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

December 15, 2015

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: 842875**
AT&T Site ID: CT5139
99 Day Hill Road, Windsor, CT 06095
Latitude: 42° 52' 16.1" / Longitude: -72° 40' 16.0"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 168-foot level of the existing 168-foot monopole at 99 Day Hill Road in Windsor, CT. The tower is owned by Crown Castle. The property is owned by the Town of Windsor. AT&T now intends to replace three (3) Kathrein with three (3) CCI antennas new 2.3 GHz antennas. These antennas would be installed at the 168-foot level of the tower. AT&T also intends to replace six (6) TMAs with three (3) CCI Dual TMAs, install three (3) RRU32s, one (1) Raycap, two (2) DC, one (1) Fiber, and remove six (6) RBS 6601's.

This facility was approved by the Planning and Zoning Commission of the Town of Windsor in Special Use Application #292A on November 30, 2000. This approval included waivers regarding tower height and no conditional statements.

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 Donald S. Trinks, Mayor for the Town of Windsor, 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 Donald S. Trinks, Mayor, Town of Windsor
Town of Windsor
275 Broad Street
Windsor, CT 06095

Town of Windsor
275 Broad St.
Attn: Accounts Receivable
Windsor, CT 06095

VOL 1249 PG 156

I, Anita M. Mips, Chairperson of the Windsor Town Planning and Zoning Commission, hereby certify that on October 10, 2000 the Planning and Zoning Commission of the Town of Windsor granted approval of Special Use Application #292A for a Wireless Telecommunications Tower with a monopole height of 170 feet plus 20-foot Town public service whip antennas for a total height of 190 feet, under Zoning Regulations Sections 12.2 & 2.2.19E(1).

This approval also includes the following waivers in accordance with Zoning Regulations Section 12.1:

1) **a waiver of the height requirement for 15 feet; and**

2) **a waiver of the fall zone distance requirement for 151 feet in relation to the distance of the tower from Day Hill Road, 380 feet being required, 229 feet being proposed.**

Said Special Use was granted for the property located at: **99 Day Hill Road**

The owner of record of said parcel is: **Town of Windsor**

Dated at Windsor, Connecticut, this 30th **day of November, 2000**

_____ **Chairperson**

Public Act #75-317

Received for Record this _____ day of _____, 2000

_____ **Attest: Town Clerk**

RECEIVED FOR RECORD
WINDSOR TOWN CLERK

00 NOV 30 PM 12:58

VOL 1249 PG 156

BY Kathleen M. Lucia
TOWN CLERK

005545

PROJECT INFORMATION

SCOPE OF WORK:
- REMOVE (1) ANTENNA PER SECTOR (TOTAL OF 3 ANTENNAS)
- INSTALL (1) ANTENNA PER SECTOR (TOTAL OF 3 NEW ANTENNAS)
- (2) EXISTING ANTENNAS TO REMAIN (TOTAL OF 6 EXISTING ANTENNAS)
- ADD (1) RRH PER SECTOR (TOTAL OF 3 NEW RRHs)
- ADD (1) R503-XMU TO LTE RACK
- INSTALL (1) FIBER PER SECTOR (TOTAL OF 3 FIBER)
- INSTALL (2) DC TRUNKS PER SECTOR (TOTAL OF 6 DC TRUNKS)

SITE ADDRESS:	99 DAY HILL ROAD WINDSOR, CT 06095
LATITUDE: LONGITUDE:	41.8710919 41°-52'-15.93084"N -72.6705989 72°-40'-14.15604"W
USID:	14489
TOWER OWNER:	TBD
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT
TOP OF TOWER:	168'-0"± (TOP OF ROOF)
RAD CENTER:	168'-0"±
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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T-1	TITLE SHEET	0
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A-2	EQUIPMENT LAYOUTS	0
A-3	ANTENNA LAYOUTS & ELEVATIONS	0
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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: 10071331
SITE NUMBER: CTV5139
SITE NAME: WINDSORDAY HILL

VICINITY MAP

FROM ROCKY HILL, HEAD SOUTHWEST ON CONCRIB LN. TURN LEFT ONTO SOLO DR. TURN RIGHT ONTO GILBERT AVE. TURN RIGHT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I-91 N. TAKE EXIT 37 FOR CT-305/BLOOMFIELD AVE. TURN LEFT ONTO CT-305W/BLOOMFIELD AVE. TURN RIGHT ONTO ADDISON RD. TURN RIGHT ONTO DAY HILL RD. SITE WILL BE ON 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: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617-639-4908
EMAIL: dcooper@empiretelecomm.com

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

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

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

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

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
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FAX: 862.209.4301

EMPIRE telecom
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BILLERICA, MA 01821

SITE NUMBER: CTV5139
SITE NAME: WINDSORDAY HILL
99 DAY HILL ROAD
WINDSOR, CT 06095
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	10/21/15	ISSUED AS FINAL	JW	NDB	NDB

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

SEAL: STATE OF CONNECTICUT NICHOLAS D. BARILE No. 28643 LICENSED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15085-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.

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

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CTV5139

SITE NAME: WINDSORDAY HILL

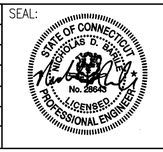
99 DAY HILL ROAD
WINDSOR, CT 06095
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	10/21/15	ISSUED AS FINAL	JW	NDB	NDB

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

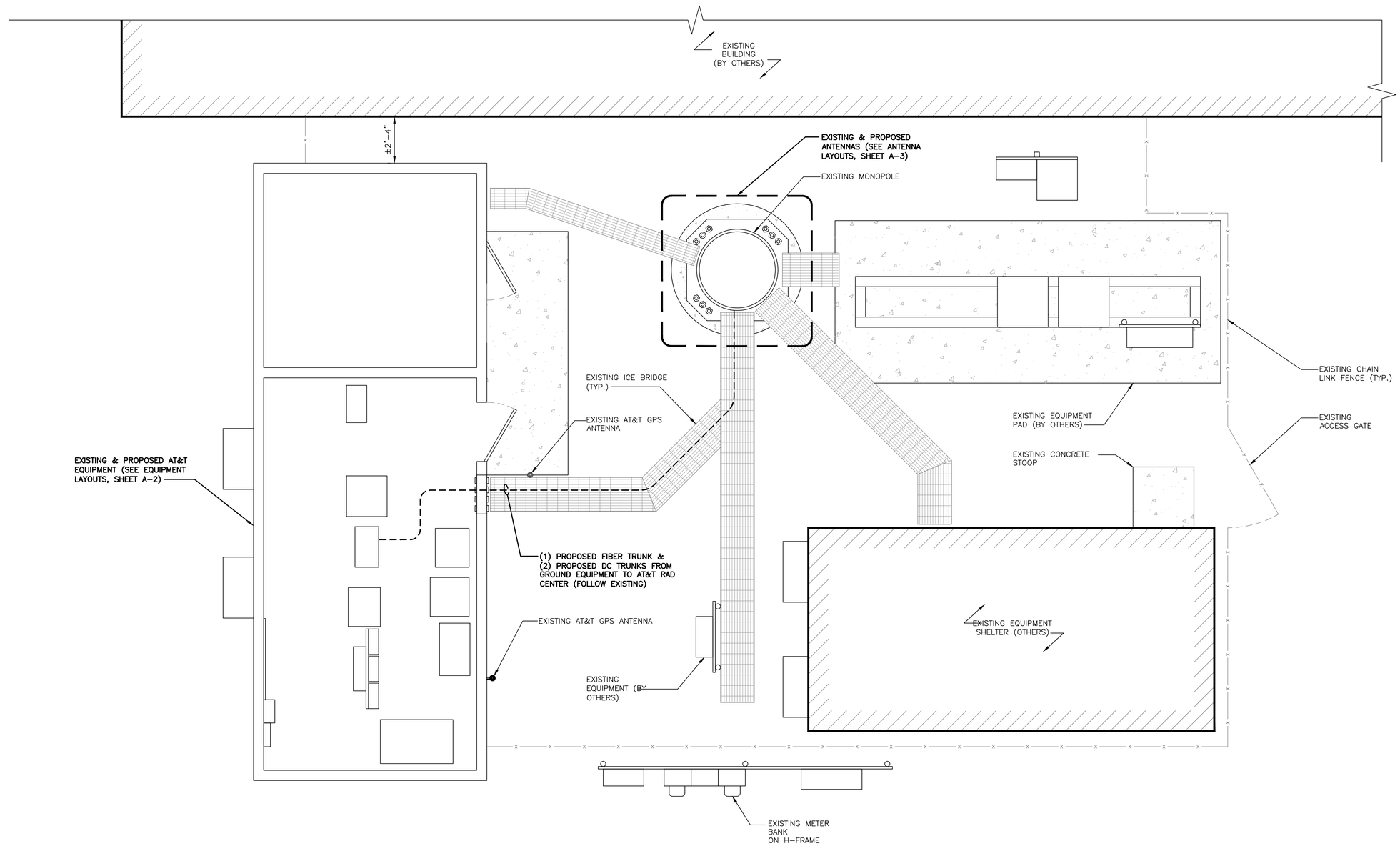
SEAL:



AT&T

DRAWING TITLE: GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15085-EMP	GN-1	0



NORTH

ROOF PLAN

SCALE: 3/16" = 1'-0"

0 1'-4" 2'-8" 5'-4"

GRAPHIC SCALE: 3/8"=1'-0"

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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0	10/21/15	ISSUED AS FINAL	JW	NDB	NDB

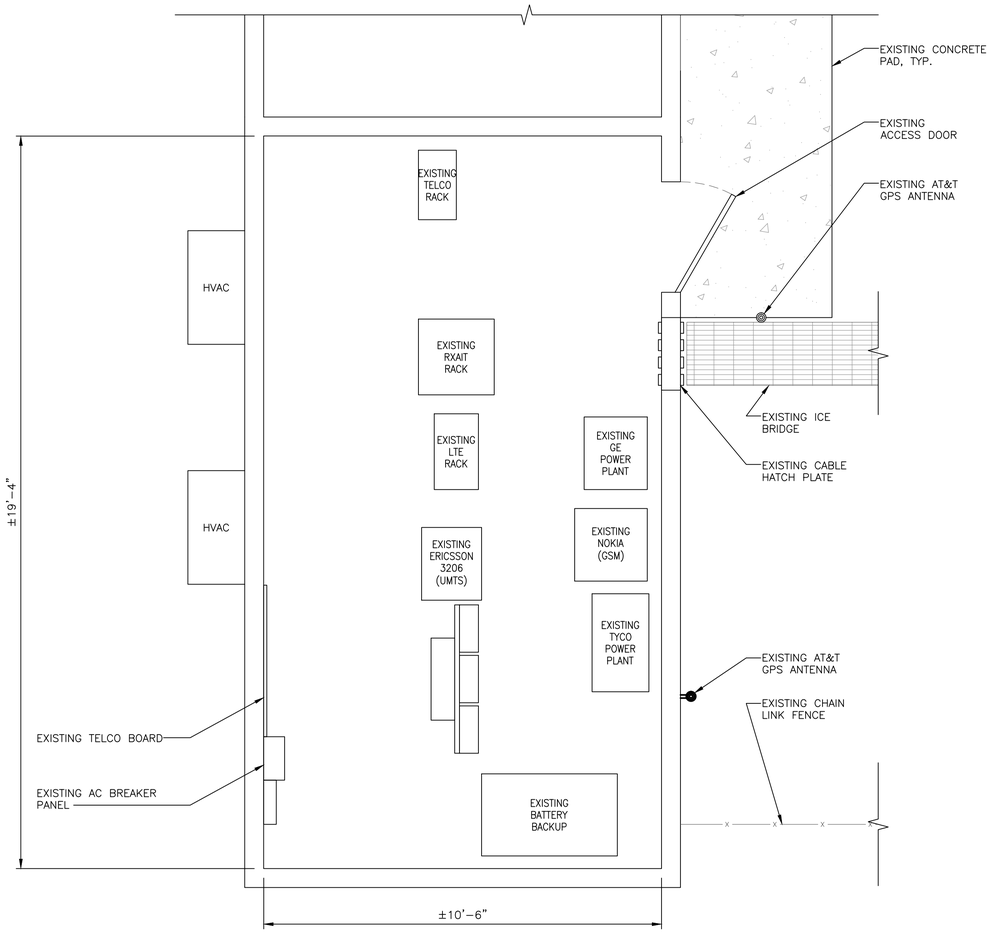
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL: STATE OF CONNECTICUT NICHOLAS D. BALDWIN No. 28643 LICENSED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE:
ROOFTOP LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15085-EMP	A-1	0

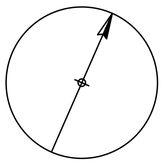


EXISTING EQUIPMENT LAYOUT

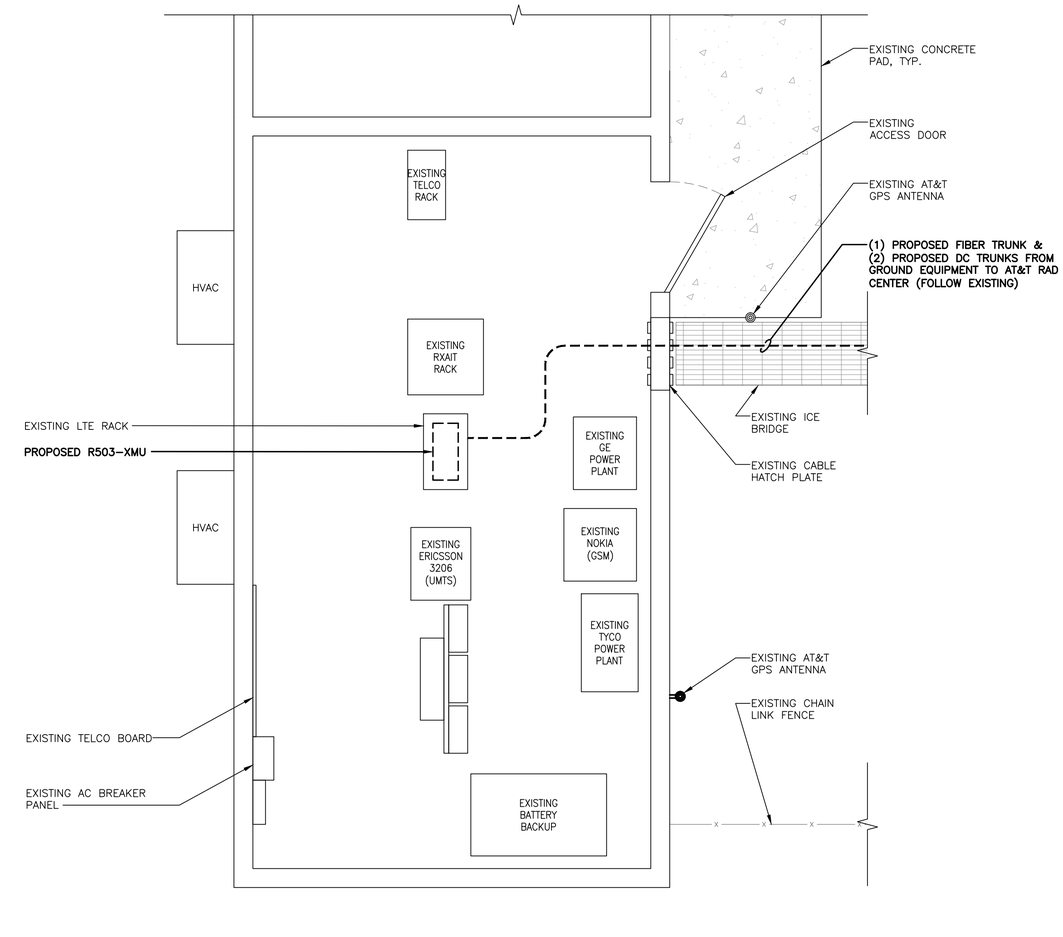
SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot



NORTH



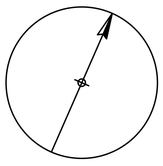
PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NO GROUND EQUIPMENT MODIFICATIONS ARE BEING MADE AS PART OF THIS SCOPE. EXISTING GROUND EQUIPMENT CONFIGURATION TO REMAIN.



NORTH

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PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CTV5139

SITE NAME: WINDSORDAY HILL

99 DAY HILL ROAD
WINDSOR, CT 06095
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	10/21/15	ISSUED AS FINAL	JW	NDB	NDB

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

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BASILE · No. 28645 · LICENSED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
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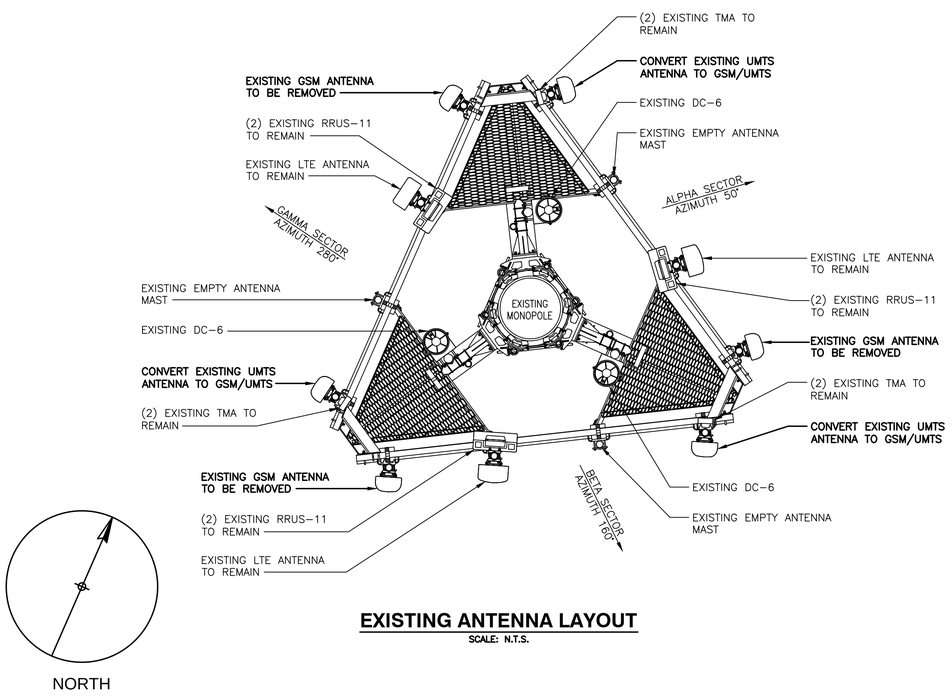
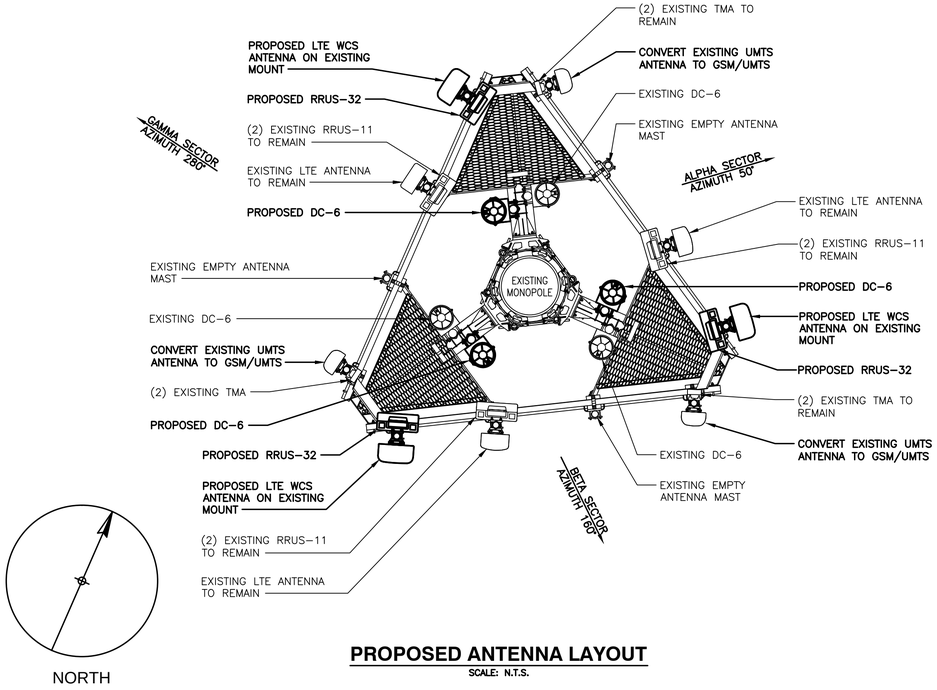


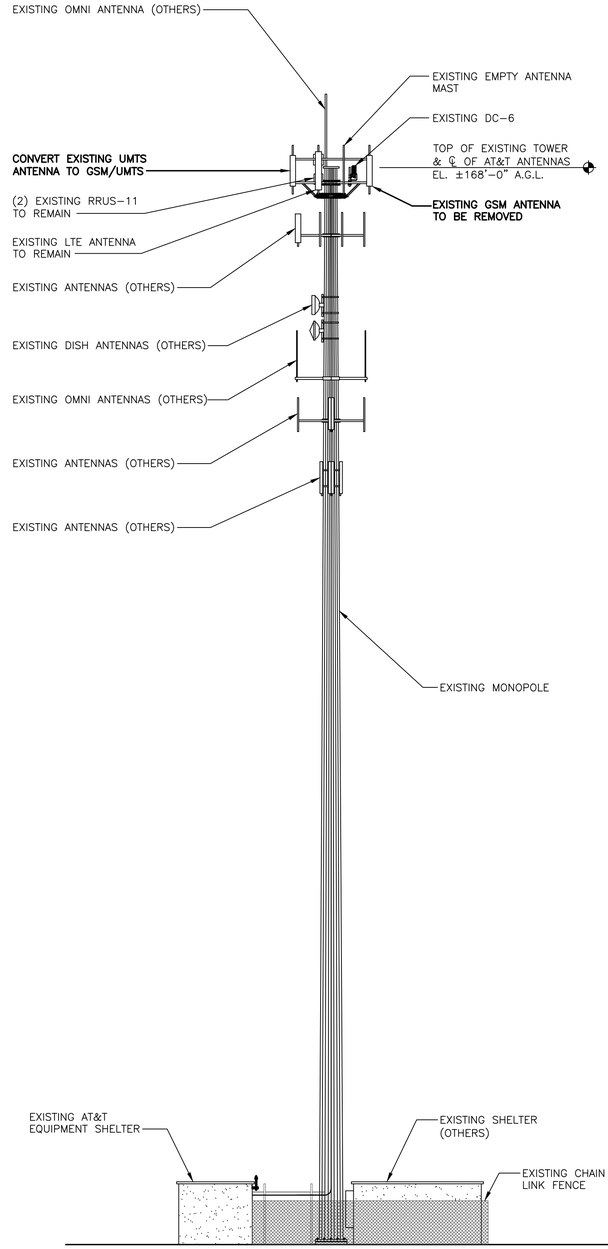
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



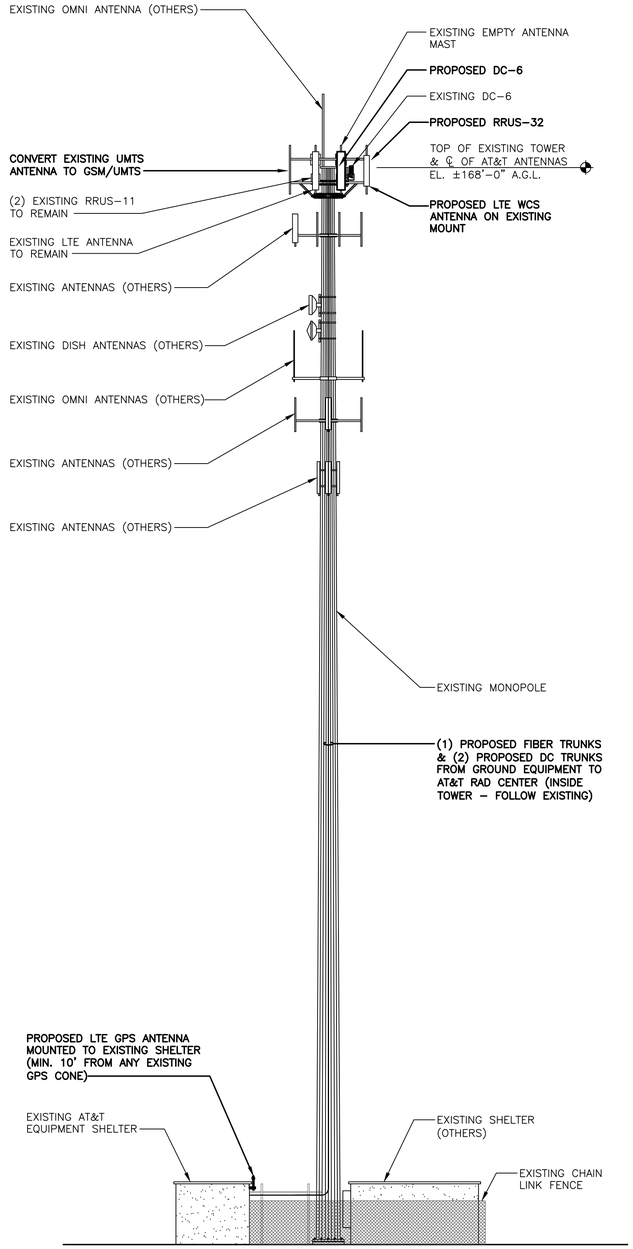
PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

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

SEAL: STATE OF CONNECTICUT — NICHOLAS D. BARILE — No. 28643 — LICENSED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: ANTENNA LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
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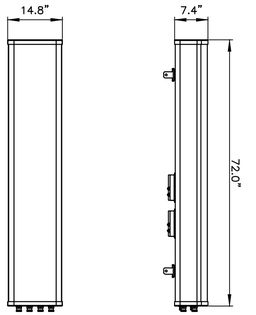


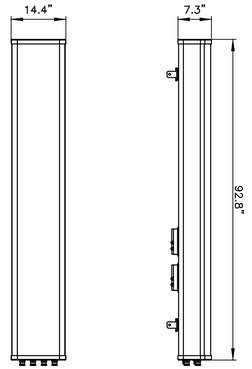
FRONT VIEW SIDE VIEW

BOTTOM VIEW

MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H6
WEIGHT	73.0 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.



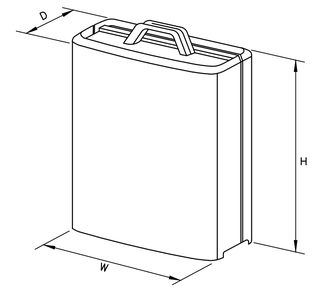
FRONT VIEW SIDE VIEW

BOTTOM VIEW

MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H8
WEIGHT	64.3 LBS

LTE ANTENNA DETAIL

SCALE: N.T.S.



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

* DENOTES EXISTING

RRUS DETAIL

SCALE: N.T.S.

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

SEAL:

AT&T

DRAWING TITLE: DETAILS

JOB NUMBER	DRAWING NUMBER	REV
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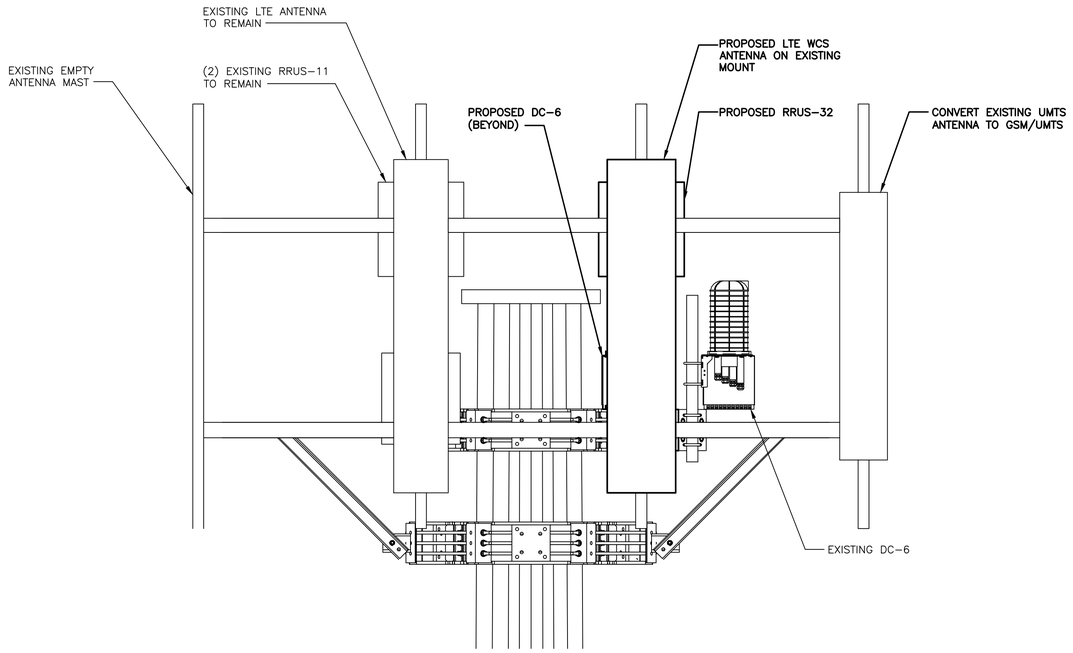
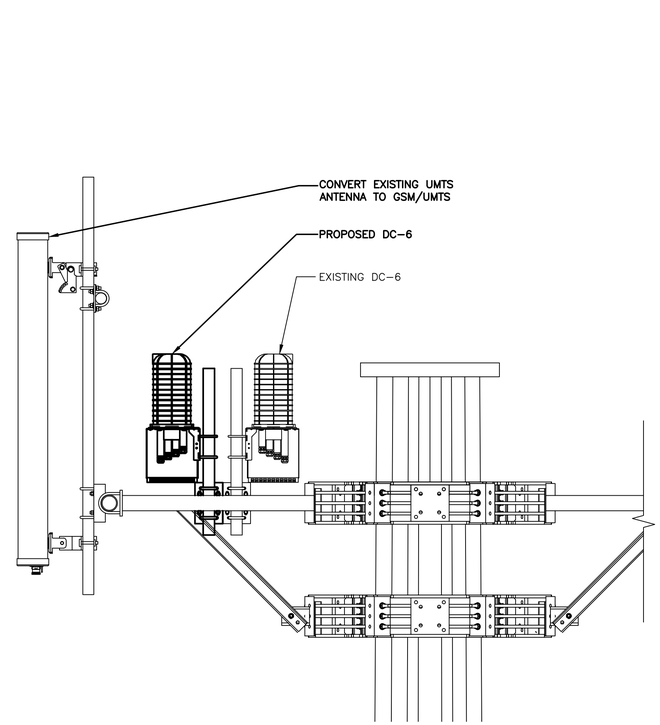


PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)

SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800 10121	54.5"x10.3"x5.9"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	KATHREIN	800 10121	54.5"x10.3"x5.9"
BETA	B1	KATHREIN	800 10121	54.5"x10.3"x5.9"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	KATHREIN	800 10121	54.5"x10.3"x5.9"
GAMMA	G1	KATHREIN	800 10121	54.5"x10.3"x5.9"
	G2	–	–	–
	G3	POWERWAVE	P65-17-XLH-RR	96"x12"x6"
	G4	KATHREIN	800 10121	54.5"x10.3"x5.9"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	KATHREIN	800 10121	54.5"x10.3"x5.9"
	A2	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x7.4"**
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	–	–	–
BETA	B1	KATHREIN	800 10121	54.5"x10.3"x5.9"
	B2	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x7.4"**
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	–	–	–
GAMMA	G1	KATHREIN	800 10121	54.5"x10.3"x5.9"
	G2	**CCI**	**OPA-65R-LCUU-H8**	**92.8"x14.4"x7.3"**
	G3	POWERWAVE	P65-17-XLH-RR	96"x12"x6"
	G4	–	–	–

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
BETA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		
GAMMA	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
	ERICSSON	**RRUS-32**	**29.9"x13.3"x9.5"**		

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

SEAL: STATE OF CONNECTICUT NICHOLAS D. BARILLA No. 28645 LICENSED PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: ANTENNA MOUNTING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
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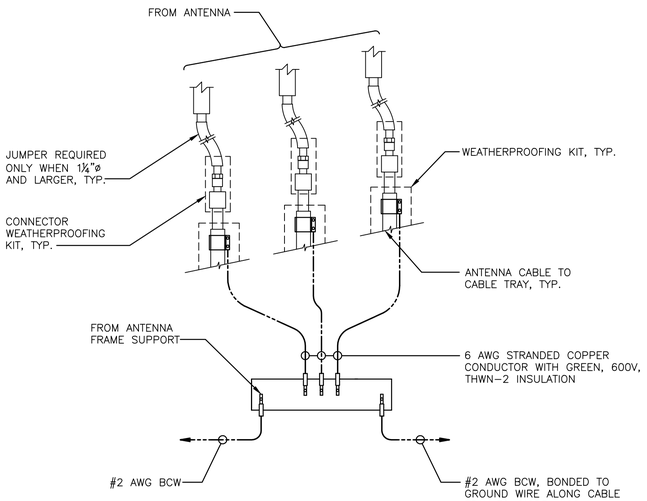
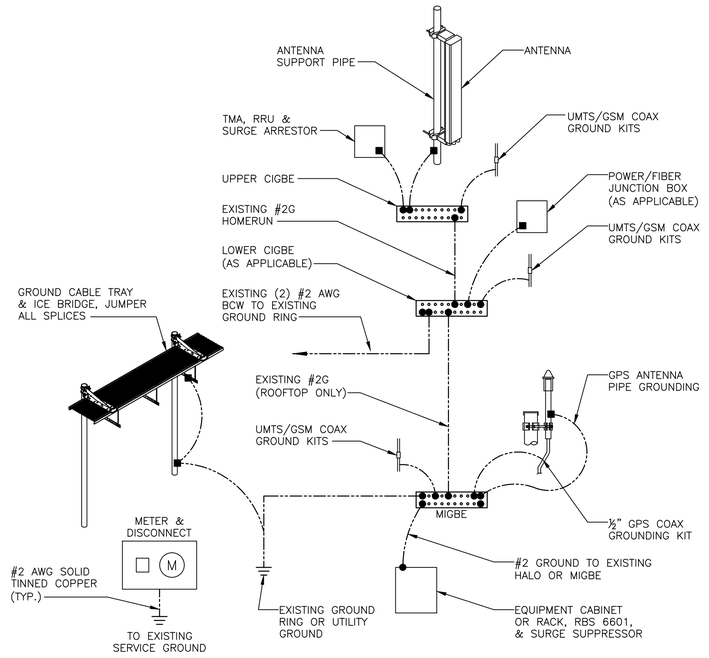


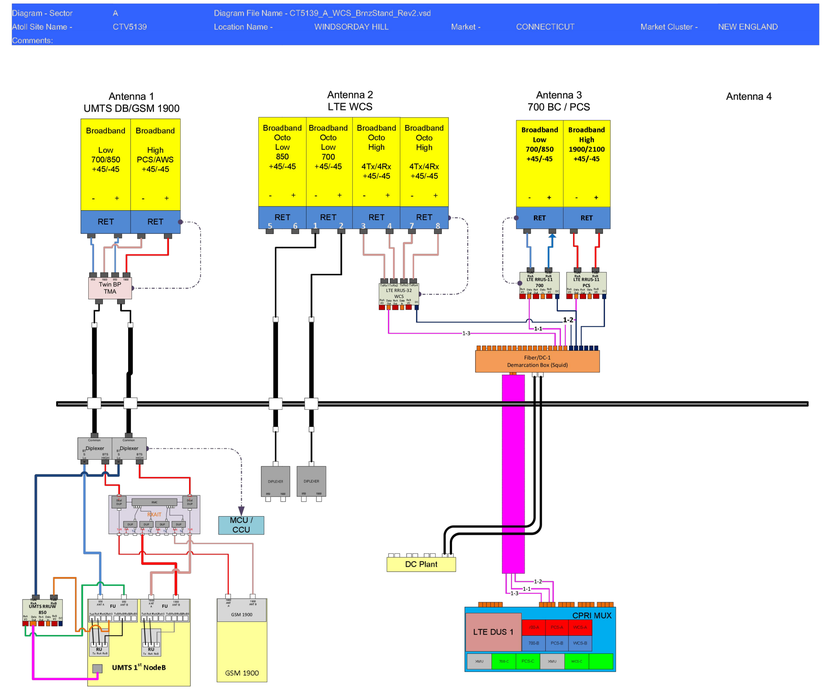
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



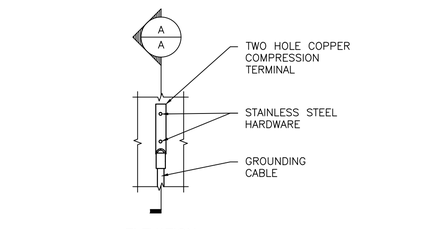
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

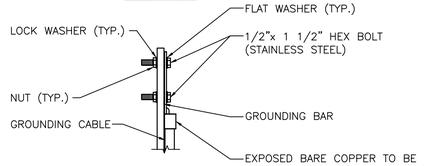


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



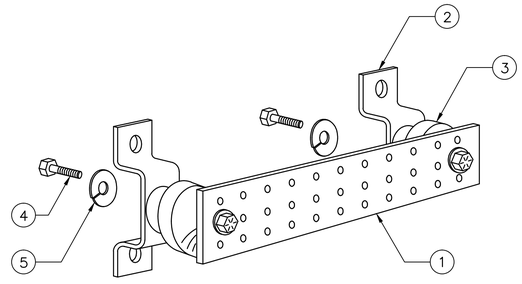
SECTION "A–A"

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

SEAL:

AT&T

DRAWING TITLE: GROUNDING, ONE–LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15085–EMP	G–1	0

Date: **October 15, 2015**

Holly Haas
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group. Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
(770) 701-2500

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5139
	Carrier Site Name:	Windsorday Hill
Crown Castle Designation:	**Crown Castle BU Number:**	842875
	Crown Castle Site Name:	WINDSORDAY HILL
	Crown Castle JDE Job Number:	350449
	Crown Castle Work Order Number:	1135204
	Crown Castle Application Number:	311707 Rev. 0
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1135204
Site Data:	**99 DAY HILL ROAD, WINDSOR, Hartford County, CT**	
	Latitude *42° 52' 16.1"*, Longitude *-72° 40' 16"*	
	168 Foot - Monopole Tower	

Dear Holly Haas,

Jacobs Engineering Group, Inc. 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 835385, in accordance with application 311707, 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:

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

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 Connecticut State Building Code based upon a wind speed of 80 mph fastest mile.

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

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

Structural analysis prepared by:

Wensen Jiang
Structural Engineer

Reviewed by:

Matthew E. Watkins, P.E.
Engineering Project Manager

STATE OF CONNECTICUT
MATTHEW E. WATKINS
No. 29955
LICENSED PROFESSIONAL ENGINEER
10/15/15

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 168 ft Monopole tower designed by Paul J. Ford in November of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

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 80 mph with no ice, 28.1 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
168.0	168.0	3	cci antennas	DTMABP7819VG12A	1 2	3/8 3/4	-
		3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe			
		3	ericsson	RRUS 32 B30			
		1	raycap	DC6-48-60-18-8F			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
168.0	169.0	6	ericsson	RBS 6601	-	-	2
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	12 1 2 1	1-5/8 3/8 3/4 7/8	1
		1	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	168.0	3	ericsson	RRUS 11-700			
		3	ericsson	RRUS-11 1900MHz			
		3	kathrein	800 10121 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 1201-1]			
		3	kathrein	800 10121 w/ Mount Pipe	-	-	2
		6	powerwave technologies	LGP21401			
159.0	164.0	3	andrew	VHLP2.5-11	6	5/16	1
		3	dragonwave	Horizon Compact			
	160.0	3	kathrein	840 10054 w/ Mount Pipe			
		3	samsung telecommunications	URAS-FLEXIBLE			
	159.0	1	tower mounts	Platform Mount [LP 1201-1]			
	156.0	1	andrew	VHLP2.5-11			
		1	dragonwave	Horizon Compact			
147.0	147.0	1	radiowaves	HP3-10	1	3/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			

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	143.0	1	radiowaves	HP3-11	1	3/8	1
		1	tower mounts	Pipe Mount [PM 601-1]			
140.0	140.0	1	motorola	PTP400 w/ Mount Pipe	1	1/4	1
				18” stand-off			
135.0	144.0	2	decibel	ASP 705K	2	7/8	1
	135.0	2	tower mounts	Side Arm Mount [SO 702-1]			
130.0	131.0	3	alcatel lucent	1900MHz RRH	3	1-1/4	1
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		3	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
	130.0	1	tower mounts	Platform Mount [LP 1201-1]			
120.0	120.0	3	kathrein	742 213 w/ Mount Pipe	6	1-5/8	1
79.0	79.0	2	gps	GPS_A	-	-	1
		2	tower mounts	Side Arm Mount [SO 202-1]			
52.0	52.0	1	pctel	GPS-TMG-HR-26NCM	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 202-1]			

Notes:
1) Existing Equipment
2) Equipment to be Removed; Not considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
168	168	12	Allgon	7184.14	-	-
163	163	12	Swedcom	ALP-9212-N	-	-
148	148	12	Swedcom	ALP-9212-N	-	-
133	133	12	Swedcom	ALP-9212-N	-	-
118	118	12	Swedcom	ALP-9212-N	-	-
103	103	12	Swedcom	ALP-9212-N	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Northeast Electrical Testing, Inc	4529457	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit Manufacturing/PJF	4529456	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing/PJF	4589719	CCISITES
4-STRUCTURAL ANALYSIS REPORT	Waterford	5229237	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	168 - 119.25	Pole	TP34.288x24x0.25	1	-12.533	1367.125	55.1	Pass
L2	119.25 - 78.5	Pole	TP42.387x32.891x0.281	2	-18.753	1902.977	79.6	Pass
L3	78.5 - 38.75	Pole	TP50.213x40.717x0.375	3	-28.064	3002.236	72.0	Pass
L4	38.75 - 0	Pole	TP57.64x48.144x0.375	4	-40.601	3516.640	80.1	Pass
							Summary	
						Pole (L4)	80.1	Pass
						Rating =	80.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	76.1	Pass
1	Base Plate	0	59.2	Pass
1	Base Foundation (Structural)	0	63.9	Pass
1	Foundation (Soil Interaction)	0	46.6	Pass

Structure Rating (max from all components) =	**80.1%**

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

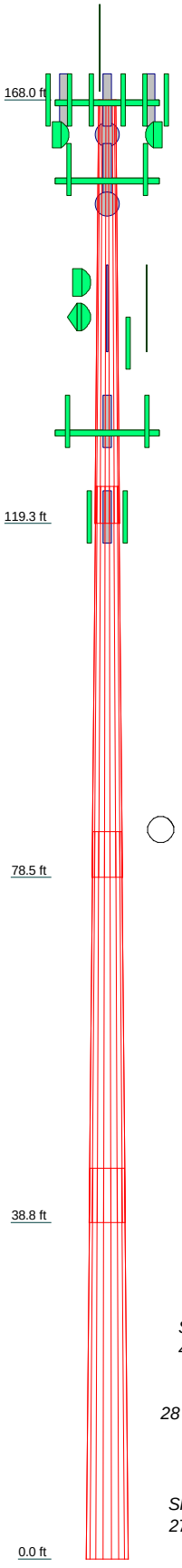
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	48.750	18	0.250	4.250	24.000	34.288		3.8
2	45.000	18	0.281	5.250	32.891	42.387		5.1
3	45.000	18	0.375	6.250	40.717	50.213		8.2
4	45.000	18	0.375		48.144	57.640		9.6
							A607-65	26.7



AXIAL
60 K

SHEAR
4 K

MOMENT
539 kip-ft

TORQUE 0 kip-ft
28 mph WIND - 1.000 in ICE

AXIAL
41 K

SHEAR
27 K

MOMENT
3271 kip-ft

TORQUE 2 kip-ft
REACTIONS - 80 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12' Omni	168	(3) 4' x 2" Pipe Mount	159
OPA-65R-LCUU-H6 w/ Mount Pipe	168	(3) 4' x 2" Pipe Mount	159
OPA-65R-LCUU-H6 w/ Mount Pipe	168	Platform Mount [LP 1201-1]	159
OPA-65R-LCUU-H6 w/ Mount Pipe	168	VHLP2.5-11	159
DTMABP7819VG12A	168	VHLP2.5-11	159
DTMABP7819VG12A	168	VHLP2.5-11	159
DTMABP7819VG12A	168	VHLP2.5-11	159
RRUS 32 B30	168	Pipe Mount [PM 601-1]	147
RRUS 32 B30	168	HP3-10	147
RRUS 32 B30	168	Pipe Mount [PM 601-1]	143
DC6-48-60-18-8F	168	HP3-11	143
800 10121 w/ Mount Pipe	168	PTP400 w/ Mount Pipe	140
800 10121 w/ Mount Pipe	168	18" Standoff	140
800 10121 w/ Mount Pipe	168	ASP 705K	135
AM-X-CD-16-65-00T-RET w/ Mount Pipe	168	Side Arm Mount [SO 702-1]	135
		3' x 2" Pipe Mount	135
P65-17-XLH-RR w/ Mount Pipe	168	3' x 2" Pipe Mount	135
AM-X-CD-16-65-00T-RET w/ Mount Pipe	168	ASP 705K	135
		Side Arm Mount [SO 702-1]	135
RRUS-11 1900MHz	168	800MHz 2X50W RRH W/FILTER	130
RRUS-11 1900MHz	168	800MHz 2X50W RRH W/FILTER	130
RRUS-11 1900MHz	168	800MHz 2X50W RRH W/FILTER	130
RRUS 11-700	168	Platform Mount [LP 1201-1]	130
RRUS 11-700	168	(2) 4' x 2" Pipe Mount	130
RRUS 11-700	168	(2) 4' x 2" Pipe Mount	130
DC6-48-60-18-8F	168	(2) 4' x 2" Pipe Mount	130
4' x 2" Pipe Mount	168	APXV9ERR18-C-A20 w/ Mount Pipe	130
4' x 2" Pipe Mount	168	APXV9ERR18-C-A20 w/ Mount Pipe	130
4' x 2" Pipe Mount	168	APXV9ERR18-C-A20 w/ Mount Pipe	130
Platform Mount [LP 1201-1]	168	1900MHz RRH	130
840 10054 w/ Mount Pipe	159	1900MHz RRH	130
840 10054 w/ Mount Pipe	159	1900MHz RRH	130
840 10054 w/ Mount Pipe	159	742 213 w/ Mount Pipe	120
Horizon Compact	159	742 213 w/ Mount Pipe	120
Horizon Compact	159	742 213 w/ Mount Pipe	120
Horizon Compact	159	Side Arm Mount [SO 202-1]	79
Horizon Compact	159	GPS_A	79
URAS-FLEXIBLE	159	GPS_A	79
URAS-FLEXIBLE	159	Side Arm Mount [SO 202-1]	79
URAS-FLEXIBLE	159	Side Arm Mount [SO 202-1]	52
(3) 4' x 2" Pipe Mount	159	GPS-TMG-HR-26NCM	52

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 80.1%

Jacobs Engineering Group, Inc.
5449 Bells Ferry Rd
Acworth, GA 30102
Phone: (770) 701-2500
FAX: (770) 701-2501

Job:	***Windsorday Hill***		
Project:	***BU842875_WO1135204***		
Client: Crown Castle	Drawn by: Wensen Jiang		App'd:
Code: TIA/EIA-222-F	Date: 10/15/15		Scale: NTS
Path: N:\Design\EQ152000 - CrownCastle\Structural\WO842875 WINDSORDAY HIL\1135204\Analysis\842875 Windsorday Hill 1135204.eri			Dwg No. E-1

Tower Input Data

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

4) Tower is located in Hartford County, Connecticut.
5) Basic wind speed of 80 mph.
6) Nominal ice thickness of 1.000 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56.000 pcf.
9) A wind speed of 28 mph is used in combination with ice.
10) Temperature drop of 50.000 °F.
11) Deflections calculated using a wind speed of 50 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	168.000-119.250	48.750	4.250	18	24.000	34.288	0.250	1.000	A607-65 (65 ksi)
L2	119.250-78.500	45.000	5.250	18	32.891	42.387	0.281	1.125	A607-65 (65 ksi)
L3	78.500-38.750	45.000	6.250	18	40.717	50.213	0.375	1.500	A607-65 (65 ksi)
L4	38.750-0.000	45.000		18	48.144	57.640	0.375	1.500	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.370	18.846	1342.998	8.431	12.192	110.154	2687.762	9.425	3.784	15.136
	34.817	27.009	3953.452	12.083	17.418	226.971	7912.106	13.507	5.595	22.379
L2	34.309	29.116	3911.636	11.576	16.709	234.108	7828.418	14.561	5.294	18.819
	43.041	37.594	8420.479	14.948	21.533	391.057	16852.037	18.801	6.965	24.76
L3	42.470	48.017	9872.638	14.321	20.684	477.308	19758.267	24.013	6.506	17.35
	50.988	59.320	18614.761	17.692	25.508	729.756	37254.015	29.665	8.177	21.807
L4	50.226	56.857	16391.375	16.958	24.457	670.207	32804.319	28.434	7.813	20.836
	58.529	68.160	28238.618	20.329	29.281	964.397	56514.393	34.086	9.485	25.292

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
L1 168.000-119.250				1	1	1		
L2 119.250-78.500				1	1	1		
L3 78.500-38.750				1	1	1		
L4 38.750-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
//// *//*// LDF4-50A(1/2")	C	Surface Ar (CaAa)	52.000 - 0.000	1	1	0.000 0.030	0.630		0.000
//// Safety Line 3/8	C	Surface Ar (CaAa)	168.000 - 0.000	1	1	0.000 0.000	0.375		0.000

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
LDF5-50A(7/8)	C	No	Inside Pole	168.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF7-50A(1-5/8")	C	No	Inside Pole	168.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-034-XXXXXX(3/8")	C	No	Inside Pole	168.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	168.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-034-	C	No	Inside Pole	168.000 - 0.000	1	No Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
XXXXXX(3/8")						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	168.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
////								
ATCB-B01-003(5/16")	B	No	Inside Pole	159.000 - 0.000	6	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
////								
LDF2-50(3/8")	B	No	Inside Pole	147.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
////								
LDF2-50(3/8")	B	No	Inside Pole	143.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
////								
CAT5e(1/4)	B	No	Inside Pole	140.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
////								
LDF5-50A(7/8")	B	No	Inside Pole	135.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
////								
HB114-13U3M12-XXXF(1-1/4")	C	No	Inside Pole	130.000 - 0.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
////								
LDF7-50A(1-5/8")	C	No	Inside Pole	120.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
//// ***								
2" Rigid Conduit	C	No	Inside Pole	168.000 - 0.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
						2" Ice	0.000	0.003
						4" Ice	0.000	0.003

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
L1	168.000-119.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.033

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	1.828	0.000	0.797
L2	119.250-78.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.053
		C	0.000	0.000	1.528	0.000	0.959
L3	78.500-38.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.052
		C	0.000	0.000	2.325	0.000	0.937
L4	38.750-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.051
		C	0.000	0.000	3.894	0.000	0.917

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
L1	168.000-119.250	A	1.192	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.033
		C		0.000	0.000	13.449	0.000	0.909
L2	119.250-78.500	A	1.140	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.053
		C		0.000	0.000	11.242	0.000	1.051
L3	78.500-38.750	A	1.071	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.052
		C		0.000	0.000	14.410	0.000	1.054
L4	38.750-0.000	A	1.000	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.051
		C		0.000	0.000	20.497	0.000	1.077

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	168.000-119.250	0.000	0.056	0.000	0.351
L2	119.250-78.500	0.000	0.056	0.000	0.364
L3	78.500-38.750	-0.001	0.089	-0.004	0.488
L4	38.750-0.000	-0.003	0.149	-0.011	0.691

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
12' Omni	C	From Leg	0.000 0.000 6.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 4.230 5.460 7.920 12.840	3.000 4.230 5.460 7.920 12.840	0.020 0.040 0.060 0.100 0.180
//									
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice 1/2" Ice	10.598 11.268 11.906	7.179 8.362 9.259	0.099 0.175 0.261

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
						1" Ice	13.209	11.086	0.459
						2" Ice	15.934	15.151	1.002
						4" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	10.598	7.179	0.099
						1/2" Ice	11.268	8.362	0.175
						1" Ice	11.906	9.259	0.261
						2" Ice	13.209	11.086	0.459
						4" Ice	15.934	15.151	1.002
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	10.598	7.179	0.099
						1/2" Ice	11.268	8.362	0.175
						1" Ice	11.906	9.259	0.261
						2" Ice	13.209	11.086	0.459
						4" Ice	15.934	15.151	1.002
DTMABP7819VG12A	A	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	1.139	0.391	0.019
						1/2" Ice	1.284	0.488	0.026
						1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
DTMABP7819VG12A	B	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	1.139	0.391	0.019
						1/2" Ice	1.284	0.488	0.026
						1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
DTMABP7819VG12A	C	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	1.139	0.391	0.019
						1/2" Ice	1.284	0.488	0.026
						1" Ice	1.437	0.595	0.036
						2" Ice	1.769	0.833	0.060
						4" Ice	2.538	1.414	0.140
RRUS 32 B30	A	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	3.141	1.739	0.060
						1/2" Ice	3.397	1.960	0.080
						1" Ice	3.661	2.189	0.104
						2" Ice	4.216	2.674	0.161
						4" Ice	5.429	3.748	0.322
RRUS 32 B30	B	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	3.141	1.739	0.060
						1/2" Ice	3.397	1.960	0.080
						1" Ice	3.661	2.189	0.104
						2" Ice	4.216	2.674	0.161
						4" Ice	5.429	3.748	0.322
RRUS 32 B30	C	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	3.141	1.739	0.060
						1/2" Ice	3.397	1.960	0.080
						1" Ice	3.661	2.189	0.104
						2" Ice	4.216	2.674	0.161
						4" Ice	5.429	3.748	0.322
DC6-48-60-18-8F	C	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	1.467	1.467	0.033
						1/2" Ice	1.667	1.667	0.051
						1" Ice	1.878	1.878	0.071
						2" Ice	2.333	2.333	0.119
						4" Ice	3.378	3.378	0.253
800 10121 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice	5.685	4.600	0.066
						1/2" Ice	6.182	5.351	0.114
						1" Ice	6.676	6.046	0.168
						2" Ice	7.695	7.526	0.298
						4" Ice	9.858	10.832	0.675
800 10121 w/ Mount Pipe	B	From Leg	4.000 0.000	0.000	168.000	No Ice	5.685	4.600	0.066
						1/2"	6.182	5.351	0.114

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
			0.000			Ice	6.676	6.046	0.168
						1" Ice	7.695	7.526	0.298
						2" Ice	9.858	10.832	0.675
						4" Ice			
800 10121 w/ Mount Pipe	C	From Leg	4.000	0.000	168.000	No Ice	5.685	4.600	0.066
			0.000			1/2"	6.182	5.351	0.114
			0.000			Ice	6.676	6.046	0.168
						1" Ice	7.695	7.526	0.298
						2" Ice	9.858	10.832	0.675
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000	0.000	168.000	No Ice	8.498	6.304	0.074
			0.000			1/2"	9.149	7.479	0.139
			1.000			Ice	9.767	8.368	0.212
						1" Ice	11.031	10.179	0.385
						2" Ice	13.679	14.024	0.874
						4" Ice			
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.000	0.000	168.000	No Ice	11.704	8.938	0.092
			0.000			1/2"	12.424	10.450	0.178
			1.000			Ice	13.153	11.986	0.273
						1" Ice	14.639	14.313	0.498
						2" Ice	17.906	19.144	1.126
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	0.000	168.000	No Ice	8.498	6.304	0.074
			0.000			1/2"	9.149	7.479	0.139
			1.000			Ice	9.767	8.368	0.212
						1" Ice	11.031	10.179	0.385
						2" Ice	13.679	14.024	0.874
						4" Ice			
RRUS-11 1900MHz	A	From Leg	4.000	0.000	168.000	No Ice	2.942	1.190	0.044
			0.000			1/2"	3.172	1.351	0.063
			0.000			Ice	3.410	1.521	0.086
						1" Ice	3.913	1.887	0.140
						2" Ice	5.023	2.721	0.291
						4" Ice			
RRUS-11 1900MHz	B	From Leg	4.000	0.000	168.000	No Ice	2.942	1.190	0.044
			0.000			1/2"	3.172	1.351	0.063
			0.000			Ice	3.410	1.521	0.086
						1" Ice	3.913	1.887	0.140
						2" Ice	5.023	2.721	0.291
						4" Ice			
RRUS-11 1900MHz	C	From Leg	4.000	0.000	168.000	No Ice	2.942	1.190	0.044
			0.000			1/2"	3.172	1.351	0.063
			0.000			Ice	3.410	1.521	0.086
						1" Ice	3.913	1.887	0.140
						2" Ice	5.023	2.721	0.291
						4" Ice			
RRUS 11-700	A	From Leg	4.000	0.000	168.000	No Ice	2.942	1.190	0.055
			0.000			1/2"	3.172	1.351	0.074
			0.000			Ice	3.410	1.521	0.097
						1" Ice	3.913	1.887	0.151
						2" Ice	5.023	2.721	0.302
						4" Ice			
RRUS 11-700	B	From Leg	4.000	0.000	168.000	No Ice	2.942	1.190	0.055
			0.000			1/2"	3.172	1.351	0.074
			0.000			Ice	3.410	1.521	0.097
						1" Ice	3.913	1.887	0.151
						2" Ice	5.023	2.721	0.302
						4" Ice			
RRUS 11-700	C	From Leg	4.000	0.000	168.000	No Ice	2.942	1.190	0.055
			0.000			1/2"	3.172	1.351	0.074
			0.000			Ice	3.410	1.521	0.097
						1" Ice	3.913	1.887	0.151
						2" Ice	5.023	2.721	0.302
						4" Ice			
DC6-48-60-18-8F	C	From Leg	4.000	0.000	168.000	No Ice	1.467	1.467	0.033

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
			0.000 1.000			1/2" Ice 1" Ice 2" Ice 4" Ice	1.667 1.878 2.333 3.378	1.667 1.878 2.333 3.378	0.051 0.071 0.119 0.253
4' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
4' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
4' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
Platform Mount [LP 1201-1]	C	None		0.000	168.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.100 26.800 30.500 37.900 52.700	23.100 26.800 30.500 37.900 52.700	2.100 2.500 2.900 3.700 5.300
////									
840 10054 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.413 5.833 6.263 7.156 9.093	2.385 2.917 3.466 4.614 7.316	0.051 0.088 0.129 0.230 0.533
840 10054 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.413 5.833 6.263 7.156 9.093	2.385 2.917 3.466 4.614 7.316	0.051 0.088 0.129 0.230 0.533
840 10054 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.413 5.833 6.263 7.156 9.093	2.385 2.917 3.466 4.614 7.316	0.051 0.088 0.129 0.230 0.533
Horizon Compact	A	From Leg	4.000 0.000 5.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.841 0.966 1.099 1.392 2.082	0.429 0.525 0.629 0.863 1.435	0.012 0.018 0.026 0.048 0.122
Horizon Compact	B	From Leg	4.000 0.000 5.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.841 0.966 1.099 1.392 2.082	0.429 0.525 0.629 0.863 1.435	0.012 0.018 0.026 0.048 0.122
Horizon Compact	C	From Leg	4.000 0.000 5.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.841 0.966 1.099 1.392 2.082	0.429 0.525 0.629 0.863 1.435	0.012 0.018 0.026 0.048 0.122

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			
Horizon Compact	A	From Leg	4.000 0.000 -3.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.841 0.966 1.099 1.392 2.082	0.429 0.525 0.629 0.863 1.435	0.012 0.018 0.026 0.048 0.122
URAS-FLEXIBLE	A	From Leg	4.000 0.000 1.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
URAS-FLEXIBLE	B	From Leg	4.000 0.000 1.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
URAS-FLEXIBLE	A	From Leg	4.000 0.000 1.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
(3) 4' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(3) 4' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(3) 4' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
Platform Mount [LP 1201-1]	C	None		0.000	159.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.100 26.800 30.500 37.900 52.700	23.100 26.800 30.500 37.900 52.700	2.100 2.500 2.900 3.700 5.300
////									
Pipe Mount [PM 601-1]	C	From Leg	0.500 0.000 0.000	0.000	147.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.740 4.480 5.960 8.920	0.900 1.120 1.340 1.780 2.660	0.065 0.079 0.093 0.122 0.178
////									
Pipe Mount [PM 601-1]	C	From Leg	0.500 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.740 4.480 5.960 8.920	0.900 1.120 1.340 1.780 2.660	0.065 0.079 0.093 0.122 0.178
////									
PTP400 w/ Mount Pipe	B	From Leg	1.500	0.000	140.000	No Ice	2.221	0.919	0.020

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
			0.000 0.000			1/2" Ice 1" Ice 2" Ice 4" Ice	2.477 2.751 3.354 4.725	1.183 1.475 2.151 3.740	0.038 0.058 0.111 0.281
18" Standoff	B	From Leg	1.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.380 0.480 0.580 0.780 1.180	0.950 1.210 1.470 1.990 3.030	0.010 0.020 0.030 0.050 0.090
////									
ASP 705K	A	From Leg	4.000 0.000 9.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.500 7.367 9.250 13.067 19.246	5.500 7.367 9.250 13.067 19.246	0.022 0.062 0.113 0.251 0.674
ASP 705K	B	From Leg	4.000 0.000 9.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.500 7.367 9.250 13.067 19.246	5.500 7.367 9.250 13.067 19.246	0.022 0.062 0.113 0.251 0.674
Side Arm Mount [SO 702-1]	A	From Leg	2.000 0.000 0.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.000 1.000 1.000 1.000	1.430 2.050 2.670 3.910 6.390	0.027 0.038 0.049 0.071 0.115
Side Arm Mount [SO 702-1]	B	From Leg	2.000 0.000 0.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.000 1.000 1.000 1.000	1.430 2.050 2.670 3.910 6.390	0.027 0.038 0.049 0.071 0.115
3' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.583 0.770 0.967 1.417 2.536	0.583 0.770 0.967 1.417 2.536	0.011 0.017 0.024 0.047 0.126
3' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	135.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.583 0.770 0.967 1.417 2.536	0.583 0.770 0.967 1.417 2.536	0.011 0.017 0.024 0.047 0.126
////									
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	7.471 8.656 9.556 11.388 15.527	0.088 0.158 0.237 0.421 0.935
APXV9ERR18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767 11.031	7.471 8.656 9.556 11.388	0.088 0.158 0.237 0.421

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 4" Ice	13.679	15.527	0.935
1900MHz RRH	A	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
1900MHz RRH	B	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
1900MHz RRH	C	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
800MHz 2X50W RRH W/FILTER	B	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
800MHz 2X50W RRH W/FILTER	C	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
800MHz 2X50W RRH W/FILTER	A	From Leg	4.000 0.000 1.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.401 2.613 2.833 3.300 4.337	2.254 2.460 2.675 3.132 4.148	0.064 0.086 0.111 0.172 0.338
Platform Mount [LP 1201-1]	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.100 26.800 30.500 37.900 52.700	23.100 26.800 30.500 37.900 52.700	2.100 2.500 2.900 3.700 5.300
(2) 4' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(2) 4' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(2) 4' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
//// 742 213 w/ Mount Pipe	C	From Leg	1.000 0.000	0.000	120.000	No Ice 1/2"	5.373 5.950	4.620 6.000	0.049 0.094

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
			0.000			Ice	6.501	6.982	0.146
						1" Ice	7.611	8.852	0.277
						2" Ice	9.933	12.794	0.683
						4" Ice			
742 213 w/ Mount Pipe	B	From Leg	1.000	0.000	120.000	No Ice	5.373	4.620	0.049
			0.000			1/2"	5.950	6.000	0.094
			0.000			Ice	6.501	6.982	0.146
						1" Ice	7.611	8.852	0.277
						2" Ice	9.933	12.794	0.683
						4" Ice			
742 213 w/ Mount Pipe	A	From Leg	1.000	0.000	120.000	No Ice	5.373	4.620	0.049
			0.000			1/2"	5.950	6.000	0.094
			0.000			Ice	6.501	6.982	0.146
						1" Ice	7.611	8.852	0.277
						2" Ice	9.933	12.794	0.683
						4" Ice			
//									
GPS_A	A	From Leg	2.000	0.000	79.000	No Ice	0.297	0.297	0.001
			0.000			1/2"	0.374	0.374	0.005
			0.000			Ice	0.459	0.459	0.010
						1" Ice	0.655	0.655	0.025
						2" Ice	1.151	1.151	0.079
						4" Ice			
GPS_A	B	From Leg	2.000	0.000	79.000	No Ice	0.297	0.297	0.001
			0.000			1/2"	0.374	0.374	0.005
			0.000			Ice	0.459	0.459	0.010
						1" Ice	0.655	0.655	0.025
						2" Ice	1.151	1.151	0.079
						4" Ice			
Side Arm Mount [SO 202-1]	A	From Leg	1.000	0.000	79.000	No Ice	2.960	2.530	0.110
			0.000			1/2"	4.100	3.510	0.134
			0.000			Ice	5.240	4.490	0.157
						1" Ice	7.520	6.450	0.204
						2" Ice	12.080	10.370	0.298
						4" Ice			
Side Arm Mount [SO 202-1]	B	From Leg	1.000	0.000	79.000	No Ice	2.960	2.530	0.110
			0.000			1/2"	4.100	3.510	0.134
			0.000			Ice	5.240	4.490	0.157
						1" Ice	7.520	6.450	0.204
						2" Ice	12.080	10.370	0.298
						4" Ice			
////									
GPS-TMG-HR-26NCM	A	From Leg	2.000	0.000	52.000	No Ice	0.156	0.156	0.001
			0.000			1/2"	0.213	0.213	0.002
			0.000			Ice	0.279	0.279	0.005
						1" Ice	0.437	0.437	0.014
						2" Ice	0.857	0.857	0.052
						4" Ice			
Side Arm Mount [SO 202-1]	B	From Leg	1.000	0.000	52.000	No Ice	2.960	2.530	0.110
			0.000			1/2"	4.100	3.510	0.134
			0.000			Ice	5.240	4.490	0.157
						1" Ice	7.520	6.450	0.204
						2" Ice	12.080	10.370	0.298
						4" Ice			
////									

Dishes

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 ft^2	Weight K
VHLP2.5-11	C	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 5.000	-40.000		159.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.680 7.070 7.460 8.230 9.780	0.048 0.080 0.120 0.190 0.340
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 5.000	24.000		159.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.680 7.070 7.460 8.230 9.780	0.048 0.080 0.120 0.190 0.340
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 5.000	17.000		159.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.680 7.070 7.460 8.230 9.780	0.048 0.080 0.120 0.190 0.340
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 -3.000	38.000		159.000	2.917	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.680 7.070 7.460 8.230 9.780	0.048 0.080 0.120 0.190 0.340
////											
HP3-10	C	Paraboloid w/Shroud (HP)	From Leg	1.000 0.000 0.000	0.000		147.000	3.167	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.880 8.300 8.720 9.560 11.240	0.050 0.093 0.135 0.220 0.391
////											
HP3-11	C	Paraboloid w/Radome	From Leg	1.000 0.000 0.000	10.000		143.000	3.167	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.880 8.300 8.720 9.560 11.240	0.050 0.050 0.063 0.103 0.274
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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

Comb. No.	Description
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	168 - 119.25	Pole	Max Tension	14	0.000	0.000	0.000
			Max. Compression	14	-23.801	-0.271	0.569
			Max. Mx	5	-12.583	-490.756	12.383
			Max. My	2	-12.560	-9.731	501.771
			Max. Vy	5	16.640	-490.756	12.383
			Max. Vx	2	-16.756	-9.731	501.771
			Max. Torque	8			-2.371
L2	119.25 - 78.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-32.564	-0.271	0.414
			Max. Mx	5	-18.787	-1234.878	29.293
			Max. My	2	-18.772	-26.369	1250.447
			Max. Vy	5	20.282	-1234.878	29.293
			Max. Vx	2	-20.395	-26.369	1250.447
			Max. Torque	5			2.211
L3	78.5 - 38.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-44.489	-1.106	0.212
			Max. Mx	5	-28.082	-2088.848	45.303
			Max. My	2	-28.074	-42.728	2108.407
			Max. Vy	5	23.590	-2088.848	45.303
			Max. Vx	2	-23.702	-42.728	2108.407
			Max. Torque	5			2.337
L4	38.75 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-60.026	-1.099	-0.219
			Max. Mx	5	-40.601	-3219.993	63.182
			Max. My	2	-40.601	-60.450	3244.428
			Max. Vy	5	26.633	-3219.993	63.182
			Max. Vx	2	-26.739	-60.450	3244.428
			Max. Torque	5			2.211

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	60.026	0.000	0.000
	Max. H_x	11	40.617	26.513	-0.338
	Max. H_z	2	40.617	-0.385	26.715
	Max. M_x	2	3244.428	-0.385	26.715
	Max. M_z	5	3219.993	-26.609	0.389
	Max. Torsion	5	2.169	-26.609	0.389
	Min. Vert	1	40.617	0.000	0.000
	Min. H_x	5	40.617	-26.609	0.389
	Min. H_z	8	40.617	0.294	-26.636
	Min. M_x	8	-3231.719	0.294	-26.636

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. M_z	11	-3205.651	26.513	-0.338
	Min. Torsion	11	-2.051	26.513	-0.338

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	40.617	0.000	0.000	-0.121	-0.382	0.000
Dead+Wind 0 deg - No Ice	40.617	0.385	-26.715	-3244.428	-60.450	0.147
Dead+Wind 30 deg - No Ice	40.617	13.429	-23.309	-2836.838	-1628.675	-0.292
Dead+Wind 60 deg - No Ice	40.617	23.095	-13.665	-1671.721	-2796.587	-1.156
Dead+Wind 90 deg - No Ice	40.617	26.609	-0.389	-63.182	-3219.993	-2.169
Dead+Wind 120 deg - No Ice	40.617	22.925	13.105	1582.665	-2768.827	-1.363
Dead+Wind 150 deg - No Ice	40.617	12.834	23.084	2802.239	-1533.661	0.071
Dead+Wind 180 deg - No Ice	40.617	-0.294	26.636	3231.719	46.618	0.386
Dead+Wind 210 deg - No Ice	40.617	-13.397	23.194	2819.409	1624.403	0.429
Dead+Wind 240 deg - No Ice	40.617	-22.984	13.689	1676.417	2778.966	1.225
Dead+Wind 270 deg - No Ice	40.617	-26.513	0.338	54.248	3205.651	2.051
Dead+Wind 300 deg - No Ice	40.617	-22.809	-13.188	-1596.740	2751.767	1.458
Dead+Wind 330 deg - No Ice	40.617	-12.888	-23.097	-2805.128	1542.571	0.414
Dead+Ice+Temp	60.026	0.000	0.000	0.219	-1.099	0.000
Dead+Wind 0 deg+Ice+Temp	60.026	0.064	-4.184	-532.669	-11.488	0.179
Dead+Wind 30 deg+Ice+Temp	60.026	2.113	-3.653	-466.014	-270.152	0.101
Dead+Wind 60 deg+Ice+Temp	60.026	3.627	-2.144	-274.832	-461.958	-0.075
Dead+Wind 90 deg+Ice+Temp	60.026	4.174	-0.064	-10.614	-530.952	-0.296
Dead+Wind 120 deg+Ice+Temp	60.026	3.593	2.048	259.478	-456.264	-0.261
Dead+Wind 150 deg+Ice+Temp	60.026	2.012	3.612	459.745	-253.543	-0.119
Dead+Wind 180 deg+Ice+Temp	60.026	-0.051	4.173	531.211	7.267	-0.101
Dead+Wind 210 deg+Ice+Temp	60.026	-2.108	3.637	463.894	267.312	-0.081
Dead+Wind 240 deg+Ice+Temp	60.026	-3.611	2.147	275.910	457.176	0.084
Dead+Wind 270 deg+Ice+Temp	60.026	-4.160	0.057	9.693	526.657	0.277
Dead+Wind 300 deg+Ice+Temp	60.026	-3.577	-2.060	-261.143	451.576	0.274
Dead+Wind 330 deg+Ice+Temp	60.026	-2.020	-3.613	-459.799	252.595	0.189
Dead+Wind 0 deg - Service	40.617	0.151	-10.435	-1268.827	-23.877	0.059
Dead+Wind 30 deg - Service	40.617	5.246	-9.105	-1109.458	-637.139	-0.116
Dead+Wind 60 deg - Service	40.617	9.022	-5.338	-653.824	-1093.846	-0.458
Dead+Wind 90 deg - Service	40.617	10.394	-0.152	-24.800	-1259.378	-0.857
Dead+Wind 120 deg - Service	40.617	8.955	5.119	618.789	-1082.937	-0.538
Dead+Wind 150 deg - Service	40.617	5.013	9.017	1095.698	-599.945	0.031
Dead+Wind 180 deg - Service	40.617	-0.115	10.405	1263.670	17.998	0.156
Dead+Wind 210 deg - Service	40.617	-5.233	9.060	1102.460	634.993	0.171
Dead+Wind 240 deg - Service	40.617	-8.978	5.347	655.483	1086.477	0.483
Dead+Wind 270 deg - Service	40.617	-10.357	0.132	21.127	1253.292	0.806
Dead+Wind 300 deg - Service	40.617	-8.910	-5.151	-624.465	1075.788	0.573
Dead+Wind 330 deg -	40.617	-5.035	-9.022	-1097.004	602.963	0.163

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-40.617	0.000	0.000	40.617	0.000	0.000%
2	0.385	-40.617	-26.715	-0.385	40.617	26.715	0.000%
3	13.429	-40.617	-23.309	-13.429	40.617	23.309	0.000%
4	23.095	-40.617	-13.665	-23.095	40.617	13.665	0.000%
5	26.609	-40.617	-0.389	-26.609	40.617	0.389	0.000%
6	22.925	-40.617	13.105	-22.925	40.617	-13.105	0.000%
7	12.834	-40.617	23.084	-12.834	40.617	-23.084	0.000%
8	-0.294	-40.617	26.636	0.294	40.617	-26.636	0.000%
9	-13.397	-40.617	23.194	13.397	40.617	-23.194	0.000%
10	-22.984	-40.617	13.689	22.984	40.617	-13.689	0.000%
11	-26.513	-40.617	0.338	26.513	40.617	-0.338	0.000%
12	-22.809	-40.617	-13.188	22.809	40.617	13.188	0.000%
13	-12.888	-40.617	-23.097	12.888	40.617	23.097	0.000%
14	0.000	-60.026	0.000	0.000	60.026	0.000	0.000%
15	0.064	-60.026	-4.184	-0.064	60.026	4.184	0.000%
16	2.113	-60.026	-3.653	-2.113	60.026	3.653	0.000%
17	3.627	-60.026	-2.144	-3.627	60.026	2.144	0.000%
18	4.174	-60.026	-0.064	-4.174	60.026	0.064	0.000%
19	3.593	-60.026	2.048	-3.593	60.026	-2.048	0.000%
20	2.012	-60.026	3.612	-2.012	60.026	-3.612	0.000%
21	-0.051	-60.026	4.173	0.051	60.026	-4.173	0.000%
22	-2.108	-60.026	3.637	2.108	60.026	-3.637	0.000%
23	-3.611	-60.026	2.147	3.611	60.026	-2.147	0.000%
24	-4.160	-60.026	0.057	4.160	60.026	-0.057	0.000%
25	-3.577	-60.026	-2.060	3.577	60.026	2.060	0.000%
26	-2.020	-60.026	-3.613	2.020	60.026	3.613	0.000%
27	0.151	-40.617	-10.435	-0.151	40.617	10.435	0.000%
28	5.246	-40.617	-9.105	-5.246	40.617	9.105	0.000%
29	9.022	-40.617	-5.338	-9.022	40.617	5.338	0.000%
30	10.394	-40.617	-0.152	-10.394	40.617	0.152	0.000%
31	8.955	-40.617	5.119	-8.955	40.617	-5.119	0.000%
32	5.013	-40.617	9.017	-5.013	40.617	-9.017	0.000%
33	-0.115	-40.617	10.405	0.115	40.617	-10.405	0.000%
34	-5.233	-40.617	9.060	5.233	40.617	-9.060	0.000%
35	-8.978	-40.617	5.347	8.978	40.617	-5.347	0.000%
36	-10.357	-40.617	0.132	10.357	40.617	-0.132	0.000%
37	-8.910	-40.617	-5.151	8.910	40.617	5.151	0.000%
38	-5.035	-40.617	-9.022	5.035	40.617	9.022	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00083154
3	Yes	5	0.00000001	0.00086622
4	Yes	5	0.00000001	0.00090306
5	Yes	5	0.00000001	0.00010994
6	Yes	5	0.00000001	0.00080421
7	Yes	5	0.00000001	0.00080453
8	Yes	5	0.00000001	0.00005725
9	Yes	5	0.00000001	0.00088051
10	Yes	5	0.00000001	0.00085843
11	Yes	4	0.00000001	0.00060139
12	Yes	5	0.00000001	0.00084613

13	Yes	5	0.00000001	0.00081675
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00018171
16	Yes	5	0.00000001	0.00019760
17	Yes	5	0.00000001	0.00019739
18	Yes	5	0.00000001	0.00018029
19	Yes	5	0.00000001	0.00019009
20	Yes	5	0.00000001	0.00019014
21	Yes	5	0.00000001	0.00018030
22	Yes	5	0.00000001	0.00019541
23	Yes	5	0.00000001	0.00019520
24	Yes	5	0.00000001	0.00017873
25	Yes	5	0.00000001	0.00019017
26	Yes	5	0.00000001	0.00019062
27	Yes	4	0.00000001	0.00013086
28	Yes	5	0.00000001	0.00008134
29	Yes	5	0.00000001	0.00008825
30	Yes	4	0.00000001	0.00036303
31	Yes	5	0.00000001	0.00007323
32	Yes	5	0.00000001	0.00007410
33	Yes	4	0.00000001	0.00019309
34	Yes	5	0.00000001	0.00008468
35	Yes	5	0.00000001	0.00007964
36	Yes	4	0.00000001	0.00022621
37	Yes	5	0.00000001	0.00008123
38	Yes	5	0.00000001	0.00007600

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load*	*Tilt*	*Twist*
	ft	*in*	*Comb.*	*°*	*°*
L1	168 - 119.25	39.943	28	2.114	0.007
L2	123.5 - 78.5	21.538	28	1.724	0.004
L3	83.75 - 38.75	9.638	28	1.085	0.001
L4	45 - 0	2.819	28	0.570	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft		*Comb.*	*in*	*°*	*°*	*ft*
168.000	12' Omni	28	39.943	2.114	0.007	31941
164.000	VHLP2.5-11	28	38.190	2.088	0.007	31941
159.000	840 10054 w/ Mount Pipe	28	36.006	2.055	0.006	17744
156.000	VHLP2.5-11	28	34.703	2.034	0.006	13308
147.000	HP3-10	28	30.852	1.967	0.005	7604
143.000	HP3-11	28	29.178	1.934	0.005	6387
140.000	PTP400 w/ Mount Pipe	28	27.942	1.907	0.005	5702
135.000	ASP 705K	28	25.925	1.859	0.004	4838
130.000	APXV9ERR18-C-A20 w/ Mount Pipe	28	23.970	1.804	0.004	4201
120.000	742 213 w/ Mount Pipe	28	20.285	1.676	0.003	3618
79.000	GPS_A	28	8.547	1.013	0.001	3900
52.000	GPS-TMG-HR-26NCM	28	3.692	0.656	0.001	3638

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168 - 119.25	101.907	3	5.398	0.017
L2	123.5 - 78.5	54.993	3	4.404	0.009
L3	83.75 - 38.75	24.625	3	2.771	0.004
L4	45 - 0	7.206	3	1.458	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.000	12' Omni	3	101.907	5.398	0.018	12697
164.000	VHLP2.5-11	3	97.439	5.332	0.017	12697
159.000	840 10054 w/ Mount Pipe	3	91.874	5.247	0.016	7053
156.000	VHLP2.5-11	3	88.554	5.195	0.016	5289
147.000	HP3-10	3	78.738	5.024	0.014	3020
143.000	HP3-11	3	74.471	4.939	0.013	2536
140.000	PTP400 w/ Mount Pipe	3	71.321	4.871	0.012	2264
135.000	ASP 705K	3	66.180	4.747	0.011	1920
130.000	APXV9ERR18-C-A20 w/ Mount Pipe	3	61.197	4.609	0.010	1666
120.000	742 213 w/ Mount Pipe	3	51.797	4.280	0.008	1433
79.000	GPS_A	3	21.839	2.587	0.003	1534
52.000	GPS-TMG-HR-26NCM	3	9.436	1.678	0.002	1426

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	168 - 119.25 (1)	TP34.288x24x0.25	48.750	0.000	0.0	39.000	26.298	-12.535	1025.600	0.012
L2	119.25 - 78.5 (2)	TP42.387x32.891x0.281	45.000	0.000	0.0	39.000	36.605	-18.755	1427.590	0.013
L3	78.5 - 38.75 (3)	TP50.213x40.717x0.375	45.000	0.000	0.0	39.000	57.750	-28.064	2252.240	0.012
L4	38.75 - 0 (4)	TP57.64x48.144x0.375	45.000	0.000	0.0	38.705	68.160	-40.601	2638.140	0.015

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	168 - 119.25 (1)	TP34.288x24x0.25	503.862	28.106	39.000	0.721	0.000	0.000	39.000	0.000
L2	119.25 - 78.5 (2)	TP42.387x32.891x0.281	1260.675	40.812	39.000	1.046	0.000	0.000	39.000	0.000
L3	78.5 - 38.75 (3)	TP50.213x40.717x0.375	2126.550	36.903	39.000	0.946	0.000	0.000	39.000	0.000
L4	38.75 - 0 (4)	TP57.64x48.144x0.375	3271.125	40.703	38.705	1.052	0.000	0.000	38.705	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	168 - 119.25 (1)	TP34.288x24x0.25	16.962	0.645	26.000	0.050	0.708	0.019	26.000	0.001
L2	119.25 - 78.5 (2)	TP42.387x32.891x0.281	20.601	0.563	26.000	0.043	0.699	0.011	26.000	0.000
L3	78.5 - 38.75 (3)	TP50.213x40.717x0.375	23.895	0.414	26.000	0.032	0.314	0.003	26.000	0.000
L4	38.75 - 0 (4)	TP57.64x48.144x0.375	26.925	0.395	26.000	0.030	0.293	0.002	26.000	0.000

Pole Interaction Design Data

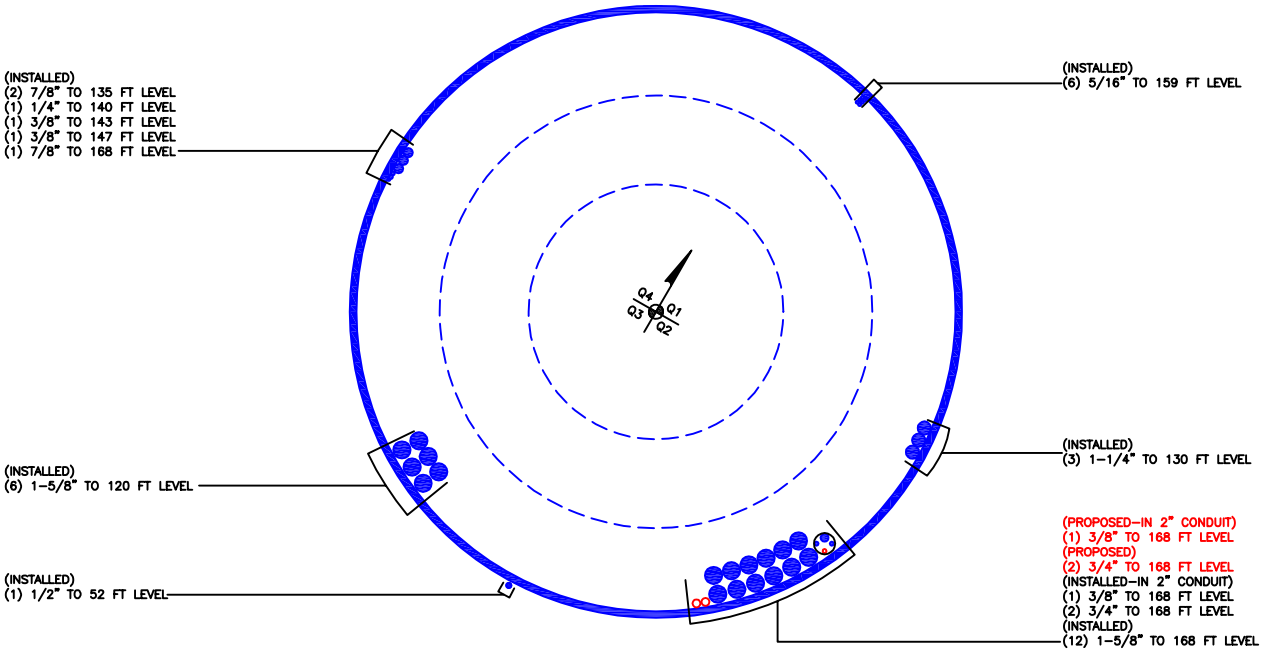
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	168 - 119.25 (1)	0.012	0.721	0.000	0.050	0.001	0.734 ✔	1.333	H1-3+VT ✔
L2	119.25 - 78.5 (2)	0.013	1.046	0.000	0.043	0.000	1.060 ✔	1.333	H1-3+VT ✔
L3	78.5 - 38.75 (3)	0.012	0.946	0.000	0.032	0.000	0.959 ✔	1.333	H1-3+VT ✔
L4	38.75 - 0 (4)	0.015	1.052	0.000	0.030	0.000	1.067 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	168 - 119.25	Pole	TP34.288x24x0.25	1	-12.535	1367.125	55.0	Pass
L2	119.25 - 78.5	Pole	TP42.387x32.891x0.281	2	-18.755	1902.977	79.5	Pass
L3	78.5 - 38.75	Pole	TP50.213x40.717x0.375	3	-28.064	3002.236	71.9	Pass
L4	38.75 - 0	Pole	TP57.64x48.144x0.375	4	-40.601	3516.640	80.1	Pass
							Summary	
						Pole (L4)	80.1	Pass
						RATING =	**80.1**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842875 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

11/03/14	NEW BUILD PER WORK ORDER # 725070	SAC
11/03/14	UPDATED PER WORK ORDER # 722778	SAC
03/04/14	UPDATED PER WORK ORDER # 739681	BMH
05/05/14	UPDATED PER WORK ORDER # 758703	CMV
28/07/14	AS-BUILT INFORMATION ADDED PER WORK ORDER 741453	KT
29/07/14	UPDATED PER WORK ORDER # 901888	DMB
02/01/15	UPDATED PER WORK ORDER # 985941	DMB
15/07/15	AS-BUILT INFORMATION ADDED PER WORK ORDER # 1094188	ASF
13/10/2015	UPDATED PER WORK ORDER 1132742 1135174	NAH

DRAWN BY: DJW
CHECKED BY: SAC
DRAWING DATE: 3/10/14

SITE NUMBER:
SITE NAME:

SITE NAME

WINDSORDAY HILL

BUSINESS UNIT NUMBER

842875

SITE ADDRESS

99 DAY HILL ROAD
WINDSOR, CT 06095
HARTFORD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

ASE LEVEL DRAWING | 1" = 1'-0" | 1

T DATE: 10/13/2015 FILE NAME: 842875_BASELEVEL.DWG

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data

BU#: *842875*
Site Name: *Windsorday Hill*
App #: *311707 Rev.0*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	65	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	63	in
Thick:	3.25	in
Grade:	55	ksi
Clip Distance:	6	in

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

Pole Data		
Diam:	57.64	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3271	ft-kips
Unfactored Axial, P:	41	kips
Unfactored Shear, V:	27	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	148.4 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	76.1% **Pass**

Base Plate Results — Flexural Check

Base Plate Stress:	32.6 ksi
Allowable PL Bending Stress:	55.0 ksi
Base Plate Stress Ratio:	59.2% **Pass**

PL Ref. Data	
Yield Line (in):	31.46
Max PL Length:	31.46

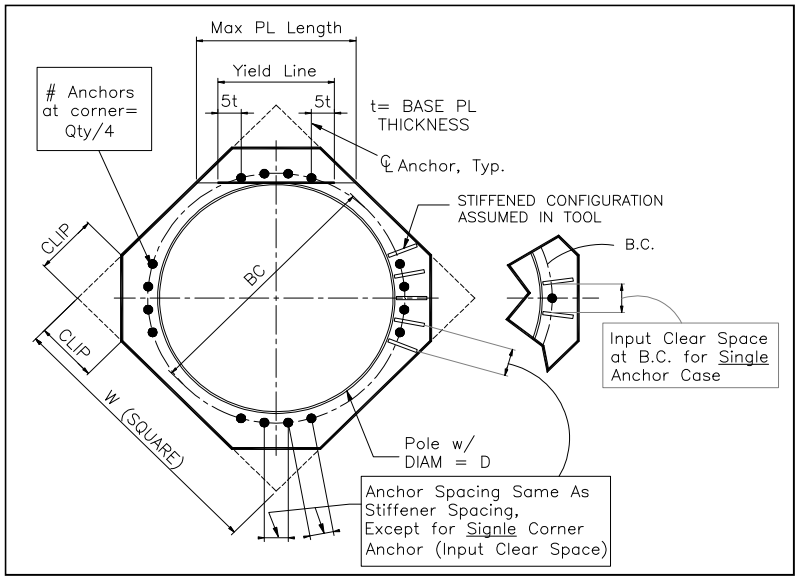
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	N/A



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

CCI Foundation Tool Suite - Monopole Pier

CCIFTS 1.2.108.14286 - Phase 1-2 Date: 10/15/2015

BU:	842875
Site Name:	Windsorday Hill
App Number:	311707 Rev.0
Work Order:	1135204

Monopole Drilled Pier

Input

Criteria

TIA Revision:	F
ACI 318 Revision:	2002
Seismic Category:	B

Forces

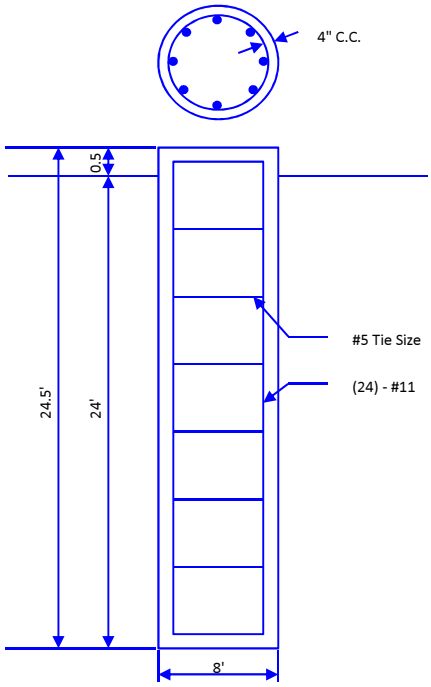
Compression	41	kips
Shear	27	kips
Moment	3271	k-ft
Swelling Force	0	kips

Foundation Dimensions

Pier Diameter:	8	ft
Ext. above grade:	0.5	ft
Depth below grade:	24	ft

Material Properties

Number of Rebar:	24	
Rebar Size:	11	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	4	in



Soil Profile: s

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	2	0	2	110					0	
2	3	2	5	120					0	
3	5	5	10	60		35			0	
4	5	10	15	55		33			0	
5	2	15	17	80		40			0	
6	7	17	24	95	10000				80	

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	7.04	ft
Max Moment, Mu:	3378.13	k-ft
Soil Safety Factor:	4.29	
Safety Factor Req'd:	2	
RATING:	46.6%	

Soil Axial Capacity

Skin Friction (k):	372.37	kips
End Bearing (k):	2010.62	kips
Comp. Capacity (k), ϕCn:	2382.99	kips
Comp. (k), Cu:	53.30	kips
RATING:	2.2%	

Concrete/Steel Check

Mu (from soil analysis)	4391.57	k-ft
ϕMn	6875.86	k-ft
RATING:	63.9%	

rho provided	0.52	
rho required	0.33	OK

Rebar Spacing	9.76	
Spacing required	22.56	OK

Dev. Length required	16.63	
Dev. Length provided	61.78	OK

Overall Foundation Rating: 63.9%

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

AT&T Existing Facility

Site ID: CT5139

Windsor Day Hill
99 Day Hill Road
Windsor, CT 06095

November 9, 2015

EBI Project Number: 6215005548

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.67 %

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

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November 9, 2015

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

Emissions Analysis for Site: **CT5139 – Windsor Day Hill**

EBI Consulting was directed to analyze the proposed AT&T facility located at **99 Day Hill Road, Windsor, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **99 Day Hill Road, Windsor, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

1) 2 GSM channels (1900 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 4 UMTS 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 (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 60 Watts

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 six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **Kathrein 800-10121** for 1900 MHz (PCS) and 850 MHz channels, the **CCI OPA-65R-LCUU-H6 & CCI OPA-65R-LCUU-H8** for and 2300 MHz (WCS) and the **KMW AM-X-CD-16-65-00T-RET & Powerwave P65-17-XLH-RR** for 1900 MHz (PCS) and 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The maximum gain values for these antennas are listed in the following Site Inventory and Power Data table. 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 centerline of the proposed antennas is **168 feet** above ground level (AGL).

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

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.3 / 14.3 dBd	Gain:	11.3 / 14.3 dBd	Gain:	11.3 / 14.3 dBd
Height (AGL):	168 feet	Height (AGL):	168 feet	Height (AGL):	168 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	8	Channel Count	8	# PCS Channels:	8
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	4,848.60	ERP (W):	4,848.60	ERP (W):	4,848.60
Antenna A1 MPE%	**0.83**	Antenna B1 MPE%	**0.83**	Antenna C1 MPE%	**0.83**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H8
Gain:	15.5 dBd	Gain:	15.5 dBd	Gain:	15.5 dBd
Height (AGL):	168 feet	Height (AGL):	168 feet	Height (AGL):	168 feet
Frequency Bands	2300 MHz (WCS)	Frequency Bands	2300 MHz (WCS)	Frequency Bands	2300 MHz (WCS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,257.76	ERP (W):	4,257.76	ERP (W):	3,794.73
Antenna A2 MPE%	**0.58**	Antenna B2 MPE%	**0.58**	Antenna C2 MPE%	**0.52**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	Powerwave P65-17-XLH-RR
Gain:	13.35 / 15.25 dBd	Gain:	13.35 / 15.25 dBd	Gain:	14.3 / 15.1 dBd
Height (AGL):	168 feet	Height (AGL):	168 feet	Height (AGL):	168 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:	240	Total TX Power:	240	Total TX Power:	240
ERP (W):	6,614.85	ERP (W):	6,614.85	ERP (W):	7,112.97
Antenna A3 MPE%	**1.31**	Antenna B3 MPE%	**1.31**	Antenna C3 MPE%	**1.48**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**2.83**
Nextel	0.22 %
Sprint	0.05 %
Clearwire	0.07 %
MetroPCS	0.84 %
Bloomfield PD	0.01 %
Municipal Antenna 1	0.16 %
Municipal Antenna 2	0.16 %
Municipal MW 1	0.00 %
Municipal MW 2	0.00 %
AT&T	1.33 %
Site Total MPE %:	**5.67 %**

AT&T Sector 1 Total:	2.73 %
AT&T Sector 2 Total:	2.73 %
AT&T Sector 3 Total:	2.83 %
Site Total:	5.67 %

AT&T _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	4	404.69	168	2.22	850	567	0.39 %
AT&T 1900 MHz (PCS) UMTS	2	807.46	168	2.21	1900	1000	0.22 %
AT&T 1900 MHz GSM	2	807.46	168	2.21	1900	1000	0.22 %
AT&T 2300 MHz (WCS) LTE	2	1897.37	168	5.20	2300	1000	0.52 %
AT&T 700 MHz LTE	2	1614.92	168	4.42	700	467	0.95 %
AT&T 1900 MHz (PCS) LTE	2	1941.56	168	5.32	1900	1000	0.53 %
						Total:	2.83 %

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Summary

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

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

AT&T Sector	Power Density Value (%)
Sector 1:	2.73 %
Sector 2:	2.73 %
Sector 3 :	2.83 %
AT&T Maximum Total (per sector):	2.83 %
Site Total:	5.67 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.67%** 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.

Scott Heffernan
RF Engineering Director

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