE ONTO I-90 W/MASSACHUSETTS TURNPIKE (26.7 MI). 7. TAKE EXIT 10 TOWARD AUBURN/WORCESTER (0.8 MI). 8. FOLLOW SIGNS FOR US-20 E/I-395 S AND MERGE ONTO I-395 S (28.7 MI). 9. TAKE EXIT 91W TO MERGE ONTO US-6 W TOWARD WILLIMANTIC/HARTFORD (18.2 MI). 10. TURN LEFT ONTO NORTHRIDGE DR (0.4 MI)



GENERAL NOTES

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		



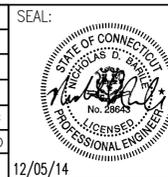
CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811



SITE NUMBER: CT1042
SITE NAME: WINDHAM NORTH RIDGE ROAD
10 NORTH RIDGE DRIVE
WINDHAM, CT 06256
WINDHAM COUNTY



NO.	DATE	REVISIONS	BY	CHK	APP'D
0	12/05/14	INITIAL SUBMISSION	CJT	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: CJT	DRAWN BY: CJT		12/05/14



AT&T		
DRAWING TITLE: TITLE SHEET		
JOB NUMBER 14022-EMP	DRAWING NUMBER T-1	REV 0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
 CONTRACTOR - EMPIRE TELECOM
 SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
 OWNER - AT&T MOBILITY
 OEM - ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
 - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
 - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
 - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
 - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
 - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
 - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
 - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
 - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
 - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
 - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
 - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

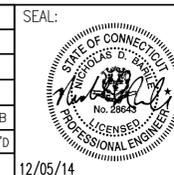


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SITE NAME: WINDHAM NORTH RIDGE ROAD

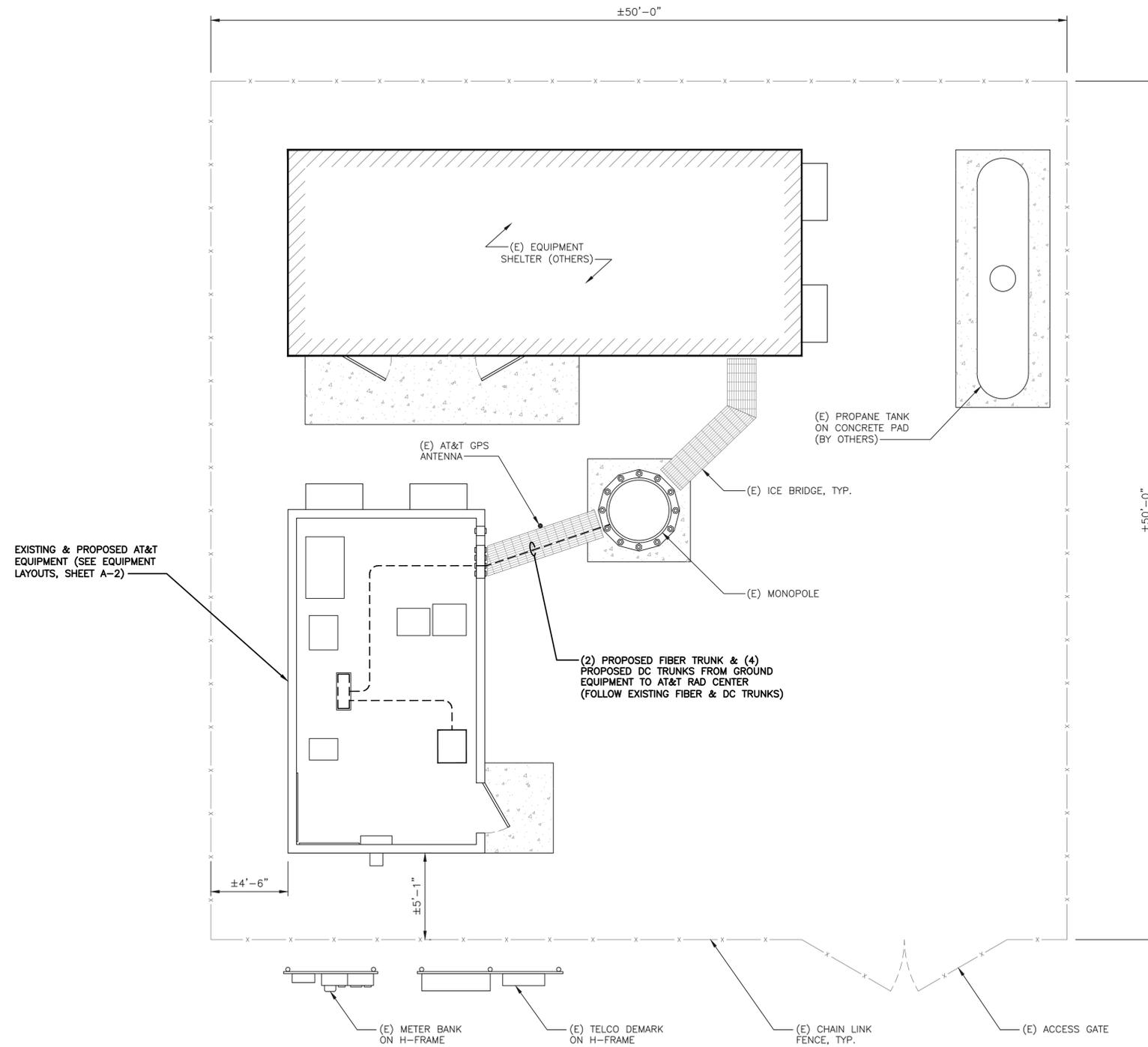
10 NORTH RIDGE DRIVE
 WINDHAM, CT 06256
 WINDHAM COUNTY



0	12/05/14	INITIAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN			DESIGNED BY: CJT		DRAWN BY: CJT



AT&T		
DRAWING TITLE: GROUNDING NOTES & GENERAL NOTES		
JOB NUMBER 14022-EMP	DRAWING NUMBER GN-1	REV 0



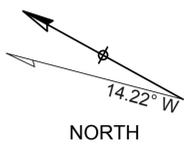
EXISTING & PROPOSED AT&T EQUIPMENT (SEE EQUIPMENT LAYOUTS, SHEET A-2)

COMPOUND LAYOUT

SCALE: 1" = 4'-0"



(IN FEET)
1/4 Inch = 1 Foot



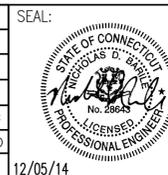
COM-EX
Consultants
4 SECOND AVENUE
SUITE 204
DENVER, NJ 07834
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

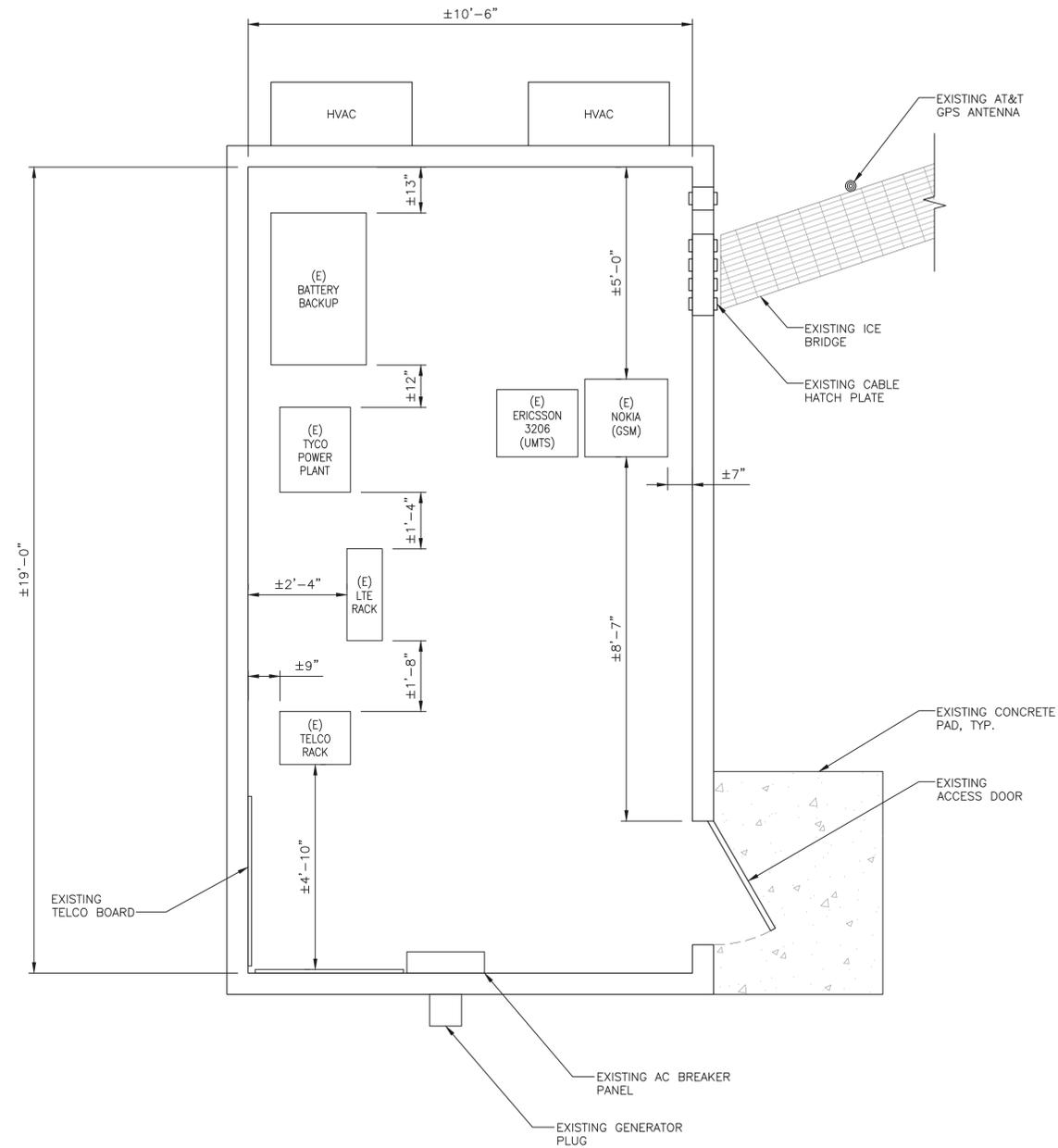
SITE NUMBER: CT1042
SITE NAME: WINDHAM NORTH RIDGE ROAD
10 NORTH RIDGE DRIVE
WINDHAM, CT 06256
WINDHAM COUNTY

at&t
MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

0	12/05/14	INITIAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: CJT	DRAWN BY: CJT		



AT&T		
DRAWING TITLE: COMPOUND LAYOUT		
JOB NUMBER 14022-EMP	DRAWING NUMBER A-1	REV 0

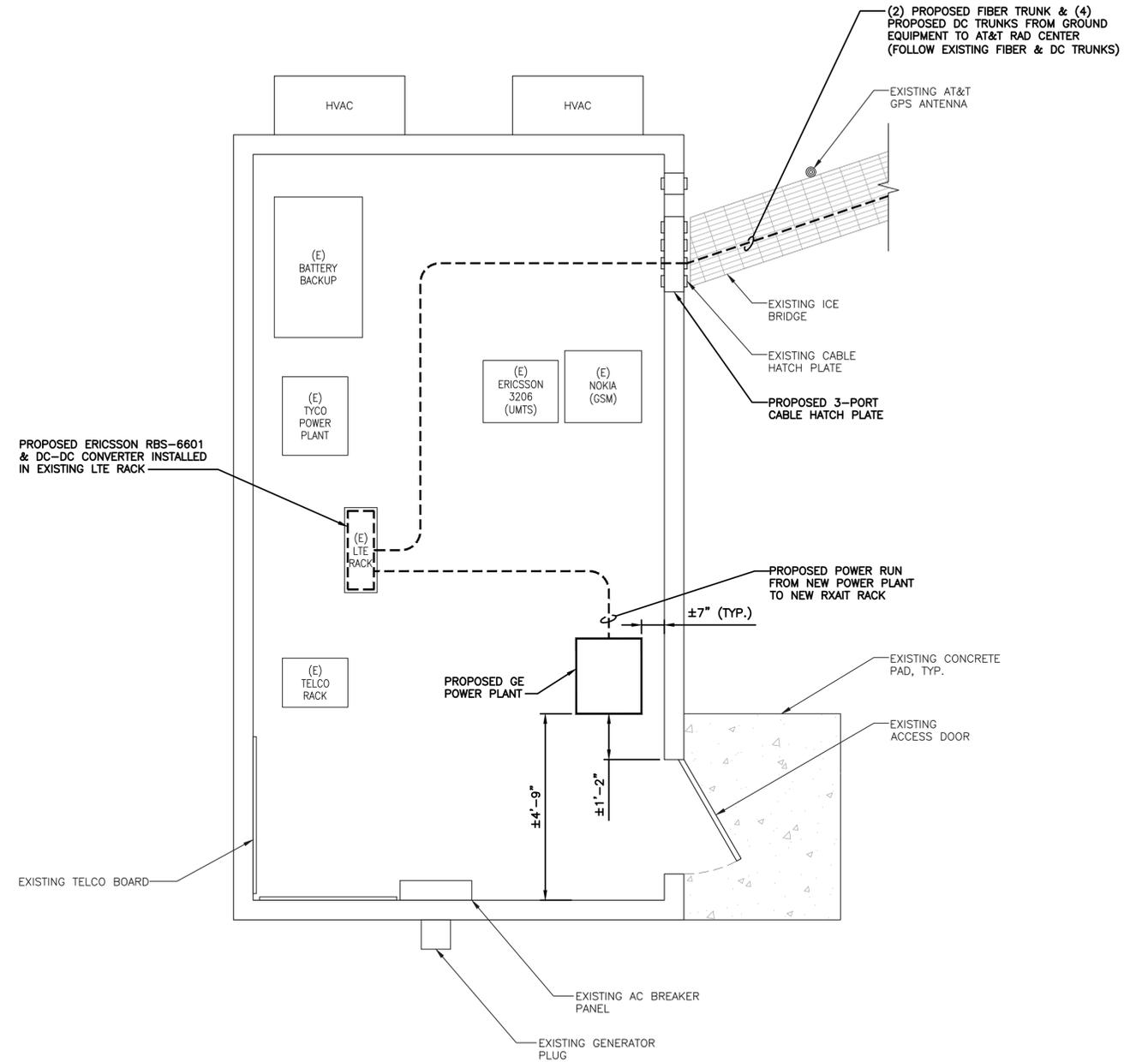
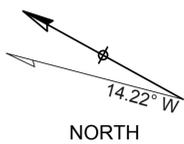


EXISTING EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"



(IN FEET)
1/2 Inch = 1 Foot

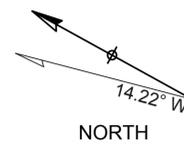


PROPOSED EQUIPMENT LAYOUT

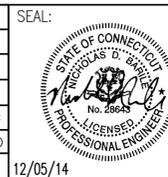
SCALE: 1" = 2'-0"



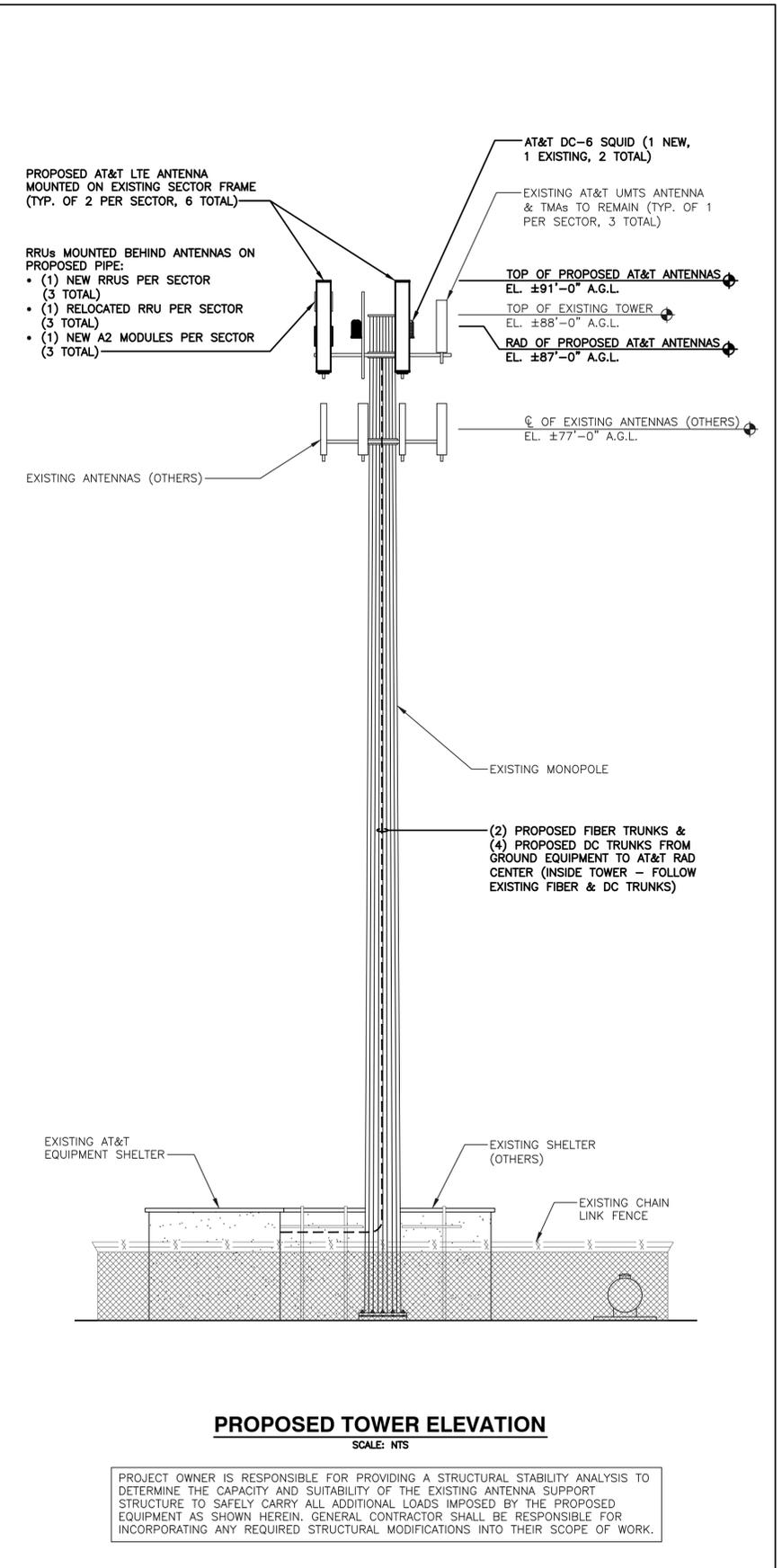
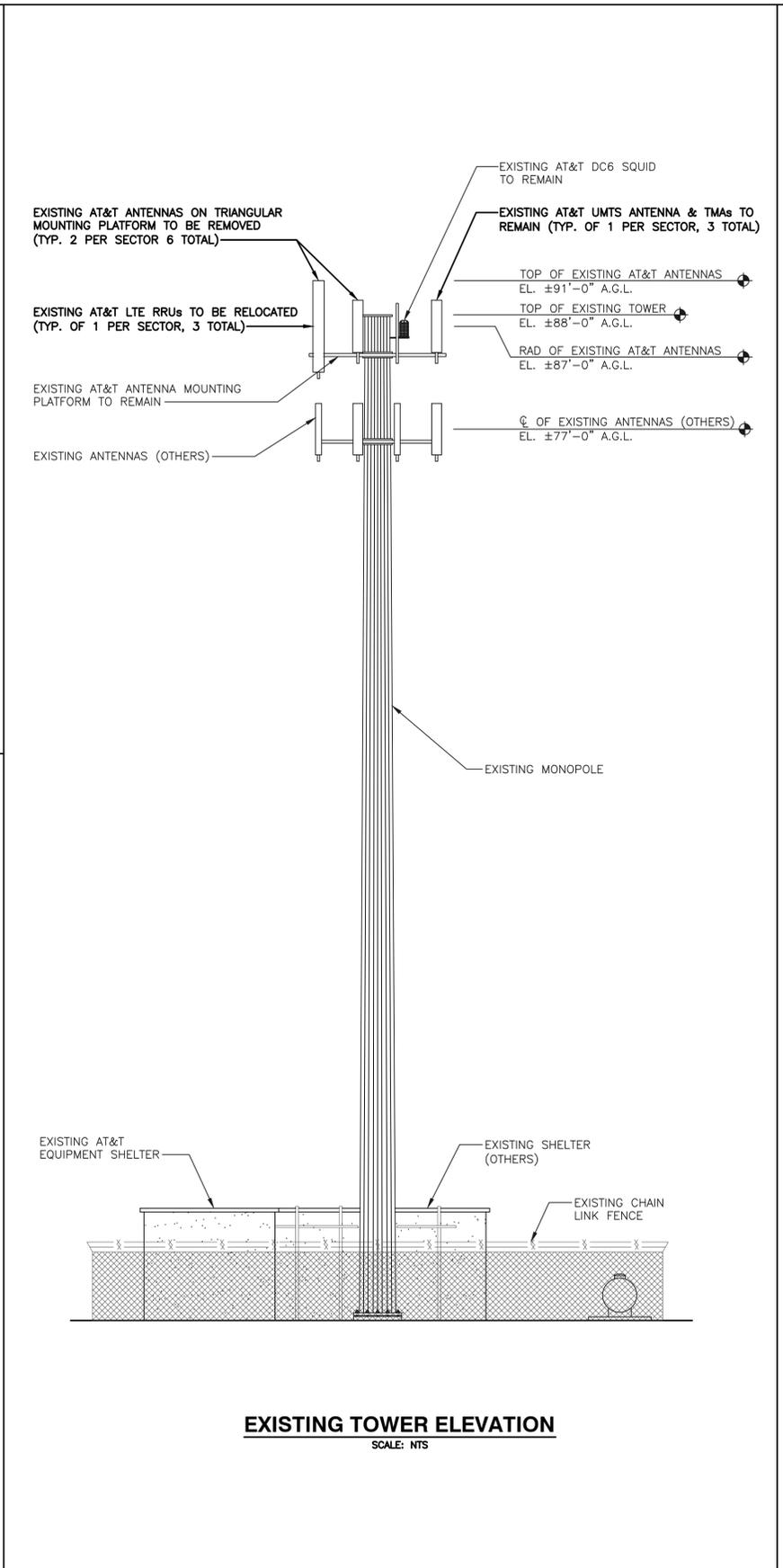
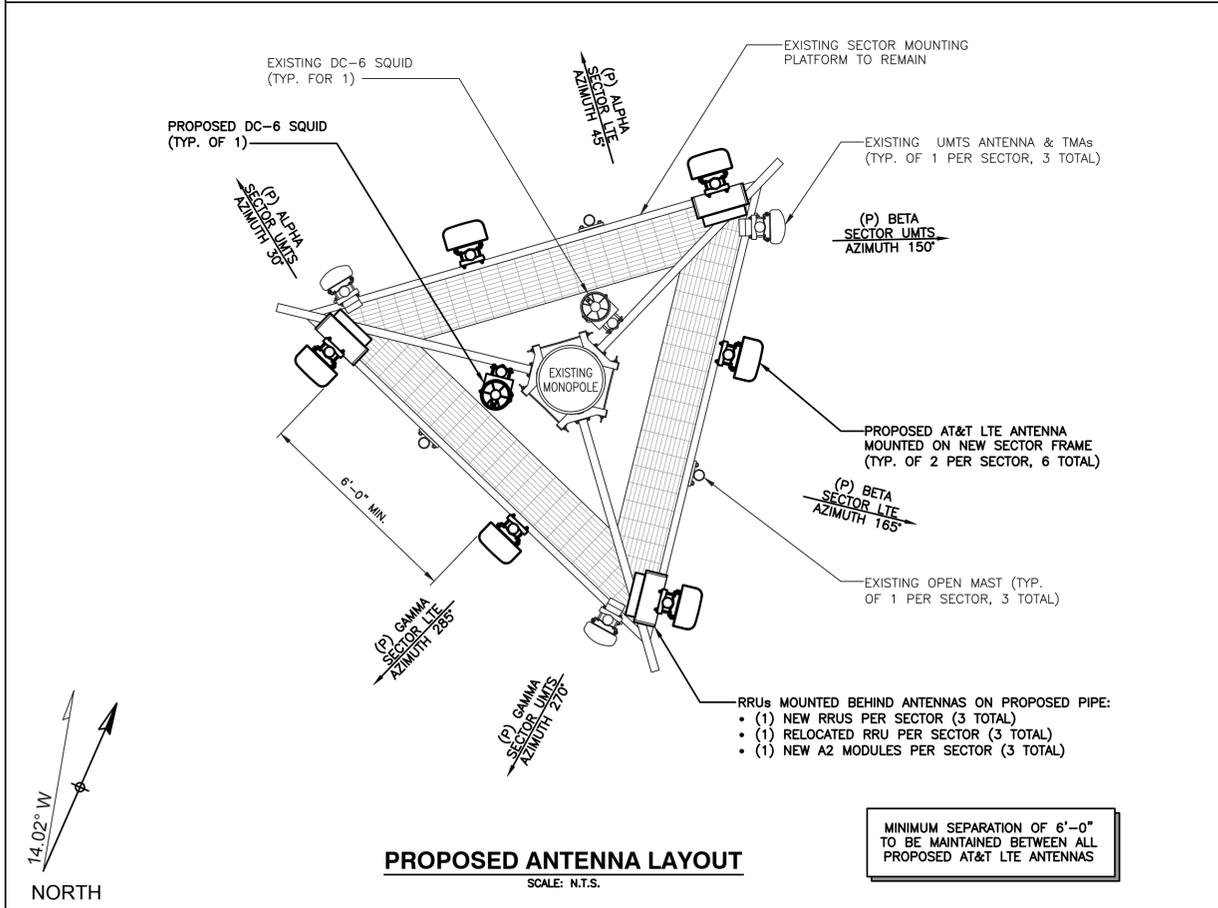
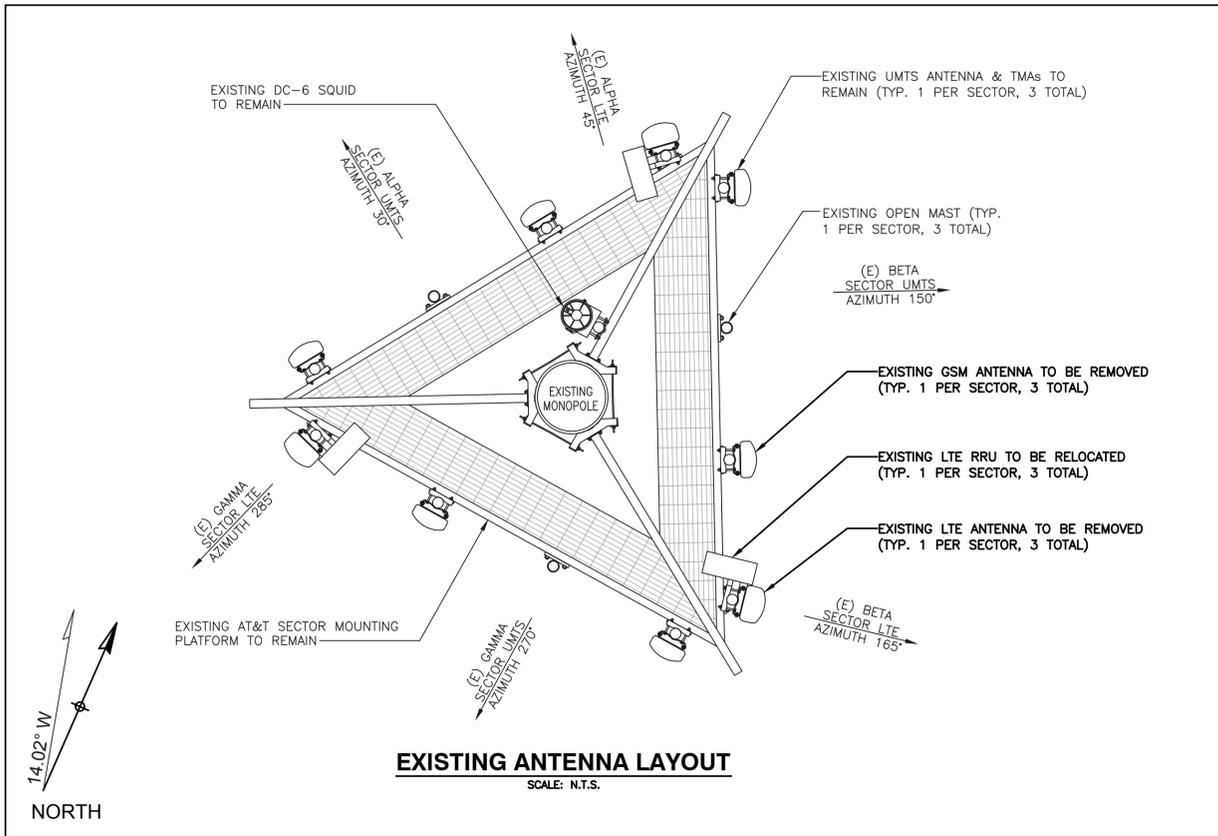
(IN FEET)
1/2 Inch = 1 Foot



0	12/05/14	INITIAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
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AT&T		
DRAWING TITLE: EQUIPMENT LAYOUTS		
JOB NUMBER 14022-EMP	DRAWING NUMBER A-2	REV 0



COM-EX
Consultants
4 SECOND AVENUE SUITE 204
DENVER, NJ 07834
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE
telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

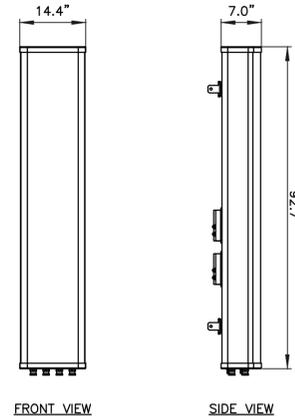
SITE NUMBER: CT1042
SITE NAME: WINDHAM NORTH RIDGE ROAD
10 NORTH RIDGE DRIVE
WINDHAM, CT 06256
WINDHAM COUNTY

at&t
MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

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SEAL:
STATE OF CONNECTICUT
MICHAEL S. B. BARR
No. 2864
LICENSED PROFESSIONAL ENGINEER

AT&T
DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS
JOB NUMBER: 14022-EMP
DRAWING NUMBER: A-3
REV: 0



FRONT VIEW

SIDE VIEW

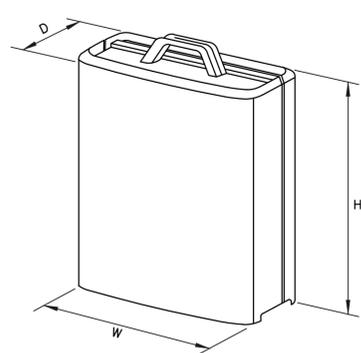


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H8
WEIGHT	88.0 LBS

LTE ANTENNA DETAIL

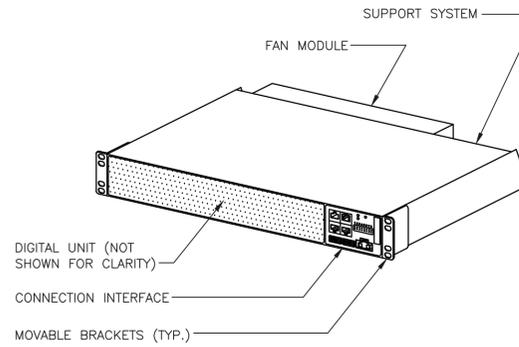
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-E2	20.4" x 18.5" x 7.5"	58 LBS
A2 MODULE	16.4" x 15.2" x 3.4"	22 LBS

RRUS DETAIL

SCALE: N.T.S.

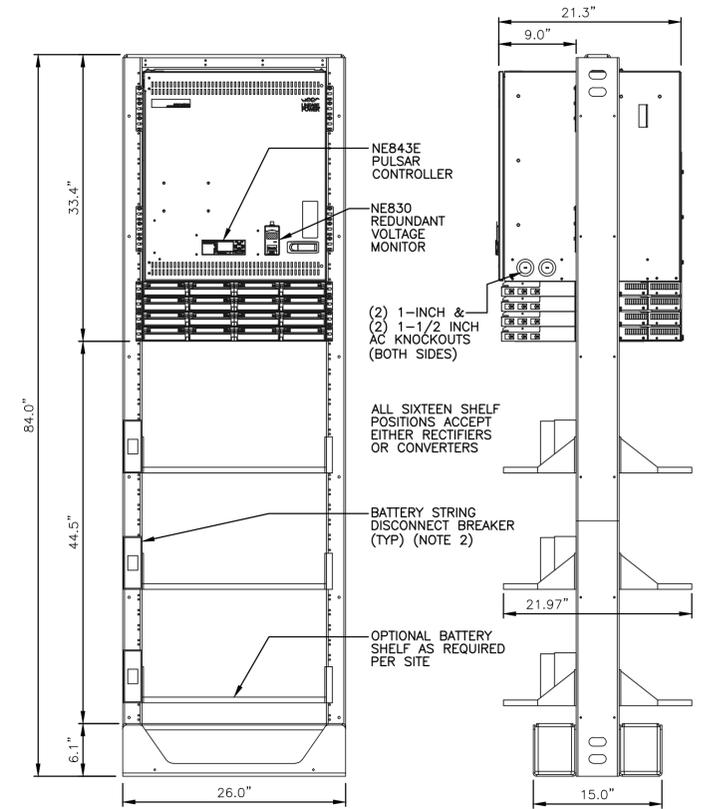


PHYSICAL CHARACTERISTICS	
HEIGHT	2.59" (1.5 U)
WIDTH	19"
DEPTH	13.77"
WEIGHT (FULLY EQUIPPED)	<22 LBS.
COLOR	WHITE

DC POWER SUPPLY	
NOMINAL VOLTAGE	-48VDC
OPERATING VOLTAGE RANGE	-40.0 TO -57.6 VDC
NON-DESTRUCTIVE VOLTAGE RANGE	0 TO -60 VDC

RBS 6601 DETAIL

SCALE: N.T.S.



FRONT VIEW

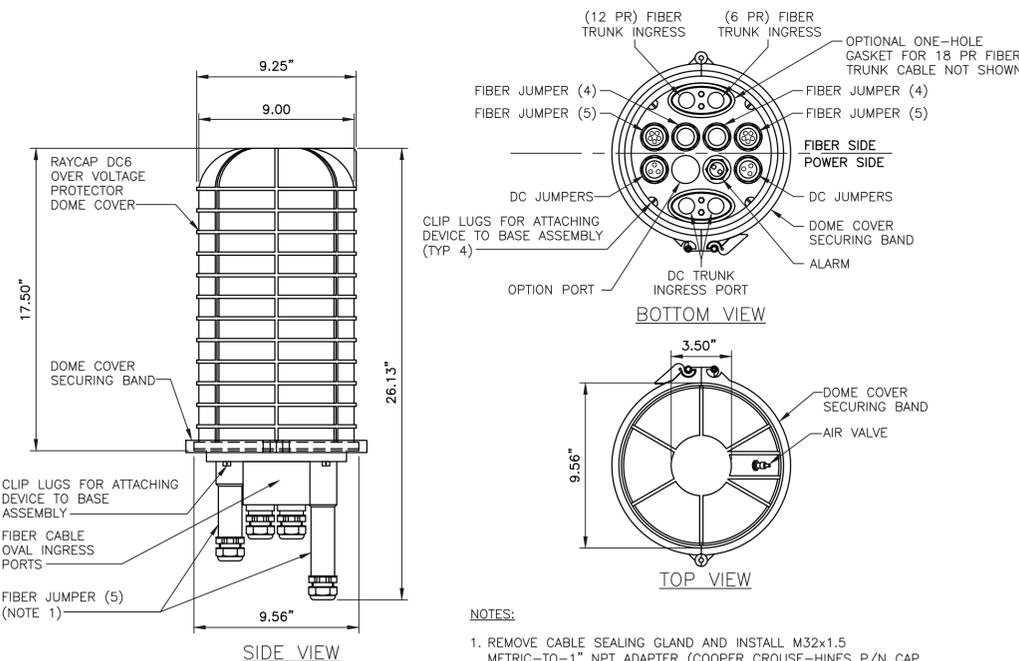
SIDE VIEW

WEIGHT:
 FRAME W/DC POWER SYSTEM AND W/O BATTERIES = 435lbs
BATTERY SHELF (W/(4) 155AH BATTERIES = APPROXIMATELY 500lbs PER SHELF
CLEARANCE:
 FRONT = 36"
 REAR = 6"
 SIDES = 2"

- NOTES:**
- GE/LINEAGE FLOOR ANCHOR KIT (847135688) MAY BE USED UNLESS LOCAL REQUIREMENTS GOVERN.
 - DISCONNECT MAY BE MOUNTED TO EITHER SIDE OF TRAY OR DIRECTLY TO FRAMEWORK
 - PER MANUFACTURER, FRAME IS SEISMIC COMPLIANT UP TO 3 BATTERY SHELVES.

POWER PLANT DETAIL

SCALE: N.T.S.



SIDE VIEW

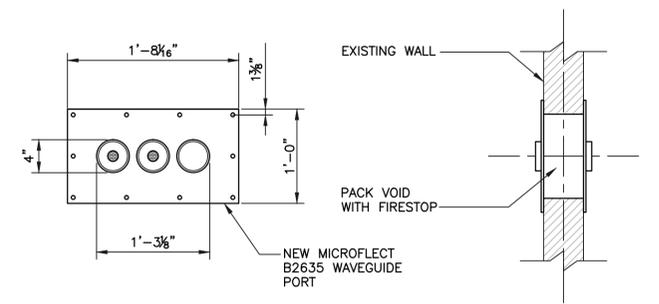
BOTTOM VIEW

TOP VIEW

- NOTES:**
- REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

DC-6 SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

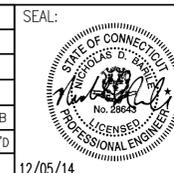


HATCH PLATE DETAIL

SCALE: N.T.S.

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SCALE: AS SHOWN DESIGNED BY: CJT DRAWN BY: CJT



AT&T		
DRAWING TITLE: DETAILS		
JOB NUMBER 14022-EMP	DRAWING NUMBER A-4	REV 0

MINIMUM SEPARATION OF 6'-0" TO BE MAINTAINED BETWEEN ALL PROPOSED AT&T LTE ANTENNAS

PROPOSED LTE ANTENNA MOUNTED TO EXISTING SECTOR FRAME (TYP. FOR 2 PER SECTOR, TOTAL OF 6)

RRUs MOUNTED BEHIND ANTENNAS ON EXISTING PIPE:

- (1) NEW RRUs PER SECTOR (3 TOTAL)
- (1) RELOCATED RRU PER SECTOR (3 TOTAL)
- (1) NEW A2 MODULE PER SECTOR (3 TOTAL)

EXISTING UMS ANTENNA & TMAs MOUNTED TO EXISTING SECTOR FRAME (TYP. FOR 1 PER SECTOR, TOTAL OF 3)

EXISTING AT&T SECTOR MOUNTING PLATFORM TO REMAIN

6'-0" MIN.

DC-6 SQUID MOUNTED TO PROPOSED VERTICAL PIPE (1 NEW, 1 EXISTING, 2 TOTAL)

PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)

SCALE: N.T.S.

AT&T ANTENNA MOUNTED TO EXISTING SECTOR FRAME (TYP. FOR 3 PER SECTOR, TOTAL OF 9)

RRUs MOUNTED BEHIND ANTENNAS ON EXISTING PIPE:

- (1) NEW RRUs PER SECTOR (3 TOTAL)
- (1) RELOCATED RRU PER SECTOR (3 TOTAL)
- (1) NEW A2 MODULE PER SECTOR (3 TOTAL)

DC-6 SQUID MOUNTED TO PROPOSED VERTICAL PIPE (1 NEW, 1 EXISTING, 2 TOTAL)

EXISTING MONOPOLE

EXISTING AT&T SECTOR MOUNTING PLATFORM TO REMAIN

16" MIN.

±5'-0"

PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

	SECTOR	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	-	-	-
	A3	POWERWAVE	7770	55"x11"x5"
	A4	KMW	AM-X-CD-17-65-00T-RET	96"x11.8"x5.9"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	-	-	-
	B3	POWERWAVE	7770	55"x11"x5"
	B4	KMW	AM-X-CD-17-65-00T-RET	96"x11.8"x5.9"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	-	-	-
	G3	POWERWAVE	7770	55"x11"x5"
	G4	KMW	AM-X-CD-17-65-00T-RET	96"x11.8"x5.9"

PROPOSED ANTENNA SCHEDULE

	SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1		POWERWAVE	7770	55"x11"x5"
	A2		CCI	OPA-65R-LCUU-H8	92.7"x14.4"x7.0"
	A3		-	-	-
	A4		CCI	OPA-65R-LCUU-H8	92.7"x14.4"x7.0"
BETA	B1		POWERWAVE	7770	55"x11"x5"
	B2		CCI	OPA-65R-LCUU-H8	92.7"x14.4"x7.0"
	B3		-	-	-
	B4		CCI	OPA-65R-LCUU-H8	92.7"x14.4"x7.0"
GAMMA	G1		POWERWAVE	7770	55"x11"x5"
	G2		CCI	OPA-65R-LCUU-H8	92.7"x14.4"x7.0"
	G3		-	-	-
	G4		CCI	OPA-65R-LCUU-H8	92.7"x14.4"x7.0"

PROPOSED RRH SCHEDULE

	SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA		ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
		ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
BETA		ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
		ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
GAMMA		ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
		ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		

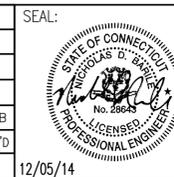
PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.



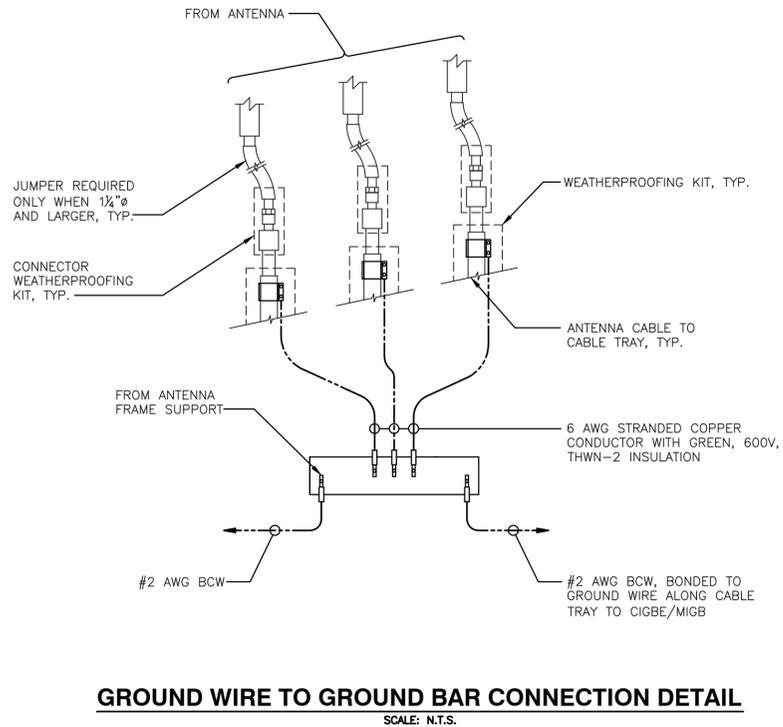
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SITE NAME: WINDHAM NORTH RIDGE ROAD
 10 NORTH RIDGE DRIVE
 WINDHAM, CT 06256
 WINDHAM COUNTY



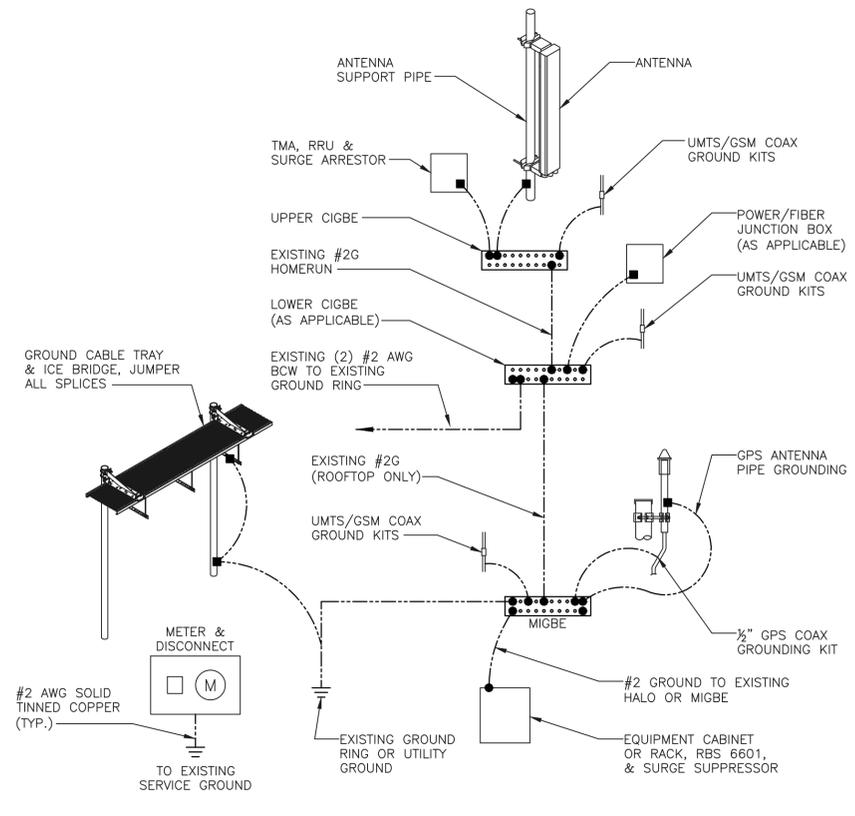
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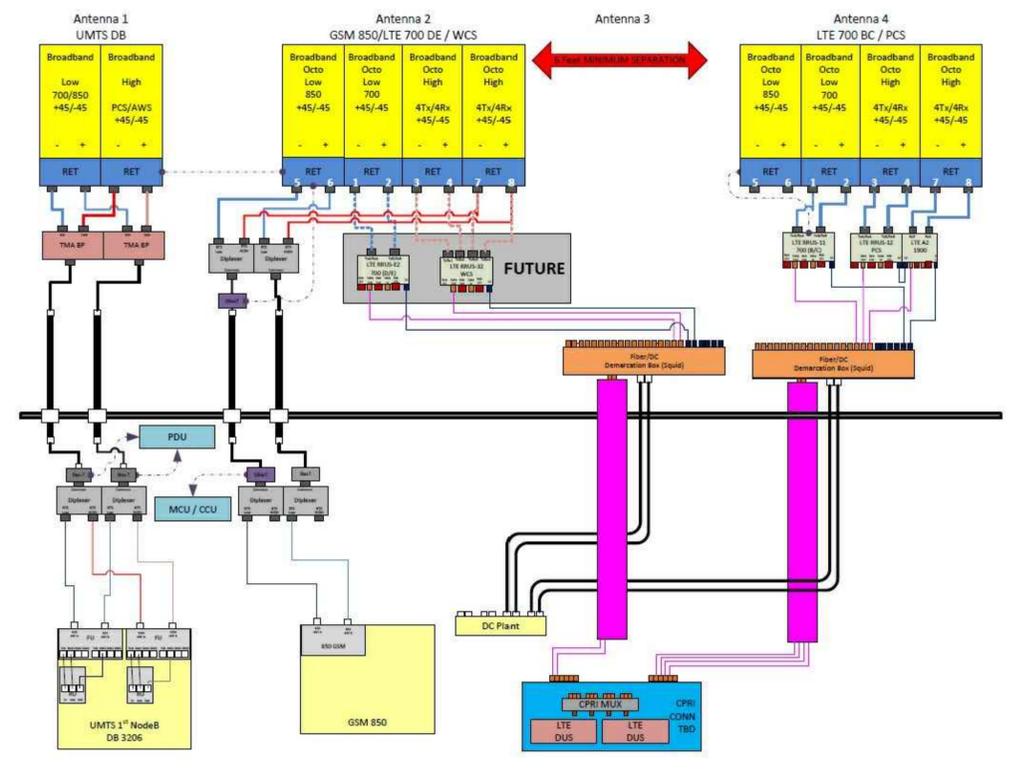
AT&T		
DRAWING TITLE:		
ANTENNA MOUNTING DETAILS		
JOB NUMBER	DRAWING NUMBER	REV
14022-EMP	A-5	0



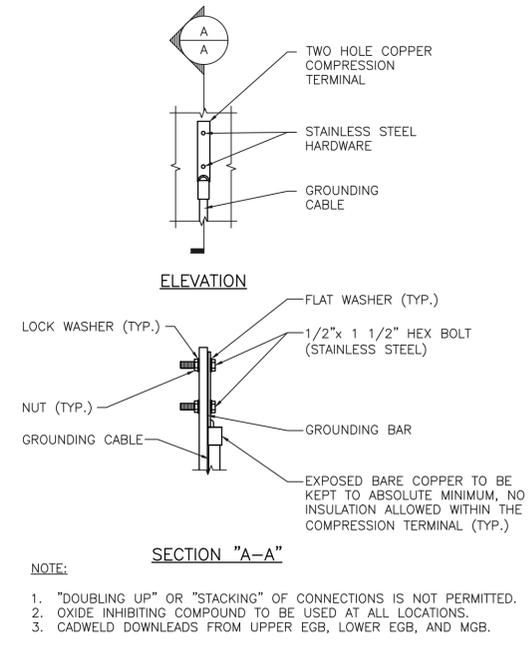
GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



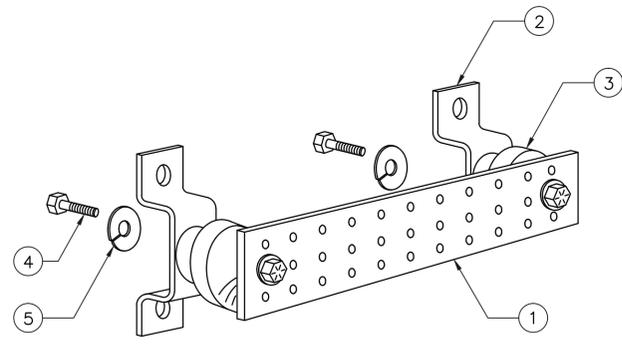
GROUNDING RISER DIAGRAM
SCALE: N.T.S.



PLUMBING DIAGRAM
SCALE: N.T.S.



TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.

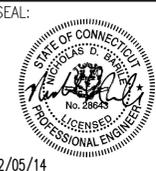


ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x 1/4")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	5/8"-11x1" H.H.C.S.
5	4	5/8" LOCK WASHER

GROUND BAR DETAIL
SCALE: N.T.S.

- NOTES:
- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION
- SECTION "P" - SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
 - GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
 - TELCO GROUND BAR
 - COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
 - +24V POWER SUPPLY RETURN BAR (#2)
 - 48V POWER SUPPLY RETURN BAR (#2)
 - RECTIFIER FRAMES
- SECTION "A" - SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
 - EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
 - METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
 - BUILDING STEEL (IF AVAILABLE) (#2)

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	12/05/14	INITIAL SUBMISSION	CJT	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: CJT	DRAWN BY: CJT		12/05/14



October 15, 2014

Darcy Tarr
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6589



B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject: **Structural Analysis Report**

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: CT1042
Carrier Site Name: Windham North Ridge Road

Crown Castle Designation: **Crown Castle BU Number:** 842423
Crown Castle Site Name: Windham North Ridge Road
Crown Castle JDE Job Number: 291534
Crown Castle Work Order Number: 772062
Crown Castle Application Number: 249050 Rev. 7

Engineering Firm Designation: **B+T Group Project Number:** 95362.001.01

Site Data: **10 NORTH RIDGE DRIVE, WINDHAM, Windham County, CT**
Latitude 41° 44' 23.53", Longitude -72° 10' 22.47"
88.7 Foot - Monopole Tower

Dear Darcy Tarr,

B+T Group 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 717690, in accordance with application 249050, revision 7.

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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at B+T Group 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.

Respectfully submitted by:
B+T Engineering, Inc.

James Lindsey
Project Engineer

Chad E. Tuttle, P.E.
President



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tnxTower Output

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1) INTRODUCTION

This tower is a 88.7 ft Monopole tower designed by EEI in March of 2005. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. Manufacturer's drawings show the tower at three levels totaling to 106 ft. However, only the bottom two sections appear to be installed which makes the tower 88.7 ft. Continuing SA per previous analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 1 inch 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
87.0	88.0	6	Cci Antennas	OPA-65R-LCUU-H8	4	3/4 3/8	--
		3	Ericsson	RRUS A2 MODULE			
		3	Ericsson	RRUS-11 1900MHZ			
		1	Raycap	DC6-48-60-18			

Table 2 - Existing and Reserved 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
87.0	88.0	3	Cci Antennas	HPA-65R-BUU-H8	--	--	3
		6	Ericsson	RBS 6601			
		3	Powerwave Technologies	7770.00			
		6	Powerwave Technologies	LGP21401			
		3	Ericsson	RRUS 11			
		3	Powerwave Technologies	7770.00			
	1	Raycap	DC6-48-60-18				
	87.0	1	--	Platform Mount [LP 712-1]			
77.0	77.0	3	Alcatel Lucent	RRH2X40-AWS	2	1-5/8	2
		3	Alcatel Lucent	RRH2x40 700			
		6	Antel	BXA-171063/12CF			
		6	Antel	BXA-70063/6CF			
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			
		1	--	Platform Mount [LP 303-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) **Equipment To Be Removed**

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)
106	106	1	Generic	12' Low Profile Platform	--	--
		6	Kathrein	AP14/17-880		
		12	Generic	Amplifiers		
		6	Generic	Future Directional Antenna		
96	96	1	Generic	12' Low Profile Platform	--	--
		6	Ems Wireless	RR90-17-02DP		
		6	Generic	Future Directional Antenna		
86	86	6	Antel	LPD-185063/8CF	--	--
		6	Antel	LPD-6513		
		1	Generic	12' Low Profile Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Locate, Revision# 7	249050	CCI Sites
Tower Manufacturer Drawings	EEl, Job No. 13253-E01	4943145	CCI Sites
Foundation Drawings	EEl, Project No. 13253-E01	4712164	CCI Sites
Geotech Report	JCI Eastern, Inc., Project No. 05191G	4290426	CCI Sites
Antenna Configuration	Crown CAD Package	Date:10/14/2014	CCI Sites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures 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 the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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 (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	88.7 - 47.57	Pole	TP30.46x21.89x0.25	1	-7.721	1208.995	48.9	Pass
L2	47.57 - 0	Pole	TP39.75x29.058x0.313	2	-15.700	2033.585	64.6	Pass
							Summary	
						Pole (L2)	64.6	Pass
						RATING =	64.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	45.3	Pass
1	Base Plate	Base	64.6	Pass
1	Base Foundation	Base	48.5	Pass

Structure Rating (max from all components) =	64.6%
---	--------------

Notes:

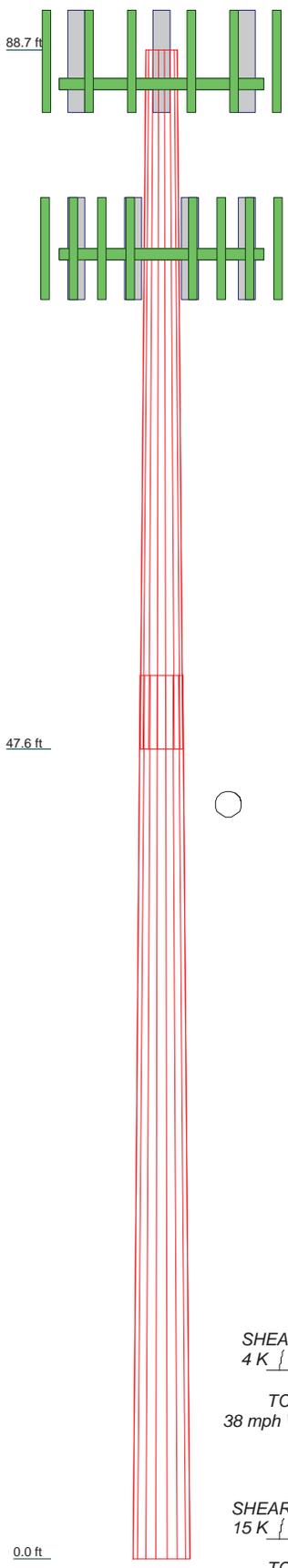
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

Section	1	2
Length (ft)	41.130	51.900
Number of Sides	18	18
Thickness (in)	0.250	0.313
Socket Length (ft)	4.330	29.058
Top Dia (in)	21.890	39.750
Bot Dia (in)	30.460	
Grade	A572-65	A572-65
Weight (K)	2.9	6.0



DESIGNED APPURTENANCE LOADING

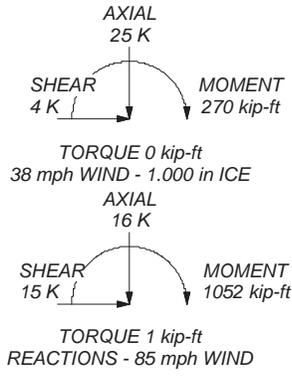
TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ Mount Pipe (E)	87	6' x 2" Mount Pipe (E)	87
7770.00 w/ Mount Pipe (E)	87	6' x 2" Mount Pipe (E)	87
7770.00 w/ Mount Pipe (E)	87	6' x 2" Mount Pipe (E-For Raycap)	87
RRUS 11 (E)	87	Platform Mount (LP 712-1) (E)	87
RRUS 11 (E)	87	(2) BXA-171063/12CF w/ Mount Pipe (R)	77
RRUS 11 (E)	87	(2) BXA-171063/12CF w/ Mount Pipe (R)	77
DC6-48-60-18 (E)	87	(2) BXA-171063/12CF w/ Mount Pipe (R)	77
(2) OPA-65R-LCUU-H8 w/ Mount Pipe (P)	87	(2) BXA-171063/12CF w/ Mount Pipe (R)	77
(2) OPA-65R-LCUU-H8 w/ Mount Pipe (P)	87	(2) BXA-70063/6CF w/ Mount Pipe (R)	77
(2) OPA-65R-LCUU-H8 w/ Mount Pipe (P)	87	(2) BXA-70063/6CF w/ Mount Pipe (R)	77
RRUS A2 MODULE (P)	87	RRH2x40 700 (R)	77
RRUS A2 MODULE (P)	87	RRH2x40 700 (R)	77
RRUS A2 MODULE (P)	87	RRH2x40 700 (R)	77
RRUS-11 1900MHz (P)	87	RRH2X40-AWS (R)	77
RRUS-11 1900MHz (P)	87	RRH2X40-AWS (R)	77
RRUS-11 1900MHz (P)	87	RRH2X40-AWS (R)	77
DC6-48-60-18 (P)	87	DB-T1-6Z-8AB-OZ (R)	77
6' x 2" Mount Pipe (E)	87	Platform Mount (LP 303-1) (E)	77

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Windham 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 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 64.6%



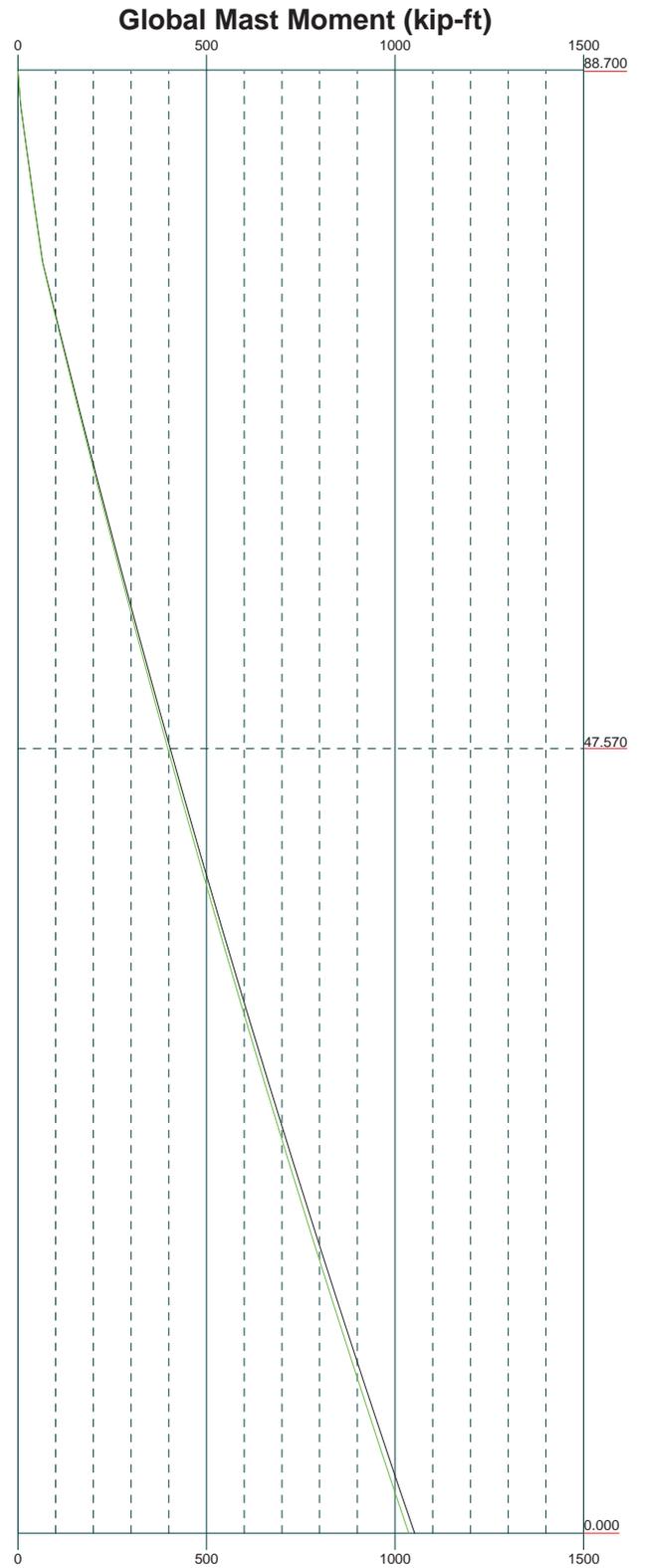
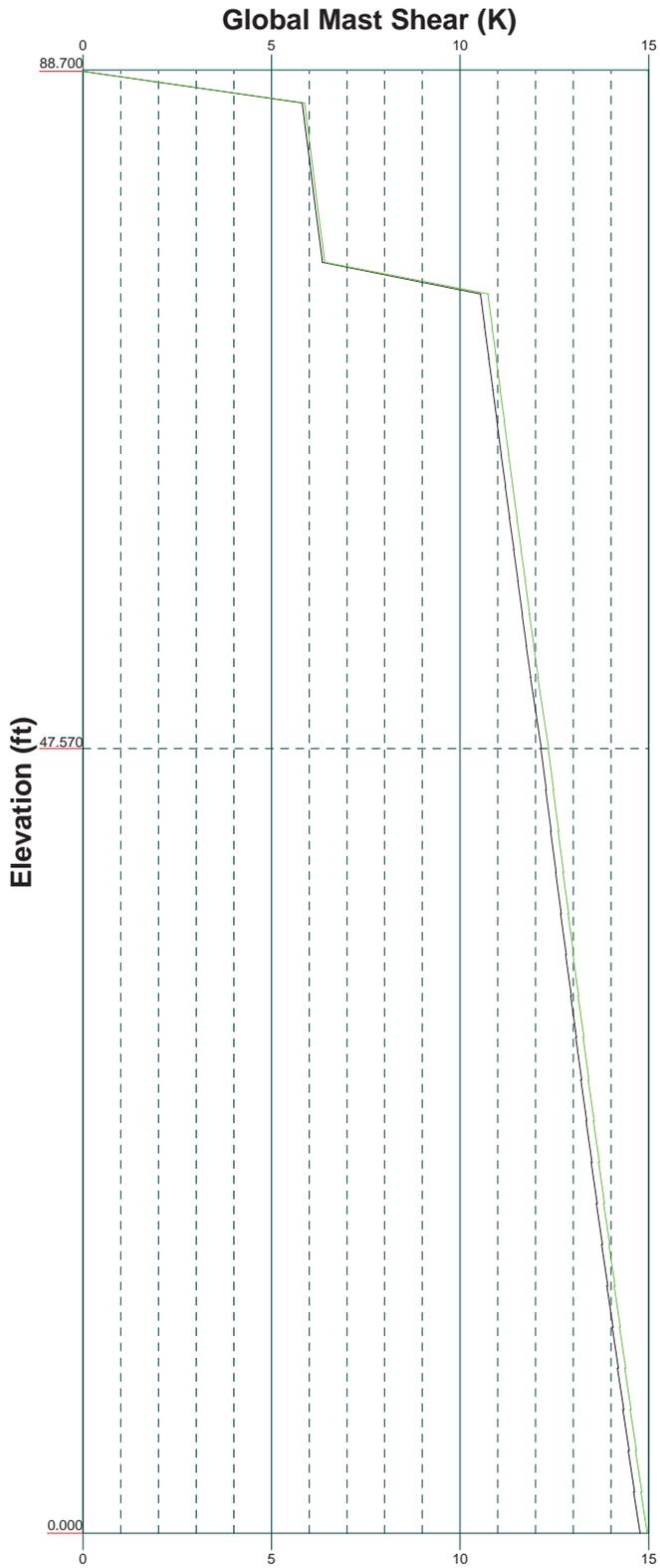
 B+T Group 1717 S. Boulder Ave., Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job: 95362.001.01 - WINDHAM NORTH RIDGE ROAD, CT (BU# 84242)
	Project:
	Client: Crown Castle Drawn by: James Lindsey App'd:
	Code: TIA/EIA-222-F Date: 10/15/14 Scale: NTS
	Path:

Vx

Vz

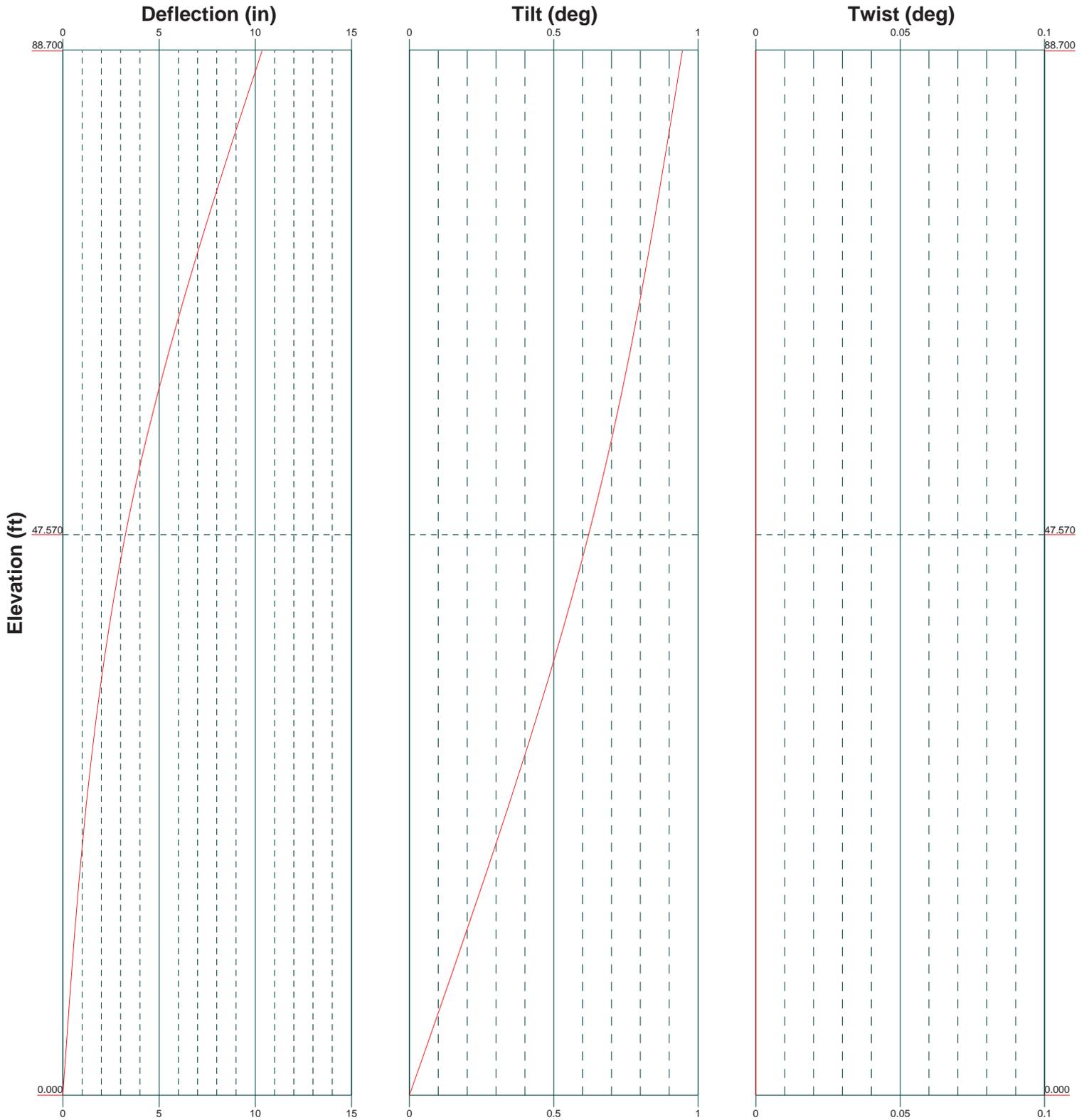
Mx

Mz



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Project:		
Client: Crown Castle	Drawn by: James Lindsey	App'd:
Code: TIA/EIA-222-F	Date: 10/15/14	Scale: NTS
Path:	Dwg No: E-4	

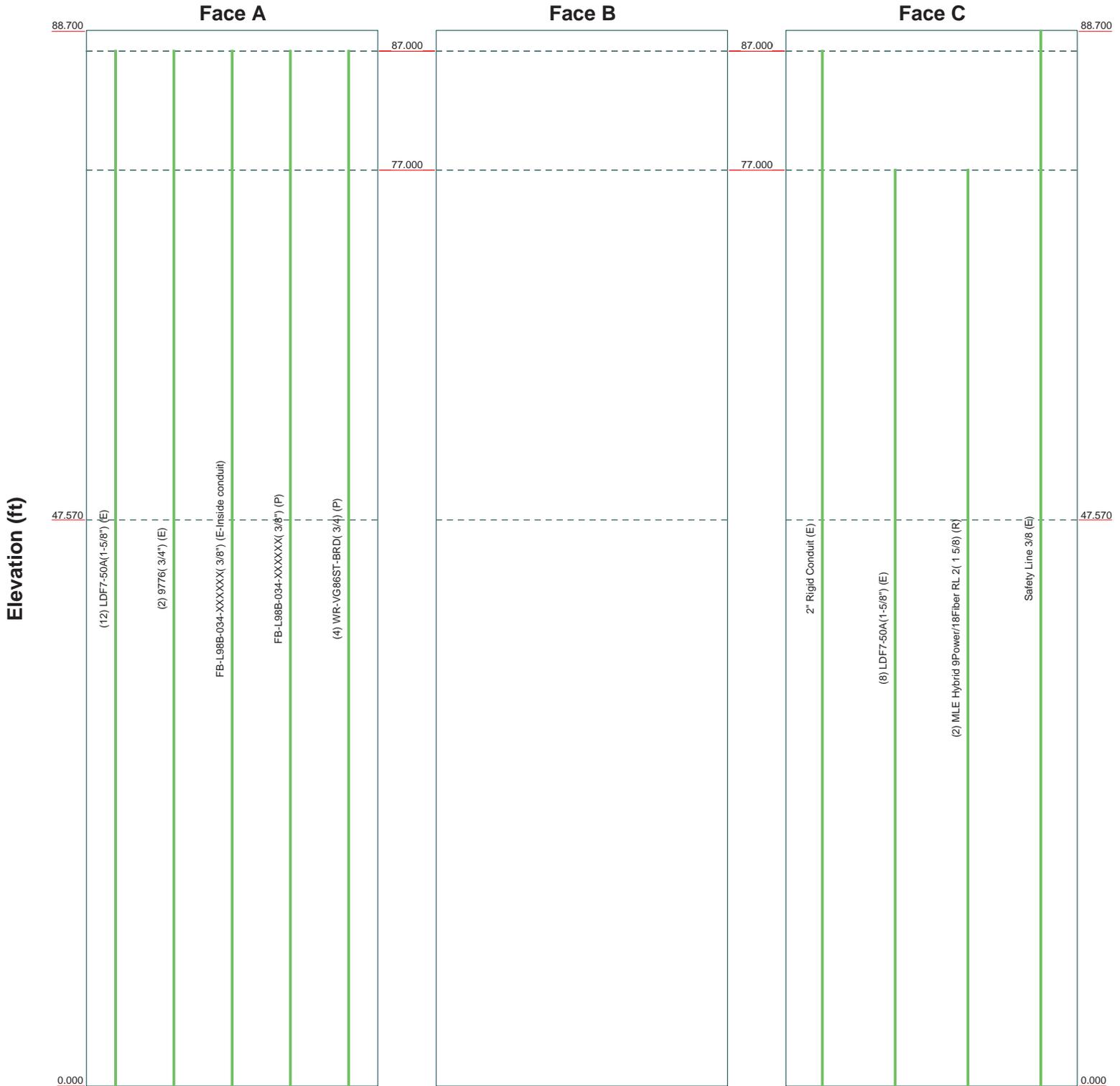


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	Project:		
	Client: Crown Castle	Drawn by: James Lindsey	App'd:
	Code: TIA/EIA-222-F	Date: 10/15/14	Scale: NTS
	Path:	Dwg No: E-5	

Feed Line Distribution Chart

0' - 88'8-13/32"

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



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	Project:		
	Client: Crown Castle	Drawn by: James Lindsey	App'd:
	Code: TIA/EIA-222-F	Date: 10/15/14	Scale: NTS
	Path:	Dwg No. E-7	

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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 Windham County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 1.000 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	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination	Use TIA-222-G Tension Splice Capacity	
	Exemption	

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	88.700-47.570	41.130	4.330	18	21.890	30.460	0.250	1.000	A572-65 (65 ksi)
L2	47.570-0.000	51.900		18	29.058	39.750	0.313	1.250	A572-65 (65 ksi)

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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	22.228	17.171	1015.912	7.682	11.120	91.358	2033.161	8.587	3.413	13.651
	30.930	23.972	2763.991	10.725	15.474	178.625	5531.618	11.988	4.921	19.684
L2	30.412	28.512	2976.420	10.205	14.761	201.636	5956.757	14.259	4.564	14.605
	40.363	39.117	7686.392	14.000	20.193	380.646	15382.898	19.562	6.446	20.627

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 88.700-47.570				1	1	1		
L2 47.570-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Face Offset	Lateral Offset	#	C _{AA}	Weight	
				ft	in	(Frac FW)		ft ² /ft	klf	
LDF7-50A(1-5/8") (E)	A	No	Inside Pole	87.000 - 0.000	0.000	0	12	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
9776(3/4") (E)	A	No	Inside Pole	87.000 - 0.000	0.000	0	2	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
FB-L98B-034-XXXXXX(3/8") (E-Inside conduit)	A	No	Inside Pole	87.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
FB-L98B-034-XXXXXX(3/8") (P)	A	No	Inside Pole	87.000 - 0.000	0.000	0	1	No Ice	0.000	0.000
								1/2" Ice	0.000	0.000
								1" Ice	0.000	0.000
								2" Ice	0.000	0.000
								4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (P)	A	No	Inside Pole	87.000 - 0.000	0.000	0	4	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C _A A _A ft ² /ft	Weight klf
2" Rigid Conduit (E)	C	No	Inside Pole	87.000 - 0.000	0.000	0	1	4" Ice	0.000	0.001
								No Ice	0.000	0.003
								1/2" Ice	0.000	0.003
								1" Ice	0.000	0.003
								2" Ice	0.000	0.003
G										
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	77.000 - 0.000	0.000	0	8	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) (R)	C	No	Inside Pole	77.000 - 0.000	0.000	0	2	No Ice	0.000	0.001
								1/2" Ice	0.000	0.001
								1" Ice	0.000	0.001
								2" Ice	0.000	0.001
								4" Ice	0.000	0.001
G										
Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	88.700 - 0.000	0.000	0.1	1	No Ice	0.037	0.000
								1/2" Ice	0.137	0.001
								1" Ice	0.238	0.001
								2" Ice	0.437	0.002
								4" Ice	0.838	0.004
G										

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	88.700-47.570	A	0.000	0.000	0.000	0.000	0.509
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.542	0.375
L2	47.570-0.000	A	0.000	0.000	0.000	0.000	0.614
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.784	0.558

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	88.700-47.570	A	1.090	0.000	0.000	0.000	0.000	0.509
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	10.505	0.423
L2	47.570-0.000	A	1.000	0.000	0.000	0.000	0.000	0.614
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	12.150	0.612

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	88.700-47.570	-0.057	0.033	-0.332	0.192
L2	47.570-0.000	-0.058	0.033	-0.346	0.200

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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
7770.00 w/ Mount Pipe (E)	A	From Leg	4.000	0.000	0.000	87.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.103
			1.000				1" Ice	7.128	5.711	0.157
							2" Ice	8.164	7.155	0.287
							4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe (E)	B	From Leg	4.000	0.000	0.000	87.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.103
			1.000				1" Ice	7.128	5.711	0.157
							2" Ice	8.164	7.155	0.287
							4" Ice	10.360	10.412	0.665
7770.00 w/ Mount Pipe (E)	C	From Leg	4.000	0.000	0.000	87.000	No Ice	6.119	4.254	0.055
			0.000				1/2" Ice	6.626	5.014	0.103
			1.000				1" Ice	7.128	5.711	0.157
							2" Ice	8.164	7.155	0.287
							4" Ice	10.360	10.412	0.665
RRUS 11 (E)	A	From Leg	4.000	0.000	0.000	87.000	No Ice	3.249	1.373	0.048
			0.000				1/2" Ice	3.491	1.551	0.068
			1.000				1" Ice	3.741	1.738	0.092
							2" Ice	4.268	2.138	0.150
							4" Ice	5.426	3.042	0.310
RRUS 11 (E)	B	From Leg	4.000	0.000	0.000	87.000	No Ice	3.249	1.373	0.048
			0.000				1/2" Ice	3.491	1.551	0.068
			1.000				1" Ice	3.741	1.738	0.092
							2" Ice	4.268	2.138	0.150
							4" Ice	5.426	3.042	0.310
RRUS 11 (E)	C	From Leg	4.000	0.000	0.000	87.000	No Ice	3.249	1.373	0.048
			0.000				1/2" Ice	3.491	1.551	0.068
			1.000				1" Ice	3.741	1.738	0.092
							2" Ice	4.268	2.138	0.150
							4" Ice	5.426	3.042	0.310
DC6-48-60-18 (E)	A	From Leg	1.000	0.000	0.000	87.000	No Ice	4.449	1.465	0.048
			0.000				1/2" Ice	4.739	1.683	0.072
			1.000				1" Ice	5.038	1.909	0.100
							2" Ice	5.661	2.387	0.167
							4" Ice	7.012	3.448	0.349
(2) OPA-65R-LCUU-H8 w/ Mount Pipe (P)	A	From Leg	4.000	0.000	0.000	87.000	No Ice	13.216	9.319	0.120
			0.000				1/2" Ice	14.017	10.790	0.214
			1.000				1" Ice	14.824	12.242	0.318
							2" Ice	16.388	14.499	0.560
							4" Ice	19.632	19.213	1.219
(2) OPA-65R-LCUU-H8 w/ Mount Pipe (P)	B	From Leg	4.000	0.000	0.000	87.000	No Ice	13.216	9.319	0.120
			0.000				1/2" Ice	14.017	10.790	0.214
			1.000				1" Ice	14.824	12.242	0.318
							2" Ice	16.388	14.499	0.560
							4" Ice	19.632	19.213	1.219
(2) OPA-65R-LCUU-H8 w/ Mount Pipe (P)	C	From Leg	4.000	0.000	0.000	87.000	No Ice	13.216	9.319	0.120
			0.000				1/2" Ice	14.017	10.790	0.214
			1.000				1" Ice	14.824	12.242	0.318
							2" Ice	16.388	14.499	0.560
							4" Ice	19.632	19.213	1.219
RRUS A2 MODULE (P)	A	From Leg	4.000	0.000	0.000	87.000	No Ice	1.867	0.423	0.021
			0.000				1/2" Ice	2.051	0.532	0.031
			1.000				1" Ice	2.244	0.650	0.044
							2" Ice	2.657	0.912	0.077

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
RRUS A2 MODULE (P)	B	From Leg	4.000	0.000	87.000	4" Ice	3.585	1.540	0.177
			0.000	0.000		No Ice	1.867	0.423	0.021
			1.000	0.000		1/2" Ice	2.051	0.532	0.031
				1.000		1" Ice	2.244	0.650	0.044
						2" Ice	2.657	0.912	0.077
RRUS A2 MODULE (P)	C	From Leg	4.000	0.000	87.000	4" Ice	3.585	1.540	0.177
			0.000	0.000		No Ice	1.867	0.423	0.021
			1.000	0.000		1/2" Ice	2.051	0.532	0.031
				1.000		1" Ice	2.244	0.650	0.044
						2" Ice	2.657	0.912	0.077
RRUS-11 1900MHz (P)	A	From Leg	4.000	0.000	87.000	4" Ice	3.585	1.540	0.177
			0.000	0.000		No Ice	2.942	1.190	0.044
			1.000	0.000		1/2" Ice	3.172	1.351	0.063
				1.000		1" Ice	3.410	1.521	0.086
						2" Ice	3.913	1.887	0.140
RRUS-11 1900MHz (P)	B	From Leg	4.000	0.000	87.000	4" Ice	5.023	2.721	0.291
			0.000	0.000		No Ice	2.942	1.190	0.044
			1.000	0.000		1/2" Ice	3.172	1.351	0.063
				1.000		1" Ice	3.410	1.521	0.086
						2" Ice	3.913	1.887	0.140
RRUS-11 1900MHz (P)	C	From Leg	4.000	0.000	87.000	4" Ice	5.023	2.721	0.291
			0.000	0.000		No Ice	2.942	1.190	0.044
			1.000	0.000		1/2" Ice	3.172	1.351	0.063
				1.000		1" Ice	3.410	1.521	0.086
						2" Ice	3.913	1.887	0.140
DC6-48-60-18 (P)	C	From Leg	4.000	0.000	87.000	4" Ice	5.023	2.721	0.291
			0.000	0.000		No Ice	4.449	1.465	0.048
			1.000	0.000		1/2" Ice	4.739	1.683	0.072
				1.000		1" Ice	5.038	1.909	0.100
						2" Ice	5.661	2.387	0.167
6' x 2" Mount Pipe (E)	A	From Leg	4.000	0.000	87.000	4" Ice	7.012	3.448	0.349
			0.000	0.000		No Ice	1.425	1.425	0.022
			1.000	0.000		1/2" Ice	1.925	1.925	0.033
				1.000		1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E)	B	From Leg	4.000	0.000	87.000	4" Ice	4.702	4.702	0.231
			0.000	0.000		No Ice	1.425	1.425	0.022
			1.000	0.000		1/2" Ice	1.925	1.925	0.033
				1.000		1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E)	C	From Leg	4.000	0.000	87.000	4" Ice	4.702	4.702	0.231
			0.000	0.000		No Ice	1.425	1.425	0.022
			1.000	0.000		1/2" Ice	1.925	1.925	0.033
				1.000		1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe (E-For Raycap)	A	From Leg	1.000	0.000	87.000	4" Ice	4.702	4.702	0.231
			0.000	0.000		No Ice	1.425	1.425	0.022
			1.000	0.000		1/2" Ice	1.925	1.925	0.033
				1.000		1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
Platform Mount [LP 712-1] (E)	C	None		0.000	87.000	4" Ice	4.702	4.702	0.231
				0.000		No Ice	24.530	24.530	1.335
				1.000		1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
		4" Ice	67.810	67.810	3.820				

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(2) BXA-171063/12CF w/ Mount Pipe (R)	A	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 5.029 1/2" Ice 5.583 1" Ice 6.103 2" Ice 7.166 4" Ice 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
(2) BXA-171063/12CF w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 5.029 1/2" Ice 5.583 1" Ice 6.103 2" Ice 7.166 4" Ice 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
(2) BXA-171063/12CF w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 5.029 1/2" Ice 5.583 1" Ice 6.103 2" Ice 7.166 4" Ice 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
(2) BXA-70063/6CF w/ Mount Pipe (R)	A	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 7.979 1/2" Ice 8.621 1" Ice 9.228 2" Ice 10.473 4" Ice 13.082	5.695 6.849 7.715 9.497 13.262	0.040 0.100 0.168 0.331 0.798
(2) BXA-70063/6CF w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 7.979 1/2" Ice 8.621 1" Ice 9.228 2" Ice 10.473 4" Ice 13.082	5.695 6.849 7.715 9.497 13.262	0.040 0.100 0.168 0.331 0.798
(2) BXA-70063/6CF w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 7.979 1/2" Ice 8.621 1" Ice 9.228 2" Ice 10.473 4" Ice 13.082	5.695 6.849 7.715 9.497 13.262	0.040 0.100 0.168 0.331 0.798
RRH2x40 700 (R)	A	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 2.290 1/2" Ice 2.493 1" Ice 2.705 2" Ice 3.155 4" Ice 4.158	1.206 1.363 1.529 1.887 2.706	0.050 0.067 0.086 0.134 0.271
RRH2x40 700 (R)	B	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 2.290 1/2" Ice 2.493 1" Ice 2.705 2" Ice 3.155 4" Ice 4.158	1.206 1.363 1.529 1.887 2.706	0.050 0.067 0.086 0.134 0.271
RRH2x40 700 (R)	C	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 2.290 1/2" Ice 2.493 1" Ice 2.705 2" Ice 3.155 4" Ice 4.158	1.206 1.363 1.529 1.887 2.706	0.050 0.067 0.086 0.134 0.271
RRH2X40-AWS (R)	A	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 2.522 1/2" Ice 2.753 1" Ice 2.993 2" Ice 3.499 4" Ice 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS (R)	B	From Leg	4.000 0.000 0.000	0.000	77.000	No Ice 2.522 1/2" Ice 2.753 1" Ice 2.993 2" Ice 3.499 4" Ice 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS (R)	C	From Leg	4.000 0.000	0.000	77.000	No Ice 2.522 1/2" Ice 2.753	1.589 1.795	0.044 0.061

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Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral	Vert					
			0.000				1" Ice	2.993	2.010	0.082
							2" Ice	3.499	2.465	0.132
							4" Ice	4.615	3.479	0.275
DB-T1-6Z-8AB-0Z (R)	A	From Leg	4.000	0.000	77.000	No Ice	5.600	2.333	0.044	
			0.000			1/2" Ice	5.915	2.558	0.080	
			0.000			1" Ice	6.240	2.791	0.120	
						2" Ice	6.914	3.284	0.213	
						4" Ice	8.365	4.373	0.455	
Platform Mount [LP 303-1] (E)	C	None		0.000	77.000	No Ice	14.660	14.660	1.250	
						1/2" Ice	18.870	18.870	1.481	
						1" Ice	23.080	23.080	1.713	
						2" Ice	31.500	31.500	2.175	
						4" Ice	48.340	48.340	3.101	
G										

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

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Comb. No.	Description
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	88.7 - 47.57	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-14.971	0.524	0.669
			Max. Mx	11	-7.734	345.481	-1.742
			Max. My	2	-7.721	-1.757	351.111
			Max. Vy	11	-11.873	345.481	-1.742
			Max. Vx	2	-12.069	-1.757	351.111
			Max. Torque	4			0.611
L2	47.57 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-25.071	0.629	0.608
			Max. Mx	11	-15.700	1036.291	-4.564
			Max. My	2	-15.700	-4.555	1051.993
			Max. Vy	11	-14.772	1036.291	-4.564
			Max. Vx	2	-14.964	-4.555	1051.993
			Max. Torque	4			0.610

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	25.071	-0.011	3.717
	Max. H _x	11	15.713	14.758	-0.053
	Max. H _z	2	15.713	-0.053	14.950
	Max. M _x	2	1051.993	-0.053	14.950
	Max. M _z	5	1035.816	-14.758	0.053
	Max. Torsion	4	0.610	-12.808	7.521
	Min. Vert	1	15.713	0.000	0.000
	Min. H _x	5	15.713	-14.758	0.053
	Min. H _z	8	15.713	0.053	-14.950
	Min. M _x	8	-1051.535	0.053	-14.950
	Min. M _z	11	-1036.291	14.758	-0.053
	Min. Torsion	10	-0.610	12.808	-7.521

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	15.713	0.000	0.000	-0.222	0.231	0.000
Dead+Wind 0 deg - No Ice	15.713	0.053	-14.950	-1051.993	-4.555	-0.285
Dead+Wind 30 deg - No Ice	15.713	7.426	-12.974	-913.479	-521.933	-0.517
Dead+Wind 60 deg - No Ice	15.713	12.808	-7.521	-530.264	-899.402	-0.610
Dead+Wind 90 deg - No Ice	15.713	14.758	-0.053	-5.021	-1035.816	-0.540

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 120 deg - No Ice	15.713	12.755	7.429	521.510	-894.615	-0.324
Dead+Wind 150 deg - No Ice	15.713	7.333	12.921	908.236	-513.636	-0.022
Dead+Wind 180 deg - No Ice	15.713	-0.053	14.950	1051.535	5.030	0.287
Dead+Wind 210 deg - No Ice	15.713	-7.426	12.974	913.022	522.407	0.518
Dead+Wind 240 deg - No Ice	15.713	-12.808	7.521	529.807	899.876	0.610
Dead+Wind 270 deg - No Ice	15.713	-14.758	0.053	4.564	1036.291	0.538
Dead+Wind 300 deg - No Ice	15.713	-12.755	-7.429	-521.967	895.090	0.323
Dead+Wind 330 deg - No Ice	15.713	-7.333	-12.921	-908.693	514.111	0.022
Dead+Ice+Temp	25.071	0.000	0.000	-0.608	0.629	0.000
Dead+Wind 0 deg+Ice+Temp	25.071	0.011	-3.717	-269.631	-0.348	-0.104
Dead+Wind 30 deg+Ice+Temp	25.071	1.848	-3.224	-234.096	-133.053	-0.153
Dead+Wind 60 deg+Ice+Temp	25.071	3.190	-1.868	-136.007	-229.931	-0.161
Dead+Wind 90 deg+Ice+Temp	25.071	3.677	-0.011	-1.646	-265.023	-0.126
Dead+Wind 120 deg+Ice+Temp	25.071	3.179	1.849	132.984	-228.925	-0.057
Dead+Wind 150 deg+Ice+Temp	25.071	1.829	3.213	231.810	-131.311	0.027
Dead+Wind 180 deg+Ice+Temp	25.071	-0.011	3.717	268.351	1.664	0.104
Dead+Wind 210 deg+Ice+Temp	25.071	-1.848	3.224	232.816	134.369	0.153
Dead+Wind 240 deg+Ice+Temp	25.071	-3.190	1.868	134.727	231.247	0.161
Dead+Wind 270 deg+Ice+Temp	25.071	-3.677	0.011	0.366	266.339	0.126
Dead+Wind 300 deg+Ice+Temp	25.071	-3.179	-1.849	-134.265	230.241	0.057
Dead+Wind 330 deg+Ice+Temp	25.071	-1.829	-3.213	-233.090	132.627	-0.027
Dead+Wind 0 deg - Service	15.713	0.018	-5.173	-364.298	-1.421	-0.099
Dead+Wind 30 deg - Service	15.713	2.569	-4.489	-316.351	-180.512	-0.179
Dead+Wind 60 deg - Service	15.713	4.432	-2.603	-183.700	-311.171	-0.212
Dead+Wind 90 deg - Service	15.713	5.107	-0.018	-1.888	-358.389	-0.187
Dead+Wind 120 deg - Service	15.713	4.413	2.571	180.369	-309.512	-0.112
Dead+Wind 150 deg - Service	15.713	2.537	4.471	314.234	-177.638	-0.008
Dead+Wind 180 deg - Service	15.713	-0.018	5.173	363.839	1.897	0.099
Dead+Wind 210 deg - Service	15.713	-2.569	4.489	315.893	180.987	0.179
Dead+Wind 240 deg - Service	15.713	-4.432	2.603	183.242	311.646	0.212
Dead+Wind 270 deg - Service	15.713	-5.107	0.018	1.430	358.864	0.187
Dead+Wind 300 deg - Service	15.713	-4.413	-2.571	-180.827	309.988	0.112
Dead+Wind 330 deg - Service	15.713	-2.537	-4.471	-314.693	178.114	0.008

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-15.713	0.000	0.000	15.713	0.000	0.000%
2	0.053	-15.713	-14.950	-0.053	15.713	14.950	0.000%
3	7.426	-15.713	-12.974	-7.426	15.713	12.974	0.000%
4	12.808	-15.713	-7.521	-12.808	15.713	7.521	0.000%
5	14.758	-15.713	-0.053	-14.758	15.713	0.053	0.000%
6	12.755	-15.713	7.429	-12.755	15.713	-7.429	0.000%
7	7.333	-15.713	12.921	-7.333	15.713	-12.921	0.000%
8	-0.053	-15.713	14.950	0.053	15.713	-14.950	0.000%
9	-7.426	-15.713	12.974	7.426	15.713	-12.974	0.000%
10	-12.808	-15.713	7.521	12.808	15.713	-7.521	0.000%
11	-14.758	-15.713	0.053	14.758	15.713	-0.053	0.000%
12	-12.755	-15.713	-7.429	12.755	15.713	7.429	0.000%
13	-7.333	-15.713	-12.921	7.333	15.713	12.921	0.000%
14	0.000	-25.071	0.000	0.000	25.071	0.000	0.000%
15	0.011	-25.071	-3.717	-0.011	25.071	3.717	0.000%
16	1.848	-25.071	-3.224	-1.848	25.071	3.224	0.000%
17	3.190	-25.071	-1.868	-3.190	25.071	1.868	0.000%
18	3.677	-25.071	-0.011	-3.677	25.071	0.011	0.000%
19	3.179	-25.071	1.849	-3.179	25.071	-1.849	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
20	1.829	-25.071	3.213	-1.829	25.071	-3.213	0.000%
21	-0.011	-25.071	3.717	0.011	25.071	-3.717	0.000%
22	-1.848	-25.071	3.224	1.848	25.071	-3.224	0.000%
23	-3.190	-25.071	1.868	3.190	25.071	-1.868	0.000%
24	-3.677	-25.071	0.011	3.677	25.071	-0.011	0.000%
25	-3.179	-25.071	-1.849	3.179	25.071	1.849	0.000%
26	-1.829	-25.071	-3.213	1.829	25.071	3.213	0.000%
27	0.018	-15.713	-5.173	-0.018	15.713	5.173	0.000%
28	2.569	-15.713	-4.489	-2.569	15.713	4.489	0.000%
29	4.432	-15.713	-2.603	-4.432	15.713	2.603	0.000%
30	5.107	-15.713	-0.018	-5.107	15.713	0.018	0.000%
31	4.413	-15.713	2.571	-4.413	15.713	-2.571	0.000%
32	2.537	-15.713	4.471	-2.537	15.713	-4.471	0.000%
33	-0.018	-15.713	5.173	0.018	15.713	-5.173	0.000%
34	-2.569	-15.713	4.489	2.569	15.713	-4.489	0.000%
35	-4.432	-15.713	2.603	4.432	15.713	-2.603	0.000%
36	-5.107	-15.713	0.018	5.107	15.713	-0.018	0.000%
37	-4.413	-15.713	-2.571	4.413	15.713	2.571	0.000%
38	-2.537	-15.713	-4.471	2.537	15.713	4.471	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00002542
3	Yes	4	0.00000001	0.00068089
4	Yes	4	0.00000001	0.00074426
5	Yes	4	0.00000001	0.00006996
6	Yes	4	0.00000001	0.00067016
7	Yes	4	0.00000001	0.00069148
8	Yes	4	0.00000001	0.00004173
9	Yes	4	0.00000001	0.00074162
10	Yes	4	0.00000001	0.00067586
11	Yes	4	0.00000001	0.00005360
12	Yes	4	0.00000001	0.00071018
13	Yes	4	0.00000001	0.00069115
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00030214
16	Yes	4	0.00000001	0.00033332
17	Yes	4	0.00000001	0.00033296
18	Yes	4	0.00000001	0.00029592
19	Yes	4	0.00000001	0.00032573
20	Yes	4	0.00000001	0.00032765
21	Yes	4	0.00000001	0.00029926
22	Yes	4	0.00000001	0.00033414
23	Yes	4	0.00000001	0.00033126
24	Yes	4	0.00000001	0.00029840
25	Yes	4	0.00000001	0.00033176
26	Yes	4	0.00000001	0.00033307
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00004442
29	Yes	4	0.00000001	0.00005534
30	Yes	4	0.00000001	0.00001211
31	Yes	4	0.00000001	0.00004387
32	Yes	4	0.00000001	0.00004718

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33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00005468
35	Yes	4	0.00000001	0.00004394
36	Yes	4	0.00000001	0.00001113
37	Yes	4	0.00000001	0.00005071
38	Yes	4	0.00000001	0.00004722

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	88.7 - 47.57	10.345	27	0.945	0.002
L2	51.9 - 0	3.798	27	0.663	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
87.000	7770.00 w/ Mount Pipe	27	10.006	0.934	0.002	24945
77.000	(2) BXA-171063/12CF w/ Mount Pipe	27	8.035	0.867	0.002	10660

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	88.7 - 47.57	29.852	3	2.727	0.006
L2	51.9 - 0	10.964	3	1.915	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
87.000	7770.00 w/ Mount Pipe	3	28.873	2.695	0.006	8676
77.000	(2) BXA-171063/12CF w/ Mount Pipe	3	23.188	2.501	0.005	3707

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Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	88.7 - 47.57 (1)	TP30.46x21.89x0.25	41.130	0.000	0.0	39.000	23.256	-7.721	906.973	0.009
L2	47.57 - 0 (2)	TP39.75x29.058x0.313	51.900	0.000	0.0	39.000	39.117	-15.700	1525.570	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	88.7 - 47.57 (1)	TP30.46x21.89x0.25	351.277	25.080	39.000	0.643	0.000	0.000	39.000	0.000
L2	47.57 - 0 (2)	TP39.75x29.058x0.313	1052.07	33.167	39.000	0.850	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} F _{vt}
L1	88.7 - 47.57 (1)	TP30.46x21.89x0.25	12.068	0.519	26.000	0.040	0.508	0.018	26.000	0.001
L2	47.57 - 0 (2)	TP39.75x29.058x0.313	14.962	0.382	26.000	0.029	0.517	0.008	26.000	0.000

Pole Interaction Design Data

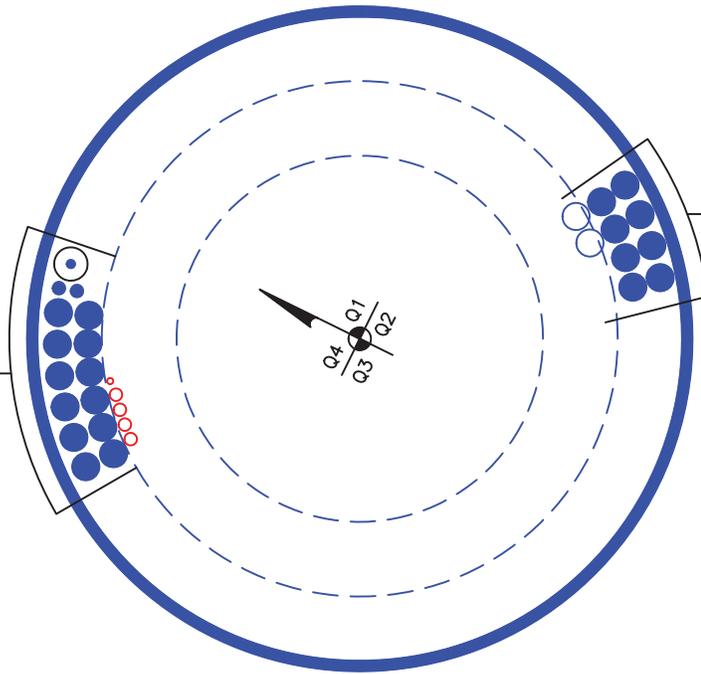
Section No.	Elevation ft	Ratio P P _a	Ratio f _{bx} F _{bx}	Ratio f _{by} F _{by}	Ratio f _v F _v	Ratio f _{vt} F _{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	88.7 - 47.57 (1)	0.009	0.643	0.000	0.040	0.001	0.652	1.333	H1-3+VT ✓
L2	47.57 - 0 (2)	0.010	0.850	0.000	0.029	0.000	0.861	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	88.7 - 47.57	Pole	TP30.46x21.89x0.25	1	-7.721	1208.995	48.9	Pass
L2	47.57 - 0	Pole	TP39.75x29.058x0.313	2	-15.700	2033.585	64.6	Pass
Summary								
Pole (L2)							64.6	Pass
RATING =							64.6	Pass

APPENDIX B
BASE LEVEL DRAWING

(PROPOSED)
(1) 3/8" TO 87 FT LEVEL
(4) 3/4" TO 87 FT LEVEL
(INSTALLED-IN CONDUIT)
(1) 3/8" TO 87 FT LEVEL
(INSTALLED)
(2) 3/4" TO 87 FT LEVEL
(12) 1-5/8" TO 87 FT LEVEL



(RESERVED)
(2) 1 5/8" TO 77 FT LEVEL
(INSTALLED)
(8) 1-5/8" TO 77 FT LEVEL

BUSINESS UNIT:95362

APPENDIX C
ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, UngROUTED, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: 842423
Site Name: WINDHAM NORTH RIDGE
App #: 249050 Rev # 7
Pole Manufacturer: <i>Other</i>

Reactions

Moment:	1052	ft-kips
Axial:	16	kips
Shear:	15	kips

Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	47	in

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

Anchor Rod Results

Maximum Rod Tension: 88.2 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 45.3% **Pass**

Non-Rigid

Service ASD
Fty*ASIF

Plate Data

Diam:	53	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.51	in

Base Plate Results

Base Plate Stress: 38.7 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 64.6% **Pass**

Flexural Check

Non-Rigid

Service ASD
0.75*Fy*ASIF
Y.L. Length:
25.08

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

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

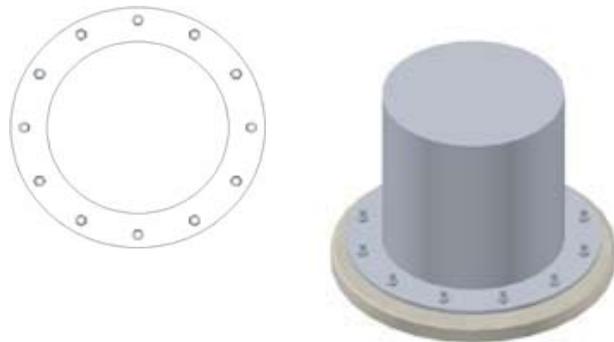
Pole Punching Shear Check: n/a

Pole Data

Diam:	39.75	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
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* 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

PROJECT	842423 - WINDHAM NORTH RIDGE ROAD		
SUBJECT	Foundation Analysis		
DATE	10/15/14	PAGE	1 OF 1

Monopole Pad & Pier Foundation Analysis

Rev. Type: **F**

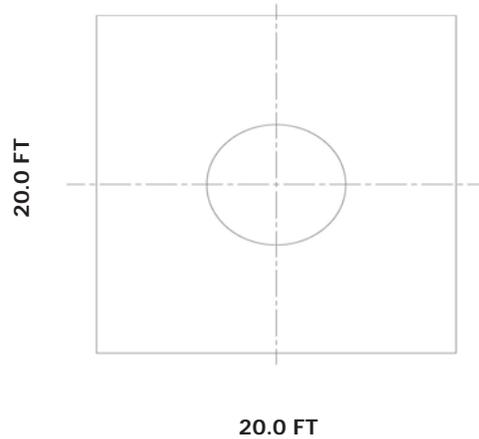
Design Loads:

Input unfactored loads

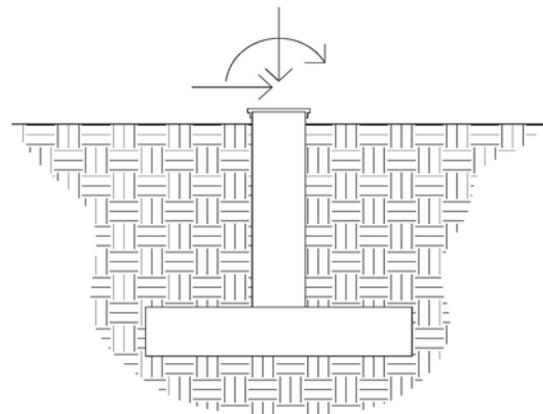
Shear:	<u>15.0</u>	kips
Moment:	<u>1,052.0</u>	ft-kips
Tower Height:	<u>88.7</u>	ft
Tower Weight:	<u>16.0</u>	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	<u>39.75</u>	in
Bearing Depth:	<u>6.0</u>	ft
Pad Width:	<u>20.0</u>	ft
Neglected Depth:	<u>3.5</u>	ft
Thickness:	<u>3.0</u>	ft
Pier Diameter:	<u>6.0</u>	ft
Pier Height Above Grade:	<u>1.0</u>	ft
BP Dist. Above Pier:	<u>4.0</u>	in
Clear Cover:	<u>4.0</u>	in
Pier Rebar Size:	<u>9</u>	
Pier Rebar Quantity:	<u>22</u>	
Pad Rebar Size:	<u>9</u>	
Pad Rebar Quantity:	<u>11</u>	
Pier Tie Size:	<u>3</u>	
Tie Quantity:	<u>6</u>	
Rebar Yield Strength:	<u>60000</u>	psi
Concrete Strength:	<u>3000</u>	psi
Concrete Unit Weight:	<u>0.15</u>	kcf



Elevation Overview



Soil Data:

Allowable Values

Soil Unit Weight:	<u>0.120</u>	kcf
Ult. Bearing Capacity:	<u>16.000</u>	ksf
Angle of Friction:	<u>30.000</u>	deg
Cohesion:	<u>0.000</u>	ksf
Passive Pressure:	<u>0.000</u>	ksf
Base Friction:	<u>0.500</u>	

** Notes:

Summary of Results

Req'd Pier Diam.	OK
Overturning	47.1%
Shear Capacity	16.1%
Bearing	15.9%
Pad Shear - 1-way	29.6%
Pad Shear - 2-way	3.5%
Pad Moment Capacity	29.4%
Pier Moment Capacity	48.5%

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

AT&T Existing Facility

Site ID: CT1042

**Windham - North Ridge Road
10 North Ridge Road
Windham, CT 06256**

November 24, 2014

EBI Project Number: 62146224

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	69.23 %

November 24, 2014

AT&T Mobility – New England
Attn: Cameron Syme
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 01701

Emissions Analysis for Site: **CT1042 – Windham - North Ridge Road**

EBI Consulting was directed to analyze the proposed AT&T facility located at **10 North Ridge Road, Windham, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 700 MHz and 800 MHz Bands are $467 \mu\text{W}/\text{cm}^2$ and $567 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the PCS and AWS bands is $1000 \mu\text{W}/\text{cm}^2$. 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 **10 North Ridge Road, Windham, 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 GSM channels (PCS Band -1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 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.
- 3) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 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.
- 5) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 6) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 7) 4 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 60 Watts
- 8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 9) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antennas used in this modeling are the **Powerwave 7770** for 850 MHz and 1900 MHz (PCS) channels and the **CCI OPA-65R-LCUU-H6** for 700 MHz, 850 MHz, 1900 MHz and 2300 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Powerwave 7770** has a maximum gain of **13.3 dBd for 850 MHz and 15.5 dBd for 1900 MHz** at its main lobe. The **CCI OPA-65R-LCUU-H6** has a maximum gain of **13.9 dBd for 700 MHz, 14.5 dBd for 850 MHz, 15.8 dBd for 2100 MHz and 17.56 dBd for 2300 MHz** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 11) The antenna mounting height centerlines of the proposed antennas are **87 feet and 85 feet** above ground level (AGL).
- 12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

AT&T Site Inventory and Power Data

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:	15.5 / 13.5 dBd	Gain:	15.5 / 13.5 dBd	Gain:	15.5 / 13.5 dBd
Height (AGL):	87 feet	Height (AGL):	87 feet	Height (AGL):	87 feet
Frequency Bands	1900 MHz(PCS) / 850 MHz	Frequency Bands	1900 MHz(PCS) / 850 MHz	Frequency Bands	1900 MHz(PCS) / 850 MHz
Channel Count	8	Channel Count	8	# PCS Channels:	8
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	3,172.53	ERP (W):	3,172.53	ERP (W):	3,172.53
Antenna A1 MPE%	4.15	Antenna B1 MPE%	4.15	Antenna C1 MPE%	4.15
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	13.5/14.5/15.8/17.56 dBd	Gain:	13.5/14.5/15.8/17.56 dBd	Gain:	13.5/14.5/15.8/17.56 dBd
Height (AGL):	87 feet	Height (AGL):	87 feet	Height (AGL):	87 feet
Frequency Bands	700 MHz / 850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	Frequency Bands	700 MHz / 850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)	Frequency Bands	700 MHz / 850 MHz / 1900 MHz (PCS) / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	240	Total TX Power:	240	Total TX Power:	240
ERP (W):	3,522.41	ERP (W):	3,522.41	ERP (W):	3,522.41
Antenna A2 MPE%	7.15	Antenna B2 MPE%	7.15	Antenna C2 MPE%	7.15
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	13.9 / 17.2 dBd	Gain:	13.9 / 17.2 dBd	Gain:	13.9 / 17.2 dBd
Height (AGL):	87 feet	Height (AGL):	87 feet	Height (AGL):	87 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:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	3,534.37	ERP (W):	3,534.37	ERP (W):	3,534.37
Antenna A3 MPE%	7.07	Antenna B3 MPE%	7.07	Antenna C3 MPE%	7.07

Site Composite MPE%	
Carrier	MPE%
AT&T	55.13 %
Verizon Wireless	14.10 %
Site Total MPE %:	69.23 %

AT&T Sector 1 Total:	18.38 %
AT&T Sector 2 Total:	18.38 %
AT&T Sector 3 Total:	18.38 %
Site Total:	69.23 %

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 1:	18.38%
Sector 2:	18.38 %
Sector 3 :	18.38 %
AT&T Total:	55.13 %
Site Total:	69.23 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **69.23%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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



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