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: 807133**
AT&T Site ID: CT2122
50 Rockland Road, Norwalk, CT 06854
Latitude: 41° 4' 54.44" / Longitude: -73° 25' 49.52"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 102-foot level of the existing 180-foot self-support tower at 50 Rockland Road in Norwalk, CT. The tower is owned by Crown Castle. The property is owned by Connecticut Light & Power Company. AT&T now replace three (3) Powerwave antennas with three (3) Quintel antennas. These antennas would be placed at the 102-foot level of the tower. AT&T also intends to install three (3) RRU-32s, two (2) DC, one (1) fiber, six (6) triplexers, and remove six (6) TMAs.

This facility was approved by the by the Connecticut Siting Council in Docket No. 73 on April 1, 1987. This approval included the conditions that:

1. The Norwalk Tower, including antennas, shall be no taller than necessary to provide the proposed service, and in no event shall exceed 193 feet.
2. A fence not lower than eight feet shall surround the Norwalk tower.
3. Unless necessary to comply with condition number four, below, no light shall be installed on the Norwalk tower.
4. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations.

This modification complies with the aforementioned condition(s).

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 Harry Rilling, Mayor, Town of Norwalk, 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: The Honorable Harry Rilling, Mayor
Town of Norwalk
125 East Avenue PO Box 5125
Norwalk, CT 06856

Connecticut Light & Power
PO Box 2957 Northeast Utilities
Hartford, CT 06141

50 ROCKLAND RD

Location	50 ROCKLAND RD	**Mblu**	5/ 82/ 58/ 0/
Acct#	25665	**Owner**	CROWN ATLANTIC COMPANY LLC
Assessment	$1,007,240	**Appraisal**	$1,438,900
PID	25665	**Building Count**	1

Assessing Distr...

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$991,370	$447,530	$1,438,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$693,970	$313,270	$1,007,240

Owner of Record

Owner	CROWN ATLANTIC COMPANY LLC	**Sale Price**	$1,600,000
Co-Owner		**Certificate**	
Address	PMB 353 4017 WASHINGTON RD McMURRAY, PA 15317-0000	**Book & Page**	3701/331
		Sale Date	04/16/1999

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
CROWN ATLANTIC COMPANY LLC	$1,600,000		3701/331	04/16/1999
CELLCO PARTNERSHIP,	$1,020,000		3489/348	04/03/1998
DEVIVO MARIO + WENCHE	$0		0/0	

Building Information

Building 1 : Section 1

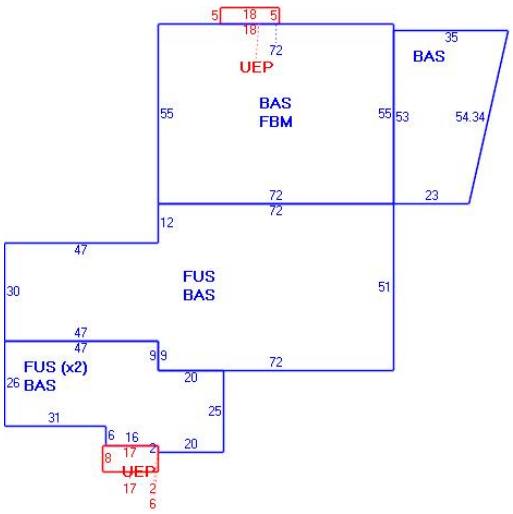
Year Built:	1987
Living Area:	21,115
Replacement Cost:	$1,084,957
Building Percent Good:	47
Replacement Cost Less Depreciation:	$509,930

Building Photo

Building Attributes	
Field	**Description**
STYLE	Light Indust
MODEL	Industrial
Stories:	3.00
Occupancy	1.00
Exterior Wall 1	Concrete
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	Concrete
Heating Fuel	Gas
Heating Type	Forced Air
AC Percent	60
Heat Percent	100
Bldg Use	Industrial
Total Rooms	0
Bedrooms	0
FBM Area	
Heat/AC	Heat/AC Pkg
Frame	Masonry
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	13.00
% Sprinkler	40.00

(http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\72/74.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	12,397	12,397
FUS	Finished Upper Story	8,718	8,718
FBM	Finished Basement	3,960	0
UEP	Utility Enclosed Porch	226	0
		25,301	21,115

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
ELV1	Pass Elevator	1.00 UNITS	$21,150	1
A/C	Air Conditioning	12669.00 S.F.	$14,890	1
SPR	Sprinklers	8446.00 S.F.	$7,940	1
ELVS	Elevator per stop	1.00 UNITS	$3,760	1

Land

Land Use

Use Code	301
Description	Industrial
Zone	RI
Neighborhood	C530

Land Line Valuation

Size (Acres)	0.82
Frontage	
Depth	
Assessed Value	$313,270
Appraised Value	$447,530

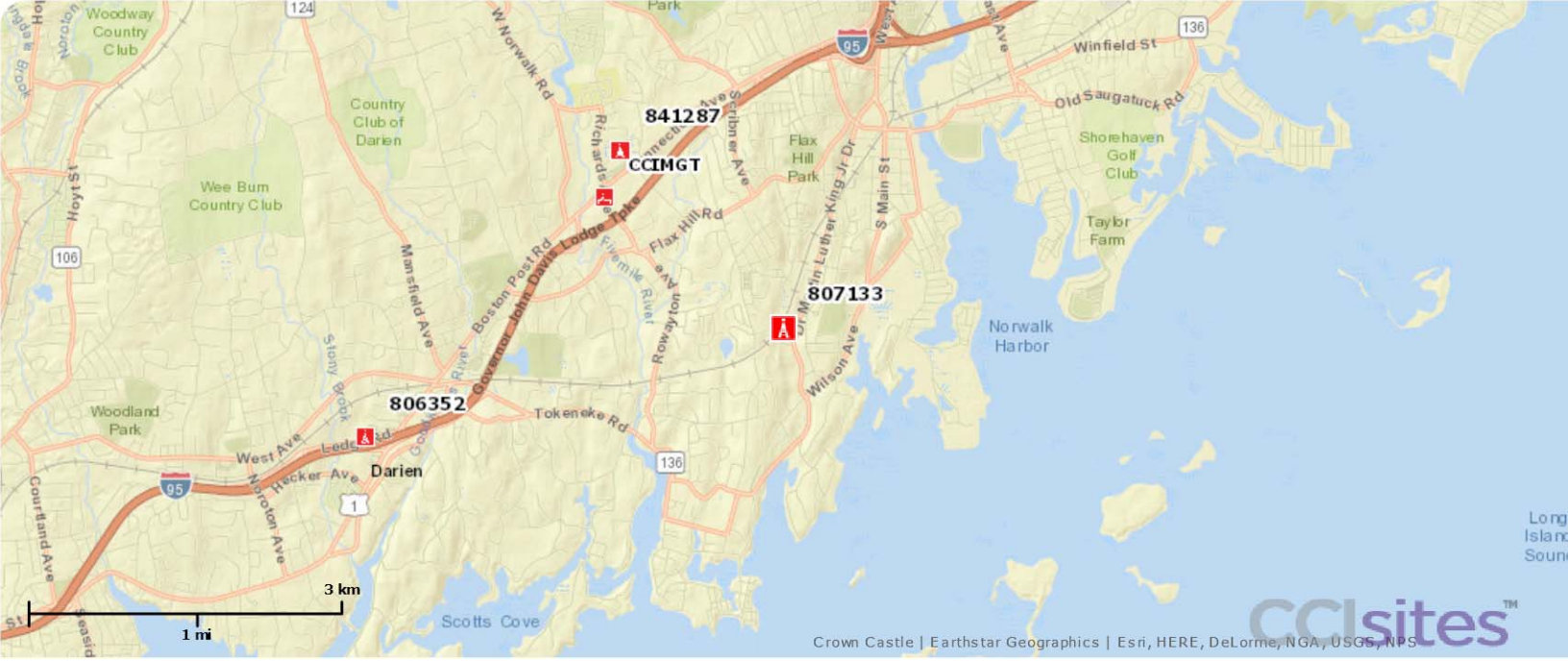
Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving Asph.			16900.00 S.F.	$17,750	1
FN6	Fence 6'			450.00 L.F.	$3,150	1
SHD4	Cell Equip	FR	Frame	128.00 S.F.	$6,400	1
CEL1	Cell Tower			5.00 UNITS	$400,000	1
SHD4	Cell Equip	FR	Frame	128.00 S.F.	$6,400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$991,370	$447,530	$1,438,900
2013	$991,370	$447,530	$1,438,900
2012	$560,200	$461,300	$1,021,500

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$693,970	$313,270	$1,007,240
2013	$693,970	$313,270	$1,007,240
2012	$392,140	$322,910	$715,050


841287
CCIMGT
807133
806352
Woodway Country Club
Country Club of Darien
Wee Burn Country Club
Woodland Park
Darien
Norwalk Harbor
Scotts Cove
Taylor Farm
Shorehaven Golf Club
Flax Hill Park
Winfield St
Old Saugatuck Rd
Flax Hill Rd
Tokeneke Rd
West Ave
Leeds Rd
Hecker Ave
Mansfield Ave
Boston Post Rd
Governor John Davis Lodge Tpke
Rowayton Ave
Wilson Ave
S Main St
Dr Martin Luther King Jr Dr
Schriber Ave
Richards Ln
W Norwalk Rd
Hoyt St
Courtland Ave
Norton Ave
Stony Brook
Fivemile River
3 km
1 mi
Crown Castle | Earthstar Geographics | Esri, HERE, DeLorme, NGA, USGS, NPS
CCIsites™

PROJECT INFORMATION

SCOPE OF WORK:

- AT&T ANTENNAS: (3) EXISTING ANTENNA PER SECTOR FOR A TOTAL OF (9) ANTENNAS, (3) TO BE REMOVED AND REPLACED WITH NEW ANTENNA
- AT&T RRUs: (2) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) NEW RRUs; (1) NEW RRUS TO REPLACE EXISTING RRU PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUS; (1) EXISTING RRU PER SECTOR TO REMAIN, FOR A TOTAL OF (3) EXISTING RRUs.
- AT&T TRIPLEXERS: INSTALL (2) TRIPLEXERS AT ANTENNA LOCATION PER SECTOR AND (2) TRIPLEXERS AT EQUIPMENT LOCATION PER SECTOR FOR A TOTAL OF (12) TRIPLEXERS
- AT&T SQUID: (1) NEW DC6 SQUID; (1) EXISTING DC6 SQUID TO REMAIN

SITE ADDRESS:	50 ROCKLAND ROAD NORWALK, CT 06854
LATITUDE:	41.0813811 41° 4' 52.97"N
LONGITUDE:	−73.4309431 −73° 25' 51.395"W
USID:	60407
TOWER OWNER:	CROWN CASTLE
TYPE OF SITE:	MONOPOLE/OUTDOOR EQUIPMENT
MONOPOLE HEIGHT:	180'−0"±
RAD CENTER:	103'−0"±
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

DRAWING INDEX

		REV.
T−1	TITLE SHEET	0
GN−1	GROUNDING & GENERAL NOTES	0
A−1	COMPOUND LAYOUT	0
A−2	EQUIPMENT LAYOUT	0
A−3	ANTENNA LAYOUTS & ELEVATIONS	0
A−4	DETAILS	0
A−5	ANTENNA MOUNTING DETAILS	0
G−1	GROUNDING, ONE−LINE DIAGRAM & DETAILS	0

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 AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

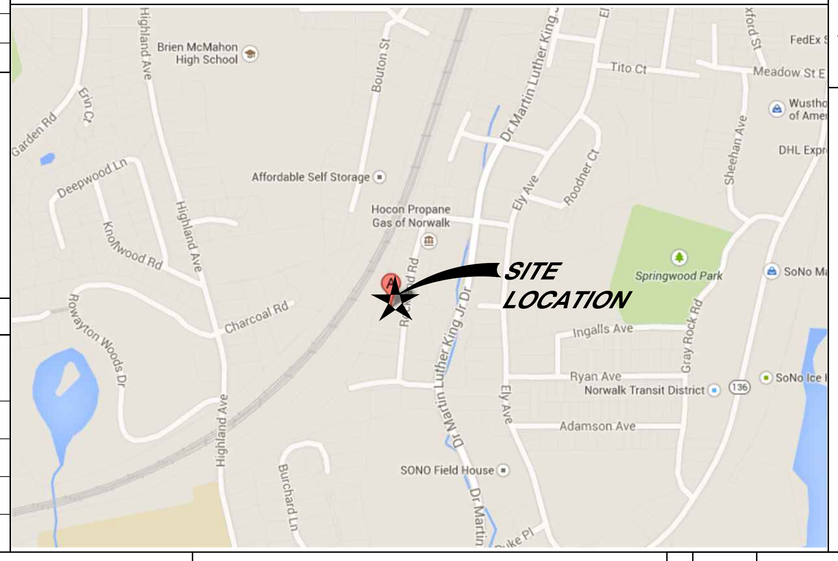
DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035123
SITE NUMBER: CT2122
SITE NAME: ROCKLAND
BUN: 807133

VICINITY MAP

HEAD EAST ON COCHITUATE RD TOWARD BURR ST (322 FT), TAKE THE RAMP TO I−90 E/MASSPIKE W/SPRINGFIELD/BOSTON (0.6 MI), KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR INTERSTATE 90 W/MASSACHUSETTS TURNPIKE/WORCHESTER/SPRINGFIELD AND MERGE ONTO I−90 W/MASSACHUSETTS TURNPIKE (0.5 MI), MERGE ONTO I−90 W/MASSACHUSETTS TURNPIKE (37.6 MI), TAKE EXIT 9 FOR I−84 TOWARD US−20/HARTFORD/NEW YORK CITY (0.9 MI), CONTINUE ONTO I−84 (40.9 MI), TAKE EXIT 57 ON THE LEFT FOR CT−15 S TOWARD I−91 S/CHARTER OAK BRIDGE/N Y. CITY (0.5 MI), CONTINUE ONTO CT−15 S (0.5 MI), CONTINUE ONTO CT−15 S/US−5 S (0.8 MI), TAKE EXIT 86 TO MERGE ONTO I−91 S TOWARD NEW HAVEN/NEW YORK CITY (7.2 MI), TAKE EXIT 23 FOR WEST ST TOWARD STATE ROUTE 3/ROCKY HILL (0.2 MI), TURN RIGHT ONTO WEST ST (0.3 MI), TURN LEFT ONTO CT−3 S (0.8 MI), TURN RIGHT ONTO INWOOD RD (0.1 MI), DESTINATION WILL BE ON THE RIGHT.



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: VERTICAL DEVELOPMENT, LLC
ADDRESS: 20 COMMERCIAL STREET, BRANFORD, CT 06405
CONTACT: DAVID BASS
PHONE: 203−826−5857
EMAIL: dbass@verticaldevelopmentllc.com

ZONING:

COMPANY: VERTICAL DEVELOPMENT, LLC
ADDRESS: 20 COMMERCIAL STREET, BRANFORD, CT 06405
CONTACT: DAVID BASS
PHONE: 203−826−5857
EMAIL: dbass@verticaldevelopmentllc.com

ENGINEERING:

COMPANY: COM−EX CONSULTANTS, LLC
ADDRESS: 115 ROUTE 46, SUITE E39, MOUNTAIN LAKES, NJ 07046
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

GENERAL NOTES

1. 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.

2. 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.

3. 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.

CONNECTICUT ONE CALL SYSTEM, INC. — 1-800-922-4455 — STOP · CALL BEFORE YOU DIG!

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

COM−EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2122
SITE NAME: NORWALK ROCKLAND RD

50 ROCKLAND ROAD
NORWALK, CT 06854
FAIRFIELD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	10/3/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: KMM

SEAL: STATE OF CONNECTICUT — NICHOLAS D. BARILE — 28643 — PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
16029−EMP	T−1	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 ½" 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 (EMPIRE TELECOM).

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.

22. 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 AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

23. INFORMATION SHOWN ON THIS SET OF DRAWINGS TAKEN FROM PLANS PREPARED BY HUDSON DESIGN GROUP FOR AT&T DATED APRIL 8, 2011. CONTRACTOR TO NOTIFY ENGINEER IF DISCREPANCIES EXIST PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT2122
SITE NAME: NORWALK ROCKLAND RD

50 ROCKLAND ROAD
NORWALK, CT 06854
FAIRFIELD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	10/3/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: KMM

SEAL:

STATE OF CONNECTICUT
DOUGLAS B. BASH
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 23643

AT&T

DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
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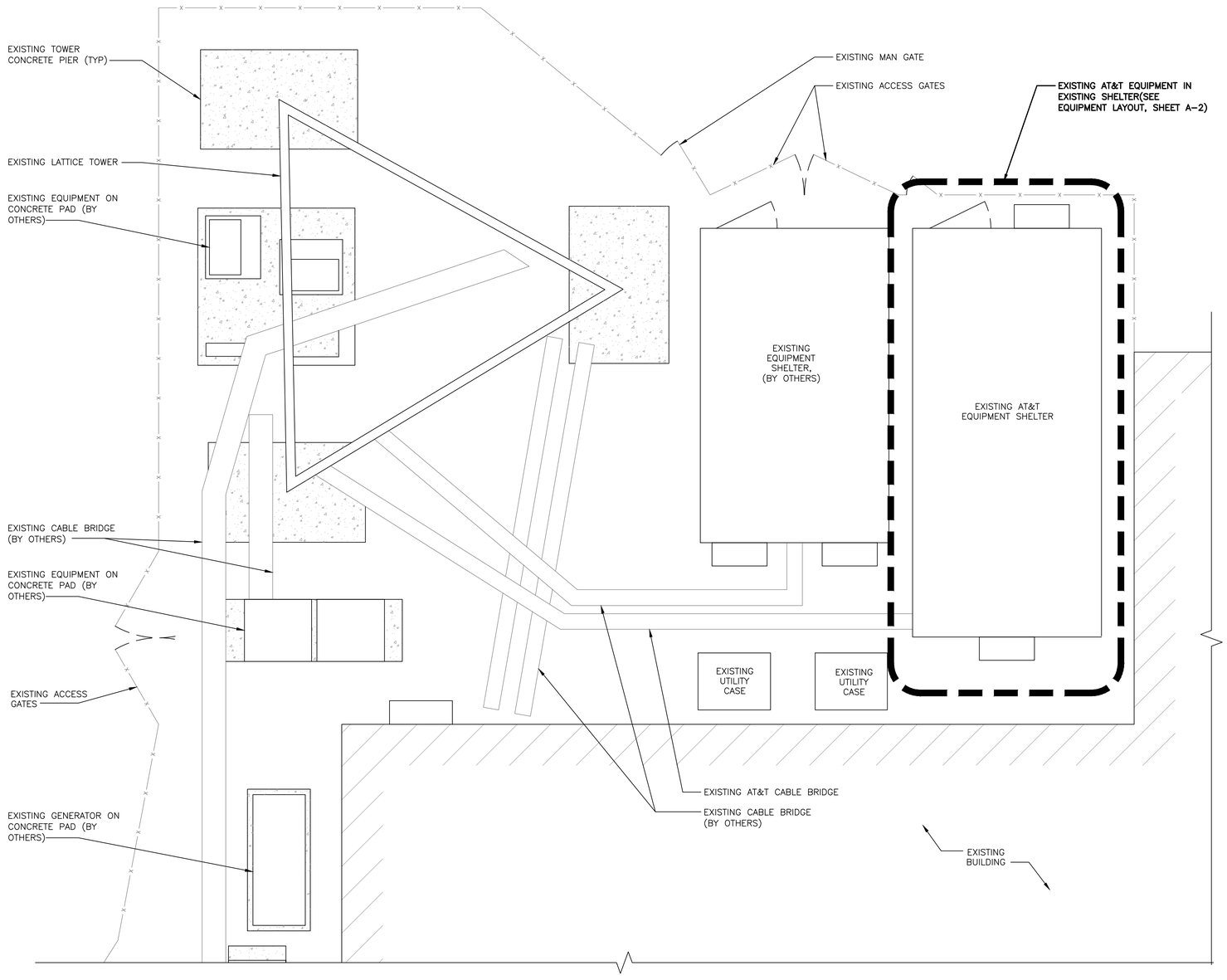

COMPOUND LAYOUT

SCALE: 1" = 4'-0"

4 0 2 4 8 16

(IN FEET)

1/4 Inch = 1 Foot

NORTH

NOTE:
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 AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: KMM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BYRON
No. 28643
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
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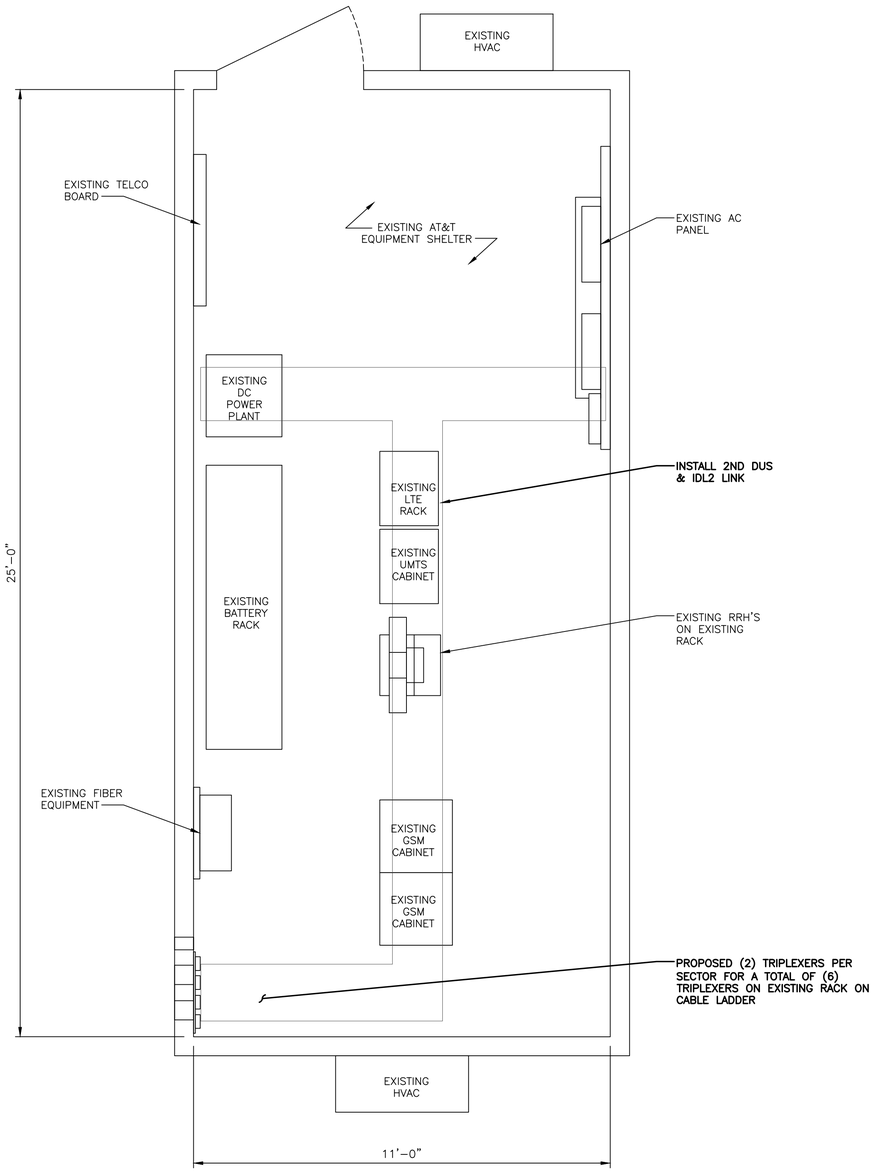
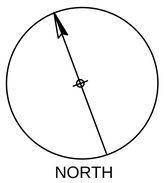


EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



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SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: KMM

SEAL:
STATE OF CONNECTICUT
NICHOLAS G. BUSH
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

DRAWING TITLE:
EQUIPMENT LAYOUT

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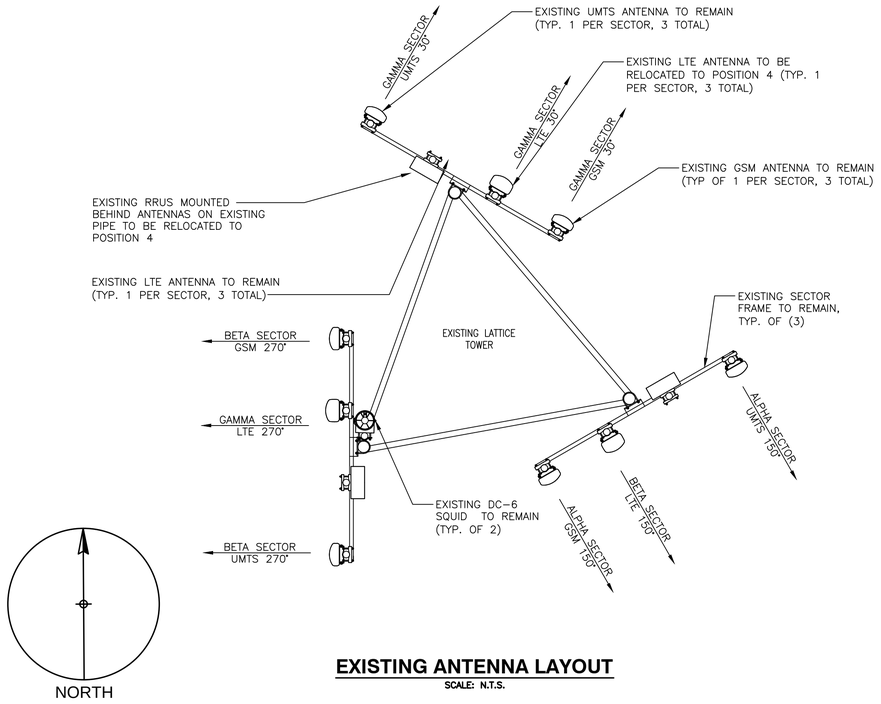
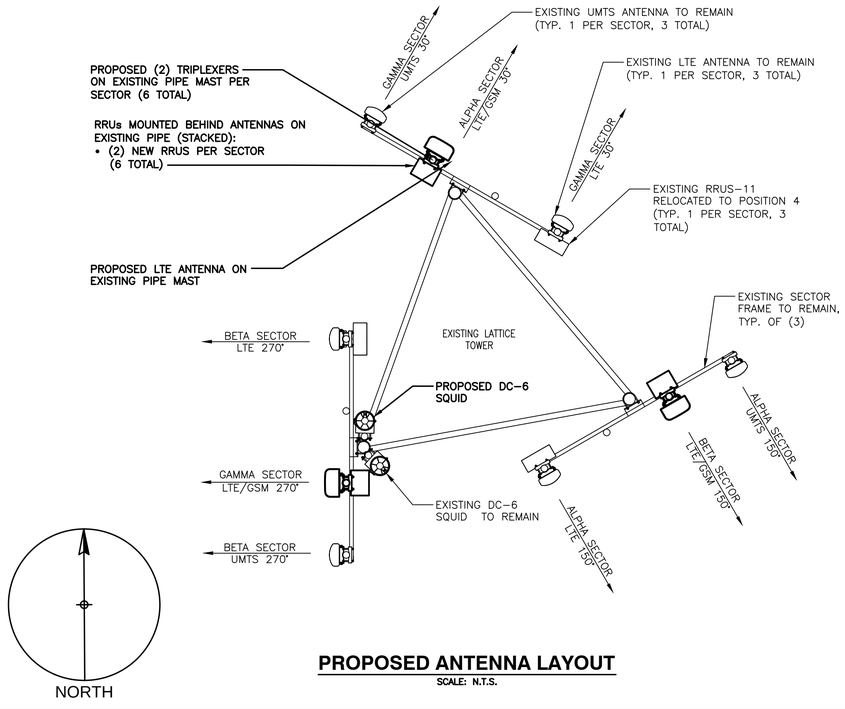


EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT

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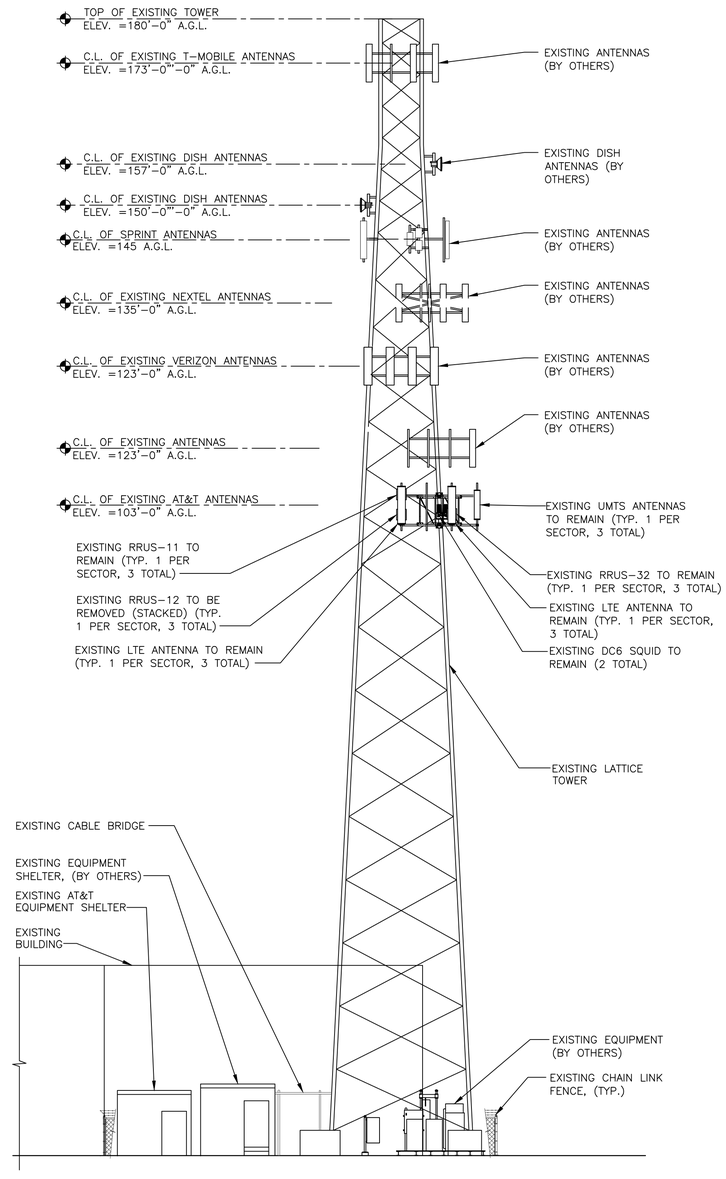
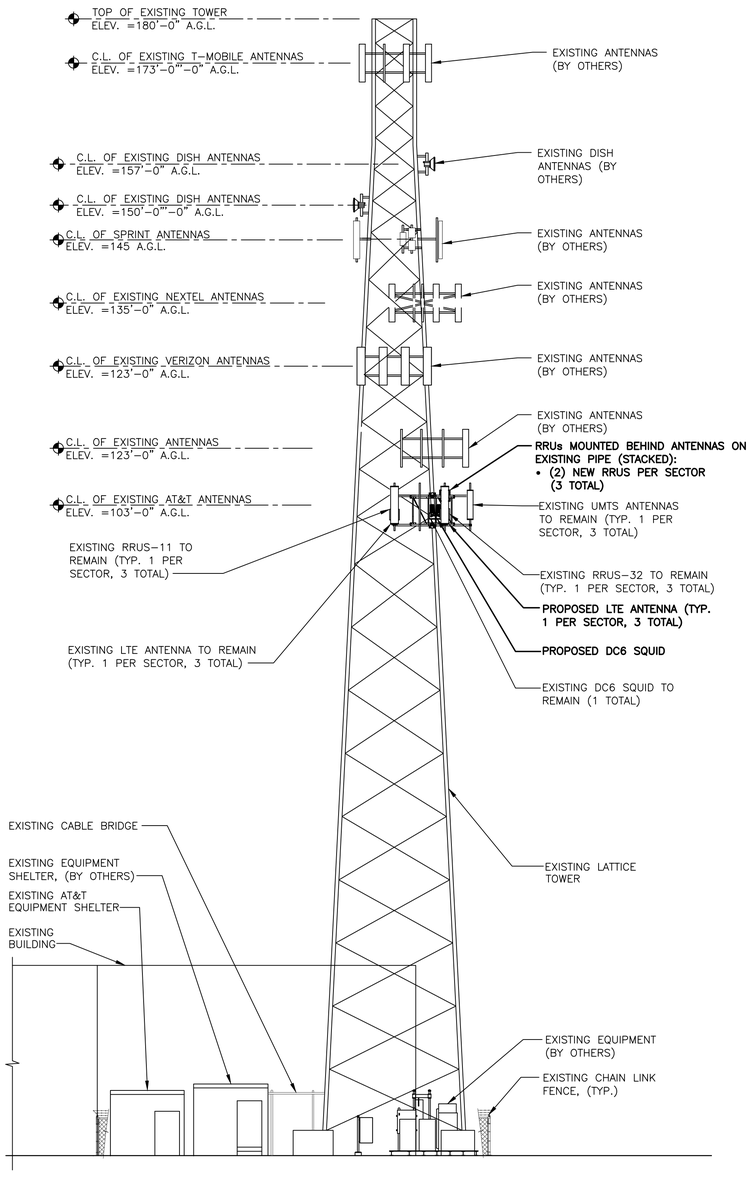


EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

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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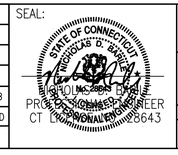
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: KMM

SEAL:



AT&T

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
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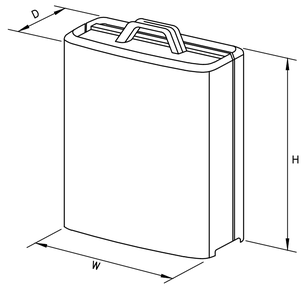
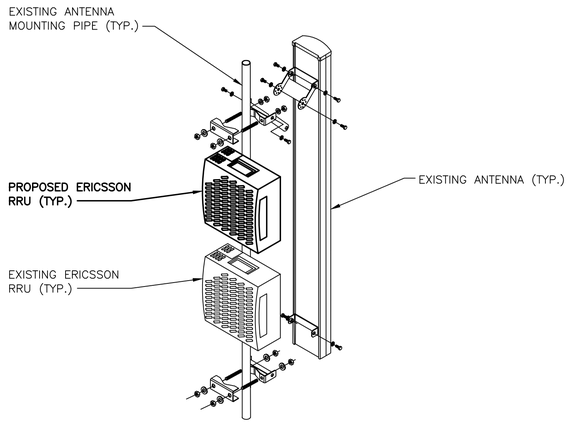


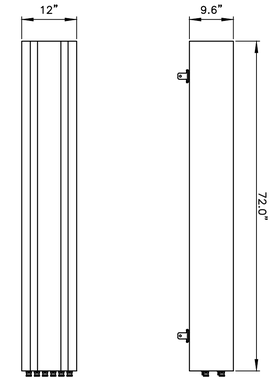
MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
*RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-32 B2	29.9" x 13.3" x 9.5"	77 LBS

*DENOTES EXISTING.

RRUS DETAIL
SCALE: N.T.S.



RRU MOUNTING DETAIL
SCALE: N.T.S.



MANUFACTURER	QUINTEL
MODEL	QS66512-2
WEIGHT	114 LBS

LTE ANTENNA DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	–	–	–
	A3	POWERWAVE	P65-16-XLH-RR	72"X12"X6"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	–	–	–
	B3	POWERWAVE	P65-16-XLH-RR	72"X12"X6"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	–	–	–
	G3	POWERWAVE	P65-16-XLH-RR	72"X12"X6"
	G4	POWERWAVE	7770	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	**QUINTEL**	**QS66512-2**	**72"X12"x9.6"**
	A3	–	–	–
	A4	POWERWAVE	P65-16-XLH-RR	72"X12"X6"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	**QUINTEL**	**QS66512-2**	**72"X12"x9.6"**
	B3	–	–	–
	B4	POWERWAVE	P65-16-XLH-RR	72"X12"X6"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	**QUINTEL**	**QS66512-2**	**72"X12"x9.6"**
	G3	–	–	–
	G4	POWERWAVE	P65-16-XLH-RR	72"X12"X6"

FINAL RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	**ERICSSON**	**RRUS-32 B2**	**29.9"x13.3"x9.5"**		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	**ERICSSON**	**RRUS-32 B2**	**29.9"x13.3"x9.5"**		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	**ERICSSON**	**RRUS-32 B2**	**29.9"x13.3"x9.5"**		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
	ERICSSON	RRUS-11 (EXISTING)	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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NO.	DATE	REVISIONS	BY	CHK	APP'D
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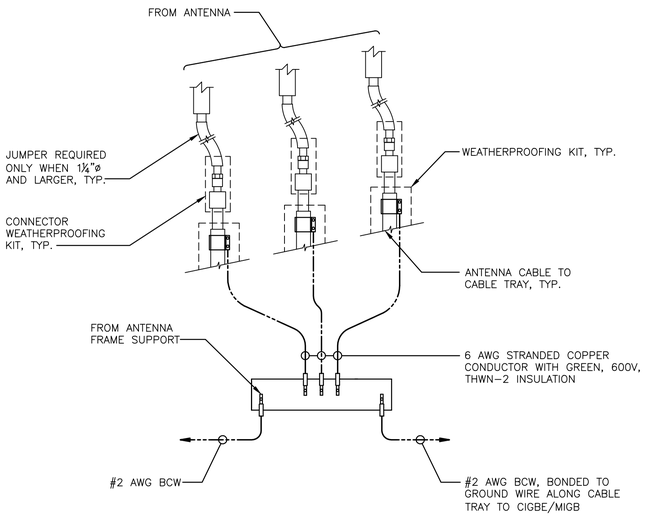
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: KMM

SEAL:
STATE OF CONNECTICUT
DOUGLAS B. ROBERTS
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

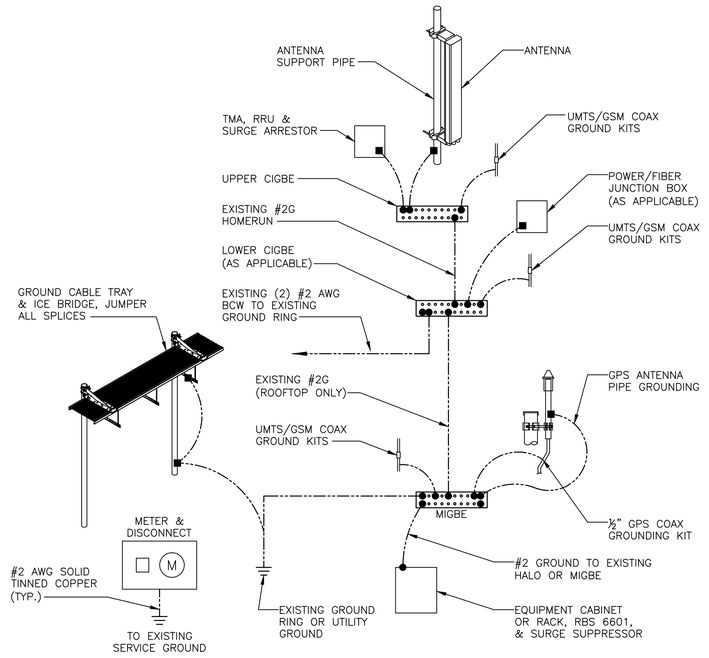
DRAWING TITLE:
DETAILS

JOB NUMBER	DRAWING NUMBER	REV
16029-EMP	A-4	0



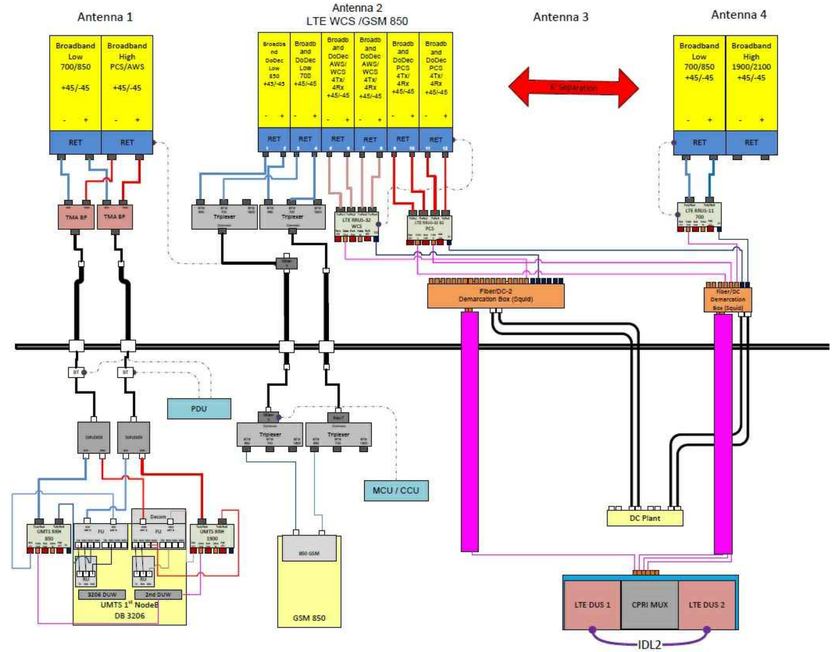
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



GROUNDING RISER DIAGRAM

SCALE: N.T.S.



TYPICAL PLUMBING DIAGRAM (PER SECTOR)

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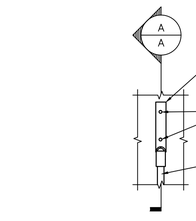
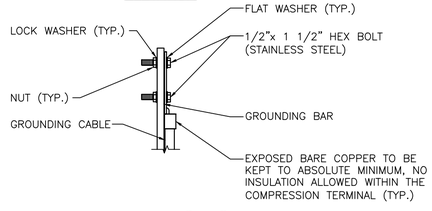


ELEVATION



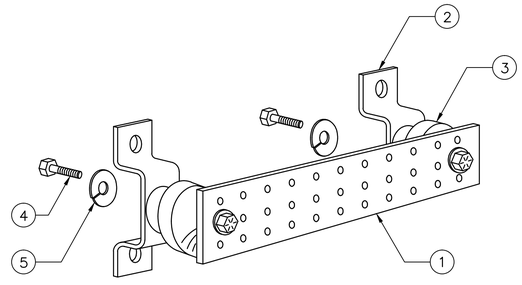
SECTION "A–A"

NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

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)

GROUND BAR DETAIL

SCALE: N.T.S.

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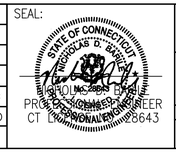
SEAL:



AT&T

DRAWING TITLE:
GROUNDING, ONE-LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
16029-EMP	G-1	0

Date: **July 21, 2016**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
9197551012

Subject: Structural Analysis Report

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Name:	NORWALK ROCKLAND RD
	Carrier Site Number:	CTL02122
Crown Castle Designation:	**Crown Castle BU Number:**	807133
	Crown Castle Site Name:	BRG 134 943057
	Crown Castle JDE Job Number:	384991
	Crown Castle Work Order Number:	1272328
	Crown Castle Application Number:	353549 Rev. 0
Engineering Firm Designation:	**FDH Velocitel Project Number:**	16FAZA1400

Site Data: **50 ROCKLAND ROAD NORWALK OFC - MTSO, SO NORWALK, Fairfield County, CT**
Latitude *41° 4' 54.44"*, Longitude *-73° 25' 49.52"*
180 Foot - Self Support Tower

Dear Charles McGuirt,

FDH Velocitel 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 927004, in accordance with application 353549, revision 0.

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 I and Table II for the proposed and existing/reserved loading, respectively.

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

We at *FDH Velocitel* 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:

Phylicia D. Hicks
Project Engineer I

Reviewed by:

Dennis D. Abel, PE
Director – Structural Engineering
CT PE License No. 23247

07-21-2016

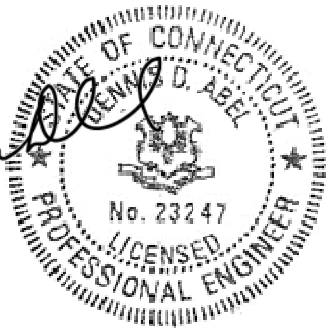


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Table 3 - Design Antenna and Cable Information

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Table 6 – Tower Component Stresses vs. Capacity
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tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by ROHN in July of 1987. The tower was originally designed for E.I.A. Zone A. This tower has been modified per reinforcement drawings prepared by Vertical Structures, Inc. in November of 2004. These modifications were considered in this 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 0.75 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
102.0	102.0	3	quintel tech	QS66512-2 w/ Mount Pipe	2 1	5/8 3/8	-
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32			
		6	cci antennas	TPX-070821			
		1	raycap	DC6-48-60-18-8F			

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
178.0	178.0	2	-	Side Arm Mount [SO 305-1]	-	-	1
170.0	173.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1	7/8	2
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		3	ericsson	KRY 112 144/1			
	170.0	1	-	Sector Mount [SM 702-3]			
157.0	157.0	2	andrew	VHLP2-18	2	7983A	1
		2	-	Side Arm Mount [SO 202-1]			
148.0	148.0	3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe	1	1-1/4	2
		3	alcatel lucent	TD-RRH8x20-25			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		9	rfs celwave	ACU-A20-N			
		3	site pro	VFA12-U w/ 12' Stiff Arm			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
143.0	145.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		3	alcatel lucent	TME-800MHZ 2X50W RRH			
	143.0	1	-	Side Arm Mount [SO 312-3]			
	142.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
134.0	135.0	1	andrew	VHLP2-23	6 1	5/16 1/2	1
		3	argus tech	LLPX310R w/ Mount Pipe			
		3	samsung telecom	RRH-2WB			
	134.0	1	-	Pipe Mount [PM 601-1]			
		1	-	Sector Mount [SM 502-3]			
126.0	130.0	1	gps	GPS_A	19 1	1-5/8 1/2	1
	128.0	2	andrew	LNX-6514DS-T4M w/ Mount Pipe			
		4	decibel	DB844G65ZAXY w/ Mount Pipe			
		2	decibel	DB844H80-XY w/ Mount Pipe			
		3	rymsa wireless	MG D3-800TV w/ Mount Pipe			
		1	powerwave tech	P65.16.XL.2 w/ Mount Pipe			
		3	alcatel lucent	RRH2X40-AWS			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	commscope	HBX-6516DS-VTM w/ Mount Pipe	-	-	2
	126.0	1	-	Sector Mount [SM 410-3]	-	-	1
112.0	112.0	3	kathrein	800 10504 w/ Mount Pipe	6	1-5/8	1
		1	-	Sector Mount [SM 104-3]			
102.0	102.0	3	powerwave tech	7770.00 w/ Mount Pipe	-	-	3
		6	powerwave tech	LGP13519			
		3	ericsson	RRUS 12			
		3	powerwave tech	7770.00 w/ Mount Pipe	12 1 2	1-5/8 3/8 5/8	1
		3	powerwave tech	P65-16-XLH-RR w/ Mount Pipe			
		6	powerwave tech	LGP2140X			
		3	ericsson	RRUS 11 B2			
		1	raycap	DC6-48-60-18-8F			
		1	-	Sector Mount [SM 301-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
48.0	48.0	1	gps	GPS_A	2	1/2	1
		2	-	Side Arm Mount [SO 701-1]			
	47.0	1	gps	GPS_A			

Notes:
1) Existing Equipment
2) Reserved Equipment; Considered in Analysis
3) Existing Equipment to be Removed; Not Considered in 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)
217.0	217.0	4	celwave	PD10017	-	-
207.0	207.0	6	celwave	PD1132	-	-
180.0	180.0	3	-	8' Dish	-	-
170.0	170.0	1	-	8' Dish	-	-
156.0	156.0	1	-	8' Dish	-	-
150.0	150.0	1	-	8' Dish	-	-
130.0	130.0	1	celwave	PD1109	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2311843	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J. Ford	821566	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	392878	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Structures, Inc.	1257479	CCISITES
4-POST-MODIFICATION INSPECTION	All Points Technology Corp.	4065020	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) 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. FDH Velocitel 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
T1	180 - 160	Leg	ROHN 3 EH	1	-9.65	96.06	10.0	Pass
T2	160 - 153.333	Leg	ROHN 4 EH	36	-14.34	139.07	10.3	Pass
T3	153.333 - 146.667	Leg	ROHN 4 EH	43	-20.93	139.07	15.0	Pass
T4	146.667 - 140	Leg	ROHN 4 EH	55	-28.88	139.07	20.8	Pass
T5	140 - 120	Leg	ROHN 5 EH	67	-60.08	206.29	29.1	Pass
T6	120 - 100	Leg	ROHN 6 EHS	88	-97.77	236.06	41.4	Pass
T7	100 - 80	Leg	ROHN 6 EH	109	-134.65	264.29	50.9	Pass
T8	80 - 70	Leg	ROHN 8 EHS	124	-153.63	338.72	45.4	Pass
T9	70 - 60	Leg	ROHN 8 EHS	133	-172.82	338.72	51.0	Pass
T10	60 - 40	Leg	ROHN 8 EHS	142	-210.00	338.72	62.0	Pass
T11	40 - 20	Leg	ROHN 8 EH	157	-246.01	435.22	56.5	Pass
T12	20 - 0	Leg	ROHN 8 EH	172	-281.30	435.22	64.6	Pass
T1	180 - 160	Diagonal	L2x2x3/16	15	-2.18	6.68	32.7 36.5 (b)	Pass
T2	160 - 153.333	Diagonal	L2 1/2x2 1/2x1/4	41	-2.64	13.09	20.2 28.4 (b)	Pass
T3	153.333 - 146.667	Diagonal	L2 1/2x2 1/2x1/4	53	-3.20	11.83	27.1 33.7 (b)	Pass
T4	146.667 - 140	Diagonal	L2 1/2x2 1/2x1/4	65	-4.58	10.74	42.7 49.6 (b)	Pass
T5	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	74	-7.01	8.26	84.8	Pass
T6	120 - 100	Diagonal	L3x3x1/4	95	-8.62	11.62	74.1 84.5 (b)	Pass
T7	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	116	-10.35	12.51	82.7 85.1 (b)	Pass
T8	80 - 70	Diagonal	L3 1/2x3 1/2x1/4	131	-10.66	11.69	91.2	Pass
T9	70 - 60	Diagonal	2L3 1/2x3 1/2x1/4x3/8	136	-11.28	17.99	62.7 64.2 (b)	Pass
T10	60 - 40	Diagonal	L4x4x1/4	146	-11.63	13.65	85.2 92.5 (b)	Pass
T11	40 - 20	Diagonal	L4x4x5/16	161	-12.07	14.28	84.5	Pass
T12	20 - 0	Diagonal	2L4x4x5/16x3/8	176	-12.99	20.68	62.8 73.9 (b)	Pass
T1	180 - 160	Top Girt	L2x2x1/8	6	-0.09	2.79	3.2	Pass
T3	153.333 -	Top Girt	L2x2x1/8	46	-0.19	1.36	14.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
	146.667							
T4	146.667 - 140	Top Girt	L2x2x1/8	60	0.12	8.50	1.4 3.0 (b)	Pass
T1	180 - 160	Mid Girt	L2x2x1/8	7	-0.51	2.05	24.8	Pass
							Summary	
						Leg (T12)	64.6	Pass
						Diagonal (T10)	92.5	Pass
						Top Girt (T3)	14.3	Pass
						Mid Girt (T1)	24.8	Pass
						Bolt Checks	92.5	Pass
						RATING =	92.5	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	55.8	Pass
1	Base Foundation	0	73.2	Pass

Structure Rating (max from all components) =	92.5%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

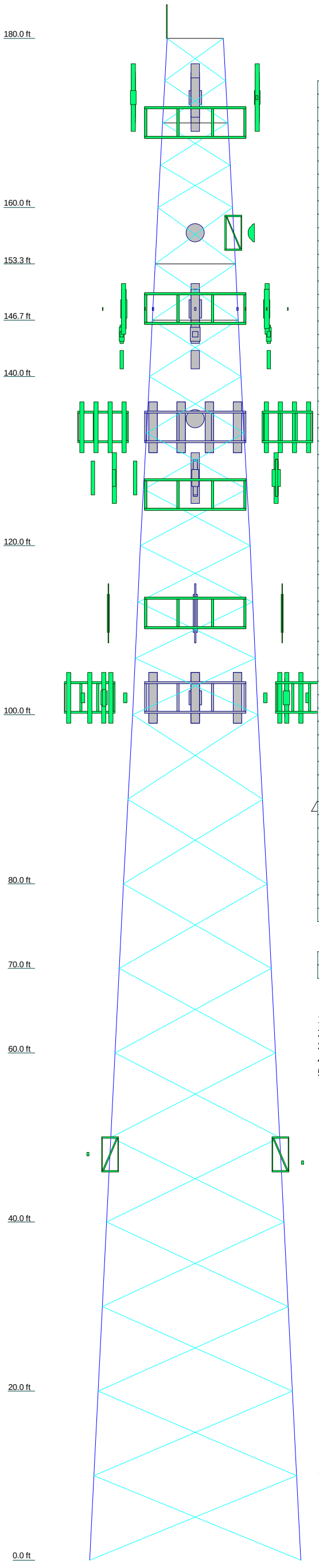
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Mid Girts	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	ROHN 3 EH	A572-50	L2x2x3/16	A36	L2x2x1/8	L2x2x1/8	6.6875	4 @ 5	1.2
T2	ROHN 4 EH	A572-50	L2 1/2x2 1/2x1/4	A572-50	N.A.	N.A.	8.76042	9 @ 6.66667	0.6
T3	ROHN 4 EH	A572-50	L2 1/2x2 1/2x1/4	A572-50	L2x2x1/8	N.A.	9.45052	9 @ 6.66667	0.6
T4	ROHN 4 EH	A572-50	L2 1/2x2 1/2x1/4	A572-50	L2x2x1/8	N.A.	10.1432	9 @ 6.66667	0.7
T5	ROHN 5 EH	A572-50	L2 1/2x2 1/2x1/4	A572-50	N.A.	N.A.	10.8333	9 @ 6.66667	2.2
T6	ROHN 6 EHS	A572-50	L3x3x1/4	A572-50	N.A.	N.A.	12.9167	10 @ 10	2.7
T7	ROHN 6 EH	A572-50	L3 1/2x3 1/2x1/4	A572-50	N.A.	N.A.	14.8542	10 @ 10	3.0
T8	ROHN 6 EH	A572-50	L3 1/2x3 1/2x1/4	A572-50	N.A.	N.A.	16.9896	10 @ 10	1.7
T9	ROHN 8 EHS	A572-50	2L3 1/2x3 1/2x1/4x3/8	A36	N.A.	N.A.	17.9948	10 @ 10	2.5
T10	ROHN 8 EHS	A572-50	L4x4x1/4	A572-50	N.A.	N.A.	19	10 @ 10	3.8
T11	ROHN 8 EH	A572-50	L4x4x5/16	A572-50	N.A.	N.A.	21	10 @ 10	5.0
T12	ROHN 8 EH	A572-50	2L4x4x5/16x3/8	A36	N.A.	N.A.	23	10 @ 10	7.7
							25		31.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	180	VHLP2-23	134
Empty Pipe Mount	178	DB844G65ZAXY w/ Mount Pipe	126
Empty Pipe Mount	178	DB844G65ZAXY w/ Mount Pipe	126
Side Arm Mount [SO 305-1]	178	(2) DB844G65ZAXY w/ Mount Pipe	126
Side Arm Mount [SO 305-1]	178	LNX-6514DS-T4M w/ Mount Pipe	126
AIR -32 B2A/B66AA w/ Mount Pipe	170	LNX-6514DS-T4M w/ Mount Pipe	126
AIR -32 B2A/B66AA w/ Mount Pipe	170	MG D3-800TV w/ Mount Pipe	126
AIR -32 B2A/B66AA w/ Mount Pipe	170	MG D3-800TV w/ Mount Pipe	126
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	170	MG D3-800TV w/ Mount Pipe	126
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	170	DB844H80-XY w/ Mount Pipe	126
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	170	DB844H80-XY w/ Mount Pipe	126
LNX-6515DS-VTM w/ Mount Pipe	170	GPS_A	126
LNX-6515DS-VTM w/ Mount Pipe	170	P65.16.XL.2 w/ Mount Pipe	126
LNX-6515DS-VTM w/ Mount Pipe	170	RRH2X40-AWS	126
KRY 112 144/1	170	RRH2X40-AWS	126
KRY 112 144/1	170	RRH2X40-AWS	126
KRY 112 144/1	170	DB-T1-6Z-8AB-0Z	126
RRUS 11 B12	170	Sector Mount [SM 410-3]	126
RRUS 11 B12	170	HBX-6516DS-VTM w/ Mount Pipe	126
RRUS 11 B12	170	HBX-6516DS-VTM w/ Mount Pipe	126
Sector Mount [SM 702-3]	170	HBX-6516DS-VTM w/ Mount Pipe	126
Empty Pipe Mount	170	Sector Mount [SM 104-3]	112
Empty Pipe Mount	170	Empty Mount Pipe	112
Empty Pipe Mount	170	Empty Mount Pipe	112
Side Arm Mount [SO 202-1]	157	Empty Mount Pipe	112
Side Arm Mount [SO 202-1]	157	800 10504 w/ Mount Pipe	112
VHLP2-18	157	800 10504 w/ Mount Pipe	112
VHLP2-18	157	800 10504 w/ Mount Pipe	112
APXVSPP18-C-A20 w/ Mount Pipe	148	P65-16-XLH-RR w/ Mount Pipe	102
APXVTM14-C-120 w/ Mount Pipe	148	P65-16-XLH-RR w/ Mount Pipe	102
APXVTM14-C-120 w/ Mount Pipe	148	P65-16-XLH-RR w/ Mount Pipe	102
APXVTM14-C-120 w/ Mount Pipe	148	(2) LGP2140X	102
(3) ACU-A20-N	148	(2) LGP2140X	102
(3) ACU-A20-N	148	(2) LGP2140X	102
(3) ACU-A20-N	148	RRUS 11 B2	102
TD-RRH8x20-25	148	RRUS 11 B2	102
TD-RRH8x20-25	148	RRUS 11 B2	102
TD-RRH8x20-25	148	DC6-48-60-18-8F	102
(3) Site Pro VFA12-U w/ 12' Stiff Arm	148	QS66512-2 w/ Mount Pipe	102
APXVSPP18-C-A20 w/ Mount Pipe	148	QS66512-2 w/ Mount Pipe	102
APXVSPP18-C-A20 w/ Mount Pipe	148	QS66512-2 w/ Mount Pipe	102
PCS 1900MHz 4x45W-65MHz	143	RRUS 32 B2	102
PCS 1900MHz 4x45W-65MHz	143	RRUS 32 B2	102
PCS 1900MHz 4x45W-65MHz	143	RRUS 32 B2	102
PCS 1900MHz 4x45W-65MHz	143	(2) TPX-070821	102
TME-800MHZ 2X50W RRH	143	(2) TPX-070821	102
TME-800MHZ 2X50W RRH	143	(2) TPX-070821	102
TME-800MHZ 2X50W RRH	143	RRUS 32	102
800 EXTERNAL NOTCH FILTER	143	RRUS 32	102
800 EXTERNAL NOTCH FILTER	143	RRUS 32	102
800 EXTERNAL NOTCH FILTER	143	DC6-48-60-18-8F	102
Side Arm Mount [SO 312-3]	143	Sector Mount [SM 301-3]	102
PCS 1900MHz 4x45W-65MHz	143	Empty Mount Pipe	102
PCS 1900MHz 4x45W-65MHz	143	Empty Mount Pipe	102
LLPX310R w/ Mount Pipe	134	Empty Mount Pipe	102
RRH-2WB	134	7770.00 w/ Mount Pipe	102
RRH-2WB	134	7770.00 w/ Mount Pipe	102
RRH-2WB	134	7770.00 w/ Mount Pipe	102
Pipe Mount [PM 601-1]	134	Side Arm Mount [SO 701-1]	48
Sector Mount [SM 502-3]	134	GPS_A	48
LLPX310R w/ Mount Pipe	134	GPS_A	48
LLPX310R w/ Mount Pipe	134	Side Arm Mount [SO 701-1]	48

MATERIAL STRENGTH

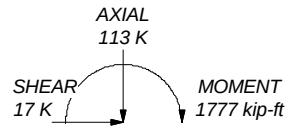
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

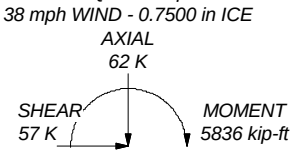
1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 92.5%

MAX. CORNER REACTIONS AT BASE:
DOWN: 290 K
SHEAR: 35 K

UPLIFT: -238 K
SHEAR: 30 K



TORQUE 11 kip-ft
38 mph WIND - 0.7500 in ICE



TORQUE 45 kip-ft
REACTIONS - 85 mph WIND

FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: 9197551012
FAX: 9197551031
Tower Analysis

Job:	***BRG 134 943057, 807133***		
Project:	***16FAZA1400***		
Client: Crown Castle	Drawn by: PHicks	App'd:	
Code: TIA/EIA-222-F	Date: 07/21/16	Scale: NTS	
Path:		Dwg No. E-1	

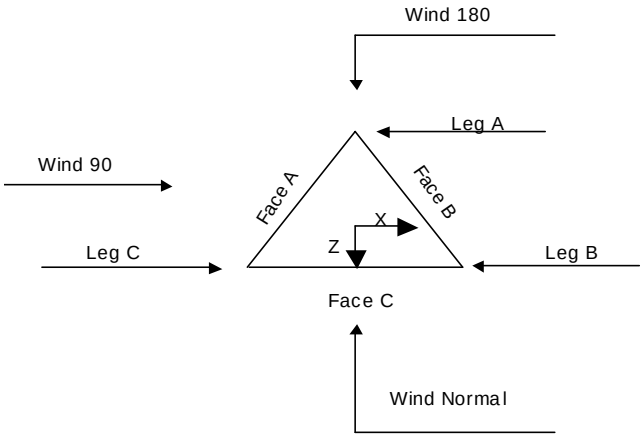
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.69 ft at the top and 25.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	180.00-160.00			6.69	1	20.00
T2	160.00-153.33			8.76	1	6.67
T3	153.33-146.67			9.45	1	6.67
T4	146.67-140.00			10.14	1	6.67
T5	140.00-120.00			10.83	1	20.00
T6	120.00-100.00			12.92	1	20.00
T7	100.00-80.00			14.85	1	20.00
T8	80.00-70.00			16.99	1	10.00
T9	70.00-60.00			17.99	1	10.00
T10	60.00-40.00			19.00	1	20.00
T11	40.00-20.00			21.00	1	20.00
T12	20.00-0.00			23.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	180.00-160.00	5.00	X Brace	No	No	0.0000	0.0000
T2	160.00-153.33	6.67	X Brace	No	No	0.0000	0.0000
T3	153.33-146.67	6.67	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T4	146.67-140.00	6.67	X Brace	No	No	0.0000	0.0000
T5	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T6	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T7	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T8	80.00-70.00	10.00	X Brace	No	No	0.0000	0.0000
T9	70.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T10	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T11	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T12	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 160.00-153.33	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T3 153.33-146.67	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 146.67-140.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T5 140.00-120.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T6 120.00-100.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T7 100.00-80.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T8 80.00-70.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T9 70.00-60.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T10 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A572-50 (50 ksi)
T11 40.00-20.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A572-50 (50 ksi)
T12 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Double Equal Angle	2L4x4x5/16x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-160.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 153.33-146.67	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T4 146.67-140.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	1	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-160.00	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T2 160.00-153.33	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T3 153.33-146.67	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T4 146.67-140.00	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T5 140.00-120.00	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T6 120.00-100.00	0.00	0.2500	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T7 100.00-80.00	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T8 80.00-70.00	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T9 70.00-60.00	0.00	0.3750	A36 (36 ksi)	1	1	1	123.1250	30.0000	36.0000
T10 60.00-40.00	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T11 40.00-20.00	0.00	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T12 20.00-0.00	0.00	0.3750	A36 (36 ksi)	1	1	1	155.6250	30.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
180.00-160.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
160.00-153.33				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
153.33-146.67				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
146.67-140.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
80.00-70.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
70.00-60.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160.00-153.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 153.33-146.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 146.67-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80.00-70.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 70.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T11 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-160.00	Flange	0.8750 A325X	4	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325N	0
T2 160.00-153.33	Flange	0.0000 A325X	0	0.6250 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T3 153.33-146.67	Flange	0.0000 A325X	0	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T4 146.67-140.00	Flange	1.0000 A325X	4	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T5 140.00-120.00	Flange	1.0000 A325X	6	0.6250 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T6 120.00-100.00	Flange	1.0000 A325X	6	0.6250 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T7 100.00-80.00	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T8 80.00-70.00	Flange	0.0000 A325X	0	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T9 70.00-60.00	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T10 60.00-40.00	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T11 40.00-20.00	Flange	1.0000 A325X	8	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0
T12 20.00-0.00	Flange	1.0000 A449	10	0.7500 A325X	1	0.0000 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Safety Line 3/8	B	No	Ar (Leg)	180.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.00
Feedline Ladder (Af) 1.5"	A	Yes	Af (CfAe)	157.00 - 0.00	0.0000	-0.4	2	2	24.0000 1.5000	1.5000	6.0000	0.00
Feedline Ladder (Af)	A	Yes	Af (CfAe)	172.00 - 0.00	0.0000	0	2	2	24.0000 1.5000	1.5000	6.0000	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
1.5" Feedline Ladder (Af)	B	Yes	Af (CfAe)	112.00 - 0.00	0.0000	0.35	2	2	24.0000 1.5000	1.5000	6.0000	0.00
1.5" Feedline Ladder (Af)	C	Yes	Af (CfAe)	126.00 - 0.00	-1.0000	-0.3	4	2	24.0000 1.5000	1.5000	6.0000	0.00
1.5" 2" Rigid Conduit	A	Yes	Ar (CfAe)	134.00 - 0.00	0.0000	-0.4	1	1	2.0000	2.0000		0.00
********** ********** ********												
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	A	Yes	Ar (CfAe)	170.00 - 0.00	4.0000	-0.05	1	1	0.5000	1.6250		0.00
LCF158-50JA-A0(1 5/8")	A	Yes	Ar (CfAe)	170.00 - 0.00	0.0000	0	12	9	0.5000	1.9800		0.00
MLC Hybrid 6/6(7/8)	A	Yes	Ar (CfAe)	170.00 - 0.00	4.0000	-0.05	1	1	0.4000	0.4000		0.00
***												
7983A(1/2")	A	Yes	Ar (CfAe)	157.00 - 0.00	0.0000	-0.47	2	2	0.5000	0.5800		0.00
***												
HB114-21U3M12-XXXF(1-1/4")	A	Yes	Ar (CfAe)	148.00 - 0.00	0.0000	-0.375	4	4	0.5000	1.5400		0.00
***												
LDF4-50A(1/2")	A	Yes	Ar (CfAe)	134.00 - 0.00	0.0000	-0.47	1	1	0.5000	0.6300		0.00
9207(5/16")	A	Yes	Ar (CfAe)	134.00 - 0.00	0.0000	0	6	6	0.3300	0.0000		0.00
2" Rigid Conduit	A	Yes	Ar (CfAe)	134.00 - 0.00	0.0000	-0.45	2	2	0.5000	2.0000		0.00
***												
561(1-5/8")	C	Yes	Ar (CfAe)	126.00 - 0.00	-4.0000	-0.3	19	10	0.5000	1.6250		0.00
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	126.00 - 0.00	-1.0000	-0.345	1	1	0.5000	0.6300		0.00
***												
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	112.00 - 0.00	0.0000	0.35	6	6	0.5000	1.9800		0.00
***												
CR 50 1873(1-5/8")	C	Yes	Ar (CfAe)	102.00 - 0.00	0.0000	0.425	12	8	0.5000	1.9800		0.00
2" Rigid Conduit	C	Yes	Ar (CfAe)	102.00 - 0.00	2.0000	0.435	1	1	0.5000	2.0000		0.00
FB-L98-002-XXX(3/8)	C	Yes	Ar (CfAe)	102.00 - 0.00	0.0000	0.425	1	1	0.5000	0.0000		0.00
WR-VG82ST-BRDA(5/8")	C	Yes	Ar (CfAe)	102.00 - 0.00	0.0000	0.425	2	2	0.5000	0.0000		0.00
FB-L98-002-XXX(3/8")	C	Yes	Ar (CfAe)	102.00 - 0.00	2.0000	0.465	1	1	0.3937	0.3937		0.00
WR-VG82ST-BRDA(5/8)	C	Yes	Ar (CfAe)	102.00 - 0.00	2.0000	0.465	2	1	0.5000 5.0000	0.6250		0.00
***												
LDF4-50A(1/2")	C	Yes	Ar (CfAe)	48.00 - 0.00	0.0000	0.35	2	2	0.5000	0.6300		0.00
***												
***												

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 klf
***							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.00-160.00	A	16.538	3.000	0.000	0.000	0.22
		B	0.625	0.000	0.000	0.000	0.00
		C	0.625	0.000	0.000	0.000	0.00
T2	160.00-153.33	A	11.379	2.583	0.000	0.000	0.16
		B	0.208	0.000	0.000	0.000	0.00
		C	0.208	0.000	0.000	0.000	0.00
T3	153.33-146.67	A	12.354	3.333	0.000	0.000	0.20
		B	0.208	0.000	0.000	0.000	0.00
		C	0.208	0.000	0.000	0.000	0.00
T4	146.67-140.00	A	15.092	3.333	0.000	0.000	0.22
		B	0.208	0.000	0.000	0.000	0.00
		C	0.208	0.000	0.000	0.000	0.00
T5	140.00-120.00	A	53.010	10.000	0.000	0.000	0.84
		B	0.625	0.000	0.000	0.000	0.00
		C	9.065	1.500	0.000	0.000	0.26
T6	120.00-100.00	A	56.325	10.000	0.000	0.000	0.91
		B	12.505	3.000	0.000	0.000	0.16
		C	31.901	5.000	0.000	0.000	0.88
T7	100.00-80.00	A	56.325	10.000	0.000	0.000	0.91
		B	20.425	5.000	0.000	0.000	0.27
		C	60.190	5.000	0.000	0.000	1.13
T8	80.00-70.00	A	28.163	5.000	0.000	0.000	0.46
		B	10.213	2.500	0.000	0.000	0.14
		C	30.095	2.500	0.000	0.000	0.57
T9	70.00-60.00	A	28.163	5.000	0.000	0.000	0.46
		B	10.213	2.500	0.000	0.000	0.14
		C	30.095	2.500	0.000	0.000	0.57
T10	60.00-40.00	A	56.325	10.000	0.000	0.000	0.91
		B	20.425	5.000	0.000	0.000	0.27
		C	61.030	5.000	0.000	0.000	1.14
T11	40.00-20.00	A	56.325	10.000	0.000	0.000	0.91
		B	20.425	5.000	0.000	0.000	0.27
		C	62.289	5.000	0.000	0.000	1.14
T12	20.00-0.00	A	56.325	10.000	0.000	0.000	0.91
		B	20.425	5.000	0.000	0.000	0.27
		C	62.289	5.000	0.000	0.000	1.14

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.00-160.00	A	0.913	7.903	21.968	0.000	0.000	0.62
		B		3.668	0.000	0.000	0.000	0.03
		C		3.668	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T2	160.00-153.33	A	0.904	5.969	16.012	0.000	0.000	0.45
		B		1.213	0.000	0.000	0.000	0.01
		C		1.213	0.000	0.000	0.000	0.00
T3	153.33-146.67	A	0.899	6.916	18.301	0.000	0.000	0.52
		B		1.208	0.000	0.000	0.000	0.01
		C		1.208	0.000	0.000	0.000	0.00
T4	146.67-140.00	A	0.895	8.372	21.006	0.000	0.000	0.59
		B		1.202	0.000	0.000	0.000	0.01
		C		1.202	0.000	0.000	0.000	0.00
T5	140.00-120.00	A	0.884	38.597	67.767	0.000	0.000	2.10
		B		3.572	0.000	0.000	0.000	0.03
		C		6.468	12.241	0.000	0.000	0.52
T6	120.00-100.00	A	0.867	43.922	69.686	0.000	0.000	2.22
		B		7.227	17.711	0.000	0.000	0.44
		C		15.615	43.703	0.000	0.000	1.83
T7	100.00-80.00	A	0.846	43.304	69.503	0.000	0.000	2.19
		B		9.565	29.426	0.000	0.000	0.71
		C		38.093	70.401	0.000	0.000	2.68
T8	80.00-70.00	A	0.828	21.377	34.670	0.000	0.000	1.08
		B		4.721	14.673	0.000	0.000	0.35
		C		18.772	35.160	0.000	0.000	1.32
T9	70.00-60.00	A	0.814	21.166	34.607	0.000	0.000	1.07
		B		4.674	14.641	0.000	0.000	0.35
		C		18.561	35.129	0.000	0.000	1.31
T10	60.00-40.00	A	0.788	41.575	68.991	0.000	0.000	2.11
		B		9.181	29.170	0.000	0.000	0.68
		C		37.836	70.899	0.000	0.000	2.61
T11	40.00-20.00	A	0.750	40.425	68.650	0.000	0.000	2.05
		B		8.925	29.000	0.000	0.000	0.66
		C		38.764	71.858	0.000	0.000	2.58
T12	20.00-0.00	A	0.750	40.425	68.650	0.000	0.000	2.05
		B		8.925	29.000	0.000	0.000	0.66
		C		38.764	71.858	0.000	0.000	2.58

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	180.00-160.00	A	0.000	2.732	1.881	2.993
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	160.00-153.33	A	0.000	1.290	1.081	1.783
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T3	153.33-146.67	A	0.000	2.041	1.578	2.671
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	146.67-140.00	A	0.000	2.314	1.825	3.041
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T5	140.00-120.00	A	0.000	5.596	4.520	7.911
		B	0.000	0.000	0.000	0.000
		C	0.000	0.798	0.713	1.128
T6	120.00-100.00	A	0.000	5.648	5.520	9.776
		B	0.000	1.086	1.238	1.879
		C	0.000	2.776	3.019	4.805

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T7	100.00-80.00	A	0.000	3.883	4.570	8.033
		B	0.000	1.247	1.709	2.579
		C	0.000	3.562	4.449	7.369
T8	80.00-70.00	A	0.000	1.839	2.228	3.889
		B	0.000	0.592	0.833	1.251
		C	0.000	1.689	2.169	3.572
T9	70.00-60.00	A	0.000	1.775	2.199	3.818
		B	0.000	0.572	0.822	1.230
		C	0.000	1.632	2.141	3.509
T10	60.00-40.00	A	0.000	3.352	4.944	8.504
		B	0.000	1.083	1.849	2.747
		C	0.000	3.151	4.876	7.994
T11	40.00-20.00	A	0.000	3.087	4.858	8.233
		B	0.000	1.002	1.816	2.671
		C	0.000	2.998	4.882	7.995
T12	20.00-0.00	A	0.000	3.045	4.791	8.119
		B	0.000	0.988	1.791	2.634
		C	0.000	2.957	4.815	7.885

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.00-160.00	-4.6141	-2.5735	-2.4104	-1.2587
T2	160.00-153.33	-9.4160	-3.7741	-6.8041	-2.4165
T3	153.33-146.67	-10.2391	-2.6539	-6.9044	-1.5557
T4	146.67-140.00	-12.8229	-1.5787	-8.2590	-1.0164
T5	140.00-120.00	-13.7899	1.9247	-9.6826	1.5647
T6	120.00-100.00	-4.7671	8.0899	-3.2588	6.5877
T7	100.00-80.00	-9.9475	14.7417	-8.7785	12.7134
T8	80.00-70.00	-9.9864	14.8604	-9.0402	13.1452
T9	70.00-60.00	-10.4572	15.5965	-9.4745	13.8114
T10	60.00-40.00	-10.8729	16.1294	-9.8009	14.3214
T11	40.00-20.00	-12.0077	17.6580	-10.6703	15.5646
T12	20.00-0.00	-12.7998	18.8730	-11.3917	16.6518

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
**********									
Lightning Rod	C	From Leg	0.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.25 0.66 0.97 1.49	0.25 0.66 0.97 1.49	0.03 0.03 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	2.68	2.68	0.14
***									
Empty Pipe Mount	A	From Leg	4.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.70 2.35 3.78	1.00 1.39 1.70 2.35 3.78	0.01 0.02 0.03 0.06 0.18
Empty Pipe Mount	B	From Leg	4.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.70 2.35 3.78	1.00 1.39 1.70 2.35 3.78	0.01 0.02 0.03 0.06 0.18
Side Arm Mount [SO 305-1]	A	From Leg	0.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
Side Arm Mount [SO 305-1]	B	From Leg	0.00 0.00 0.00	0.0000	178.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
***									
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.34 7.87 8.39 9.47 11.76	6.15 7.01 7.80 9.43 12.91	0.15 0.21 0.28 0.44 0.89
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.34 7.87 8.39 9.47 11.76	6.15 7.01 7.80 9.43 12.91	0.15 0.21 0.28 0.44 0.89
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.34 7.87 8.39 9.47 11.76	6.15 7.01 7.80 9.43 12.91	0.15 0.21 0.28 0.44 0.89
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.68 12.40 13.14 14.60	9.84 11.37 12.91 15.27	0.08 0.17 0.27 0.51

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *K*
						4" Ice	17.87	20.14	1.15
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	0.08 0.17 0.27 0.51 1.15
KRY 112 144/1	A	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.60 0.82 1.36	0.19 0.26 0.33 0.51 0.97	0.01 0.01 0.02 0.03 0.08
RRUS 11 B12	A	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	B	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
RRUS 11 B12	C	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.31 3.55 3.80 4.33 5.50	1.36 1.54 1.73 2.13 3.04	0.05 0.07 0.10 0.15 0.31
Sector Mount [SM 702-3]	C	None		0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	37.40 54.20 71.00 104.60 171.80	37.40 54.20 71.00 104.60 171.80	1.55 2.35 3.15 4.75 7.96
Empty Pipe Mount	A	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.05 1.67 2.09 2.85 4.48	1.05 1.67 2.09 2.85 4.48	0.02 0.03 0.04 0.08 0.21
Empty Pipe Mount	B	From Leg	4.00 0.00 3.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.05 1.67 2.09 2.85 4.48	1.05 1.67 2.09 2.85 4.48	0.02 0.03 0.04 0.08 0.21
Empty Pipe Mount	C	From Leg	4.00	0.0000	170.00	No Ice	1.05	1.05	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.67	1.67	0.03
			3.00			1" Ice	2.09	2.09	0.04
						2" Ice	2.85	2.85	0.08
						4" Ice	4.48	4.48	0.21
***									
Side Arm Mount [SO 202-1]	A	From Leg	0.00	0.0000	157.00	No Ice	2.96	2.53	0.11
			0.00			1/2" Ice	4.10	3.51	0.13
			0.00			1" Ice	5.24	4.49	0.16
						2" Ice	7.52	6.45	0.20
						4" Ice	12.08	10.37	0.30
Side Arm Mount [SO 202-1]	B	From Leg	0.00	0.0000	157.00	No Ice	2.96	2.53	0.11
			0.00			1/2" Ice	4.10	3.51	0.13
			0.00			1" Ice	5.24	4.49	0.16
						2" Ice	7.52	6.45	0.20
						4" Ice	12.08	10.37	0.30
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	148.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15
			0.00			1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	148.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15
			0.00			1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	148.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15
			0.00			1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	148.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			0.00			1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	148.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			0.00			1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.0000	148.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			0.00			1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
(3) ACU-A20-N	A	From Leg	4.00	0.0000	148.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			0.00			1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	B	From Leg	4.00	0.0000	148.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			0.00			1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
(3) ACU-A20-N	C	From Leg	4.00	0.0000	148.00	No Ice	0.08	0.14	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.12	0.19	0.00
			0.00			1" Ice	0.17	0.25	0.00
						2" Ice	0.30	0.40	0.01
						4" Ice	0.67	0.80	0.04
TD-RRH8x20-25	A	From Leg	4.00	0.0000	148.00	No Ice	4.72	1.70	0.07
			0.00			1/2" Ice	5.01	1.92	0.10
			0.00			1" Ice	5.32	2.14	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Leg	4.00	0.0000	148.00	No Ice	4.72	1.70	0.07
			0.00			1/2" Ice	5.01	1.92	0.10
			0.00			1" Ice	5.32	2.14	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Leg	4.00	0.0000	148.00	No Ice	4.72	1.70	0.07
			0.00			1/2" Ice	5.01	1.92	0.10
			0.00			1" Ice	5.32	2.14	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
(3) Site Pro VFA12-U w/ 12' Stiff Arm	C	None		0.0000	148.00	No Ice	33.02	33.02	1.67
						1/2" Ice	47.36	47.36	2.22
						1" Ice	61.70	61.70	2.77
						2" Ice	90.38	90.38	3.88
						4" Ice	147.74	147.74	6.08
***									
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00	0.0000	143.00	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			2.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00	0.0000	143.00	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			-1.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00	0.0000	143.00	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			2.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00	0.0000	143.00	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			-1.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.00	0.0000	143.00	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			2.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.00	0.0000	143.00	No Ice	2.71	2.61	0.06
			0.00			1/2" Ice	2.95	2.85	0.08
			-1.00			1" Ice	3.20	3.09	0.11
						2" Ice	3.72	3.61	0.17
						4" Ice	4.86	4.74	0.35
TME-800MHZ 2X50W RRH	A	From Leg	4.00	0.0000	143.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
TME-800MHZ 2X50W RRH	B	From Leg	4.00	0.0000	143.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			2.00			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
TME-800MHZ 2X50W RRH	C	From Leg	4.00	0.0000	143.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			2.00			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	143.00	No Ice	0.77	0.37	0.01
			0.00			1/2" Ice	0.89	0.46	0.02
			2.00			1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	143.00	No Ice	0.77	0.37	0.01
			0.00			1/2" Ice	0.89	0.46	0.02
			2.00			1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	143.00	No Ice	0.77	0.37	0.01
			0.00			1/2" Ice	0.89	0.46	0.02
			2.00			1" Ice	1.02	0.56	0.02
						2" Ice	1.30	0.79	0.04
						4" Ice	1.97	1.34	0.11
Side Arm Mount [SO 312-3]	C	None		0.0000	143.00	No Ice	7.87	7.87	0.21
						1/2" Ice	11.82	11.82	0.32
						1" Ice	15.77	15.77	0.43
						2" Ice	23.67	23.67	0.65
						4" Ice	39.47	39.47	1.08
***									
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	134.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			1.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	134.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			1.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	134.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			1.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
RRH-2WB	A	From Leg	4.00	0.0000	134.00	No Ice	2.69	0.85	0.04
			0.00			1/2" Ice	2.91	1.01	0.06
			1.00			1" Ice	3.14	1.18	0.08
						2" Ice	3.63	1.55	0.12
						4" Ice	4.72	2.38	0.25
RRH-2WB	B	From Leg	4.00	0.0000	134.00	No Ice	2.69	0.85	0.04
			0.00			1/2" Ice	2.91	1.01	0.06
			1.00			1" Ice	3.14	1.18	0.08

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
						2" Ice	3.63	1.55	0.12
						4" Ice	4.72	2.38	0.25
RRH-2WB	C	From Leg	4.00 0.00 1.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.69 2.91 3.14 3.63 4.72	0.85 1.01 1.18 1.55 2.38	0.04 0.06 0.08 0.12 0.25
Pipe Mount [PM 601-1]	A	From Leg	4.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
Sector Mount [SM 502-3]	C	None		0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	33.02 47.36 61.70 90.38 147.74	33.02 47.36 61.70 90.38 147.74	1.67 2.22 2.77 3.88 6.08
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HBX-6516DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.56 3.96 4.38 5.32 7.31	3.24 3.91 4.56 5.91 8.88	0.03 0.06 0.10 0.20 0.50
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.56 3.96 4.38 5.32 7.31	3.24 3.91 4.56 5.91 8.88	0.03 0.06 0.10 0.20 0.50
HBX-6516DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.56 3.96 4.38 5.32 7.31	3.24 3.91 4.56 5.91 8.88	0.03 0.06 0.10 0.20 0.50
DB844G65ZAXY w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.90 5.35 5.80 6.73 8.73	4.92 5.60 6.28 7.71 10.83	0.03 0.08 0.13 0.26 0.62
DB844G65ZAXY w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.90 5.35 5.80 6.73 8.73	4.92 5.60 6.28 7.71 10.83	0.03 0.08 0.13 0.26 0.62
(2) DB844G65ZAXY w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.90 5.35 5.80 6.73 8.73	4.92 5.60 6.28 7.71 10.83	0.03 0.08 0.13 0.26 0.62
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.57 9.22 9.84 11.10 13.75	7.00 8.19 9.08 10.90 14.93	0.06 0.13 0.20 0.38 0.89
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.57 9.22 9.84 11.10	7.00 8.19 9.08 10.90	0.06 0.13 0.20 0.38

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	13.75	14.93	0.89
MG D3-800TV w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
MG D3-800TV w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
MG D3-800TV w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.57 3.98 4.39 5.33 7.34	3.42 4.12 4.78 6.16 9.18	0.04 0.07 0.11 0.21 0.52
DB844H80-XY w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
DB844H80-XY w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.10 3.48 3.88 4.76 6.66	5.15 5.83 6.52 7.96 11.09	0.03 0.07 0.11 0.22 0.55
GPS_A	B	From Leg	4.00 0.00 4.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
P65.16.XL.2 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	5.78 6.95 7.83 9.63 13.44	0.06 0.12 0.19 0.36 0.84
RRH2X40-AWS	A	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	C	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0.00 2.00	0.0000	126.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Sector Mount [SM 410-3]	C	None		0.0000	126.00	No Ice	23.96	23.96	1.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	34.06	34.06	1.60
						1" Ice	44.16	44.16	2.10
						2" Ice	64.36	64.36	3.10
						4" Ice	104.76	104.76	5.09
***									
800 10504 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
Sector Mount [SM 104-3]	C	None		0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	30.02 40.48 50.94 71.86 113.70	30.02 40.48 50.94 71.86 113.70	0.95 1.40 1.86 2.76 4.57
Empty Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
Empty Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.40 2.13 2.68 3.56 5.42	1.40 2.13 2.68 3.56 5.42	0.03 0.04 0.06 0.10 0.26
***									
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
P65-16-XLH-RR w/ Mount	A	From Leg	4.00	0.0000	102.00	No Ice	8.64	6.36	0.08

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 K
Pipe			0.00			1/2" Ice	9.29	7.54	0.14
			0.00			1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.00	0.0000	102.00	No Ice	8.64	6.36	0.08
			0.00			1/2" Ice	9.29	7.54	0.14
			0.00			1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.0000	102.00	No Ice	8.64	6.36	0.08
			0.00			1/2" Ice	9.29	7.54	0.14
			0.00			1" Ice	9.91	8.43	0.22
						2" Ice	11.18	10.24	0.39
						4" Ice	13.83	14.10	0.89
(2) LGP2140X	A	From Leg	4.00	0.0000	102.00	No Ice	1.26	0.38	0.01
			0.00			1/2" Ice	1.42	0.49	0.02
			0.00			1" Ice	1.58	0.62	0.03
						2" Ice	1.94	0.89	0.05
						4" Ice	2.75	1.54	0.13
(2) LGP2140X	B	From Leg	4.00	0.0000	102.00	No Ice	1.26	0.38	0.01
			0.00			1/2" Ice	1.42	0.49	0.02
			0.00			1" Ice	1.58	0.62	0.03
						2" Ice	1.94	0.89	0.05
						4" Ice	2.75	1.54	0.13
(2) LGP2140X	C	From Leg	4.00	0.0000	102.00	No Ice	1.26	0.38	0.01
			0.00			1/2" Ice	1.42	0.49	0.02
			0.00			1" Ice	1.58	0.62	0.03
						2" Ice	1.94	0.89	0.05
						4" Ice	2.75	1.54	0.13
RRUS 11 B2	A	From Leg	4.00	0.0000	102.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			0.00			1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15
						4" Ice	5.50	3.04	0.31
RRUS 11 B2	B	From Leg	4.00	0.0000	102.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			0.00			1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15
						4" Ice	5.50	3.04	0.31
RRUS 11 B2	C	From Leg	4.00	0.0000	102.00	No Ice	3.31	1.36	0.05
			0.00			1/2" Ice	3.55	1.54	0.07
			0.00			1" Ice	3.80	1.73	0.10
						2" Ice	4.33	2.13	0.15
						4" Ice	5.50	3.04	0.31
DC6-48-60-18-8F	C	From Leg	4.00	0.0000	102.00	No Ice	2.57	4.32	0.03
			0.00			1/2" Ice	2.80	4.60	0.06
			0.00			1" Ice	3.04	4.88	0.10
						2" Ice	3.54	5.49	0.18
						4" Ice	4.66	6.80	0.40
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	102.00	No Ice	8.64	8.46	0.14
			0.00			1/2" Ice	9.29	9.66	0.21
			0.00			1" Ice	9.91	10.62	0.30
						2" Ice	11.18	12.61	0.49
						4" Ice	13.83	16.81	1.03
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	102.00	No Ice	8.64	8.46	0.14
			0.00			1/2" Ice	9.29	9.66	0.21
			0.00			1" Ice	9.91	10.62	0.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	11.18	12.61	0.49
						4" Ice	13.83	16.81	1.03
QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.64 9.29 9.91 11.18 13.83	8.46 9.66 10.62 12.61 16.81	0.14 0.21 0.30 0.49 1.03
RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
(2) TPX-070821	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.02 1.63	0.12 0.17 0.24 0.39 0.80	0.01 0.01 0.02 0.03 0.08
(2) TPX-070821	B	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.02 1.63	0.12 0.17 0.24 0.39 0.80	0.01 0.01 0.02 0.03 0.08
(2) TPX-070821	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.55 0.65 0.76 1.02 1.63	0.12 0.17 0.24 0.39 0.80	0.01 0.01 0.02 0.03 0.08
RRUS 32	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
RRUS 32	B	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
RRUS 32	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.33 3.60 3.87 4.44 5.68	1.98 2.21 2.45 2.96 4.07	0.06 0.08 0.10 0.16 0.34
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	0.03 0.06 0.10 0.18 0.40

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 K
Sector Mount [SM 301-3]	C	None		0.0000	102.00	No Ice	29.61	1.00	1.30
						1/2" Ice	39.80	1.20	1.84
						1" Ice	49.99	1.40	2.38
						2" Ice	70.37	1.80	3.46
						4" Ice	111.13	2.60	5.63
Empty Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice	1.40	1.40	0.03
						1/2" Ice	2.13	2.13	0.04
						1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
Empty Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice	1.40	1.40	0.03
						1/2" Ice	2.13	2.13	0.04
						1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
Empty Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	102.00	No Ice	1.40	1.40	0.03
						1/2" Ice	2.13	2.13	0.04
						1" Ice	2.68	2.68	0.06
						2" Ice	3.56	3.56	0.10
						4" Ice	5.42	5.42	0.26
***									
GPS_A	B	From Leg	3.00 0.00 -1.00	0.0000	48.00	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
GPS_A	C	From Leg	3.00 0.00 0.00	0.0000	48.00	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
Side Arm Mount [SO 701-1]	B	From Leg	0.00 0.00 0.00	0.0000	48.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
Side Arm Mount [SO 701-1]	C	From Leg	0.00 0.00 0.00	0.0000	48.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft^2	Weight K

****

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
**********											
*											
VHLP2-18	A	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	-10.0000		157.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20
VHLP2-18	B	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	-40.0000		157.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20
***											
VHLP2-23	A	Paraboloid w/o Radome	From Leg	4.00 0.00 1.00	0.0000		134.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.20

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

Comb. No.	Description
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 °
T1	180 - 160	3.421	35	0.1418	0.0138
T2	160 - 153.333	2.819	35	0.1393	0.0136
T3	153.333 - 146.667	2.622	35	0.1370	0.0135
T4	146.667 - 140	2.427	35	0.1340	0.0134
T5	140 - 120	2.235	35	0.1299	0.0131
T6	120 - 100	1.683	35	0.1168	0.0115
T7	100 - 80	1.191	35	0.0983	0.0096
T8	80 - 70	0.780	35	0.0790	0.0075
T9	70 - 60	0.604	35	0.0696	0.0064
T10	60 - 40	0.458	35	0.0594	0.0058
T11	40 - 20	0.215	35	0.0376	0.0034
T12	20 - 0	0.060	35	0.0195	0.0012

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod	35	3.421	0.1418	0.0138	943496
178.00	Empty Pipe Mount	35	3.361	0.1417	0.0138	943496
170.00	AIR -32 B2A/B66AA w/ Mount Pipe	35	3.119	0.1411	0.0138	471743
157.00	VHLP2-18	35	2.730	0.1383	0.0136	178617
148.00	APXVSPP18-C-A20 w/ Mount Pipe	35	2.466	0.1347	0.0134	329225
143.00	PCS 1900MHz 4x45W-65MHz	35	2.321	0.1318	0.0133	211770
135.00	VHLP2-23	35	2.093	0.1268	0.0128	115362
134.00	LLPX310R w/ Mount Pipe	35	2.064	0.1262	0.0127	112402
126.00	HBX-6516DS-VTM w/ Mount Pipe	35	1.844	0.1211	0.0121	93262
112.00	800 10504 w/ Mount Pipe	35	1.478	0.1100	0.0107	67797
102.00	7770.00 w/ Mount Pipe	35	1.237	0.1003	0.0098	55660
48.00	GPS_A	35	0.303	0.0460	0.0045	66172

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	9.799	10	0.4059	0.0400
T2	160 - 153.333	8.074	10	0.3987	0.0394
T3	153.333 - 146.667	7.509	10	0.3922	0.0390

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T4	146.667 - 140	6.953	10	0.3833	0.0386
T5	140 - 120	6.401	10	0.3717	0.0379
T6	120 - 100	4.822	10	0.3342	0.0332
T7	100 - 80	3.414	10	0.2812	0.0277
T8	80 - 70	2.236	10	0.2259	0.0218
T9	70 - 60	1.732	10	0.1991	0.0185
T10	60 - 40	1.313	10	0.1697	0.0167
T11	40 - 20	0.616	10	0.1074	0.0099
T12	20 - 0	0.172	10	0.0557	0.0035

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod	10	9.799	0.4059	0.0400	332210
178.00	Empty Pipe Mount	10	9.626	0.4056	0.0400	332210
170.00	AIR -32 B2A/B66AA w/ Mount Pipe	10	8.933	0.4039	0.0398	166105
157.00	VHLP2-18	10	7.819	0.3960	0.0393	62762
148.00	APXVSPP18-C-A20 w/ Mount Pipe	10	7.063	0.3854	0.0387	114806
143.00	PCS 1900MHz 4x45W-65MHz	10	6.649	0.3771	0.0383	74254
135.00	VHLP2-23	10	5.994	0.3629	0.0370	40361
134.00	LLPX310R w/ Mount Pipe	10	5.914	0.3611	0.0368	39326
126.00	HBX-6516DS-VTM w/ Mount Pipe	10	5.281	0.3466	0.0349	32631
112.00	800 10504 w/ Mount Pipe	10	4.234	0.3146	0.0310	23692
102.00	7770.00 w/ Mount Pipe	10	3.545	0.2869	0.0282	19432
48.00	GPS_A	10	0.871	0.1316	0.0130	23206

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325X	0.8750	4	1.65	26.46	0.062	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	2.22	4.55	0.487	1.333	Member Block Shear
		Top Girt	A325X	0.6250	1	0.07	3.04	0.023	1.333	Member Block Shear
		Mid Girt	A325X	0.6250	1	0.49	3.04	0.162	1.333	Member Block Shear
T2	160	Diagonal	A325X	0.6250	1	2.57	6.80	0.378	1.333	Member Bearing
T3	153.333	Diagonal	A325X	0.6250	1	3.06	6.80	0.450	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	0.32	3.04	0.106	1.333	Member Block Shear
T4	146.667	Leg	A325X	1.0000	4	5.40	34.56	0.156	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	4.50	6.80	0.661	1.333	Member Bearing
		Top Girt	A325X	0.6250	1	0.12	3.04	0.040	1	Member Block Shear
T5	140	Leg	A325X	1.0000	6	7.81	34.56	0.226	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	7.00	6.80	1.030	1.333	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T6	120	Leg	A325X	1.0000	6	13.06	34.56	0.378	1.333	Bolt Tension
		Diagonal	A325X	0.6250	1	8.58	7.62	1.126	1.333	Member Bearing
T7	100	Leg	A325X	1.0000	8	13.74	34.56	0.397	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	10.36	9.14	1.134	1.333	Member Bearing
T8	80	Diagonal	A325X	0.7500	1	10.48	9.14	1.146	1.333	Member Bearing
T9	70	Leg	A325X	1.0000	8	17.87	34.56	0.517	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	11.05	12.91	0.856	1.333	Gusset Bearing
T10	60	Leg	A325X	1.0000	8	21.80	34.56	0.631	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	11.28	9.14	1.234	1.333	Member Bearing
T11	40	Leg	A325X	1.0000	8	25.52	34.56	0.738	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	11.78	11.43	1.031	1.333	Member Bearing
T12	20	Leg	A449	1.0000	10	23.14	31.10	0.744	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	12.73	12.91	0.985	1.333	Gusset Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 160	ROHN 3 EH	20.04	5.01	52.9 K=1.00	23.893	3.0159	-9.65	72.06	0.134
T2	160 - 153.333	ROHN 4 EH	6.68	6.68	54.3 K=1.00	23.671	4.4074	-14.34	104.33	0.137
T3	153.333 - 146.667	ROHN 4 EH	6.68	6.68	54.3 K=1.00	23.671	4.4074	-20.93	104.33	0.201
T4	146.667 - 140	ROHN 4 EH	6.68	6.68	54.3 K=1.00	23.671	4.4074	-28.88	104.33	0.277
T5	140 - 120	ROHN 5 EH	20.04	6.68	43.6 K=1.00	25.320	6.1120	-60.08	154.75	0.388
T6	120 - 100	ROHN 6 EHS	20.03	6.68	36.0 K=1.00	26.380	6.7133	-97.77	177.09	0.552
T7	100 - 80	ROHN 6 EH	20.04	10.02	54.8 K=1.00	23.589	8.4049	-134.65	198.26	0.679
T8	80 - 70	ROHN 8 EHS	10.02	10.02	40.6 K=1.00	25.754	9.8666	-153.63	254.10	0.605
T9	70 - 60	ROHN 8 EHS	10.02	10.02	40.6 K=1.00	25.754	9.8666	-172.82	254.10	0.680
T10	60 - 40	ROHN 8 EHS	20.03	10.02	40.6 K=1.00	25.754	9.8666	-210.00	254.10	0.826
T11	40 - 20	ROHN 8 EH	20.03	10.02	41.8 K=1.00	25.582	12.7627	-246.01	326.50	0.753
T12	20 - 0	ROHN 8 EH	20.03	10.02	41.8 K=1.00	25.582	12.7627	-281.30	326.50	0.862

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x3/16	9.86	4.79	146.0 K=1.00	7.007	0.7150	-2.18	5.01	0.436
T2	160 - 153.333	L2 1/2x2 1/2x1/4	11.29	5.51	134.5 K=1.00	8.249	1.1900	-2.64	9.82	0.269
T3	153.333 - 146.667	L2 1/2x2 1/2x1/4	11.85	5.79	141.5 K=1.00	7.461	1.1900	-3.20	8.88	0.361
T4	146.667 - 140	L2 1/2x2 1/2x1/4	12.43	6.08	148.5 K=1.00	6.769	1.1900	-4.58	8.06	0.569
T5	140 - 120	L2 1/2x2 1/2x1/4	14.23	6.93	169.3 K=1.00	5.207	1.1900	-7.01	6.20	1.131
T6	120 - 100	L3x3x1/4	15.99	7.75	157.1 K=1.00	6.053	1.4400	-8.62	8.72	0.988
T7	100 - 80	L3 1/2x3 1/2x1/4	19.26	9.48	164.0 K=1.00	5.554	1.6900	-10.35	9.39	1.102
T8	80 - 70	L3 1/2x3 1/2x1/4	20.15	9.81	169.6 K=1.00	5.190	1.6900	-10.66	8.77	1.216
T9	70 - 60	2L3 1/2x3 1/2x1/4x3/8 2L 'a' > 58.7386 in - 136	21.03	10.25	193.4 K=1.00	3.993	3.3800	-11.28	13.50	0.836
T10	60 - 40	L4x4x1/4	22.81	11.14	168.2 K=1.00	5.279	1.9400	-11.63	10.24	1.135
T11	40 - 20	L4x4x5/16	24.62	12.06	182.9 K=1.00	4.463	2.4000	-12.07	10.71	1.127
T12	20 - 0	2L4x4x5/16x3/8 2L 'a' > 74.5105 in - 176	26.46	12.98	214.9 K=1.00	3.233	4.8000	-12.99	15.52	0.837

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8	6.69	6.16	185.8 K=1.00	4.324	0.4844	-0.09	2.09	0.043
T3	153.333 - 146.667	L2x2x1/8 KL/R > 200 (C) - 46	9.45	8.84	266.7 K=1.00	2.099	0.4844	-0.19	1.02	0.191

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8 KL/R > 200 (C) - 7	7.72	7.19	217.1 K=1.00	3.168	0.4844	-0.51	1.53	0.331

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	180 - 160	ROHN 3 EH	20.04	5.01	52.9	30.000	3.0159	6.59	90.48	0.073
T2	160 - 153.333	ROHN 4 EH	6.68	6.68	54.3	30.000	4.4074	10.73	132.22	0.081
T3	153.333 - 146.667	ROHN 4 EH	6.68	6.68	54.3	30.000	4.4074	15.71	132.22	0.119
T4	146.667 - 140	ROHN 4 EH	6.68	6.68	54.3	30.000	4.4074	21.62	132.22	0.163
T5	140 - 120	ROHN 5 EH	20.04	6.68	43.6	30.000	6.1120	46.85	183.36	0.255
T6	120 - 100	ROHN 6 EHS	20.03	6.68	36.0	30.000	6.7133	78.35	201.40	0.389
T7	100 - 80	ROHN 6 EH	20.04	10.02	54.8	30.000	8.4049	109.89	252.15	0.436
T8	80 - 70	ROHN 8 EHS	10.02	10.02	40.6	30.000	9.8666	126.56	296.00	0.428
T9	70 - 60	ROHN 8 EHS	10.02	10.02	40.6	30.000	9.8666	142.92	296.00	0.483
T10	60 - 40	ROHN 8 EHS	20.03	10.02	40.6	30.000	9.8666	174.39	296.00	0.589
T11	40 - 20	ROHN 8 EH	20.03	10.02	41.8	30.000	12.7627	204.14	382.88	0.533
T12	20 - 0	ROHN 8 EH	20.03	10.02	41.8	30.000	12.7627	231.43	382.88	0.604

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	180 - 160	L2x2x3/16	9.86	4.79	95.6	29.000	0.4308	2.22	12.49	0.177
T2	160 - 153.333	L2 1/2x2 1/2x1/4	11.29	5.51	87.8	29.000	0.7519	2.57	21.80	0.118
T3	153.333 - 146.667	L2 1/2x2 1/2x1/4	11.85	5.79	92.2	29.000	0.7519	3.06	21.80	0.140
T4	146.667 - 140	L2 1/2x2 1/2x1/4	12.43	6.08	96.7	29.000	0.7519	4.50	21.80	0.206
T5	140 - 120	L2 1/2x2 1/2x1/4	14.23	6.93	110.0	29.000	0.7519	7.00	21.80	0.321
T6	120 - 100	L3x3x1/4	15.99	7.75	101.5	32.500	0.9394	8.58	30.53	0.281
T7	100 - 80	L3 1/2x3 1/2x1/4	19.26	9.48	105.9	32.500	1.1034	10.36	35.86	0.289
T8	80 - 70	L3 1/2x3 1/2x1/4	20.15	9.81	109.5	32.500	1.1034	10.48	35.86	0.292
T9	70 - 60	2L3 1/2x3 1/2x1/4x3/8 2L 'a' > 58.7386 in - 137	21.03	10.25	114.3	29.000	2.2069	11.05	64.00	0.173
T10	60 - 40	L4x4x1/4	22.81	11.14	108.3	32.500	1.2909	11.28	41.96	0.269
T11	40 - 20	L4x4x5/16	23.71	11.60	113.6	32.500	1.5949	11.78	51.84	0.227
T12	20 - 0	2L4x4x5/16x3/8 2L 'a' > 74.5105 in - 175	26.46	12.98	126.9	29.000	3.1898	12.73	92.51	0.138

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	180 - 160	L2x2x1/8	6.69	6.16	122.6	29.000	0.2930	0.07	8.50	0.008
T3	153.333 - 146.667	L2x2x1/8	9.45	8.84	173.9	29.000	0.2930	0.32	8.50	0.038
T4	146.667 - 140	L2x2x1/8	10.14	9.53	187.2	29.000	0.2930	0.12	8.50	0.014*

* DL controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8	7.72	7.19	142.4	29.000	0.2930	0.49	8.50	0.058

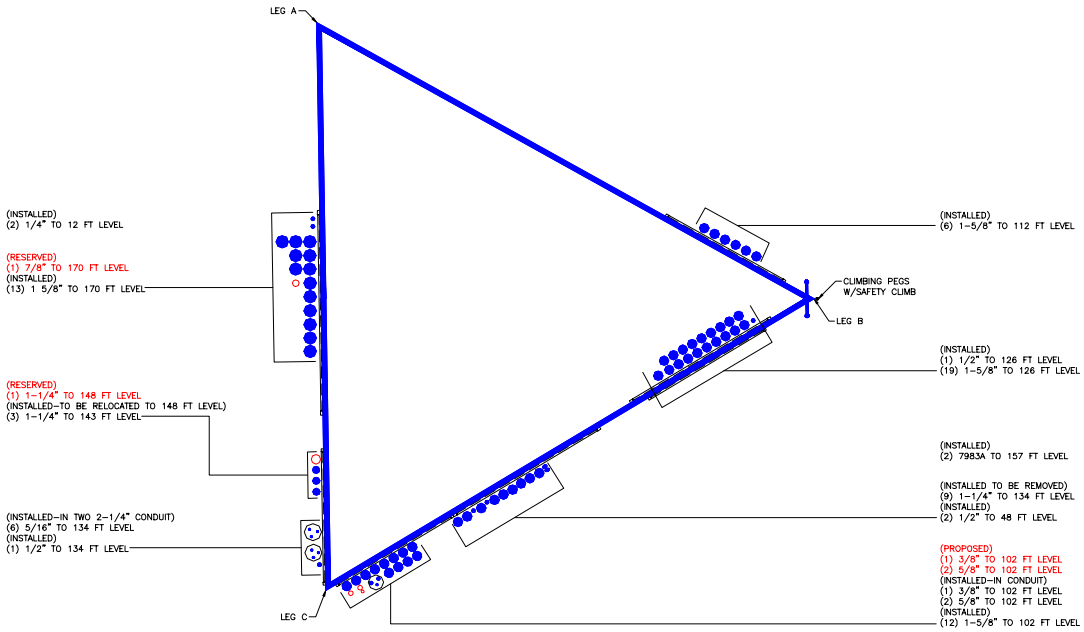
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 3 EH	1	-9.65	96.06	10.0	Pass
T2	160 - 153.333	Leg	ROHN 4 EH	36	-14.34	139.07	10.3	Pass
T3	153.333 - 146.667	Leg	ROHN 4 EH	43	-20.93	139.07	15.0	Pass
T4	146.667 - 140	Leg	ROHN 4 EH	55	-28.88	139.07	20.8	Pass
T5	140 - 120	Leg	ROHN 5 EH	67	-60.08	206.29	29.1	Pass
T6	120 - 100	Leg	ROHN 6 EHS	88	-97.77	236.06	41.4	Pass
T7	100 - 80	Leg	ROHN 6 EH	109	-134.65	264.29	50.9	Pass
T8	80 - 70	Leg	ROHN 8 EHS	124	-153.63	338.72	45.4	Pass
T9	70 - 60	Leg	ROHN 8 EHS	133	-172.82	338.72	51.0	Pass
T10	60 - 40	Leg	ROHN 8 EHS	142	-210.00	338.72	62.0	Pass
T11	40 - 20	Leg	ROHN 8 EH	157	-246.01	435.22	56.5	Pass
T12	20 - 0	Leg	ROHN 8 EH	172	-281.30	435.22	64.6	Pass
T1	180 - 160	Diagonal	L2x2x3/16	15	-2.18	6.68	32.7	Pass
							36.5 (b)	
T2	160 - 153.333	Diagonal	L2 1/2x2 1/2x1/4	41	-2.64	13.09	20.2	Pass
							28.4 (b)	
T3	153.333 - 146.667	Diagonal	L2 1/2x2 1/2x1/4	53	-3.20	11.83	27.1	Pass
							33.7 (b)	
T4	146.667 - 140	Diagonal	L2 1/2x2 1/2x1/4	65	-4.58	10.74	42.7	Pass
							49.6 (b)	
T5	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	74	-7.01	8.26	84.8	Pass
T6	120 - 100	Diagonal	L3x3x1/4	95	-8.62	11.62	74.1	Pass
							84.5 (b)	
T7	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	116	-10.35	12.51	82.7	Pass
							85.1 (b)	
T8	80 - 70	Diagonal	L3 1/2x3 1/2x1/4	131	-10.66	11.69	91.2	Pass
T9	70 - 60	Diagonal	2L3 1/2x3 1/2x1/4x3/8	136	-11.28	17.99	62.7	Pass
							64.2 (b)	
T10	60 - 40	Diagonal	L4x4x1/4	146	-11.63	13.65	85.2	Pass
							92.5 (b)	
T11	40 - 20	Diagonal	L4x4x5/16	161	-12.07	14.28	84.5	Pass
T12	20 - 0	Diagonal	2L4x4x5/16x3/8	176	-12.99	20.68	62.8	Pass
							73.9 (b)	
T1	180 - 160	Top Girt	L2x2x1/8	6	-0.09	2.79	3.2	Pass
T3	153.333 - 146.667	Top Girt	L2x2x1/8	46	-0.19	1.36	14.3	Pass
T4	146.667 - 140	Top Girt	L2x2x1/8	60	0.12	8.50	1.4	Pass
							3.0 (b)	
T1	180 - 160	Mid Girt	L2x2x1/8	7	-0.51	2.05	24.8	Pass
							Summary	
						Leg (T12)	64.6	Pass
						Diagonal (T10)	92.5	Pass
						Top Girt	14.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						(T3) Mid Girt	24.8	Pass
						(T1) Bolt Checks	92.5	Pass
						RATING =	**92.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


LEG A
(INSTALLED)
(2) 1/4" TO 12 FT LEVEL
(RESERVED)
(1) 7/8" TO 170 FT LEVEL
(INSTALLED)
(13) 1 5/8" TO 170 FT LEVEL
(RESERVED)
(1) 1-1/4" TO 148 FT LEVEL
(INSTALLED-TO BE RELOCATED TO 148 FT LEVEL)
(3) 1-1/4" TO 143 FT LEVEL
(INSTALLED-IN TWO 2-1/4" CONDUIT)
(6) 5/16" TO 134 FT LEVEL
(INSTALLED)
(1) 1/2" TO 134 FT LEVEL
LEG C
(INSTALLED)
(6) 1-5/8" TO 112 FT LEVEL
CLIMBING PEGS
W/SAFETY CLIMB
LEG B
(INSTALLED)
(1) 1/2" TO 126 FT LEVEL
(19) 1-5/8" TO 126 FT LEVEL
(INSTALLED)
(2) 7983A TO 157 FT LEVEL
(INSTALLED TO BE REMOVED)
(9) 1-1/4" TO 134 FT LEVEL
(INSTALLED)
(2) 1/2" TO 48 FT LEVEL
(PROPOSED)
(1) 3/8" TO 102 FT LEVEL
(2) 5/8" TO 102 FT LEVEL
(INSTALLED-IN CONDUIT)
(1) 3/8" TO 102 FT LEVEL
(2) 5/8" TO 102 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 102 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Rock Anchor Foundation Calculations

TNX Reactions:

$P_{uplift} := 238\ kip$ $P_{comp} := 290\ kip$

Concrete Bearing Check:

$w_c := (6.25\ ft \cdot 8.75\ ft \cdot 9\ ft) \cdot 150\ pcf = 73.828\ kip$

$q_{ult} := 30\ ksf$ (Ultimate bearing pressure per FDH Project No. 08-07100E G1)

$A_{bearing} := 6.25\ ft \cdot 8.75\ ft = 54.688\ ft^2$

$P_{total} := P_{comp} + w_c = 363.828\ kip$

$q_n := \frac{P_{total}}{A_{bearing}} = 6.653\ ksf$

$Capacity := \frac{q_n}{0.5 \cdot q_{ult}} \cdot 100 = 44.352\ \%$

Tensile Yielding Check: (4) #11 A615 Gr. 60 Anchor Bars

$\Omega := 1.67$ $N := 4$ $d := 1.410\ in$ $F_y := 60\ ksi$ $A_g := \left(\frac{\pi}{4}\right) \cdot d^2 = 1.561\ in^2$

$P_u := \frac{P_{uplift} - w_c}{N} = 41.043\ kip$

$P_n := \frac{F_y \cdot A_g}{\Omega} = 56.1\ kip$

$Capacity := \frac{P_u}{P_n} \cdot 100 = 73.16\ \%$

Tensile Rupture Check: (4) #11 A615 Gr. 60 Anchor Bars

$\Omega := 2.0$ $N := 4$ $d := 1.410\ in$ $F_u := 80\ ksi$ $A_e := \left(\frac{\pi}{4}\right) \cdot d^2 = 1.561\ in^2$

$$P_u := \frac{P_{uplift} - w_c}{N} = 41.043\ kip$$

$$P_n := \frac{F_u \cdot A_e}{\Omega} = 62.458\ kip$$

$$Capacity := \frac{P_u}{P_n} \cdot 100 = 65.713 \quad \%$$

Uplift Check / Soil-Grout Interaction:

$\Omega := 2.0$ $Q_{ult} := 16.0\ ksf$ (Ultimate skin friction from FDH Project No. 08-07100 E G1)

$$P_u := \frac{P_{uplift} - w_c}{N} = 41.043\ kip$$

$$P_n := \frac{\pi \cdot (2.25\ in) \cdot 14.0\ ft \cdot Q_{ult}}{\Omega} = 65.973\ kip$$

$$Capacity := \frac{P_u}{P_n} \cdot 100 = 62.211 \quad \%$$ Passing

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

AT&T Existing Facility

Site ID: CT2122

Rockland
50 Rockland Road
Norwalk, CT 06854

July 7, 2016

EBI Project Number: 6216003131

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	11.82 %

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

EBI Consulting
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July 7, 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: **CT2122 – Rockland**

EBI Consulting was directed to analyze the proposed AT&T facility located at **50 Rockland Road, Norwalk, 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 **50 Rockland Road, Norwalk, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

3) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (2300 MHz (WCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 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.

6) 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.

7) 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.

8) 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.

9) The antennas used in this modeling are the **Powerwave 7770, Quintel QS66512-2 and the Powerwave P65-15-XLH-RR** for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerlines of the proposed antennas are **103 feet** above ground level (AGL) for **Sector A**, **103 feet** above ground level (AGL) for **Sector B** and **103 feet** above ground level (AGL) for Sector C.

11) 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):	**103 feet**	Height (AGL):	**103 feet**	Height (AGL):	**103 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%	**1.06 %**	Antenna B1 MPE%	**1.06 %**	Antenna C1 MPE%	**1.06 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2	Make / Model:	Quintel QS66512-2
Gain:	11.35 / 14.85 dBd	Gain:	11.35 / 14.85 dBd	Gain:	11.35 / 14.85 dBd
Height (AGL):	**103 feet**	Height (AGL):	**103 feet**	Height (AGL):	**103 feet**
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts	Total TX Power(W):	180 Watts
ERP (W):	4,484.66	ERP (W):	4,484.66	ERP (W):	4,484.66
Antenna A2 MPE%	**1.95 %**	Antenna B2 MPE%	**1.95 %**	Antenna C2 MPE%	**1.95 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Powerwave P65-15-XLH-RR	Make / Model:	Powerwave P65-15-XLH-RR	Make / Model:	Powerwave P65-15-XLH-RR
Gain:	11.9 / 14.6 dBd	Gain:	11.9 / 14.6 dBd	Gain:	11.9 / 14.6 dBd
Height (AGL):	**103 feet**	Height (AGL):	**103 feet**	Height (AGL):	**103 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):	5,319.42	ERP (W):	5,319.42	ERP (W):	5,319.42
Antenna A3 MPE%	**2.84 %**	Antenna B3 MPE%	**2.84 %**	Antenna C3 MPE%	**2.84 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**5.86 %**
MetroPCS	1.56 %
Verizon Wireless	2.17 %
T-Mobile	1.46 %
Sprint	0.77 %
Site Total MPE %:	**11.82 %**

AT&T Sector A Total:	5.86 %
AT&T Sector B Total:	5.86 %
AT&T Sector C Total:	5.86 %
Site Total:	11.82 %

AT&T _ Max Values Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	103	3.16	850 MHz	567	0.56 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	103	5.02	1900 MHz (PCS)	1000	0.50 %
AT&T 850 MHz GSM	2	409.37	103	3.13	850 MHz	567	0.55 %
AT&T 2300 MHz (WCS) LTE	2	1,832.95	103	14.01	2300 MHz (WCS)	1000	1.40 %
AT&T 700 MHz LTE	2	929.29	103	7.10	700 MHz	467	1.52 %
AT&T 1900 MHz (PCS) LTE	2	1,730.42	103	13.22	1900 MHz (PCS)	1000	1.32 %
						Total:	**5.86 %**

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:	5.86 %
Sector B:	5.86 %
Sector C:	5.86 %
AT&T Maximum Total (per sector):	5.86 %
Site Total:	11.82 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.82 %** 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.