Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

March 31, 2016

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

RE: **Notice of Exempt Modification for AT&T / L700 Crown Site BU: 876321**
AT&T Site ID: CT2220
Located at: 150 North Main Street (a/k/a 148-160 N. Main), Branford, CT 06405
Latitude: 41° 17' 19" / Longitude: -72° 48' 49.9"

Dear Ms. Bachman,

AT&T currently maintains nine (9) antennas at the 112 foot level of the existing 147 foot monopole located at 150 North Main Street, Branford, CT. The tower is owned by Crown Castle. The property is owned by Irene M. Maculaitis Living Trust. AT&T now proposes to replace three (3) antennas and add three (3) remote radio units (non-antennas), two (2) DC power cables, one (1) raycap, and one (1) fiber line. They also intend to remove six (6) TMAs. The antennas would be installed at the same 112 foot level of the tower.

This facility was approved by the Town of Branford Planning and Zoning Commission on September 18, 1997. This approval included the condition(s) that:

1. Prior to issuance of a building permit, revised plan to show the following:
    a. Revise width of eastern-most curb cut to 30 feet (Sect. 25.10a) by creating new landscaped island extending 15 feet back from street line (Sect. 25.8.2) with new sidewalk (Sect. 31.5.3(b)).
    b. Relocate proposed utility pole so that it is not is the access drive.
2. Provide for co-location of communications equipment to be operated by the Town of Branford Sewage Treatment Plant.

3. Change plantings around tower yard to 6’ to 7’ dark American Arborvitae and rearrange to screen parking area from street.
4. All users of the telecommunications facility must demonstrate compliance with current FCC regulations for electromagnetic frequency emissions and any future changes in these standards.
5. The owner of the telecommunications facility shall provide for and encourage co-location of other antennae on the facility.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. James B. Cosgrove, First Selectman for the Town of Branford, as well as the property owner and the tower owner.

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

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

Sincerely,

Amanda Goodall
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
339-205-7017
Amanda.Goodall@crowncastle.com
Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 4: Exhibit-3: General Power Density Table report (RF Emissions Analysis Report)

cc: First Selectman, James B. Cosgrove
Town of Branford
1019 Main Street
Branford, CT 06405

Crown Castle, Tower Owner
12 Gill Street, Suite 5800
Woburn, Ma 01801

Irene M. Maculaitis
150 North Main Street
Branford, CT 06405

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4704

PLANNING AND ZONING COMMISSION
TOWN OF BRANFORD TOWN HALL DRIVE P.O. BOX 150
Branford, Connecticut 06405 488-1255

NOTICE OF DECISION

Recorded 9/29/97

September 22, 1997

Sprint PCS
% Attorney John Knuff
Harris Beach & Wilcox, L.L.P
147 North Broad Street
Milford, Connecticut 06460

SUBJECT: Special Exception

LOCATION: 150 North Main Street

APPLICATION # 97-6.5

OWNER OF RECORD: Irene Maculaitis

Dear Sir:

At a meeting of the Branford Planning & Zoning Commission held on Thursday, September 18, 1997, the Commission voted to:

X Approve your above subject application with the conditions noted below.

Very truly yours,

Shirley Rasmussen

Shirley Rasmussen
Town Planner

NOTE: This Special Exception shall become effective only after it is filed on the Land Records in the office of the Town Clerk.

1. Prior to issuance of a building permit, revise plan to show the following:

   a. Revise width of eastern-most curb cut to 30 feet (Sect. 25.10a) by creating new landscaped island extending 15 feet back from streetline (Sect. 25.8.2) with new sidewalk (Sect. 31.5.3(b)).

   b. Relocate proposed utility pole so that it is not in the access drive.

2. Provide for co-location of communications equipment to be operated by the Town of Branford Sewage Treatment Plant.

3. Change plantings around tower yard to 6' to 7' dark American Arborvitae and rearrange to screen parking area from street.

(OVER)

4. All users of the telecommunications facility must demonstrate compliance with current FCC regulations for electromagnetic frequency emissions and any future changes in these standards.

5. The owner of the telecommunication facility shall provide for and encourage co-location of other antennae on the facility.

NOTE: Special Exception shall become null and void in the event the applicant fails to obtain a building permit within one (1) year of date of approval.
(Per Section 31.7 of the Branford Zoning Regulations)

CC: Scott M. Thomae
Sprint PCS
Irene Maculaitis

SITE PLAN AND SPECIAL EXCEPTION

APPLICATION FOR CERTIFICATE OF ZONING COMPLIANCE
TOWN OF BRANFORD

ADDRESS OF SUBJECT PROPERTY 150 N. MAIN Street Branford, CT 06405

ASSESSOR'S MAP D-6 BLOCK 13 LOT 13 ZONE: IG-1

APPLICANT'S NAME Sprint PCS

TELEPHONE (203) 237-1737 ext.17

ADDRESS 300 RESEARCH Parkway 3rd fl. Meriden, CT 06450

Briefly describe the building, structure or use for which Zoning Compliance Application is made:

The erection of a monopole telecommunications facility and placement of the associated equipment cabinets on property located at 150 N. MAIN Street within the IG-1/ Industrial District.

PLEASE SUBMIT THE FOLLOWING WITH YOUR COMPLETED APPLICATION:

1. $125.00 (which includes $100.00 application fee, $15.00 Zoning Compliance fee, and $10.00 State surcharge)

2. Application materials described in Sect. 31.4 of the Branford Zoning Regulations including:
   - (1) Statement of Use
   - (2) Site Plan Map
   - (3) Erosion Control Plan
   - (4) Tabulation of Standards
   - (5) Staging Plan
   - (6) Building Plans
   - (7) Traffic Report
   - (8) Drainage Report
   - (9) Flood Requirements
   - (10) Agency Reports

RECEIVED
JUN 11 1997
BRANFORD PLANNING & ZONING COMMISSION

3. Sufficient information to determine compliance with special standards listed on attached sheet.

4. Copy of any variance or Wetlands Commission approval pertinent to this application.

5. Additional information which may be necessary to determine compliance, as specified by the Branford Planning & Zoning Commission.

The undersigned states that information submitted with this application is correct and acknowledges that any approval based on erroneous or incomplete information shall be null and void.

SIGNATURE OF APPLICANT Scott M. Young DATE 6/10/97

SIGNATURE OF OWNER John Reed as agent DATE 6/11/97

PROJECT INFORMATION

SCOPE OF WORK:	ITEMS TO BE MOUNTED ON THE MONOPOLE: (3) 3C LTE ANTENNAS, (3) RRH & (1) SURGE ARRESTOR, (2) DC POWER & (1) FIBER LINE ITEMS TO BE INSTALLED INSIDE THE EXISTING AT&T EQUIPMENT AREA: (1) DUS, (1) DUS41 & (1) DC POWER PLANT TO REPLACE EXISTING ITEMS TO REMAIN: (3) UMTS ANTENNAS, (3) 2C LTE ANTENNAS, (6) RRH, (6) TMA'S, (1) SURGE ARRESTOR, (2) DC POWER & (1) FIBER LINE, (12) 1-1/4" COAX. ITEMS TO BE REMOVED: (3) 2C LTE ANTENNAS, (1) POWER PLANT PTN: 2051585424
SITE ADDRESS:	150 N MAIN ST BRANFORD, CT 06405
LATITUDE:	41.288603° N, 41° 17' 18.97" N
LONGITUDE:	72.813860° W, 72° 48' 49.90" W
USID:	24492
PROPERTY OWNER:	CROWN CASTLE
TYPE OF SITE:	MONOPOLE
MONOPOLE HEIGHT:	147'-0"
RAD CENTER:	112'-0"
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

FA NUMBER: 10035122
SITE NUMBER: CTL02220
SITE NAME: BRANFORD CENTRAL
150 N. MAIN STREET
BRANFORD, CT 06405
CROWN CASTLE SITE ID: 876321
PROJECT: LTE 3C

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	1997 ANNAPOLIS EXCHANGE PARKWAY, SUITE 200
CITY, STATE, ZIP:	ANNAPOLIS, MD 21401
CONTACT:	TIM BOYCE
PHONE:	(908) 333-3640
E-MAIL:	tboyce@smartlinkllc.com

RF ENGINEER

COMPANY:	AT&T MOBILITY - NEW ENGLAND
ADDRESS:	550 COCHITUATE ROAD SUITE 550 13 AND 14
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	CAMERON SYME
PHONE:	(508) 596-7146
E-MAIL:	cs6970@att.com

SITE ACQUISITION

COMPANY:	SMARTLINK, LLC
ADDRESS:	33 BOSTON POST ROAD WEST SUITE 210
CITY, STATE, ZIP:	MARLBOROUGH, MA 01752
CONTACT:	TODD OLIVER
PHONE:	(774) 369-3618
E-MAIL:	todd.oliver@smartlink.com

CONSTRUCTION MANAGER

COMPANY:	SMARTLINK, LLC.
ADDRESS:	33 BOSTON POST ROAD WEST SUITE 210
CITY, STATE, ZIP:	MARLBOROUGH, MA 01752
CONTACT:	ROBERT PICARD
PHONE:	(774) 369-3618
E-MAIL:	robert.picard@smartlinkllc.com

ENGINEERING

COMPANY:	HUDSON DESIGN GROUP, LLC.
ADDRESS:	1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090
CITY, STATE, ZIP:	NORTH ANDOVER, MA 01845
CONTACT:	DANIEL P. HAMM, PE
PHONE:	(978) 557-5553
E-MAIL:	info@hudsondesigngroupllc.com

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI TURN LEFT ONTO CAPITOL BLVD. 0.3 MI TURN LEFT ONTO WEST ST. 0.3 MI MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. 29.0 MI MERGE ONTO I-95 N/GOVERNOR JOHN DAVIS LODGE TURNPIKE VIA THE EXIT ON THE LEFT TOWARD NEW LONDON. 5.6 MI TAKE THE CEDAR ST EXIT, EXIT 54, TOWARD BRANFORD. 0.1 MI TURN RIGHT ONTO CEDAR ST/CT-740. 0.2 MI TAKE THE 1ST LEFT ONTO N MAIN ST/US-1.IF 0.2 MI 150 N MAIN ST IS ON THE LEFT.

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 MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455

OR CALL 811

UNDERGROUND SERVICE ALERT

APPROVALS

DISCIPLINE:	SIGNATURE:	DATE:
THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.		
SMARTLINK SITE ACQUISITION:		
SMARTLINK CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

smartlink
1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL02220
SITE NAME: BRANFORD CENTRAL
CROWN CASTLE SITE ID: 876321
150 N MAIN ST
BRANFORD, CT 06405
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	03/11/16	ISSUED FOR CONSTRUCTION	FM	HC	DPH
1	02/05/16	ISSUED FOR PERMITTING	MC	HC	DPH
0	01/07/16	ISSUED FOR REVIEW	MC	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

DEREK J. CREAGER — STATE OF CONNECTICUT — No. 28554 — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02220	T-1	2

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.
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 TO 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 SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SMARTLINK
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. 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.
9. 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.
10. 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.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF 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.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. 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) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. 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.
18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS 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 ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
    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.
    BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

    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, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

    EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

Hudson Design Groupuc
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

smartlink
1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL02220
SITE NAME: BRANFORD CENTRAL
CROWN CASTLE SITE ID: 876321
150 N MAIN ST
BRANFORD, CT 06405
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	02/05/16	ISSUED FOR PERMITTING	MC	HC	DPH
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT · DEREK J. CREAMER · 26,285 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
(LTE 3C)

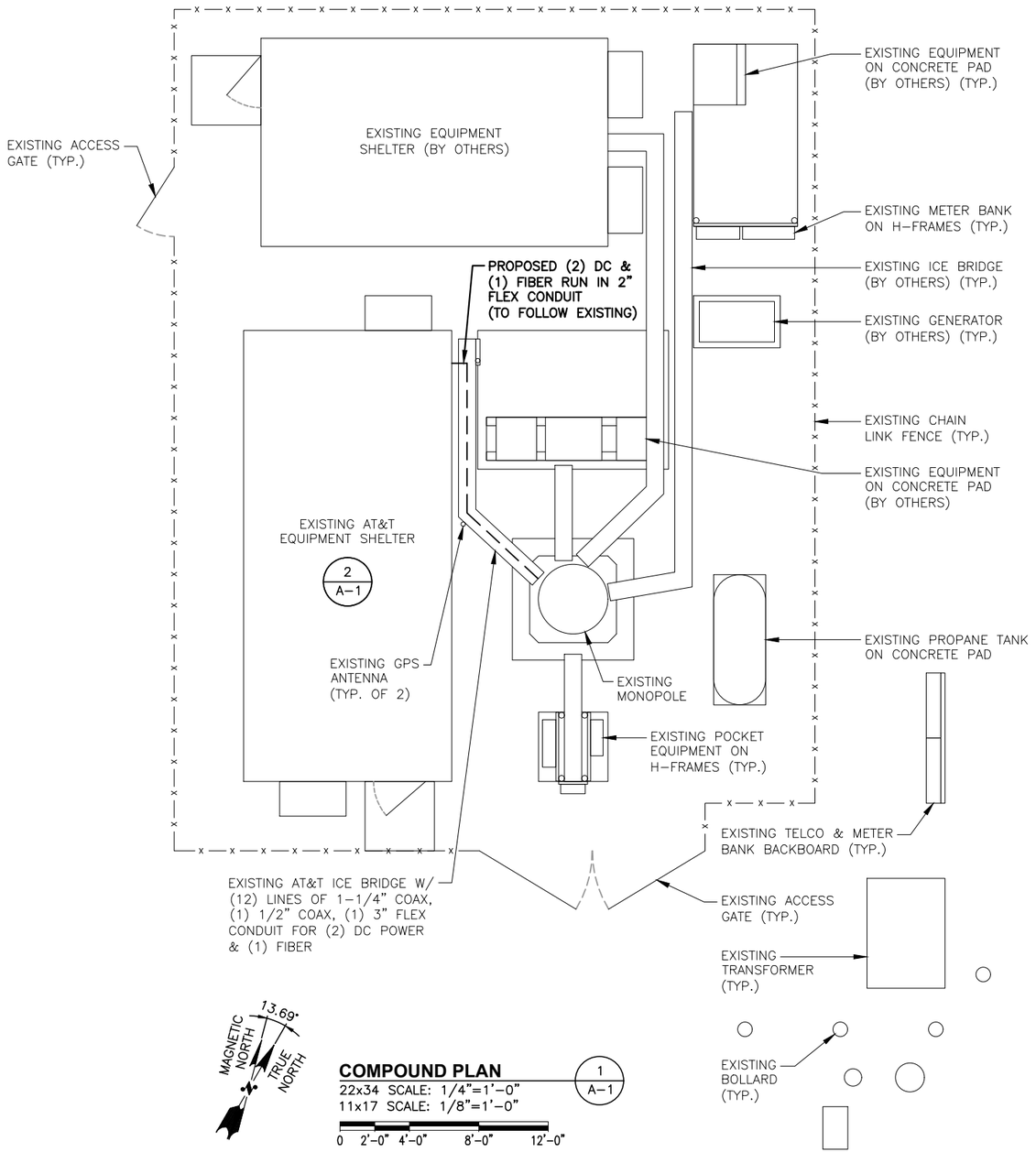
SITE NUMBER	DRAWING NUMBER	REV
CTL02220	GN-1	2

NOTE:
ALL LINES AND ANTENNAS TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS & MODIFICATION PLAN PROVIDED BY: CROWN CASTLE AND AT&T ANTENNA DESIGN SHEET RECOMMENDATION.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

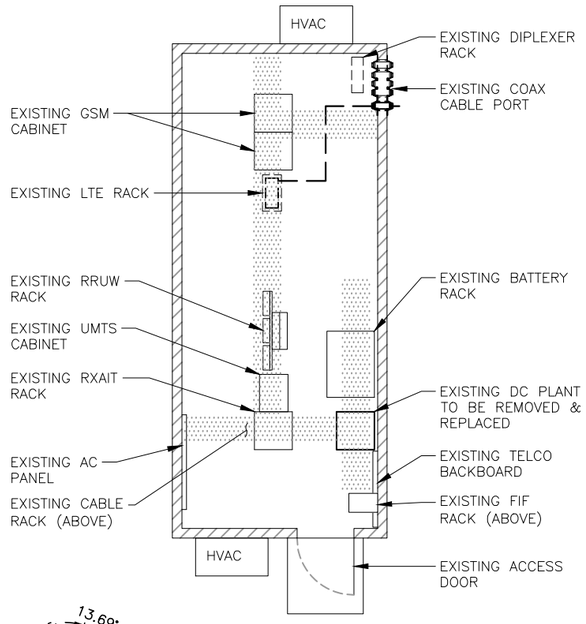
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC.
DATED: JANUARY 29, 2016



COMPOUND PLAN 1 A-1

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

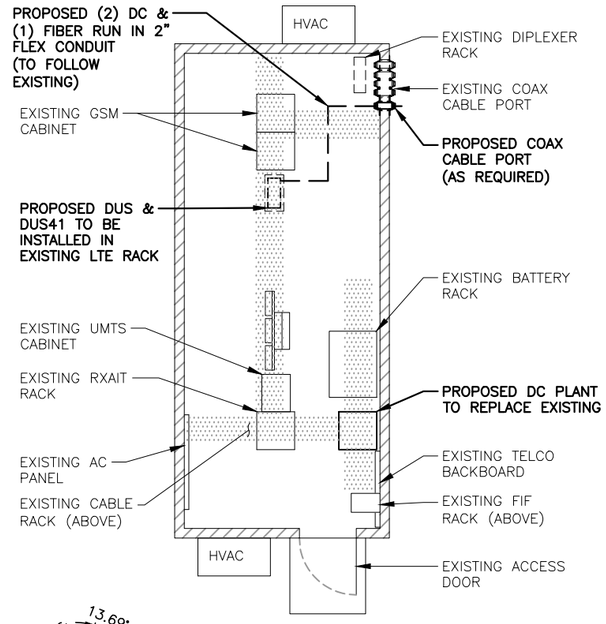
0 2'-0" 4'-0" 8'-0" 12'-0"



EXISTING EQUIPMENT PLAN 2 A-1

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"



PROPOSED EQUIPMENT PLAN 3 A-1

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"

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1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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CROWN CASTLE SITE ID: 876321
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BRANFORD, CT 06405
NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

DEREK J. CREASER — No. 29455 — LICENSED PROFESSIONAL ENGINEER — STATE OF CONNECTICUT

AT&T

COMPOUND & SHELTER PLANS
(LTE 3C)

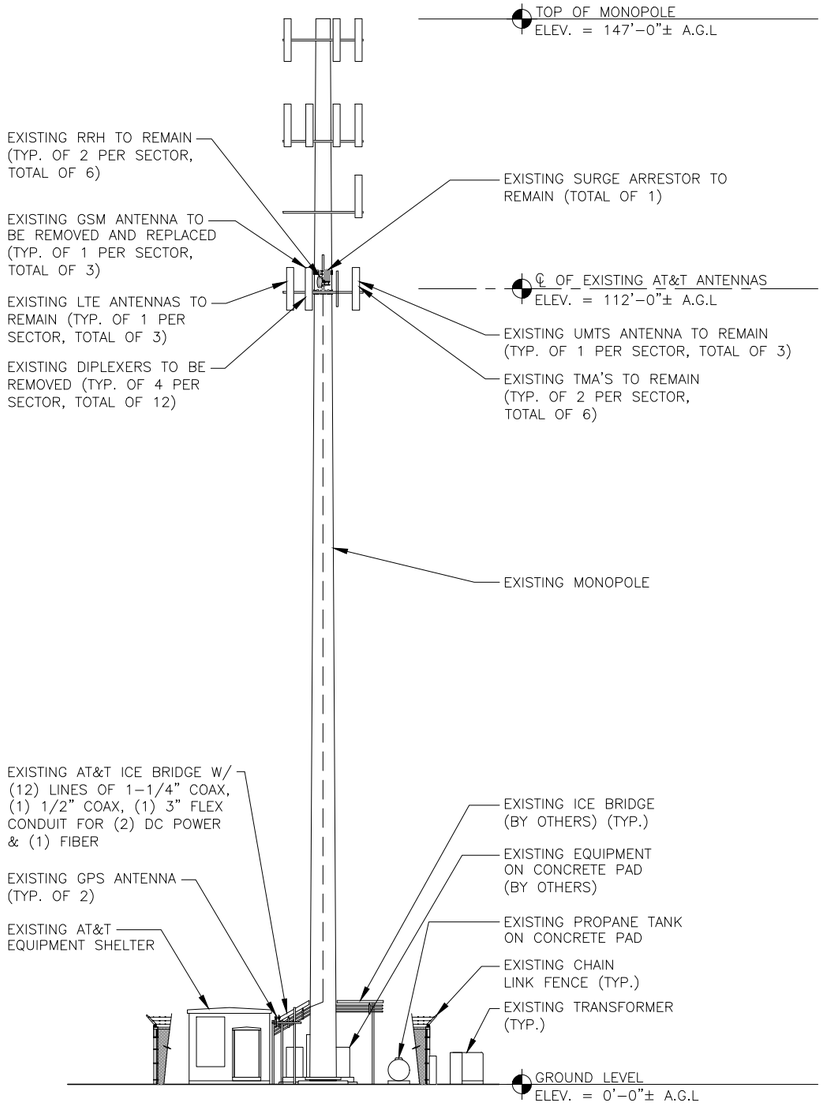
SITE NUMBER	DRAWING NUMBER	REV
CTL02220	A-1	2

NOTE:
ALL LINES AND ANTENNAS TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS & MODIFICATION PLAN PROVIDED BY: CROWN CASTLE AND AT&T ANTENNA DESIGN SHEET RECOMMENDATION.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

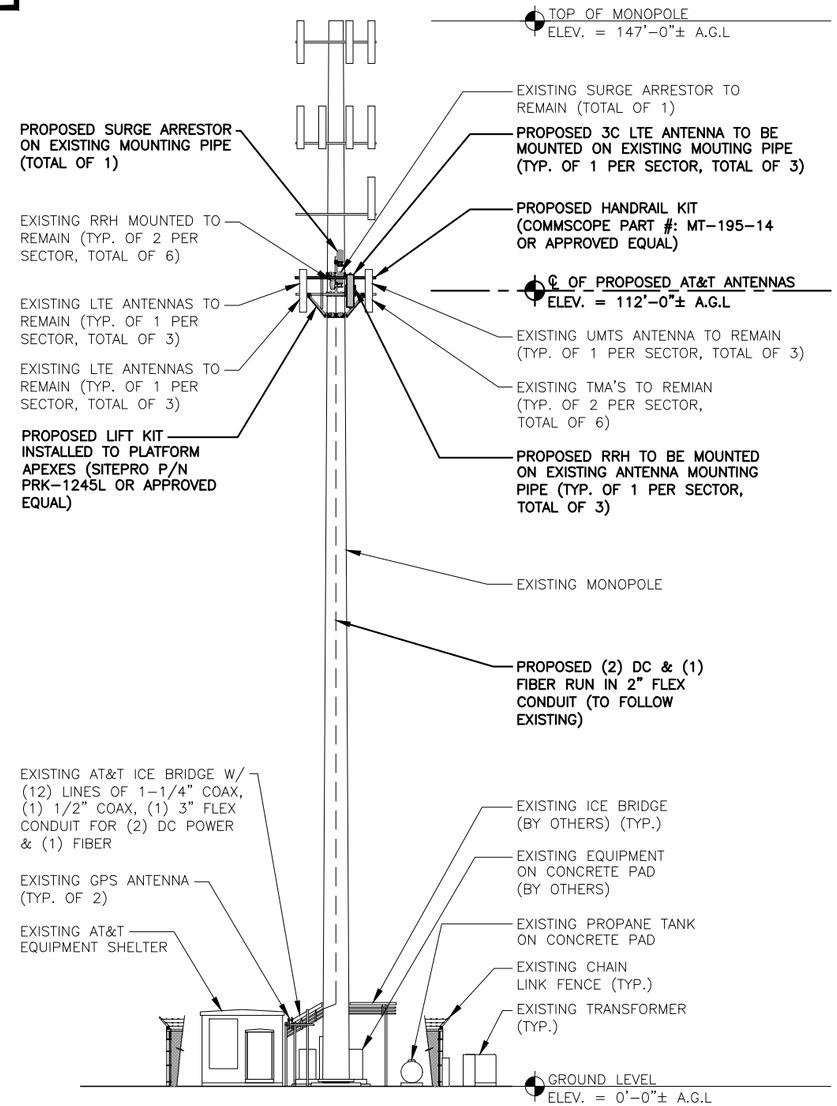
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC.
DATED: JANUARY 29, 2016



EXISTING SOUTH ELEVATION (1 / A-2)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"



PROPOSED SOUTH ELEVATION (2 / A-2)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"

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N. ANDOVER, MA 01845
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CROWN CASTLE SITE ID: 876321
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BRANFORD, CT 06405
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at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT · DEREK J. CREASER · No. 29057 · LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATIONS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02220	A-2	2

NOTE:
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DATED: JANUARY 29, 2016

NOTE:
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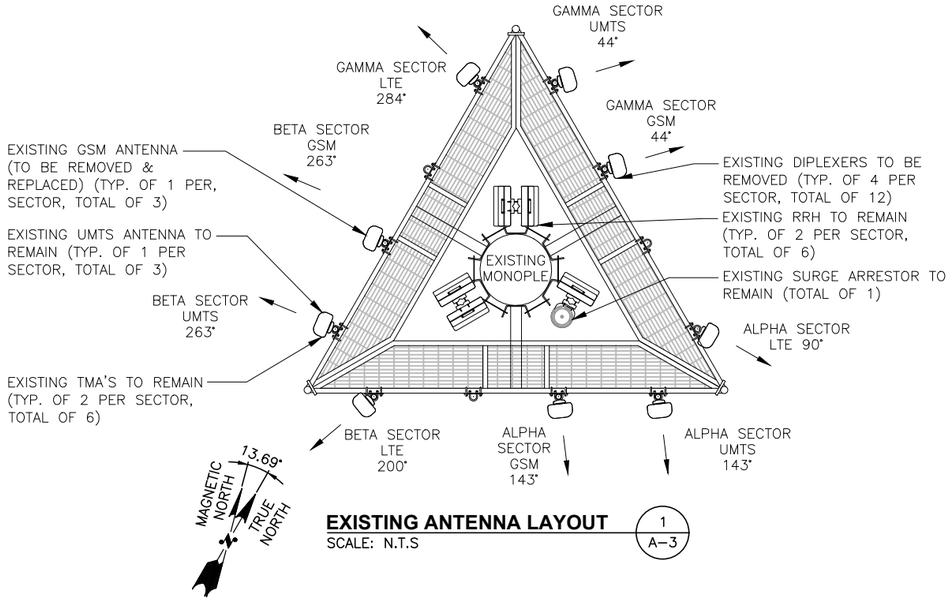
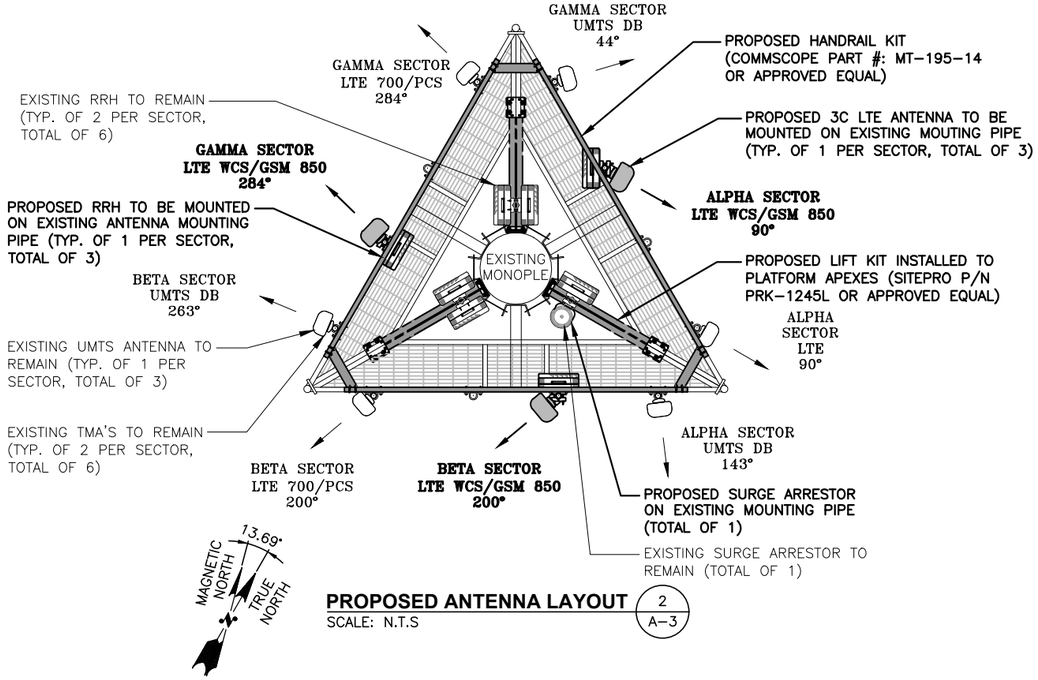


EXISTING ANTENNA LAYOUT (1 / A-3)
SCALE: N.T.S



PROPOSED ANTENNA LAYOUT (2 / A-3)
SCALE: N.T.S

Hudson Design Groupuc
1600 OSGOOD STREET
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT — DEREK J. CREASER — 26,295 — LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02220	A-3	2

NOTE:
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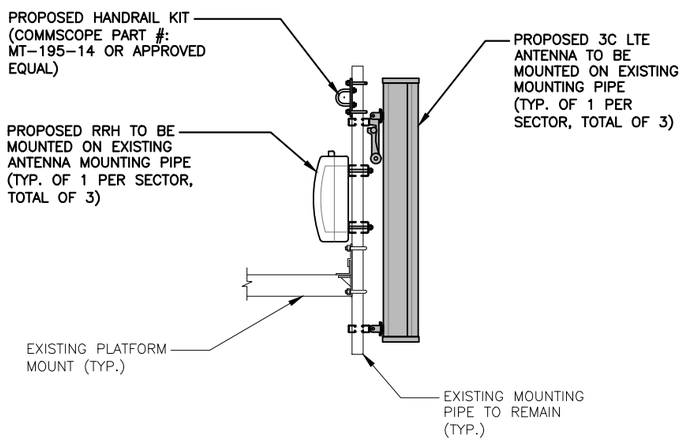
DATED: JANUARY 29, 2016

EXISTING & PROPOSED ANTENNA SCHEDULE

SECTOR	TECHNOLOGY	EXISTING/PROPOSED	RAD CENTER	AZIMUTH	MAKE	MODEL#	SIZE (INCHES) (L x W x D)
ALPHA	UMTS	EXISTING	112'-0"±	143°	POWERWAVE	7770	55.0x11.0x5.0
	LTE 3C	PROPOSED	112'-0"±	90°	ANDREW	SBNHH-165DA	55.0x11.9x7.1
	LTE	EXISTING	112'-0"±	90°	KATHREIN	8001064	48.0x11.8x5.9
BETA	UMTS	EXISTING	112'-0"±	263°	POWERWAVE	7770	55.0x11.0x5.0
	LTE 3C	PROPOSED	112'-0"±	143°	ANDREW	SBNHH-165DA	55.0x11.9x7.1
	LTE	EXISTING	112'-0"±	200°	KATHREIN	8001064	48.0x11.8x5.9
GAMMA	UMTS	EXISTING	112'-0"±	44°	POWERWAVE	7770	55.0x11.0x5.0
	LTE 3C	PROPOSED	112'-0"±	284°	ANDREW	SBNHH-165DA	55.0x11.9x7.1
	LTE	EXISTING	112'-0"±	284°	KMW	AM-X-CD-14-65-00T-RET	48.0x11.8x5.9

EXISTING & PROPOSED RRU SCHEDULE

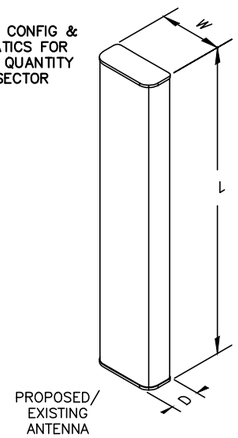
SECTOR	EXISTING/PROPOSED	MAKE	MODEL#	SIZE (INCHES) (L x W x D)
ALPHA				
	PROPOSED	ERICSSON	RRUS-32	26.7x12.1x6.7
	EXISTING	ERICSSON	(2)RRUS-11	19.7X17.0X7.2
BETA				
	PROPOSED	ERICSSON	RRUS-32	26.7x12.1x6.7
	EXISTING	ERICSSON	(2)RRUS-11	19.7X17.0X7.2
GAMMA				
	PROPOSED	ERICSSON	RRUS-32	26.7x12.1x6.7
	EXISTING	ERICSSON	(2)RRUS-11	19.7X17.0X7.2



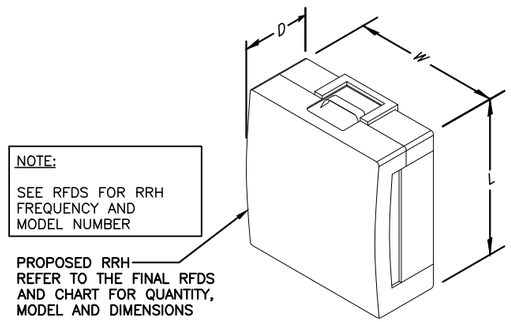
PROPOSED ANTENNA & RRH MOUNTING DETAIL
SCALE: N.T.S — 1 / A-4

NOTES:

1. REFER TO RF CONFIG & SECTOR SCHEMATICS FOR MODEL, TYPE & QUANTITY REQUIRED PER SECTOR

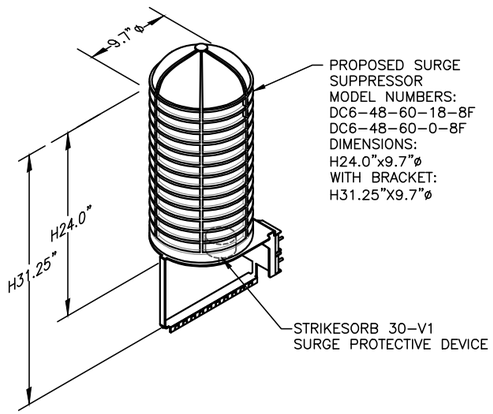


PROPOSED ANTENNA DETAIL
SCALE: N.T.S — 2 / A-4



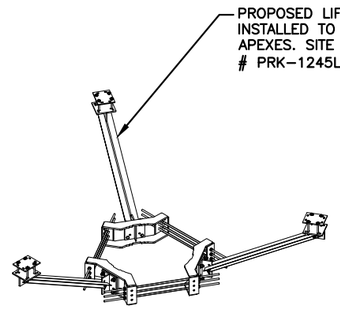
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRH DETAIL
SCALE: N.T.S — 3 / A-4

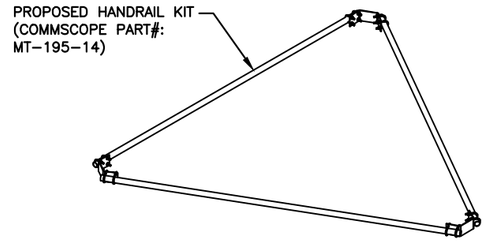


NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

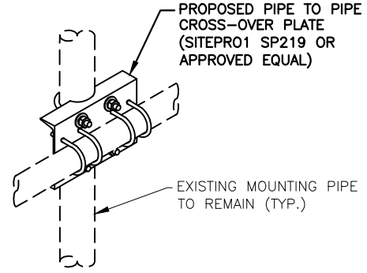
DC SURGE ARRESTOR DETAIL
SCALE: N.T.S — 4 / A-4



PROPOSED LIFT KIT DETAIL
SCALE: N.T.S — 5 / A-4



PROPOSED HANDRAIL KIT
SCALE: N.T.S — 7 / A-4



PROPOSED PIPE TO PIPE CROSS-OVER PLATE
SCALE: N.T.S — 6 / A-4

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1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

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NEW HAVEN COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT — DEREK J. CREASEY — 26,255 — LICENSED PROFESSIONAL ENGINEER

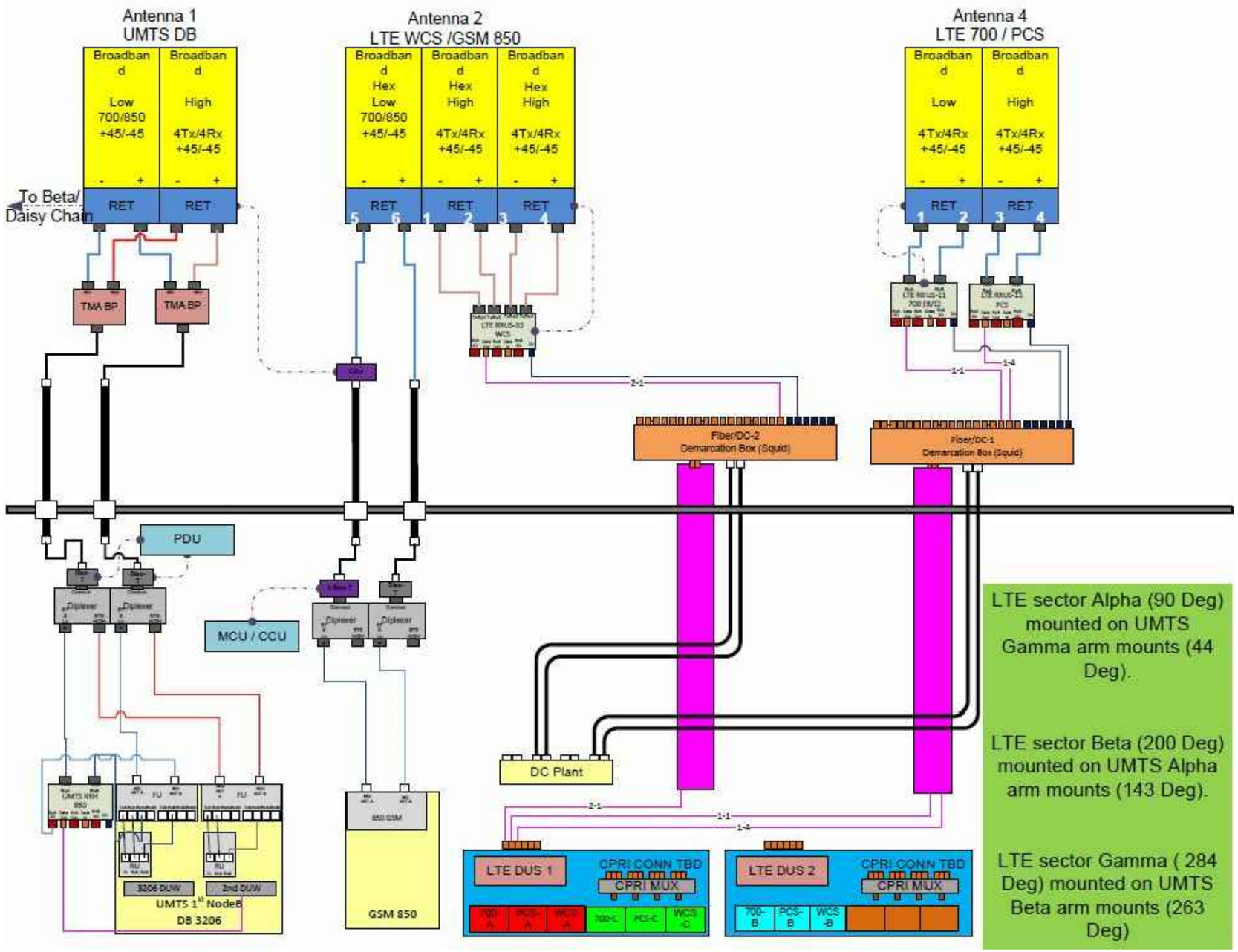
AT&T

DETAILS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02220	A-4	2

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



LTE sector Alpha (90 Deg) mounted on UMTS Gamma arm mounts (44 Deg).

LTE sector Beta (200 Deg) mounted on UMTS Alpha arm mounts (143 Deg).

LTE sector Gamma (284 Deg) mounted on UMTS Beta arm mounts (263 Deg)

RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

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1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT · DEREK J. CREAMER · 28355 · LICENSED PROFESSIONAL ENGINEER

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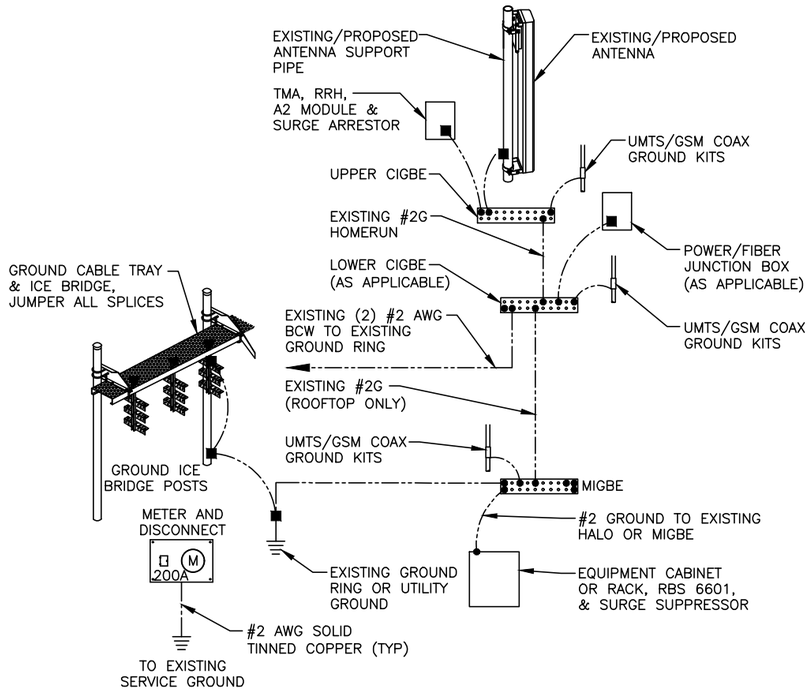
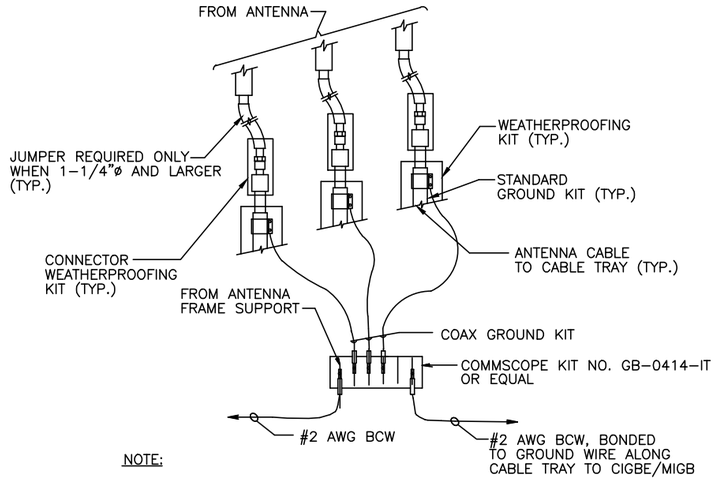
RF PLUMBING DIAGRAM
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02220	RF–1	2

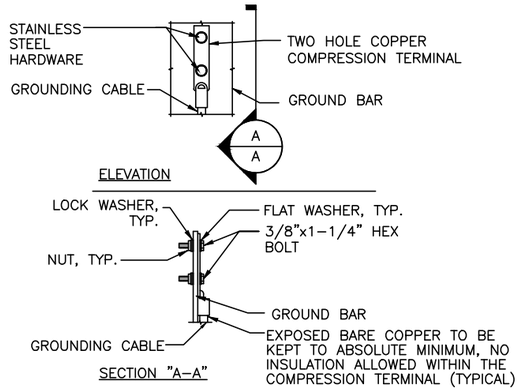


GROUNDING RISER DIAGRAM (1 / G–1)
SCALE: N.T.S



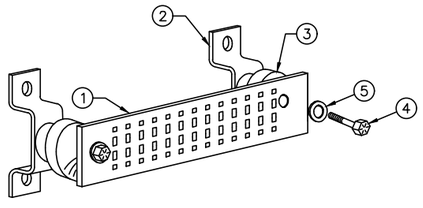
NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL (2 / G–1)
SCALE: N.T.S



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

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G–1)
SCALE: N.T.S



GROUND BAR - DETAIL (4 / G–1)
SCALE: N.T.S

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)

Hudson Design Groupllc
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MC

STATE OF CONNECTICUT · DEREK J. CREAGER · NO. 25[illegible] · LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
(LTE 3C)

SITE NUMBER	DRAWING NUMBER	REV
CTL02220	G–1	2

PAUL J. FORD & COMPANY

Date: **March 15, 2016**

Jay Patton
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
980-209-8250

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614-221-6679

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02220
	Carrier Site Name:	Branford Central
Crown Castle Designation:	**Crown Castle BU Number:**	876321
	Crown Castle Site Name:	BRANFORD BANM TOWER
	Crown Castle JDE Job Number:	362870
	Crown Castle Work Order Number:	1206713
	Crown Castle Application Number:	329797 Rev. 3
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-0242.004.7805
Site Data:	**150 North Main Street, BRANFORD, New Haven County, CT** **Latitude *41° 17' 19"*, Longitude *-72° 48' 49.9"*** **147 Foot - Monopole Tower**	

Dear Jay Patton,

Paul J Ford and Company 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 881635, in accordance with application 329797, revision 3.

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

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

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

Joshua Johnson, EI
Structural Designer RCH

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
3-15-16

PAUL J. FORD & COMPANY

Date: **March 15, 2016**

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Subject: **Structural Analysis Report**

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	Crown Castle Site Name:	BRANFORD BANM TOWER
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Paul J Ford and Company 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 881635, in accordance with application 329797, revision 3.

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

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

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

Joshua Johnson, EI
Structural Designer

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1) INTRODUCTION

This tower is a 147-ft Monopole tower designed by SUMMIT in March of 1999. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the 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, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	112.0	3	andrew	SBNHH-1D65A w/ Mount Pipe	1 2	3/8 3/4	-
		3	ericsson	RRUS 32			
		1	raycap	DC6-48-60-18-8F			
	110.0	1	tower mounts	MT-195-14 (Hand Rail)			
		1	tower mounts	PRK-1245L (Kickers)			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	149.0	1	andrew	VHLP2-18	6 3	1/2 1-1/4	1
		2	dragonwave	A-ANT-23G-2-C			
	147.0	3	alcatel lucent	TD-RRH8x20-25			
		1	powerwave	P40-16-XLPP-RR-A w/ Mount Pipe			
		9	rfs celwave	ACU-A20-N			
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 1201-1]			
145.0	146.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	-	-	1
		3	alcatel lucent	TME-800MHZ RRH			
	145.0	1	tower mounts	Side Arm Mount [SO 102-3]			
	143.0	3	alcatel lucent	TME-1900MHz RRH (65 MHz)			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
119.0	121.0	3	andrew	LNX-6515DS-VTM w/ Mount Pipe	-	-	2
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1 12	1-1/4 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	119.0	1	tower mounts	T-Arm Mount [TA 601-3]			
110.0	113.0	1	ericsson	RRUS 11	1	3/8	3
	112.0	6	powerwave	LGP2140X			
		3	powerwave	7770.00 w/ Mount Pipe			
		6	ericsson	RRUS 11	2 2 2 12 1	3/8 5/8 3/4 1-1/4 2” Conduit	1
		2	kathrein	800 10764 w/ Mount Pipe			
		1	kmw	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		6	powerwave	7020.00			
		3	powerwave	7770.00 w/ Mount Pipe			
		6	powerwave	LGP2140X			
		1	raycap	DC6-48-60-18-8F			
	110.0	1	tower mounts	Platform Mount [LP 1201-1]			
100.0	100.0	3	rfs celwave	APXV18-206517S-C □ ý □6	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
53.0	54.0	1	gps	GPS_A	1	1/2	1
	53.0	1	tower mounts	Side Arm Mount [SO 701-1]			
49.0	50.0	1	lucent	KS24019-L112A	1	1/2	1
	49.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C., 10/08/96	2135657	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 41709-0058, 06/15/09	2448190	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 128359, 03/06/13	3890848	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 130357, 12/9/13	4699667	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit/PJF, 29299-111, 03/15/99	1613620	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit/PJF, 29299-111, 03/15/99	1614568	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) For existing modifications: monopole was modified in conformance with the referenced modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company 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	147 - 99.5	Pole	TP30.313x22x0.25	1	-11.18	1135.99	64.1	Pass
L2	99.5 - 69.5	Pole	TP35.0626x29.1567x0.3125	2	-16.80	1817.84	89.6	Pass
L3	69.5 - 59	Pole	TP36.9x35.0626x0.4301	3	-18.02	2267.58	78.5	Pass
L4	59 - 58	Pole	TP36.45x35.2086x0.375	4	-19.88	2264.58	86.0	Pass
L5	58 - 50.5	Pole	TP37.7624x36.45x0.4271	5	-21.60	2494.38	85.5	Pass
L6	50.5 - 50	Pole	TP37.8499x37.7624x0.5405	6	-21.74	2941.54	73.3	Pass
L7	50 - 29.25	Pole	TP41.481x37.8499x0.479	7	-25.71	2851.53	88.0	Pass
L8	29.25 - 24	Pole	TP41.6499x39.6043x0.5047	8	-29.64	3263.40	85.8	Pass
L9	24 - 0	Pole	TP45.85x41.6499x0.5901	9	-37.56	3978.72	83.8	Pass
							Summary	
						Pole (L2)	89.6	Pass
						RATING =	**89.6**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.8	Pass
1	Base Plate	0	65.0	Pass
1	Base Foundation Steel	0	90.0	Pass
1	Base Foundation Soil Interaction	0	82.0	Pass

Structure Rating (max from all components) =	90.0%

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in New Haven County, Connecticut.
2) Basic wind speed of 80 mph.
3) Nominal ice thickness of 0.7500 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 38 mph is used in combination with ice.
7) Temperature drop of 50 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	147.0000-99.5000	47.5000	3.75	12	22.0000	30.3130	0.2500	1.0000	A607-60 (60 ksi)
L2	99.5000-69.5000	33.7500	0.00	12	29.1567	35.0626	0.3125	1.2500	A607-65 (65 ksi)
L3	69.5000-59.0000	10.5000	4.75	12	35.0626	36.9000	0.4301	1.7205	Reinf 57.44 ksi (57 ksi)
L4	59.0000-58.0000	5.7500	0.00	12	35.2086	36.4500	0.3750	1.5000	A607-65 (65 ksi)
L5	58.0000-50.5000	7.5000	0.00	12	36.4500	37.7624	0.4271	1.7084	Reinf 60.74 ksi (61 ksi)
L6	50.5000-50.0000	0.5000	0.00	12	37.7624	37.8499	0.5405	2.1620	Reinf 56.64 ksi (57 ksi)

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
L7	50.0000-29.2500	20.7500	5.25	12	37.8499	41.4810	0.4790	1.9160	Reinf 57.67 ksi (58 ksi)
L8	29.2500-24.0000	10.5000	0.00	12	39.6043	41.6499	0.5047	2.0188	Reinf 61.02 ksi (61 ksi)
L9	24.0000-0.0000	24.0000		12	41.6499	45.8500	0.5900	2.3602	Reinf 57.85 ksi (58 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	31.3823	24.2007	2791.7645	10.7626	15.7021	177.7952	5656.8718	11.9109	7.4539	29.816
L2	30.8646	29.0245	3082.2497	10.3262	15.1032	204.0796	6245.4735	14.2850	6.9765	22.325
	36.2995	34.9673	5389.6479	12.4405	18.1624	296.7470	10920.8879	17.2098	8.5593	27.39
L3	36.2995	47.9655	7343.1536	12.3984	18.1624	404.3045	14879.2200	23.6072	8.2441	19.167
	38.2017	50.5103	8575.0066	13.0562	19.1142	448.6197	17375.2881	24.8596	8.7365	20.312
L4	37.5123	42.0615	6514.2837	12.4704	18.2380	357.1812	13199.7048	20.7014	8.4309	22.482
	37.7358	43.5606	7235.8925	12.9148	18.8811	383.2347	14661.8800	21.4392	8.7636	23.37
L5	37.7358	49.5409	8205.5446	12.8962	18.8811	434.5904	16626.6580	24.3825	8.6240	20.192
	39.0945	51.3459	9135.4801	13.3660	19.5609	467.0267	18510.9595	25.2709	8.9757	21.015
L6	39.0945	64.7814	11456.0311	13.3255	19.5609	585.6586	23213.0249	31.8834	8.6718	16.044
	39.1851	64.9337	11537.0125	13.3568	19.6063	588.4350	23377.1151	31.9584	8.6952	16.087
L7	39.1851	57.6390	10274.7280	13.3788	19.6063	524.0533	20819.3846	28.3682	8.8601	18.497
	42.9443	63.2394	13570.1207	14.6787	21.4872	631.5456	27496.7436	31.1245	9.8332	20.529
L8	42.0603	63.5434	12399.4054	13.9977	20.5150	604.4058	25124.5570	31.2741	9.2613	18.35
	43.1191	66.8677	14449.0629	14.7300	21.5746	669.7248	29277.7188	32.9103	9.8095	19.436
L9	43.1191	78.0120	16787.3228	14.6994	21.5746	778.1049	34015.6674	38.3952	9.5808	16.237
	47.4674	85.9921	22483.9622	16.2031	23.7503	946.6812	45558.6031	42.3227	10.7065	18.145

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
760002253(1/2")	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	4	No Ice	0.0510	0.10
						1/2" Ice	0.1510	0.72
						1" Ice	0.2510	1.95
						2" Ice	0.4510	6.24
						4" Ice	0.8510	22.14
760002253(1/2")	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	2	No Ice	0.0000	0.10
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	1.95
						2" Ice	0.0000	6.24
						4" Ice	0.0000	22.14
HB114-1-0813U4-M5J(1-1/4")	C	No	Inside Pole	147.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	1.20
						1" Ice	0.0000	1.20
						2" Ice	0.0000	1.20
						4" Ice	0.0000	1.20

****

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	119.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
HB114-1-0813U4-M5J(1-1/4")	C	No	CaAa (Out Of Face)	100.0000 - 0.0000	1	No Ice	0.0000	1.20
						1/2" Ice	0.0000	2.45
						1" Ice	0.0000	4.30
						2" Ice	0.0000	9.85
						4" Ice	0.0000	28.27
HB114-1-0813U4-M5J(1-1/4")	C	No	CaAa (Out Of Face)	119.0000 - 100.0000	1	No Ice	0.1540	1.20
						1/2" Ice	0.2540	2.45
						1" Ice	0.3540	4.30
						2" Ice	0.5540	9.85
						4" Ice	0.9540	28.27
****								
LDF4.5-50(5/8")	C	No	Inside Pole	110.0000 - 0.0000	2	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
LDF6-50A(1-1/4")	C	No	Inside Pole	110.0000 - 0.0000	12	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
FB-L98B-034-XXX(3/8")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	110.0000 - 0.0000	2	No Ice	0.0000	0.58
						1/2" Ice	0.0000	0.58
						1" Ice	0.0000	0.58
						2" Ice	0.0000	0.58
						4" Ice	0.0000	0.58
FB-L98B-034-XXX(3/8")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4")	C	No	Inside Pole	110.0000 - 0.0000	2	No Ice	0.0000	0.58
						1/2" Ice	0.0000	0.58
						1" Ice	0.0000	0.58
						2" Ice	0.0000	0.58
						4" Ice	0.0000	0.58
LDF2-50(3/8")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.08
						1" Ice	0.0000	0.08
						2" Ice	0.0000	0.08
						4" Ice	0.0000	0.08
2" (Nominal) Conduit	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
						2" Ice	0.0000	0.72
						4" Ice	0.0000	0.72
****								
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	100.0000 - 0.0000	5	No Ice	0.0000	0.83
						1/2" Ice	0.0000	2.34
						1" Ice	0.0000	4.47
						2" Ice	0.0000	10.55
						4" Ice	0.0000	30.05
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	100.0000 - 0.0000	1	No Ice	0.1980	0.83
						1/2" Ice	0.2980	2.34
						1" Ice	0.3980	4.47
						2" Ice	0.5980	10.55
						4" Ice	0.9980	30.05
****								
LDF4-50A(1/2")	C	No	Inside Pole	53.0000 - 0.0000	1	No Ice	0.0000	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
****								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	49.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
						2" Ice	0.0000	6.58
						4" Ice	0.0000	22.78
****								
Aero MP3-04	C	No	CaAa (Out Of Face)	35.5000 - 0.0000	2	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
						2" Ice	0.7135	0.00
						4" Ice	1.1579	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	52.0000 - 35.5000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
						2" Ice	0.7135	0.00
						4" Ice	1.1579	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	71.0000 - 61.0000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
						2" Ice	0.7135	0.00
						4" Ice	1.1579	0.00
Aero MP3-03	C	No	CaAa (Out Of Face)	59.0000 - 49.0000	1	No Ice	0.2625	0.00
						1/2" Ice	0.3736	0.00
						1" Ice	0.4847	0.00
						2" Ice	0.7069	0.00
						4" Ice	1.1514	0.00

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	147.0000-99.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.715	0.54
L2	99.5000-69.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.464	0.95
L3	69.5000-59.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.508	0.33
L4	59.0000-58.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.664	0.03
L5	58.0000-50.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.387	0.24
L6	50.5000-50.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.467	0.02
L7	50.0000-29.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	15.868	0.66
L8	29.2500-24.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.935	0.17
L9	24.0000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	22.561	0.77

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	147.0000-99.5000	A	0.878	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	49.490	1.04
L2	99.5000-69.5000	A	0.839	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	39.087	1.87
L3	69.5000-59.0000	A	0.812	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.572	0.62
L4	59.0000-58.0000	A	0.803	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.657	0.06
L5	58.0000-50.5000	A	0.796	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.950	0.44
L6	50.5000-50.0000	A	0.789	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.036	0.03
L7	50.0000-29.2500	A	0.766	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	36.536	1.23
L8	29.2500-24.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.746	0.31
L9	24.0000-0.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	48.562	1.40

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.0000-99.5000	-0.3166	0.1828	-0.8867	0.5119
L2	99.5000-69.5000	-0.4690	0.2708	-1.1033	0.6370
L3	69.5000-59.0000	-0.6661	0.3846	-1.3032	0.7524
L4	59.0000-58.0000	-0.7079	0.4087	-1.3524	0.7808
L5	58.0000-50.5000	-0.7580	0.4376	-1.4017	0.8093
L6	50.5000-50.0000	-0.9355	0.5401	-1.5843	0.9147
L7	50.0000-29.2500	-0.8089	0.4670	-1.4584	0.8420
L8	29.2500-24.0000	-0.9584	0.5533	-1.6270	0.9393
L9	24.0000-0.0000	-0.9708	0.5605	-1.6539	0.9549

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
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00	0.00	147.0000	No Ice 1/2"	8.4975 9.1490	6.9458 8.1266	0.08 0.15

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
			0.00			Ice	9.7672	9.0212	0.23
						1" Ice	11.0311	10.8440	0.41
						2" Ice	13.6786	14.8507	0.91
						4" Ice			
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.7198 5.0138 5.3165 5.9478 7.3141	1.7027 1.9196 2.1453 2.6224 3.6805	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.7198 5.0138 5.3165 5.9478 7.3141	1.7027 1.9196 2.1453 2.6224 3.6805	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.7198 5.0138 5.3165 5.9478 7.3141	1.7027 1.9196 2.1453 2.6224 3.6805	0.07 0.10 0.13 0.20 0.40
(3) ACU-A20-N	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.0778 0.1210 0.1728 0.3025 0.6654	0.1361 0.1890 0.2506 0.3997 0.8015	0.00 0.00 0.00 0.01 0.04
P40-16-XLPP-RR-A w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.3725 9.9120 10.4497 11.5558 13.8921	4.8250 5.5706 6.2654 7.8034 11.1071	0.07 0.14 0.21 0.37 0.82
(2) 6' x 2'' Mount Pipe	A	From Leg	4.0000	0.00	147.0000	No Ice	1.4250	1.4250	0.02

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
			0.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	1.9250 2.2939 3.0596 4.7022	1.9250 2.2939 3.0596 4.7022	0.03 0.05 0.09 0.23
(2) 6' x 2'' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2'' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4250 1.9250 2.2939 3.0596 4.7022	1.4250 1.9250 2.2939 3.0596 4.7022	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 1201-1]	B	None		0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.1000 26.8000 30.5000 37.9000 52.7000	23.1000 26.8000 30.5000 37.9000 52.7000	2.10 2.50 2.90 3.70 5.30
****									
TME-1900MHz RRH (65 MHz)	A	From Leg	1.0000 0.00 -2.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
TME-1900MHz RRH (65 MHz)	B	From Leg	1.0000 0.00 -2.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
TME-1900MHz RRH (65 MHz)	C	From Leg	1.0000 0.00 -2.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.6979 2.9362 3.1832 3.7030 4.8463	2.7708 3.0111 3.2600 3.7837 4.9348	0.06 0.08 0.11 0.18 0.35
800 EXTERNAL NOTCH FILTER	A	From Leg	1.0000 0.00 1.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
TME-800MHZ RRH	A	From Leg	1.0000 0.00 1.00	0.00	145.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
800 EXTERNAL NOTCH FILTER	B	From Leg	1.0000 0.00 1.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
TME-800MHZ RRH	B	From Leg	1.0000 0.00 1.00	0.00	145.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32

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			
800 EXTERNAL NOTCH FILTER	C	From Leg	1.0000 0.00 1.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.7701 0.8898 1.0181 1.3007 1.9696	0.3747 0.4647 0.5634 0.7868 1.3372	0.01 0.02 0.02 0.04 0.11
TME-800MHZ RRH	C	From Leg	1.0000 0.00 1.00	0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4899 2.7061 2.9310 3.4068 4.4620	2.0685 2.2705 2.4812 2.9284 3.9265	0.05 0.07 0.10 0.16 0.32
Side Arm Mount [SO 102-3]	B	None		0.00	145.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.0000 3.4800 3.9600 4.9200 6.8400	3.0000 3.4800 3.9600 4.9200 6.8400	0.08 0.11 0.14 0.20 0.32
**** ****									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8253 7.3471 7.8631 8.9261 11.1755	5.6424 6.4800 7.2567 8.8640 12.2932	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8155 7.3373 7.8532 8.9160 11.1650	5.6334 6.4717 7.2478 8.8537 12.2804	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8155 7.3373 7.8532 8.9160 11.1650	5.6334 6.4717 7.2478 8.8537 12.2804	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.8155 7.3373 7.8532 8.9160 11.1650	5.6334 6.4717 7.2478 8.8537 12.2804	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	A	From Leg	4.0000 0.00 2.00	0.00	119.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.4083 0.4969 0.5941 0.8145 1.3590	0.2042 0.2733 0.3511 0.5326 0.9992	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	4.0000 0.00	0.00	119.0000	No Ice 1/2"	0.4083 0.4969	0.2042 0.2733	0.01 0.01

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
			2.00			Ice	0.5941	0.3511	0.02
						1" Ice	0.8145	0.5326	0.03
						2" Ice	1.3590	0.9992	0.08
						4" Ice			
KRY 112 144/1	C	From Leg	4.0000	0.00	119.0000	No Ice	0.4083	0.2042	0.01
			0.00			1/2"	0.4969	0.2733	0.01
			2.00			Ice	0.5941	0.3511	0.02
						1" Ice	0.8145	0.5326	0.03
						2" Ice	1.3590	0.9992	0.08
						4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.0000	0.00	119.0000	No Ice	11.6382	9.8359	0.08
			0.00			1/2"	12.3560	11.3566	0.17
			2.00			Ice	13.0830	12.9014	0.27
						1" Ice	14.5347	15.2444	0.50
						2" Ice	17.7991	20.1092	1.15
						4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.0000	0.00	119.0000	No Ice	11.6382	9.8359	0.08
			0.00			1/2"	12.3560	11.3566	0.17
			2.00			Ice	13.0830	12.9014	0.27
						1" Ice	14.5347	15.2444	0.50
						2" Ice	17.7991	20.1092	1.15
						4" Ice			
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.0000	0.00	119.0000	No Ice	11.6382	9.8359	0.08
			0.00			1/2"	12.3560	11.3566	0.17
			2.00			Ice	13.0830	12.9014	0.27
						1" Ice	14.5347	15.2444	0.50
						2" Ice	17.7991	20.1092	1.15
						4" Ice			
RRUS 11 B12	A	From Leg	4.0000	0.00	119.0000	No Ice	3.3056	1.3611	0.05
			0.00			1/2"	3.5497	1.5404	0.07
			2.00			Ice	3.8025	1.7284	0.10
						1" Ice	4.3340	2.1302	0.15
						2" Ice	5.5006	3.0377	0.31
						4" Ice			
RRUS 11 B12	B	From Leg	4.0000	0.00	119.0000	No Ice	3.3056	1.3611	0.05
			0.00			1/2"	3.5497	1.5404	0.07
			2.00			Ice	3.8025	1.7284	0.10
						1" Ice	4.3340	2.1302	0.15
						2" Ice	5.5006	3.0377	0.31
						4" Ice			
RRUS 11 B12	C	From Leg	4.0000	0.00	119.0000	No Ice	3.3056	1.3611	0.05
			0.00			1/2"	3.5497	1.5404	0.07
			2.00			Ice	3.8025	1.7284	0.10
						1" Ice	4.3340	2.1302	0.15
						2" Ice	5.5006	3.0377	0.31
						4" Ice			
T-Arm Mount [TA 601-3]	B	None		0.00	119.0000	No Ice	10.9000	10.9000	0.73
						1/2"	14.6500	14.6500	0.93
						Ice	18.4000	18.4000	1.13
						1" Ice	25.9000	25.9000	1.52
						2" Ice	40.9000	40.9000	2.32
						4" Ice			
****									
(2) 7020.00	A	From Leg	4.0000	0.00	110.0000	No Ice	0.1191	0.2042	0.00
			0.00			1/2"	0.1714	0.2791	0.01
			2.00			Ice	0.2323	0.3627	0.01
						1" Ice	0.3801	0.5559	0.02
						2" Ice	0.7793	1.0459	0.07
						4" Ice			
(2) 7020.00	B	From Leg	4.0000	0.00	110.0000	No Ice	0.1191	0.2042	0.00
			0.00			1/2"	0.1714	0.2791	0.01
			2.00			Ice	0.2323	0.3627	0.01
						1" Ice	0.3801	0.5559	0.02
						2" Ice	0.7793	1.0459	0.07
						4" Ice			

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) 7020.00	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.1191 0.1714 0.2323 0.3801 0.7793	0.2042 0.2791 0.3627 0.5559 1.0459	0.00 0.01 0.01 0.02 0.07
7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2208 6.7144 7.2182 8.2568 10.4762	4.8204 5.5082 6.2127 7.6716 11.0613	0.09 0.14 0.21 0.36 0.76
7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2208 6.7144 7.2182 8.2568 10.4762	4.8204 5.5082 6.2127 7.6716 11.0613	0.09 0.14 0.21 0.36 0.76
7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2208 6.7144 7.2182 8.2568 10.4762	4.8204 5.5082 6.2127 7.6716 11.0613	0.09 0.14 0.21 0.36 0.76
(2) LGP2140X	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2600 1.4160 1.5806 1.9358 2.7499	0.3780 0.4932 0.6170 0.8905 1.5412	0.01 0.02 0.03 0.05 0.13
(2) LGP2140X	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2600 1.4160 1.5806 1.9358 2.7499	0.3780 0.4932 0.6170 0.8905 1.5412	0.01 0.02 0.03 0.05 0.13
(2) LGP2140X	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2600 1.4160 1.5806 1.9358 2.7499	0.3780 0.4932 0.6170 0.8905 1.5412	0.01 0.02 0.03 0.05 0.13
(2) RRUS 11	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2560 3.4982 3.7490 4.2766 5.4355	1.3790 1.5577 1.7450 2.1455 3.0504	0.05 0.07 0.10 0.15 0.31
(2) RRUS 11	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2560 3.4982 3.7490 4.2766 5.4355	1.3790 1.5577 1.7450 2.1455 3.0504	0.05 0.07 0.10 0.15 0.31
(2) RRUS 11	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2560 3.4982 3.7490 4.2766 5.4355	1.3790 1.5577 1.7450 2.1455 3.0504	0.05 0.07 0.10 0.15 0.31
800 10764 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.2031 6.6897 7.1782 8.1863 10.3284	4.2940 4.9925 5.6620 7.1004 10.3001	0.06 0.11 0.17 0.30 0.67

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			
800 10764 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2031 6.6897 7.1782 8.1863 10.3284	4.2940 4.9925 5.6620 7.1004 10.3001	0.06 0.11 0.17 0.30 0.67
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.7442 6.1977 6.6606 7.6178 9.6678	4.0153 4.6330 5.2765 6.6779 9.7441	0.05 0.10 0.15 0.27 0.63
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4667 1.6667 1.8778 2.3333 3.3778	1.4667 1.6667 1.8778 2.3333 3.3778	0.02 0.04 0.06 0.11 0.24
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2483 6.7093 7.1792 8.1474 10.2006	5.0515 5.7157 6.4259 7.9337 11.2125	0.06 0.11 0.17 0.31 0.70
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2483 6.7093 7.1792 8.1474 10.2006	5.0515 5.7157 6.4259 7.9337 11.2125	0.06 0.11 0.17 0.31 0.70
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2483 6.7093 7.1792 8.1474 10.2006	5.0515 5.7157 6.4259 7.9337 11.2125	0.06 0.11 0.17 0.31 0.70
RRUS 32	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3332 3.5968 3.8690 4.4394 5.6838	1.9828 2.2137 2.4533 2.9583 4.0721	0.06 0.08 0.10 0.16 0.34
RRUS 32	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3332 3.5968 3.8690 4.4394 5.6838	1.9828 2.2137 2.4533 2.9583 4.0721	0.06 0.08 0.10 0.16 0.34
RRUS 32	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.3332 3.5968 3.8690 4.4394 5.6838	1.9828 2.2137 2.4533 2.9583 4.0721	0.06 0.08 0.10 0.16 0.34
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.4667 1.6667 1.8778 2.3333 3.3778	1.4667 1.6667 1.8778 2.3333 3.3778	0.02 0.04 0.06 0.11 0.24
Platform Mount [LP 1201-1]	B	None		0.00	110.0000	No Ice 1/2" Ice 1" Ice	23.1000 26.8000 30.5000 37.9000	23.1000 26.8000 30.5000 37.9000	2.10 2.50 2.90 3.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment ° °	Placement ft ft		C_AA_A Front ft^2 ft^2	C_AA_A Side ft^2 ft^2	Weight K K
						2" Ice	52.7000	52.7000	5.30
						4" Ice			
MT-195-14 (Hand Rail)	B	None		0.00	110.0000	No Ice	11.8400	11.8400	0.28
						1/2" Ice	16.9600	16.9600	0.30
						1" Ice	22.0800	22.0800	0.32
						2" Ice	32.3200	32.3200	0.36
						4" Ice	52.8000	52.8000	0.44
PRK-1245L (Kickers)	B	None		0.00	110.0000	No Ice	6.0000	6.0000	0.26
						1/2" Ice	8.5000	8.5000	0.34
						1" Ice	11.0000	11.0000	0.42
						2" Ice	16.0000	16.0000	0.59
						4" Ice	26.0000	26.0000	0.93
****									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	1.0000 0.00 0.00	0.00	100.0000	No Ice	5.4042	4.7000	0.05
						1/2" Ice	5.9597	5.8600	0.10
						1" Ice	6.4808	6.7338	0.15
						2" Ice	7.5467	8.5150	0.28
						4" Ice	9.9193	12.2774	0.68
APXV18-206517S-C w/ Mount Pipe	B	From Leg	1.0000 0.00 0.00	0.00	100.0000	No Ice	5.4042	4.7000	0.05
						1/2" Ice	5.9597	5.8600	0.10
						1" Ice	6.4808	6.7338	0.15
						2" Ice	7.5467	8.5150	0.28
						4" Ice	9.9193	12.2774	0.68
APXV18-206517S-C w/ Mount Pipe	C	From Leg	1.0000 0.00 0.00	0.00	100.0000	No Ice	5.4042	4.7000	0.05
						1/2" Ice	5.9597	5.8600	0.10
						1" Ice	6.4808	6.7338	0.15
						2" Ice	7.5467	8.5150	0.28
						4" Ice	9.9193	12.2774	0.68
Pipe Mount [PM 601-3]	C	None		0.00	100.0000	No Ice	4.3900	4.3900	0.20
						1/2" Ice	5.4800	5.4800	0.24
						1" Ice	6.5700	6.5700	0.28
						2" Ice	8.7500	8.7500	0.36
						4" Ice	13.1100	13.1100	0.53
****									
GPS_A	B	From Leg	2.0000 0.00 1.00	0.00	53.0000	No Ice	0.2975	0.2975	0.00
						1/2" Ice	0.3739	0.3739	0.00
						1" Ice	0.4589	0.4589	0.01
						2" Ice	0.6549	0.6549	0.02
						4" Ice	1.1506	1.1506	0.08
Side Arm Mount [SO 701-1]	B	None		0.00	53.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12
						4" Ice	3.1700	7.0300	0.18
****									
KS24019-L112A	C	From Leg	2.0000 0.00 1.00	0.00	49.0000	No Ice	0.1556	0.1556	0.01
						1/2" Ice	0.2247	0.2247	0.01
						1" Ice	0.3025	0.3025	0.01
						2" Ice	0.4840	0.4840	0.02
						4" Ice	0.9506	0.9506	0.06
Side Arm Mount [SO 701-1]	C	None		0.00	49.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12
						4" Ice	3.1700	7.0300	0.18

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
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Leg	4.0000 0.00 2.00	0.00		147.0000	2.1750	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.7200 4.0100 4.3000 4.8800 6.0400	0.01 0.02 0.03 0.04 0.07
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Leg	4.0000 0.00 2.00	0.00		147.0000	2.1750	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.7200 4.0100 4.3000 4.8800 6.0400	0.01 0.02 0.03 0.04 0.07
VHLP2-18	B	Paraboloid w/o Radome	From Leg	4.0000 0.00 2.00	60.00		147.0000	2.1750	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.7200 4.0100 4.3000 4.8800 6.0400	0.03 0.05 0.07 0.11 0.20

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 147.0000-99.5000	122.3179	1.454	23.78	103.536	A	0.000	103.536	103.536	100.00	0.000	0.000
					B	0.000	103.536		100.00	0.000	0.000
					C	0.000	103.536		100.00	0.000	12.715
L2 99.5000-69.5000	84.0954	1.306	21.40	81.094	A	0.000	81.094	81.094	100.00	0.000	0.000
					B	0.000	81.094		100.00	0.000	0.000
					C	0.000	81.094		100.00	0.000	12.464
L3 69.5000-59.0000	64.2053	1.209	19.82	31.484	A	0.000	31.484	31.484	100.00	0.000	0.000
					B	0.000	31.484		100.00	0.000	0.000
					C	0.000	31.484		100.00	0.000	6.508
L4 59.0000-58.0000	58.4995	1.178	19.30	3.029	A	0.000	3.029	3.029	100.00	0.000	0.000
					B	0.000	3.029		100.00	0.000	0.000
					C	0.000	3.029		100.00	0.000	0.664
L5 58.0000-50.5000	54.2279	1.152	18.88	23.191	A	0.000	23.191	23.191	100.00	0.000	0.000
					B	0.000	23.191		100.00	0.000	0.000
					C	0.000	23.191		100.00	0.000	5.387
L6 50.5000-50.0000	50.2499	1.128	18.48	1.575	A	0.000	1.575	1.575	100.00	0.000	0.000
					B	0.000	1.575		100.00	0.000	0.000
					C	0.000	1.575		100.00	0.000	0.467
L7 50.0000-29.2500	39.4667	1.052	17.24	68.588	A	0.000	68.588	68.588	100.00	0.000	0.000
					B	0.000	68.588		100.00	0.000	0.000
					C	0.000	68.588		100.00	0.000	15.868
L8 29.2500-24.0000	26.6141	1	16.38	17.998	A	0.000	17.998	17.998	100.00	0.000	0.000
					B	0.000	17.998		100.00	0.000	0.000
					C	0.000	17.998		100.00	0.000	4.935
L9 24.0000-0.0000	11.8080	1	16.38	87.500	A	0.000	87.500	87.500	100.00	0.000	0.000
					B	0.000	87.500		100.00	0.000	0.000
					C	0.000	87.500		100.00	0.000	22.561

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.0000-99.5000	122.3179	1.454	5.25	0.8777	110.484	A	0.000	110.484	110.484	100.00	0.000	0.000
						B	0.000	110.484		100.00	0.000	0.000
						C	0.000	110.484		100.00	0.000	49.490
L2 99.5000-69.5000	84.0954	1.306	4.73	0.8391	85.483	A	0.000	85.483	85.483	100.00	0.000	0.000
						B	0.000	85.483		100.00	0.000	0.000
						C	0.000	85.483		100.00	0.000	39.087
L3 69.5000-59.0000	64.2053	1.209	4.38	0.8124	32.905	A	0.000	32.905	32.905	100.00	0.000	0.000
						B	0.000	32.905		100.00	0.000	0.000
						C	0.000	32.905		100.00	0.000	16.572
L4 59.0000-58.0000	58.4995	1.178	4.26	0.8033	3.164	A	0.000	3.164	3.164	100.00	0.000	0.000
						B	0.000	3.164		100.00	0.000	0.000
						C	0.000	3.164		100.00	0.000	1.657
L5 58.0000-50.5000	54.2279	1.152	4.17	0.7961	24.186	A	0.000	24.186	24.186	100.00	0.000	0.000
						B	0.000	24.186		100.00	0.000	0.000
						C	0.000	24.186		100.00	0.000	12.950
L6 50.5000-50.0000	50.2499	1.128	4.08	0.7888	1.641	A	0.000	1.641	1.641	100.00	0.000	0.000
						B	0.000	1.641		100.00	0.000	0.000
						C	0.000	1.641		100.00	0.000	1.036
L7 50.0000-29.2500	39.4667	1.052	3.81	0.7663	71.238	A	0.000	71.238	71.238	100.00	0.000	0.000
						B	0.000	71.238		100.00	0.000	0.000
						C	0.000	71.238		100.00	0.000	36.536
L8 29.2500-24.0000	26.6141	1	3.62	0.7500	18.669	A	0.000	18.669	18.669	100.00	0.000	0.000
						B	0.000	18.669		100.00	0.000	0.000
						C	0.000	18.669		100.00	0.000	10.746
L9 24.0000-0.0000	11.8080	1	3.62	0.7500	90.500	A	0.000	90.500	90.500	100.00	0.000	0.000
						B	0.000	90.500		100.00	0.000	0.000
						C	0.000	90.500		100.00	0.000	48.562

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.0000-99.5000	122.3179	1.454	9.29	103.536	A	0.000	103.536	103.536	100.00	0.000	0.000
					B	0.000	103.536		100.00	0.000	0.000
					C	0.000	103.536		100.00	0.000	12.715
L2 99.5000-69.5000	84.0954	1.306	8.36	81.094	A	0.000	81.094	81.094	100.00	0.000	0.000
					B	0.000	81.094		100.00	0.000	0.000
					C	0.000	81.094		100.00	0.000	12.464
L3 69.5000-59.0000	64.2053	1.209	7.74	31.484	A	0.000	31.484	31.484	100.00	0.000	0.000
					B	0.000	31.484		100.00	0.000	0.000
					C	0.000	31.484		100.00	0.000	6.508
L4 59.0000-58.0000	58.4995	1.178	7.54	3.029	A	0.000	3.029	3.029	100.00	0.000	0.000
					B	0.000	3.029		100.00	0.000	0.000
					C	0.000	3.029		100.00	0.000	0.664
L5 58.0000-50.5000	54.2279	1.152	7.38	23.191	A	0.000	23.191	23.191	100.00	0.000	0.000
					B	0.000	23.191		100.00	0.000	0.000
					C	0.000	23.191		100.00	0.000	5.387
L6 50.5000-50.0000	50.2499	1.128	7.22	1.575	A	0.000	1.575	1.575	100.00	0.000	0.000
					B	0.000	1.575		100.00	0.000	0.000
					C	0.000	1.575		100.00	0.000	0.467
L7 50.0000-29.2500	39.4667	1.052	6.74	68.588	A	0.000	68.588	68.588	100.00	0.000	0.000
					B	0.000	68.588		100.00	0.000	0.000
					C	0.000	68.588		100.00	0.000	15.868
L8 29.2500-24.0000	26.6141	1	6.40	17.998	A	0.000	17.998	17.998	100.00	0.000	0.000
					B	0.000	17.998		100.00	0.000	0.000
					C	0.000	17.998		100.00	0.000	4.935
L9 24.0000-0.0000	11.8080	1	6.40	87.500	A	0.000	87.500	87.500	100.00	0.000	0.000
					B	0.000	87.500		100.00	0.000	0.000
					C	0.000	87.500		100.00	0.000	22.561

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	147 - 99.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.44	-0.06	0.24
			Max. Mx	11	-11.22	419.06	3.72
			Max. My	2	-11.18	7.23	428.73
			Max. Vy	11	-18.28	419.06	3.72
			Max. Vx	2	-18.49	7.23	428.73
			Max. Torque	12			-2.35
L2	99.5 - 69.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.33	1.30	-0.54
			Max. Mx	11	-16.82	1123.27	6.31
			Max. My	2	-16.80	12.98	1139.59
			Max. Vy	11	-22.84	1123.27	6.31
			Max. Vx	2	-23.05	12.98	1139.59
			Max. Torque	12			-2.32
L3	69.5 - 59	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.84	1.56	-0.69
			Max. Mx	11	-18.04	1256.52	6.74
			Max. My	2	-18.02	13.97	1273.94
			Max. Vy	11	-23.52	1256.52	6.74
			Max. Vx	2	-23.72	13.97	1273.94
			Max. Torque	12			-2.18
L4	59 - 58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.22	1.82	-0.84

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-19.90	1393.91	7.17
			Max. My	2	-19.88	14.95	1412.43
			Max. Vy	11	-24.26	1393.91	7.17
			Max. Vx	2	-24.47	14.95	1412.43
			Max. Torque	12			-2.11
L5	58 - 50.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.33	2.13	-1.05
			Max. Mx	11	-21.61	1579.22	7.72
			Max. My	2	-21.60	16.23	1599.17
			Max. Vy	11	-25.18	1579.22	7.72
			Max. Vx	2	-25.39	16.23	1599.17
			Max. Torque	12			-2.10
L6	50.5 - 50	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.49	2.16	-1.06
			Max. Mx	11	-21.75	1591.83	7.76
			Max. My	2	-21.74	16.32	1611.88
			Max. Vy	11	-25.24	1591.83	7.76
			Max. Vx	2	-25.45	16.32	1611.88
			Max. Torque	12			-2.04
L7	50 - 29.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-39.25	2.94	-1.51
			Max. Mx	11	-25.72	1996.92	8.88
			Max. My	2	-25.71	18.98	2019.86
			Max. Vy	11	-26.98	1996.92	8.88
			Max. Vx	2	-27.18	18.98	2019.86
			Max. Torque	12			-2.04
L8	29.25 - 24	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.93	3.46	-1.81
			Max. Mx	11	-29.65	2286.82	9.63
			Max. My	2	-29.64	20.76	2311.72
			Max. Vy	11	-28.19	2286.82	9.63
			Max. Vx	2	-28.39	20.76	2311.72
			Max. Torque	12			-1.85
L9	24 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53.04	4.72	-2.54
			Max. Mx	11	-37.56	2994.92	11.31
			Max. My	2	-37.56	24.80	3024.19
			Max. Vy	11	-30.83	2994.92	11.31
			Max. Vx	2	-31.03	24.80	3024.19
			Max. Torque	12			-1.80

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	53.04	0.00	-0.00
	Max. H_x	11	37.57	30.82	0.08
	Max. H_z	2	37.57	0.16	31.02
	Max. M_x	2	3024.19	0.16	31.02
	Max. M_z	5	2982.01	-30.75	0.04
	Max. Torsion	8	0.70	0.03	-30.95
	Min. Vert	2	37.57	0.16	31.02
	Min. H_x	5	37.57	-30.75	0.04
	Min. H_z	8	37.57	0.03	-30.95
	Min. M_x	8	-3014.92	0.03	-30.95
	Min. M_z	11	-2994.92	30.82	0.08
	Min. Torsion	12	-1.54	26.71	15.63

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

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
Dead Only	37.57	-0.00	0.00	0.37	0.75	0.00
Dead+Wind 0 deg - No Ice	37.57	-0.16	-31.02	-3024.19	24.80	0.74
Dead+Wind 30 deg - No Ice	37.57	15.38	-26.80	-2610.26	-1491.94	0.44
Dead+Wind 60 deg - No Ice	37.57	26.65	-15.63	-1530.21	-2586.09	0.65
Dead+Wind 90 deg - No Ice	37.57	30.75	-0.04	-6.49	-2982.01	-0.12
Dead+Wind 120 deg - No Ice	37.57	26.64	15.59	1525.85	-2585.14	-0.27
Dead+Wind 150 deg - No Ice	37.57	15.34	26.82	2613.60	-1485.16	-0.41
Dead+Wind 180 deg - No Ice	37.57	-0.03	30.95	3014.92	4.72	-0.70
Dead+Wind 210 deg - No Ice	37.57	-15.38	26.81	2611.30	1492.96	-0.56
Dead+Wind 240 deg - No Ice	37.57	-26.80	15.50	1511.74	2610.29	-0.05
Dead+Wind 270 deg - No Ice	37.57	-30.82	-0.08	-11.31	2994.92	0.50
Dead+Wind 300 deg - No Ice	37.57	-26.71	-15.63	-1531.15	2597.19	1.54
Dead+Wind 330 deg - No Ice	37.57	-15.48	-26.83	-2613.42	1508.48	1.16
Dead+Ice+Temp	53.04	-0.00	0.00	2.54	4.72	0.00
Dead+Wind 0 deg+Ice+Temp	53.04	-0.04	-8.83	-875.52	11.11	-0.07
Dead+Wind 30 deg+Ice+Temp	53.04	4.38	-7.63	-755.57	-429.10	-0.04
Dead+Wind 60 deg+Ice+Temp	53.04	7.59	-4.44	-441.16	-747.16	0.16
Dead+Wind 90 deg+Ice+Temp	53.04	8.76	-0.01	0.84	-862.43	0.11
Dead+Wind 120 deg+Ice+Temp	53.04	7.59	4.43	445.08	-746.88	0.18
Dead+Wind 150 deg+Ice+Temp	53.04	4.37	7.63	761.50	-427.29	0.19
Dead+Wind 180 deg+Ice+Temp	53.04	-0.01	8.81	878.21	5.98	0.09
Dead+Wind 210 deg+Ice+Temp	53.04	-4.38	7.63	760.93	438.82	0.02
Dead+Wind 240 deg+Ice+Temp	53.04	-7.63	4.41	441.48	762.89	-0.00
Dead+Wind 270 deg+Ice+Temp	53.04	-8.78	-0.02	-0.35	875.24	-0.02
Dead+Wind 300 deg+Ice+Temp	53.04	-7.61	-4.44	-441.36	759.47	0.13
Dead+Wind 330 deg+Ice+Temp	53.04	-4.40	-7.63	-756.36	442.79	-0.00
Dead+Wind 0 deg - Service	37.57	-0.06	-12.12	-1182.38	10.16	0.30
Dead+Wind 30 deg - Service	37.57	6.01	-10.47	-1020.46	-582.93	0.18
Dead+Wind 60 deg - Service	37.57	10.41	-6.10	-598.13	-1010.78	0.26
Dead+Wind 90 deg - Service	37.57	12.01	-0.02	-2.31	-1165.60	-0.05
Dead+Wind 120 deg - Service	37.57	10.41	6.09	596.89	-1010.40	-0.12
Dead+Wind 150 deg - Service	37.57	5.99	10.48	1022.23	-580.28	-0.17
Dead+Wind 180 deg - Service	37.57	-0.01	12.09	1179.20	2.30	-0.28
Dead+Wind 210 deg - Service	37.57	-6.01	10.47	1021.33	584.25	-0.22
Dead+Wind 240 deg - Service	37.57	-10.47	6.06	591.37	1021.17	-0.02
Dead+Wind 270 deg - Service	37.57	-12.04	-0.03	-4.20	1171.59	0.19
Dead+Wind 300 deg - Service	37.57	-10.43	-6.11	-598.51	1016.04	0.60
Dead+Wind 330 deg - Service	37.57	-6.05	-10.48	-1021.71	590.33	0.46

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-37.57	0.00	0.00	37.57	0.00	0.000%
2	-0.16	-37.57	-31.02	0.16	37.57	31.02	0.005%
3	15.38	-37.57	-26.80	-15.38	37.57	26.80	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
4	26.65	-37.57	-15.63	-26.65	37.57	15.63	0.000%
5	30.75	-37.57	-0.04	-30.75	37.57	0.04	0.005%
6	26.64	-37.57	15.59	-26.64	37.57	-15.59	0.000%
7	15.34	-37.57	26.82	-15.34	37.57	-26.82	0.000%
8	-0.03	-37.57	30.95	0.03	37.57	-30.95	0.005%
9	-15.38	-37.57	26.81	15.38	37.57	-26.81	0.000%
10	-26.80	-37.57	15.50	26.80	37.57	-15.50	0.000%
11	-30.82	-37.57	-0.08	30.82	37.57	0.08	0.005%
12	-26.71	-37.57	-15.63	26.71	37.57	15.63	0.000%
13	-15.48	-37.57	-26.83	15.48	37.57	26.83	0.000%
14	0.00	-53.04	0.00	0.00	53.04	-0.00	0.000%
15	-0.04	-53.04	-8.83	0.04	53.04	8.83	0.000%
16	4.38	-53.04	-7.63	-4.38	53.04	7.63	0.000%
17	7.59	-53.04	-4.44	-7.59	53.04	4.44	0.000%
18	8.76	-53.04	-0.01	-8.76	53.04	0.01	0.000%
19	7.59	-53.04	4.43	-7.59	53.04	-4.43	0.000%
20	4.37	-53.04	7.63	-4.37	53.04	-7.63	0.000%
21	-0.01	-53.04	8.81	0.01	53.04	-8.81	0.000%
22	-4.38	-53.04	7.63	4.38	53.04	-7.63	0.000%
23	-7.63	-53.04	4.41	7.63	53.04	-4.41	0.000%
24	-8.78	-53.04	-0.02	8.78	53.04	0.02	0.000%
25	-7.61	-53.04	-4.44	7.61	53.04	4.44	0.000%
26	-4.40	-53.04	-7.63	4.40	53.04	7.63	0.000%
27	-0.06	-37.57	-12.12	0.06	37.57	12.12	0.003%
28	6.01	-37.57	-10.47	-6.01	37.57	10.47	0.001%
29	10.41	-37.57	-6.10	-10.41	37.57	6.10	0.001%
30	12.01	-37.57	-0.02	-12.01	37.57	0.02	0.003%
31	10.41	-37.57	6.09	-10.41	37.57	-6.09	0.001%
32	5.99	-37.57	10.48	-5.99	37.57	-10.48	0.001%
33	-0.01	-37.57	12.09	0.01	37.57	-12.09	0.003%
34	-6.01	-37.57	10.47	6.01	37.57	-10.47	0.001%
35	-10.47	-37.57	6.06	10.47	37.57	-6.06	0.001%
36	-12.04	-37.57	-0.03	12.04	37.57	0.03	0.003%
37	-10.43	-37.57	-6.11	10.43	37.57	6.11	0.001%
38	-6.05	-37.57	-10.48	6.05	37.57	10.48	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	13	0.00006580	0.00010180
3	Yes	17	0.00000001	0.00006754
4	Yes	17	0.00000001	0.00006694
5	Yes	13	0.00006593	0.00009677
6	Yes	17	0.00000001	0.00006664
7	Yes	17	0.00000001	0.00006753
8	Yes	13	0.00006583	0.00013402
9	Yes	17	0.00000001	0.00006567
10	Yes	17	0.00000001	0.00006779
11	Yes	13	0.00006589	0.00013333
12	Yes	17	0.00000001	0.00007077
13	Yes	17	0.00000001	0.00006573
14	Yes	6	0.00000001	0.00000001
15	Yes	15	0.00000001	0.00013705
16	Yes	16	0.00000001	0.00006116
17	Yes	16	0.00000001	0.00006128
18	Yes	15	0.00000001	0.00013453
19	Yes	16	0.00000001	0.00006144
20	Yes	16	0.00000001	0.00006133
21	Yes	15	0.00000001	0.00013709
22	Yes	16	0.00000001	0.00006184
23	Yes	16	0.00000001	0.00006222
24	Yes	15	0.00000001	0.00013632
25	Yes	16	0.00000001	0.00006217
26	Yes	16	0.00000001	0.00006191
27	Yes	13	0.00000001	0.00004876

28	Yes	14	0.00000001	0.00010134
29	Yes	14	0.00000001	0.00009632
30	Yes	13	0.00000001	0.00004415
31	Yes	14	0.00000001	0.00009587
32	Yes	14	0.00000001	0.00010197
33	Yes	13	0.00000001	0.00004977
34	Yes	14	0.00000001	0.00009425
35	Yes	14	0.00000001	0.00009990
36	Yes	13	0.00000001	0.00004708
37	Yes	14	0.00000001	0.00011052
38	Yes	14	0.00000001	0.00009260

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 99.5	36.66	27	2.15	0.01
L2	103.25 - 69.5	18.19	27	1.76	0.00
L3	69.5 - 59	7.84	27	1.10	0.00
L4	63.75 - 58	6.58	27	1.00	0.00
L5	58 - 50.5	5.41	27	0.93	0.00
L6	50.5 - 50	4.06	27	0.79	0.00
L7	50 - 29.25	3.98	27	0.78	0.00
L8	34.5 - 24	1.89	27	0.50	0.00
L9	24 - 0	0.91	27	0.36	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.0000	A-ANT-23G-2-C	27	36.66	2.15	0.01	30977
147.0000	APXVSPP18-C-A20 w/ Mount Pipe	27	36.66	2.15	0.01	30977
145.0000	TME-1900MHz RRH (65 MHz)	27	35.76	2.14	0.01	30977
119.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	24.43	1.95	0.01	5530
110.0000	(2) 7020.00	27	20.78	1.85	0.00	4184
100.0000	APXV18-206517S-C w/ Mount Pipe	27	16.99	1.71	0.00	3388
53.0000	GPS_A	27	4.48	0.83	0.00	3010
49.0000	KS24019-L112A	27	3.82	0.76	0.00	2988

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 99.5	93.59	2	5.49	0.03
L2	103.25 - 69.5	46.46	2	4.49	0.01
L3	69.5 - 59	20.04	2	2.81	0.00
L4	63.75 - 58	16.81	2	2.55	0.00
L5	58 - 50.5	13.82	2	2.38	0.00
L6	50.5 - 50	10.38	2	2.01	0.00
L7	50 - 29.25	10.17	2	1.99	0.00
L8	34.5 - 24	4.84	2	1.29	0.00
L9	24 - 0	2.33	2	0.93	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.0000	A-ANT-23G-2-C	2	93.59	5.49	0.03	12320
147.0000	APXVSPP18-C-A20 w/ Mount Pipe	2	93.59	5.49	0.03	12320
145.0000	TME-1900MHz RRH (65 MHz)	2	91.31	5.46	0.03	12320
119.0000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	62.39	4.99	0.01	2196
110.0000	(2) 7020.00	2	53.07	4.73	0.01	1660
100.0000	APXV18-206517S-C w/ Mount Pipe	2	43.42	4.36	0.01	1342
53.0000	GPS_A	2	11.46	2.13	0.00	1181
49.0000	KS24019-L112A	2	9.76	1.95	0.00	1171

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	147 - 99.5 (1)	TP30.313x22x0.25	47.5000	0.0000	0.0	36.00	23.6724	-11.18	852.21	0.013
L2	99.5 - 69.5 (2)	TP35.0626x29.1567x0.3125	33.7500	0.0000	0.0	39.00	34.9673	-16.80	1363.72	0.012
L3	69.5 - 59 (3)	TP36.9x35.0626x0.4301	10.5000	0.0000	0.0	34.46	49.3591	-18.02	1701.11	0.011
L4	59 - 58 (4)	TP36.45x35.2086x0.375	5.7500	0.0000	0.0	39.00	43.5606	-19.88	1698.86	0.012
L5	58 - 50.5 (5)	TP37.7624x36.45x0.4271	7.5000	0.0000	0.0	36.44	51.3459	-21.60	1871.25	0.012
L6	50.5 - 50 (6)	TP37.8499x37.7624x0.5405	0.5000	0.0000	0.0	33.98	64.9337	-21.74	2206.71	0.010
L7	50 - 29.25 (7)	TP41.481x37.8499x0.479	20.7500	0.0000	0.0	34.60	61.8224	-25.71	2139.18	0.012
L8	29.25 - 24 (8)	TP41.6499x39.6043x0.5047	10.5000	0.0000	0.0	36.61	66.8677	-29.64	2448.16	0.012
L9	24 - 0 (9)	TP45.85x41.6499x0.5901	24.0000	0.0000	0.0	34.71	85.9921	-37.56	2984.79	0.013

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	147 - 99.5 (1)	TP30.313x22x0.25	428.80	30.25	36.00	0.840	0.00	0.00	36.00	0.000
L2	99.5 - 69.5 (2)	TP35.0626x29.1567x0.3125	1139.66	46.09	39.00	1.182	0.00	0.00	39.00	0.000
L3	69.5 - 59 (3)	TP36.9x35.0626x0.4301	1274.02	35.70	34.46	1.036	0.00	0.00	34.46	0.000
L4	59 - 58 (4)	TP36.45x35.2086x0.375	1412.52	44.23	39.00	1.134	0.00	0.00	39.00	0.000
L5	58 - 50.5 (5)	TP37.7624x36.45x0.4271	1599.26	41.09	36.44	1.128	0.00	0.00	36.44	0.000
L6	50.5 - 50 (6)	TP37.8499x37.7624x0.5405	1611.96	32.87	33.98	0.967	0.00	0.00	33.98	0.000
L7	50 - 29.25 (7)	TP41.481x37.8499x0.479	2019.95	40.17	34.60	1.161	0.00	0.00	34.60	0.000
L8	29.25 - 24 (8)	TP41.6499x39.6043x0.5047	2311.81	41.42	36.61	1.131	0.00	0.00	36.61	0.000
L9	24 - 0 (9)	TP45.85x41.6499x0.5901	3024.29	38.34	34.71	1.104	0.00	0.00	34.71	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 $\frac{f_{vt}}{F_{vt}}$

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	147 - 99.5 (1)	TP30.313x22x0.25	18.49	0.78	24.00	0.066	1.51	0.05	24.00	0.002
L2	99.5 - 69.5 (2)	TP35.0626x29.1567x0.3125	23.05	0.66	26.00	0.052	1.36	0.03	26.00	0.001
L3	69.5 - 59 (3)	TP36.9x35.0626x0.4301	23.72	0.48	22.98	0.043	1.32	0.02	22.98	0.001
L4	59 - 58 (4)	TP36.45x35.2086x0.375	24.47	0.56	26.00	0.044	1.28	0.02	26.00	0.001
L5	58 - 50.5 (5)	TP37.7624x36.45x0.4271	25.39	0.49	24.30	0.041	1.25	0.02	24.30	0.001
L6	50.5 - 50 (6)	TP37.8499x37.7624x0.5405	25.45	0.39	22.66	0.035	1.24	0.01	22.66	0.001
L7	50 - 29.25 (7)	TP41.481x37.8499x0.479	27.18	0.44	23.07	0.039	1.10	0.01	23.07	0.000
L8	29.25 - 24 (8)	TP41.6499x39.6043x0.5047	28.40	0.42	24.41	0.035	1.01	0.01	24.41	0.000
L9	24 - 0 (9)	TP45.85x41.6499x0.5901	31.03	0.36	23.14	0.032	0.76	0.00	23.14	0.000

Pole Interaction Design Data

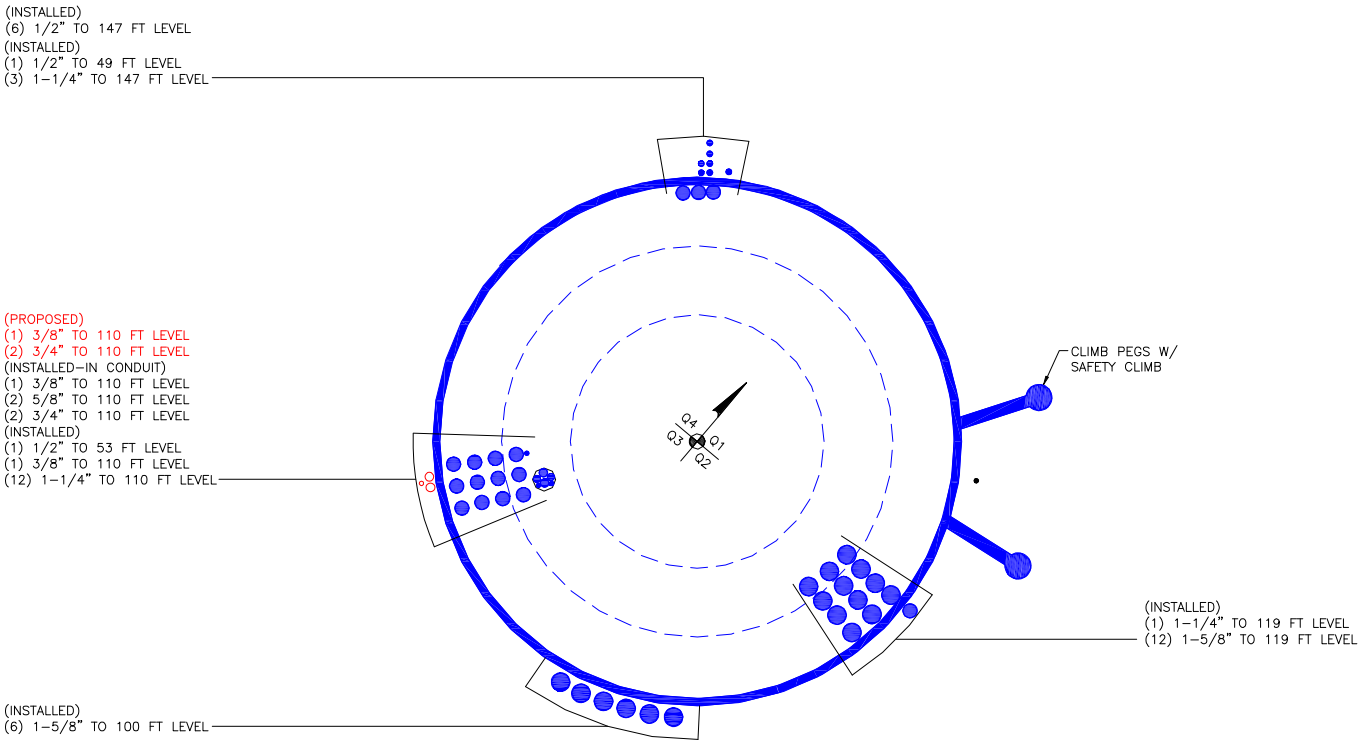
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 99.5 (1)	0.013	0.840	0.000	0.066	0.002	0.855 ✔	1.333	H1-3+VT ✔
L2	99.5 - 69.5 (2)	0.012	1.182	0.000	0.052	0.001	1.195 ✔	1.333	H1-3+VT ✔
L3	69.5 - 59 (3)	0.011	1.036	0.000	0.043	0.001	1.047 ✔	1.333	H1-3+VT ✔
L4	59 - 58 (4)	0.012	1.134	0.000	0.044	0.001	1.146 ✔	1.333	H1-3+VT ✔
L5	58 - 50.5 (5)	0.012	1.128	0.000	0.041	0.001	1.140 ✔	1.333	H1-3+VT ✔
L6	50.5 - 50 (6)	0.010	0.967	0.000	0.035	0.001	0.977 ✔	1.333	H1-3+VT ✔
L7	50 - 29.25 (7)	0.012	1.161	0.000	0.039	0.000	1.173 ✔	1.333	H1-3+VT ✔
L8	29.25 - 24 (8)	0.012	1.131	0.000	0.035	0.000	1.144 ✔	1.333	H1-3+VT ✔
L9	24 - 0 (9)	0.013	1.104	0.000	0.032	0.000	1.117 ✔	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	147 - 99.5	Pole	TP30.313x22x0.25	1	-11.18	1135.99	64.1	Pass
L2	99.5 - 69.5	Pole	TP35.0626x29.1567x0.3125	2	-16.80	1817.84	89.6	Pass
L3	69.5 - 59	Pole	TP36.9x35.0626x0.4301	3	-18.02	2267.58	78.5	Pass
L4	59 - 58	Pole	TP36.45x35.2086x0.375	4	-19.88	2264.58	86.0	Pass
L5	58 - 50.5	Pole	TP37.7624x36.45x0.4271	5	-21.60	2494.38	85.5	Pass
L6	50.5 - 50	Pole	TP37.8499x37.7624x0.5405	6	-21.74	2941.54	73.3	Pass
L7	50 - 29.25	Pole	TP41.481x37.8499x0.479	7	-25.71	2851.53	88.0	Pass
L8	29.25 - 24	Pole	TP41.6499x39.6043x0.5047	8	-29.64	3263.40	85.8	Pass
L9	24 - 0	Pole	TP45.85x41.6499x0.5901	9	-37.56	3978.72	83.8	Pass
							Summary	
						Pole (L2)	89.6	Pass
						RATING =	**89.6**	**Pass**

APPENDIX B

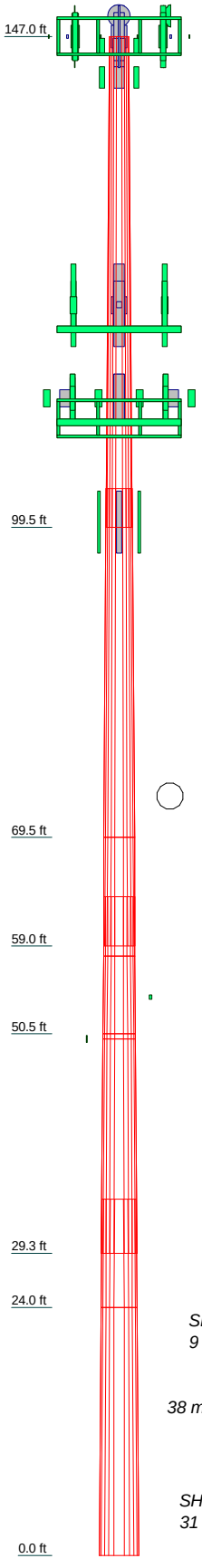
BASE LEVEL DRAWING

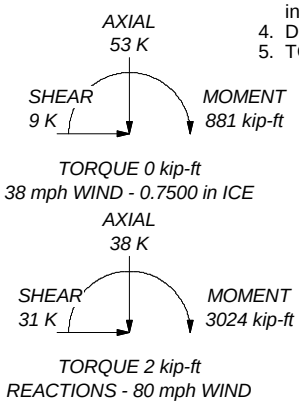


APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	47.5000	12	0.2500	3.7500	22.0000	30.3130	A607-60	3.4
2	33.7500	12	0.3125		29.1567	35.0626	A607-65	3.7
3	5.7500	12	0.4301	4.7500	35.0626	36.9000	Reinf 57.44 ksi	1.8
4	0.5000	12	0.3750		35.2086	36.4500	Reinf 57.67 ksi	0.8
5	7.5000	12	0.4271		36.4500	37.7624	Reinf 60.74 ksi	1.3
6	0.5000	12	0.5405		37.7624	37.8499	Reinf 56.64 ksi	0.1
7	20.7500	12	0.4790	5.2500	37.8499	41.4810	Reinf 57.67 ksi	4.3
8	10.5000	12	0.5047		39.6043	41.6499	Reinf 61.02 ksi	2.3
9	24.0000	12	0.5900		41.6499	45.8500	Reinf 57.85 ksi	6.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	147	RRUS 11 B12	119
APXVSPP18-C-A20 w/ Mount Pipe	147	T-Arm Mount [TA 601-3]	119
APXVTM14-C-120 w/ Mount Pipe	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
APXVTM14-C-120 w/ Mount Pipe	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
APXVTM14-C-120 w/ Mount Pipe	147	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
TD-RRH8x20-25	147	7770.00 w/ Mount Pipe	110
TD-RRH8x20-25	147	7770.00 w/ Mount Pipe	110
TD-RRH8x20-25	147	7770.00 w/ Mount Pipe	110
(3) ACU-A20-N	147	(2) LGP2140X	110
(3) ACU-A20-N	147	(2) LGP2140X	110
(3) ACU-A20-N	147	(2) LGP2140X	110
P40-16-XLPP-RR-A w/ Mount Pipe	147	(2) RRUS 11	110
(2) 6' x 2" Mount Pipe	147	(2) RRUS 11	110
(2) 6' x 2" Mount Pipe	147	(2) RRUS 11	110
(2) 6' x 2" Mount Pipe	147	800 10764 w/ Mount Pipe	110
Platform Mount [LP 1201-1]	147	800 10764 w/ Mount Pipe	110
A-ANT-23G-2-C	147	AM-X-CD-14-65-00T-RET w/ Mount Pipe	110
A-ANT-23G-2-C	147	DC6-48-60-18-8F	110
VHLP2-18	147	SBNHH-1D65A w/ Mount Pipe	110
800 EXTERNAL NOTCH FILTER	145	SBNHH-1D65A w/ Mount Pipe	110
TME-800MHZ RRH	145	SBNHH-1D65A w/ Mount Pipe	110
800 EXTERNAL NOTCH FILTER	145	RRUS 32	110
TME-800MHZ RRH	145	RRUS 32	110
800 EXTERNAL NOTCH FILTER	145	RRUS 32	110
TME-800MHZ RRH	145	DC6-48-60-18-8F	110
Side Arm Mount [SO 102-3]	145	Platform Mount [LP 1201-1]	110
TME-1900MHz RRH (65 MHz)	145	MT-195-14 (Hand Rail)	110
TME-1900MHz RRH (65 MHz)	145	PRK-1245L (Kickers)	110
TME-1900MHz RRH (65 MHz)	145	(2) 7020.00	110
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	119	(2) 7020.00	110
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	119	(2) 7020.00	110
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	119	Pipe Mount [PM 601-3]	100
KRY 112 144/1	119	APXV18-206517S-C w/ Mount Pipe	100
KRY 112 144/1	119	APXV18-206517S-C w/ Mount Pipe	100
KRY 112 144/1	119	APXV18-206517S-C w/ Mount Pipe	100
LNX-6515DS-VTM w/ Mount Pipe	119	GPS_A	53
LNX-6515DS-VTM w/ Mount Pipe	119	Side Arm Mount [SO 701-1]	53
LNX-6515DS-VTM w/ Mount Pipe	119	Side Arm Mount [SO 701-1]	49
RRUS 11 B12	119	KS24019-L112A	49
RRUS 11 B12	119		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 56.64 ksi	57 ksi	71 ksi
A607-65	65 ksi	80 ksi	Reinf 57.67 ksi	58 ksi	73 ksi
Reinf 57.44 ksi	57 ksi	72 ksi	Reinf 61.02 ksi	61 ksi	77 ksi
Reinf 60.74 ksi	61 ksi	76 ksi	Reinf 57.85 ksi	58 ksi	73 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven 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 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 89.6%

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, Ohio
Phone: 614.221.6679
FAX:

Job:	***147' MP; Branford Banm Tower; Branford, CT***		
Project:	***PJF# 37516-0242.004.7805 (BU# 876321)***		
Client: CCI	Drawn by: jjohnson		App'd:
Code: TIA/EIA-222-F	Date: 03/15/16		Scale: NTS
Path: G:\TOWER\375_Crown_Castle\2016\37516-0242_876321_BRANFORD BANM TOWER\37516-0242.004.7805_SA_120671\37516-0242.004.7805.eri			Dwg No. E-1

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

v4.4 - Effective 7-12-13

Date: 3/15/2016
PJF Project: 37516-0242.004.7805
Client Ref. # BU 876321
Site Name: Branford Banm Tower
Description: 147' MP
Owner: CCI
Engineer: JRJ

Asymmetric Anchor Rod Analysis

Moment =	3024	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	38.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	31.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	19							

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	25.8	54.00	0.00	3.98	143.09	138.82	138.82	0.00	195.00	71.2%
2	2.250	#18J A615 Gr 75	75	100	38.4	54.00	0.00	3.98	144.52	140.25	140.25	0.00	195.00	71.9%
3	2.250	#18J A615 Gr 75	75	100	51.0	54.00	0.00	3.98	147.11	142.85	142.85	0.00	195.00	73.3%
4	2.250	#18J A615 Gr 75	75	100	63.6	54.00	0.00	3.98	150.23	145.96	145.96	0.00	195.00	74.9%
5	2.250	#18J A615 Gr 75	75	100	115.8	54.00	0.00	3.98	155.17	150.90	150.90	0.00	195.00	77.4%
6	2.250	#18J A615 Gr 75	75	100	128.4	54.00	0.00	3.98	152.80	148.54	148.54	0.00	195.00	76.2%
7	2.250	#18J A615 Gr 75	75	100	141.0	54.00	0.00	3.98	149.31	145.04	145.04	0.00	195.00	74.4%
8	2.250	#18J A615 Gr 75	75	100	153.6	54.00	0.00	3.98	145.25	140.98	140.98	0.00	195.00	72.3%
9	2.250	#18J A615 Gr 75	75	100	205.8	54.00	0.00	3.98	138.03	133.77	133.77	0.00	195.00	68.6%
10	2.250	#18J A615 Gr 75	75	100	218.4	54.00	0.00	3.98	140.81	136.54	136.54	0.00	195.00	70.0%
11	2.250	#18J A615 Gr 75	75	100	231.0	54.00	0.00	3.98	144.90	140.64	140.64	0.00	195.00	72.1%
12	2.250	#18J A615 Gr 75	75	100	243.6	54.00	0.00	3.98	149.56	145.29	145.29	0.00	195.00	74.5%
13	2.250	#18J A615 Gr 75	75	100	295.8	54.00	0.00	3.98	159.93	155.67	155.67	0.00	195.00	79.8%
14	2.250	#18J A615 Gr 75	75	100	308.4	54.00	0.00	3.98	158.50	154.24	154.24	0.00	195.00	79.1%
15	2.250	#18J A615 Gr 75	75	100	321.0	54.00	0.00	3.98	155.74	151.47	151.47	0.00	195.00	77.7%
16	2.250	#18J A615 Gr 75	75	100	333.6	54.00	0.00	3.98	152.16	147.90	147.90	0.00	195.00	75.8%
17	1.750	A193 Gr B7	105	125	20.7	61.88	0.00	2.41	98.55	95.97	95.97	0.00	132.29	72.5%
18	1.750	A193 Gr B7	105	125	148.7	61.88	0.00	2.41	101.81	99.23	99.23	0.00	132.29	75.0%
19	1.750	A193 Gr B7	105	125	225.7	61.88	0.00	2.41	98.99	96.41	96.41	0.00	132.29	72.9%
								70.90						

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#:
Site Name:
App #:

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

Plate Data		
W=Side:	54	in
Thick:	3.5	in
Grade:	50	ksi
Clip Distance:	6	in

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

Pole Data		
Diam:	45.85	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2840.3	ft-kips
Unfactored Axial, P:	34.1	kips
Unfactored Shear, V:	27.8	kips

Reactions have been adjusted to account for additional anchor rods.

Anchor Rod Results

TIA F --> Maximum Rod Tension	155.7	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	79.8%	**Pass**

Base Plate Results Flexural Check

Base Plate Stress:	32.5	ksi
Allowable PL Bending Stress:	50.0	ksi
Base Plate Stress Ratio:	65.0%	**Pass**

PL Ref. Data
Yield Line (in):
30.52
Max PL Length:
30.52

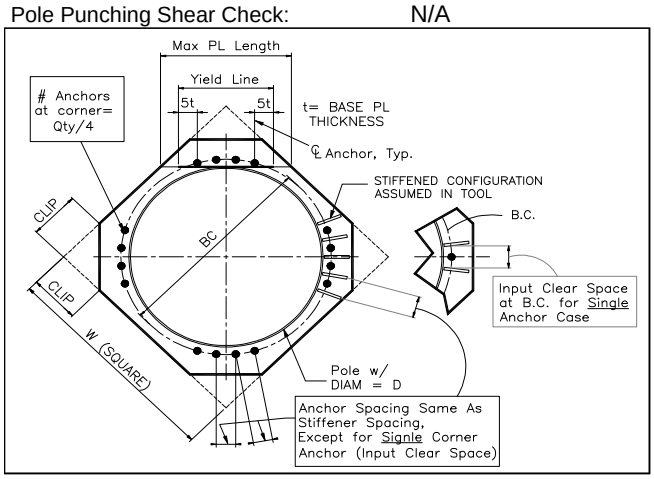
N/A - Unstiffened

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

Foundation Loads:

Pole weight or tower leg compression =	**38**	(kips)
Horizontal load at top of pier =	**31**	(kips)
Overturning moment at top of pier=	**3024**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**125**	(pcf)
Allowable soil bearing =	**4**	(ksf)
Depth to water table =	**4.5**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**11**	(ft)
Footing thickness =	**3**	(ft)
Footing width =	**20.5**	(ft)
Footing length =	**20.5**	(ft)

Concrete:

Concrete strength =	**3**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

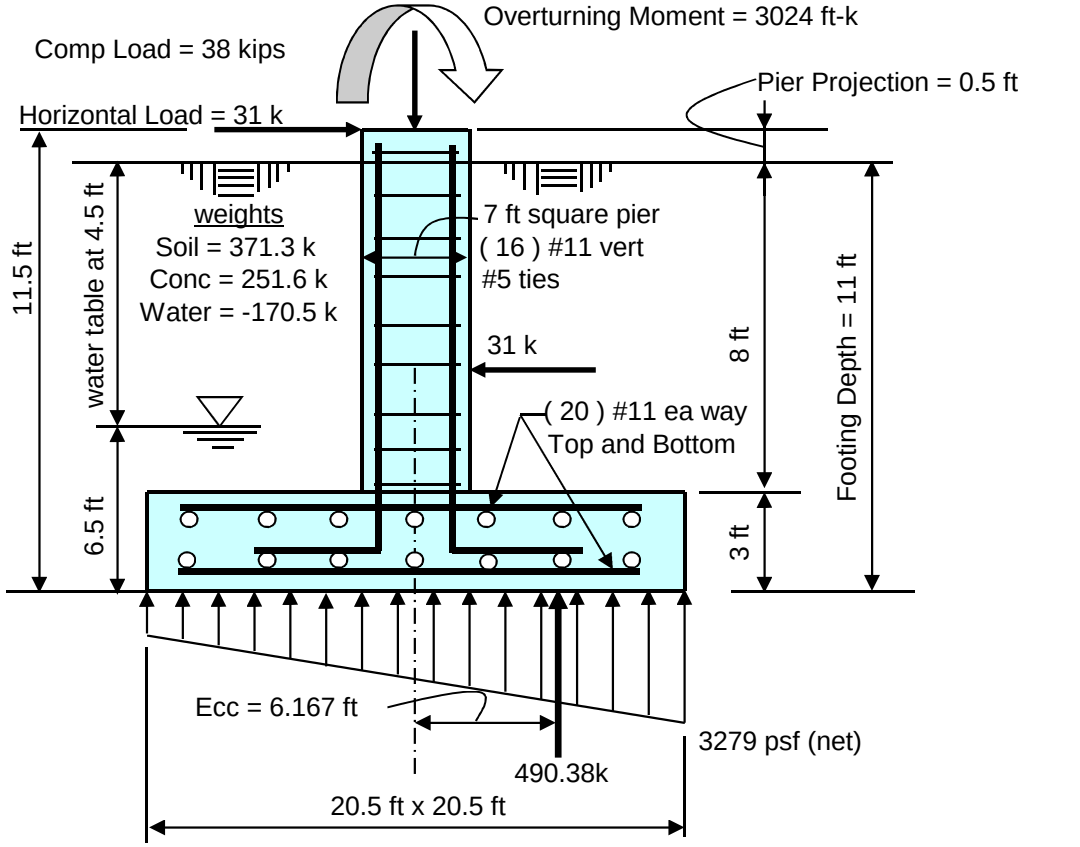
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#11**	bar
quantity of pad rebar =	**20**	(ea direction)

Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#11**	bar
vertical rebar quantity =	**16**	
size of pier ties =	**#5**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 62.1 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 3.279 ksf Allowable Net Soil Bearing = 4 ksf **Soil Bearing Stress Ratio = 0.82 Okay**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 45 psi **Bending Shear Stress Ratio = 0.41 Okay**
Ftg Overturning Resistance = 5026 ft-kips Overturning Moment = 3024 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.662 **Ratio = 0.9 Okay**	Pad Bending Moment Capacity= 4134 ft-k Pad Bending Moment = 1301 ft-k **Bending Moment Stress Ratio = 0.31 OK**

SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

SmartLink, LLC
on behalf of AT&T Mobility, LLC
Site FA – 10035122
Site ID – CTL02220 (3C)
USID – 24492
Site Name – Branford Central
Site Compliance Report

150 North Main Street
Branford, CT 06405

Latitude: N41-17-18.97
Longitude: W72-48-49.90
Structure Type: Monopole

Report generated date: January 18, 2016
Report by: Young Kim
Customer Contact: Kristen Smith

AT&T Mobility, LLC Will Be Compliant When the Remediation Recommended in Section 5.2 or Other Appropriate Remediation is Implemented.

Registered Professional Engineer (Electrical) CERTIFICATE NO. 45335 KLAUS BENDER Signed: 1/18/2016 Date Signed ARIZONA U.S.A.

Klaus Bender
Registered Professional Engineer (Electrical)

Expires December 31, 2018

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	No
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated Radio Frequency Exposure (RFE) level on Ground Level	<5% of General Public limit
FCC & AT&T Compliant?	Will Be Compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTU2220_2016-LTE-Next-Carrier_LTE-3C_om636a_2051585424_10035122_24492_09-15-2015_Preliminary-Approved_v1.00

CD's: 10035122_AE201_010716_CTL02220_REV0 BP Redlined KES 1.14.16

RF Configuration Datasheet: CT_33 sites with power density form

2 Map of Site

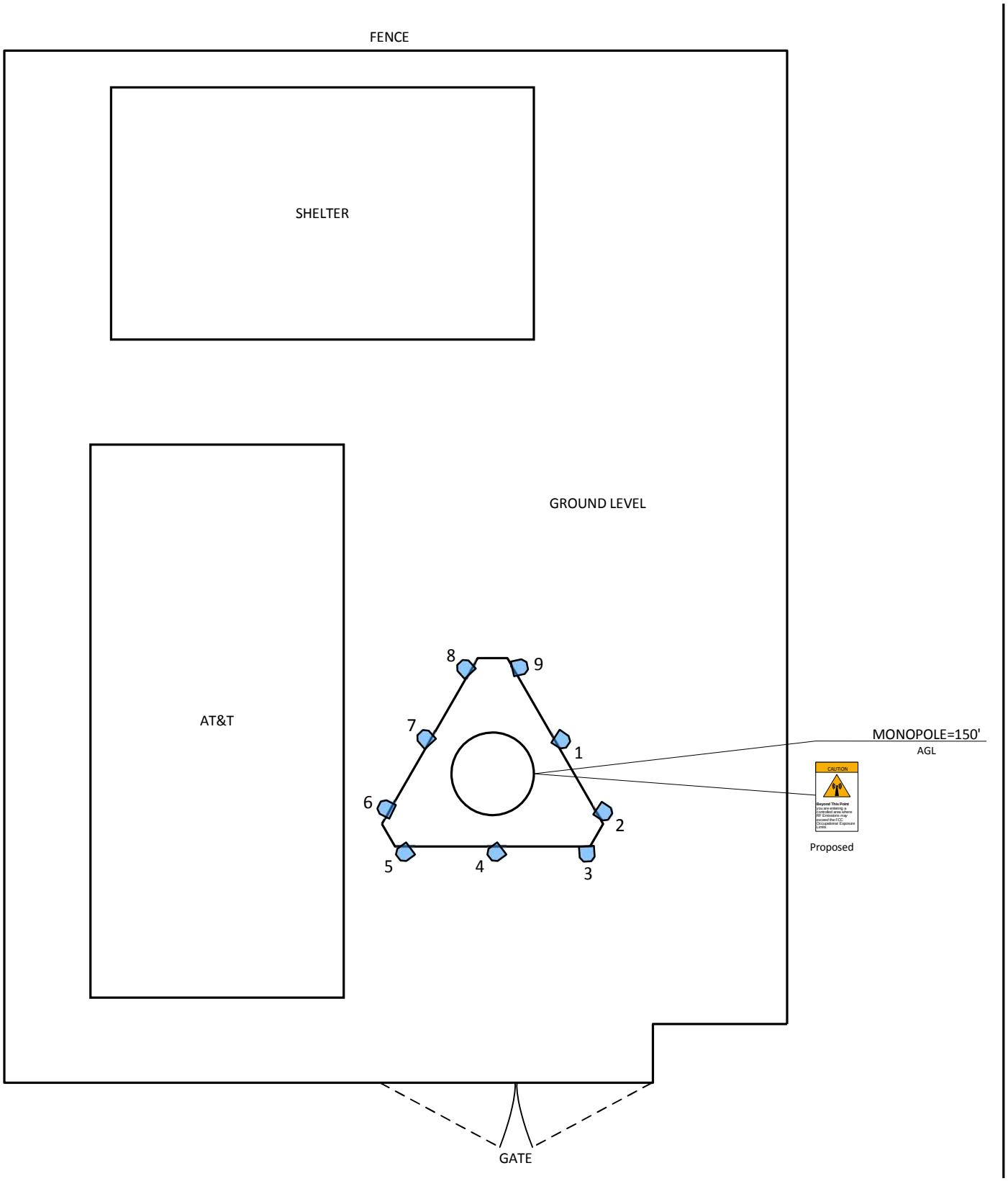
In the RF Emissions Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

The following diagrams are included:

- Site Map
- RF Emissions Diagram
- Elevation View

Site Map For: Branford Central



N

(Feet)

0 3.2 6.5

www.sitesafe.com
Site Name:Branford Central

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

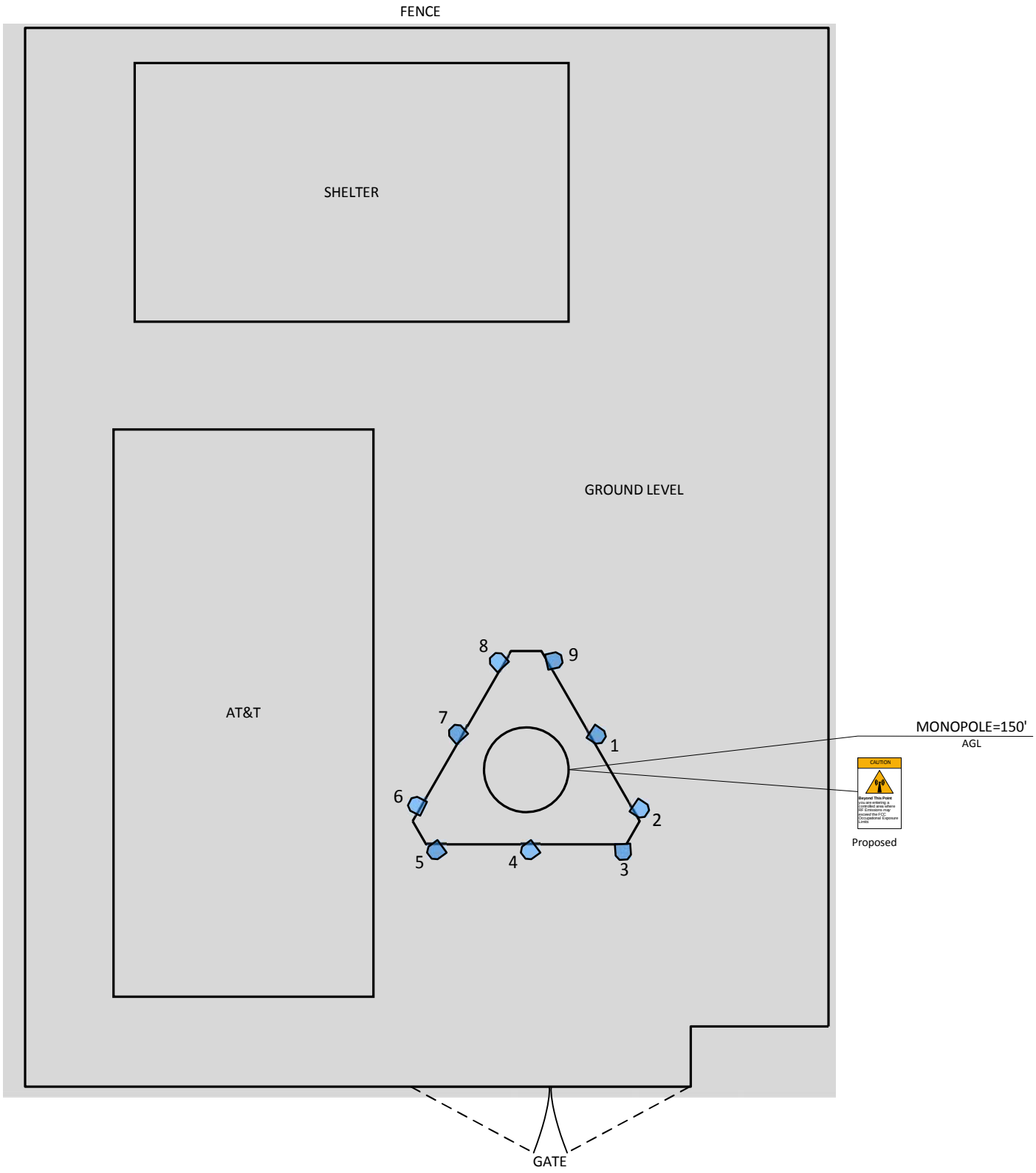
3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP	X	Y	Z (AGL
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10764	Panel	737	90	68	4.6	12.14	0	0	1	899.8	36.1'	28.5'	110.7'
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10764	Panel	1900	90	60	4.6	15.43	0	0	1	1476.2	36.1'	28.5'	110.7'
2	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	90	61	4.6	11.47	1	0	0	93.4	38.1'	25.2'	110.7'
2	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	2300	90	61	4.6	14.3	0	0	1	667	38.1'	25.2'	110.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	143	82	4.6	11.51	0	1	0	178.3	37.3'	23.2'	110.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	143	86	4.6	13.41	0	1	0	200.5	37.3'	23.2'	110.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	143	86	4.6	13.41	0	1	0	348.5	37.3'	23.2'	110.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10764	Panel	737	200	68	4.6	12.14	0	0	1	899.8	33'	23.3'	110.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10764	Panel	1900	200	60	4.6	15.43	0	0	1	1476.2	33'	23.3'	110.7'
5	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	200	61	4.6	11.47	1	0	0	52.5	28.7'	23.3'	110.7'
5	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	2300	200	61	4.6	14.3	0	0	1	667	28.7'	23.3'	110.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	0	1	0	178.3	27.9'	25.3'	110.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	1	0	200.5	27.9'	25.3'	110.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	1	0	348.5	27.9'	25.3'	110.7'
7	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	737	284	67	4	11.66	0	0	1	483.2	29.7'	28.6'	111'
7	AT&T MOBILITY LLC	KMW AM-X-CD-14-65-00T	Panel	1900	284	65	4	13.86	0	0	1	1057.2	29.7'	28.6'	111'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	284	61	4.6	11.47	1	0	0	83.2	31.6'	31.9'	110.7'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	2300	284	61	4.6	14.3	0	0	1	667	31.6'	31.9'	110.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	44	82	4.6	11.51	0	1	0	178.3	34.2'	32'	110.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	44	86	4.6	13.41	0	1	0	200.5	34.2'	32'	110.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	44	86	4.6	13.41	0	1	0	348.5	34.2'	32'	110.7'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above ground level**. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline**.** Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed.

RF Emissions Simulation For: Branford Central



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)

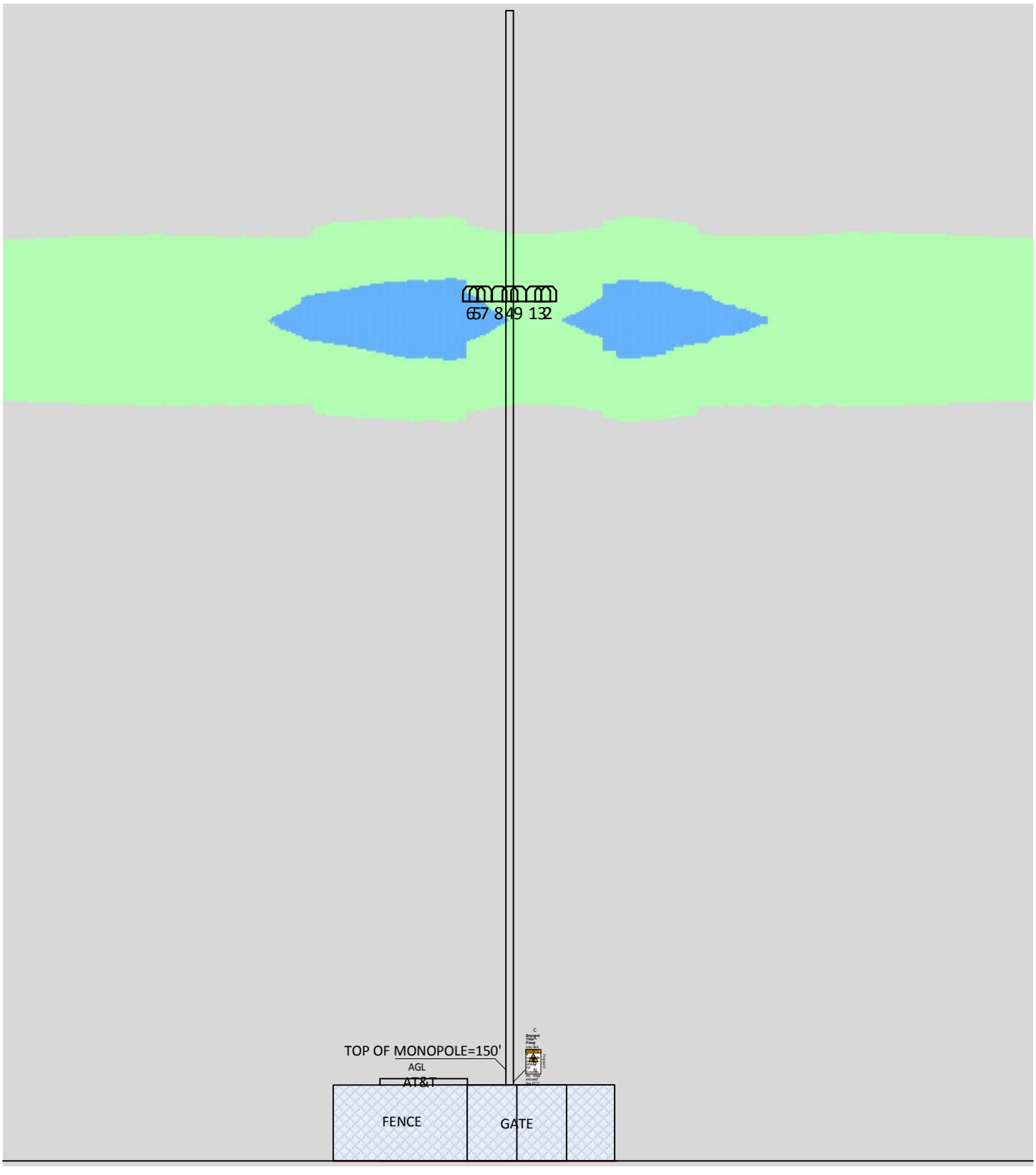
0 3.2 6.5

>= 5000 >= 500 >= 100 >= 5 < 5

www.sitesafe.com
Site Name:Branford Central

AT&T MOBILITY LLC	VERIZONWIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

RF Emissions Simulation For: Branford Central
Elevation View



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 9 17.9

>= 5000 >= 500 >= 100 >= 5 < 5

AT&T MOBILITY LLC	VERIZONWIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

www.sitesafe.com
Site Name:Branford Central

SitesafeTC Version: 1.0.0.0
1/18/2016 10:45:54 AM

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended insection 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

The site will be made compliant if the following changes are implemented:

Monopole Base

Yellow caution 2 sign required.

6 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms that:

I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Young Kim.

January 18, 2016

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

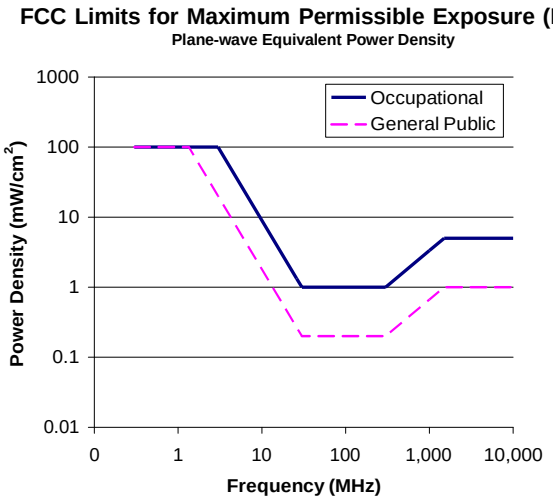
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit**.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels**.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Sitesafe believes this to be a *worst-case* analysis, based on best available data. Areas modeled to predict emissions greater than 100% of the applicable MPE level may not actually occur, but are shown as a *worst-case* prediction that could be realized real time. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Thus, at any time, if power density measurements were made, we believe the real-time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modeling in this way, Sitesafe has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf