EMPIRE telecom

February 14th, 2020

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

Regarding:	Notice of Exempt Modification – Equipment Modification
Property Address:	260 Beckley Rd. Berlin, CT 06037
Applicant:	Empire Telecom on behalf of AT&T ("AT&T", Site # CT1014)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 152-foot monopole at the above-referenced address latitude 41.6316638888889°, longitude -72.7298666666667°. Said monopole is owned by American Tower Corporation and the underlying property owners are Elaine & John C. Matulis.

AT&T desires to modify its existing telecommunications facility by adding: (3) CB-C23SR-43 Combiners, (3) SDARS Remote Radios, (1) Main Unit, (3) RR-FA3 Mounts, and ancillary equipment and cables. The centerline height of the existing antennas and ancillary tower-mounted equipment is and will remain at 152 feet.

Please accept this application as notification pursuant to R.C.S.A. §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.C.S.A. §16-50j-73, a copy of this letter is being sent to the Mayor, Mark H. Kaczynski; the Zoning Enforcement Officer, Maureen Giusti; Tower Owners, American Tower Corporation; and property owners, Elaine & John C. Matulis.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The modified equipment will be installed at the existing height of 152 feet on the 152-foot tower.

2. The proposed modifications will not involve any changes to AT&T's ground-space footprint, and therefore and therefore will not require an extension of the site boundary.

3. The proposed modification will not increase the noise level at the facility by six decibels or more, or to levels that exceed state and local criteria.

Moriah King • Empire Telecom USA, LLC • 16 Esquire Road, Billerica, MA 01862 • moking@empiretelecomm.com

AT&T at 260 Beckley Rd. Berlin, CT 06037
February 14, 2020

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (enclosed) for AT&T's modified facility is herein provided.

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 AT&T's proposed modifications. Please see enclosed structural analysis completed by completed by American Tower Corporation, dated January 3rd, 2020; stamped January 3rd, 2020.

For the foregoing reasons, AT&T respectfully requests that the proposed installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Moriah king

Moriah King
Site Acquisition Specialist
Empire Telecom USA, LLC
moking@empiretelecomm.com

Enclosures: Exhibit 1 – Field Card and GIS Map
Exhibit 2 – Construction Drawings
Exhibit 3 – Structural Analysis
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc:
Mark H. Kaczynski – Mayor
187 Castlewood Drive
Berlin, CT 06037

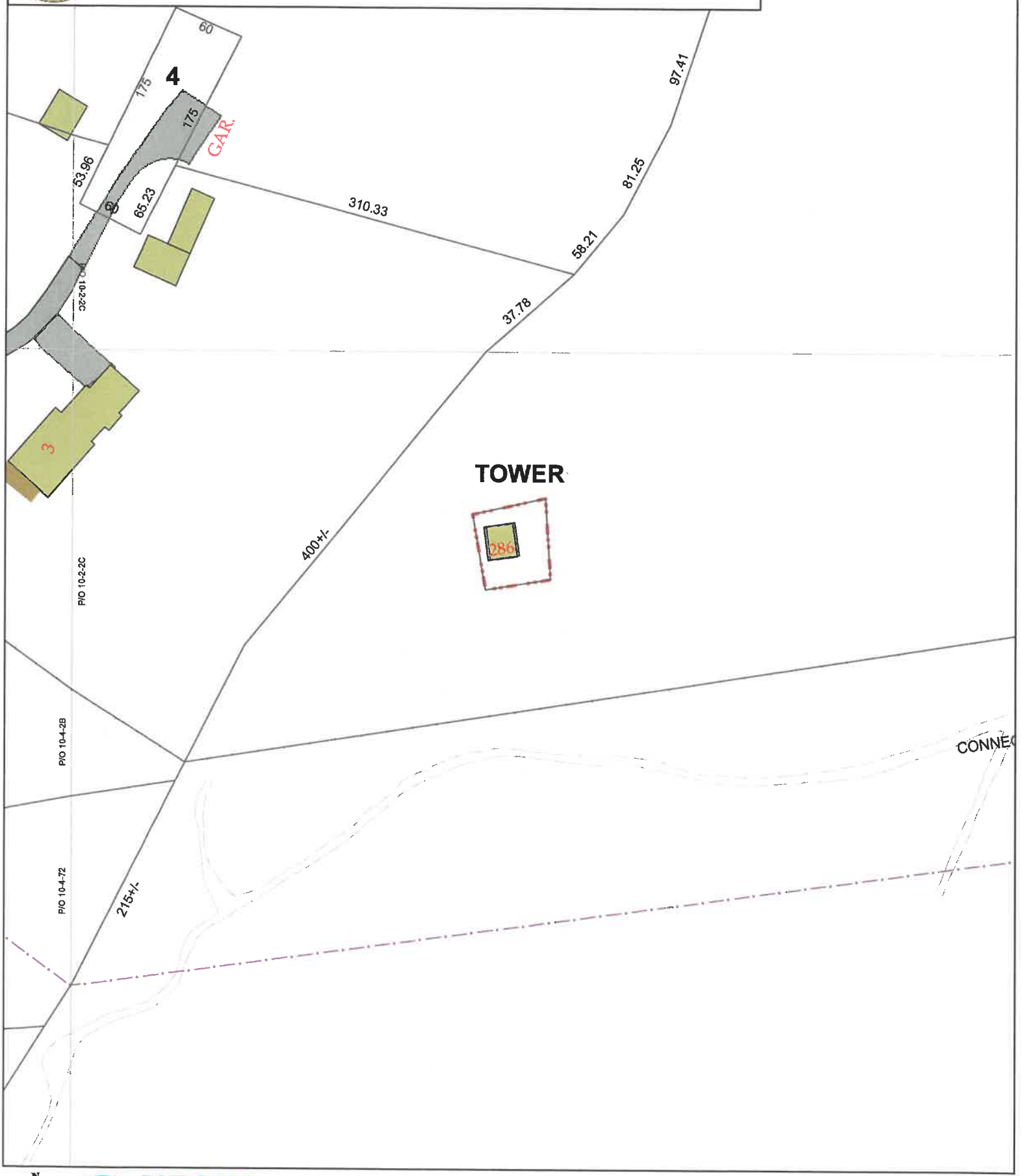
Maureen Giusti
Zoning Enforcement Officer;
240 Kensington Rd.; Berlin, CT 06037

Elaine & John C. Matulis
260 Beckley Rd
Berlin, CT 06037

American Tower Corporation
10 Presidential Way
Woburn, MA 01801
ATTN: Ryan Tierney, Account Project Manager

Town of Berlin, Connecticut - Assessment Parcel Map

Parcel: 11-3-132-7-3877 Address: 260 BECKLEY RD



N W E S

NEGEO New England Geosystems www.negeosystems.com 282 Main Street Extension - C2 Middletown, CT 06457 - (203) 404 7129

Approximate Scale: 1 inch = 100 feet

0 50 100 150 200 Feet

Map Produced: August 2019

Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The Town of Berlin and its mapping contractors assume no legal responsibility for the information contained herein.

Town of Berlin, CT

Property Listing Report

Map Block Lot 11-3-132-7-3877 | Building # 1 | Account 1040691

Property Information

Property Location	260 BECKLEY RD
Owner	MATULIS ELAINE E & JOHN C JR
Co-Owner	na
Mailing Address	NA NA NA NA
Land Use	4330 Rad/TV Twr
Land Class	I
Zoning Code	R-43
Census Tract	

Street Index	2030
Acreage	0.01
Utilities	UNKNOWN
Lot Setting/Desc	UNKNOWN UNKNOWN
Additional Info	

Photo

Sketch

No Photo Available

Primary Construction Details

Year Built	0
Stories	
Building Style	UNKNOWN
Building Use	Vacant
Building Condition	
Interior Floors 1	
Interior Floors 2	NA
Whirlpool Tub	
Total Rooms	0
Basement Garages	0

Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Bath Style	NA
Kitchen Style	NA
Roof Style	
Roof Cover	
Fireplaces	0
AC TYPE	

Exterior Walls	
Exterior Walls 2	NA
Interior Walls	
Interior Walls 2	NA
Heating Type	
Heating Fuel	
Fin Basement Area	
Fin BSMT Quality	
Fin BSMT Area 2	
Fin BSMT Quality 2	

Report Created On 2/13/2020

Town of Berlin, CT

Property Listing Report | Map Block Lot 11-3-132-7-3877 | Building # 1 | Account 1040691

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements	0	0
Outbuildings	0	0
Land	600000	420000
Total	600000	420000

Outbuilding and Extra Features

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	0	0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
MATULIS ELAINE E & JOHN C JR	0/0		0

Report Created On 2/13/2020

PROJECT INFORMATION

SCOPE OF WORK	UNMANNED COMMUNICATIONS FACILITY MODIFICATIONS INCLUDING: -(P) SIRIUS-XM NEW COMMSCOPE IQN-M23 SDARS REMOTE RADIO ON NEW RR-FA3 MOUNT (1/SECT., 3 TOT.) -(P) SIRIUS-XM NEW COMMSCOPE CBC235R-43 COMBINER ON NEW RR-FA3 MOUNT (1/SECT., 3 TOT.) -(P) AT&T ALPHA/BETA/GAMMA LTE/WCS 1RUS-32 TxRx-1 PORT TO BE CONNECTED TO NEW COMMSCOPE 5XM/WCS DIPLEXER CBC235F43 (1/SECT., 3 TOT.) -(P) AT&T NEW (1) DC6-48-60-18-8C6V ALONG WITH EXISTING (2) DC6-48-60-18-8F SURGE ARRESTOR (3 TOT.) -(P) IN SHELTER: -SIRIUS-XM EQUIPMENT NEW CommScope RACK -ADD 2-5A BREAKER IN AT&T POWER PLANT FOR SIRIUS-XM EQUIPMENT -SIRIUS-XM DC CABLES BETWEEN AT&T POWER PLANT AND SIRIUS-XM EQUIPMENT
SITE NUMBER:	CT1014
SITE NAME:	BERLIN – NE
SITE ADDRESS:	260 BECKLEY ROAD BERLIN, CT 06037
TOWER OWNER:	AMERICAN TOWER CORP 116 HUNTINGTON AVE. 11th FLOOR BOSTON, MA 02116
APPLICANT:	AT&T 550 COCHITUATE RD SUITES 13 & 14 FRAMINGHAM, MA 01701
NOC CONTACT:	TEL 866-915-5600
COORDINATES	LAT. N41° 37' 54.17" LONG. W72° 43' 47.69"
GROUND LEVEL:	±187'
DEED REFERENCE:	N/A
SITE PARCEL NO.:	N/A
CURRENT ZONING:	N/A
HORIZONTAL DATUM:	(NAD) 1983

at&t

SITE NUMBER: CT1014 FA: 10034969
SITE NAME: BERLIN NE
PROJECT: RF MOD // IP REPEATER MRTCB037929

DRAWING INDEX

		REV
01	TITLE SHEET	1
02	NOTES	1
03	SITE PLAN & EQUIPMENT PLAN	1
04	ELEVATION VIEW & ANTENNA LAYOUT	1
05	GROUNDING DETAILS	1

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

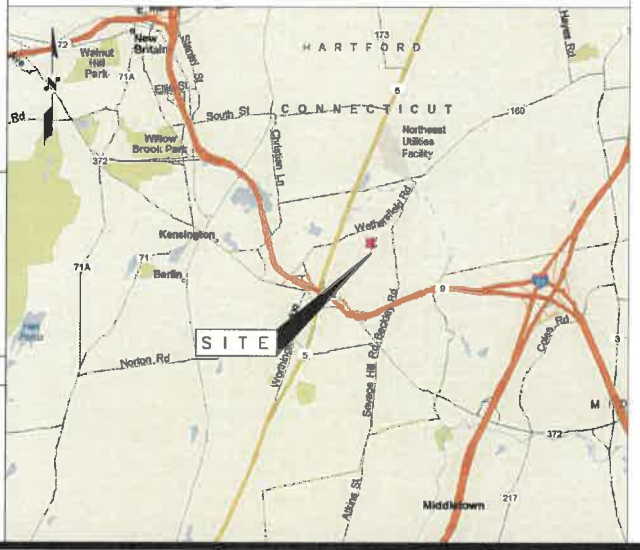
CONTACT & UTILITY INFORMATION

CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	MIGUEL NOBRE	VRG	(508) 981-9590
SITE ACQUISITION:	DAVID COOPER	EMPIRE	(617) 638-4908
CONSTRUCTION:	GREG DORMAN	EMPIRE	(484) 683-1750
UTILITIES			
POWER:	WORK REQUEST GROUP	NATIONAL GRID	(800) 375-7405
TELCO:		VERIZON	(800) 941-9900

LOCATION MAP

DIRECTIONS: FROM ROCKY HILL, TAKE I-91 SOUTH. TAKE I-91 SOUTH EXIT 22N TOWARDS RT-9 WEST. TAKE RT-9 WEST EXIT 21 TOWARDS MILL ST. AT END OF OFF RAMP TURN LEFT ONTO MILL ST. TURN LEFT ONTO BECKLEY ROAD. TURN LEFT ONTO GRAVEL DRIVE RIGHT AFTER PASSING UNDER POWER LINES. SITE IS AT END OF GRAVEL DRIVE.

SITE ACCESS: LOCKED GATE



APPLICABLE BUILDING CODES AND STANDARDS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARDS AND SPECIFICATIONS. SUBCONTRACTOR 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:
CONNECTICUT STATE BUILDING CODE

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE LATEST EDITION
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, NINTH EDITION
AMERICAN NATIONAL STANDARDS INSTITUTE/TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA) 222-F OR G AS APPLICABLE, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" AND "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

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.

VRG
VERTICAL RESOURCES GRP.
489 Washington Street
Auburn, MA 01501
Tel. (508) 981- 9590
Fax (508) 519 – 8939
mnobre@verticalresourcesgrp.com

EMPIRE telecom
EMPIRE TELECOM USA, LLC
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1014
SITE NAME: BERLIN NE
PROJECT: RF MOD // IP
260 BECKLEY ROAD
BERLIN, CT 06037
HARTFORD COUNTY

at&t
550 COCHITUATE RD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISION	BY	CHK
1	09/23/19	GENERAL REVISIONS	E.L.P.	G.A.M.
A	05/06/19	FOR CONSTRUCTION	E.L.P.	G.A.M.

SCALE | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

AT&T MOBILITY

TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
CT1014-IPRepeater	01	1

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – PRIME CONTRACTOR
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T WIRELESS
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.

ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. ROUTING OF CONDUIT FOR POWER AND TELCO SHALL BE APPROVED BY OWNER OF SITE.

9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE 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.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

SITE WORK GENERAL NOTES

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.

3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.

6. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.

7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE OWNER SPECIFICATION FOR SITE SIGNAGE.

8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.

9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE DETAIL 303.

11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.

12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

13. ALL EARTH WORK SHALL BE PERFORMED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 (HOT-DIP) UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".

2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.

3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. STEEL FASTENER HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (HOT-DIP)

4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.

5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAWSET/REDHEAD HILTI OR APPROVED EQUAL

6. ALL STRUCTURAL STEEL SHALL BE SUPPLIED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED.

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS.

   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:

   #6 AND LARGER .....2 INCH
   #5 AND SMALLER & WWF.....1 1/2 INCH

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:

   SLAB AND WALL .....3/4 INCH
   BEAMS AND COLUMNS.....1 1/2 INCH

5. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAWSET/REDHEAD HILTI OR APPROVED EQUAL

7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT.

   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.

   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.

8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.

9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED. UNLESS IT IS VERIFIED BY TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

10. ALL CONCRETE SHALL BE SUPPLIED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL. EXPOSE UNDISTURBED NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATIVE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
4. COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.
5. AS AN ALTERNATIVE TO ITEMS 2 AND 3 PROOF ROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL, AND COMPACTED AS STATED ABOVE.
6. COMPACTION CRITERIA FOR OTHER FILL AREAS ON SITE SHALL MEET THE SAME REQUIREMENTS AS NOTED ABOVE.
7. SOIL COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH TECHNICAL SPECIFICATION FOR CONSTRUCTION OF RADIO ACCESS NETWORK SITES

COMPACTION EQUIPMENT:

HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

ELECTRICAL INSTALLATION NOTES

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.

4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.

5. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.

6. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA.

7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PERMANENT LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S). NO HAND WRITTEN LABELS ALLOWED.

8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED. NO HAND WRITTEN LABELS ALLOWED.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.

13. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

ELECTRICAL INSTALLATION NOTES (cont.)

15. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

17. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

18. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

19. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

20. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.

21. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

22. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER. DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

23. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS

24. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

25. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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EMPIRE TELECOM USA, LLC
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1014
SITE NAME: BERLIN NE
PROJECT: RF MOD // IP
260 BECKLEY ROAD
BERLIN, CT 06037
HARTFORD COUNTY

at&t
550 COCHITUATE RD
SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISION	BY	CHK	APP'D
1	09/23/19	GENERAL REVISIONS	E.L.P.	G.A.M.	
0	05/08/19	FOR CONSTRUCTION	E.L.P.	G.A.M.	

SCALE | DESIGNED BY: M.N. | DRAWN BY: C.A.W.

AT&T MOBILITY

NOTES

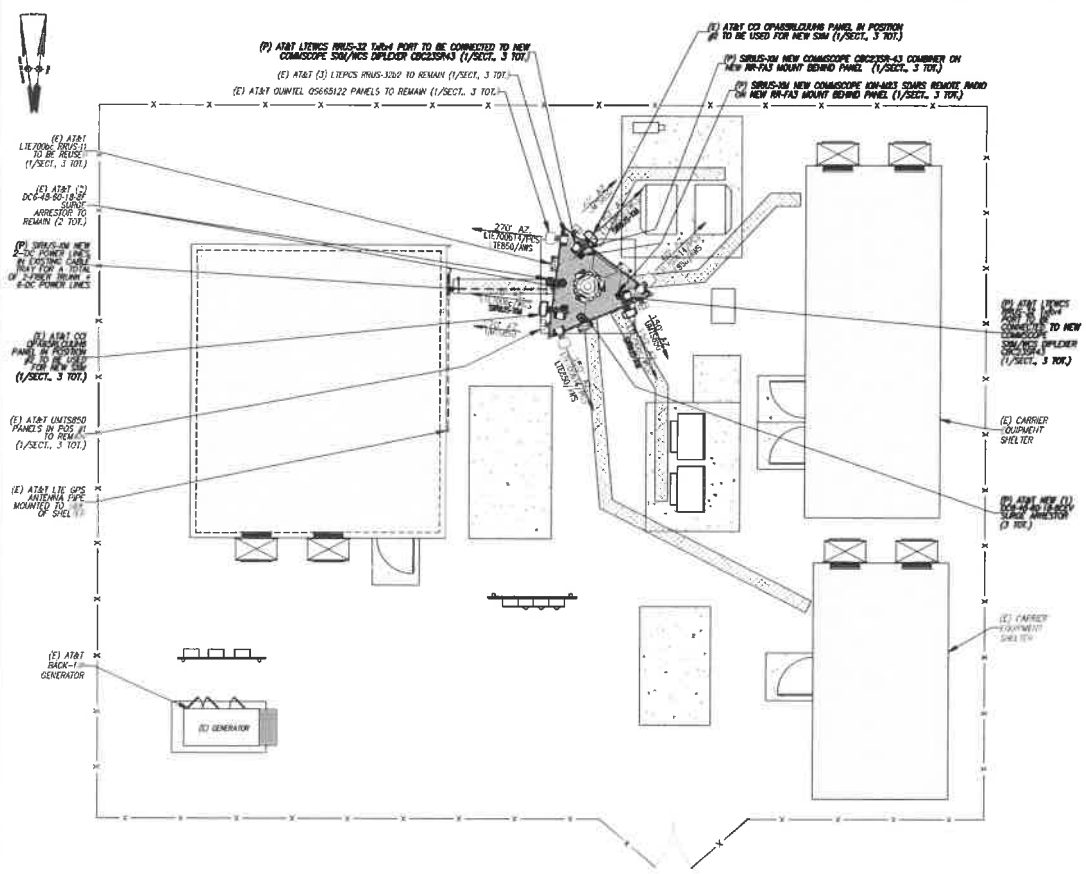
JOB NUMBER	DRAWING NUMBER	REV
CT1014-IPRepeater	02	1

GENERAL NOTES

1. THE CELLULAR INSTALLATION IS AN UNMANNED PRIVATE AND SECURED COMPOUND. 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.
2. CONSTRUCTION, MAINTENANCE & OPERATION OF PROPOSED TOWER FACILITY WILL BE HELD IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE & FEDERAL REGULATIONS AND GUIDELINES.

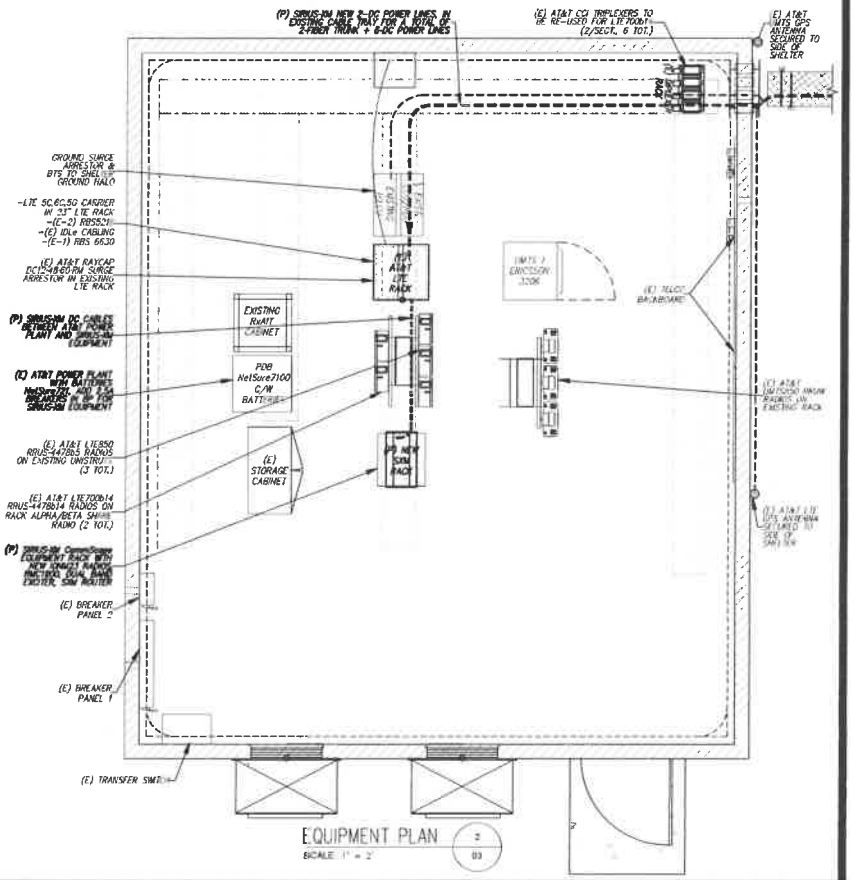
AT&T RF SYSTEM SCHEDULE

POSITION	SECTOR	STATUS	BAND	ANTENNA MAKE	ANTENNA MODEL	SIZE(INCHES) (LxWxH)	RAD CTR FT. AGL	AZIMUTH	TMA DIPLEXER COMBINER	REMOTE RADIOS	RADIO LOCATION	SIZE(INCHES) (LxWxH)	FEEDER TYPE	FEEDER LENGTH	RAYCAP
1	Gamma	EXISTING	UMTS850	POWERWAVE	7770	55.0x11.0x5.0	±152'	40°	---	---	---	---	(2) 1.25" (1) FIBER	(2) 175'	(E2) DC6-48-60-18-8F (P1) DC6-48-60-18-8CV
2	Alpha	EXISTING	LTE700b/CBC/SIRIUSXM	CCI	OPA65R-LCUU-H6	72.0x14.0x7.4	±152'	40°	1-CDU CBC2SRX3						
3	Alpha	EXISTING	LTE700b/UMTS850	QUINTEL	QS6651Z2	72.0x12.0x9.6	±152'	40°	2-DD RRH78B1						
4	Alpha														
1	Alpha	EXISTING	UMTS850	POWERWAVE	7770	55.0x11.0x5.0	±152'	150°	---	---	---	---	(2) 1.25" (1) FIBER	(2) 175'	
2	Beta	EXISTING	LTE700b/CBC/SIRIUSXM	CCI	OPA65R-LCUU-H6	72.0x14.0x7.4	±152'	150°	1-CDU CBC2SRX3						
3	Beta	EXISTING	LTE700b/UMTS850	QUINTEL	QS6651Z2	72.0x12.0x9.6	±152'	150°	2-DD RRH78B1						
4	Beta														
1	Beta	EXISTING	UMTS850	POWERWAVE	7770	55.0x11.0x5.0	±152'	270°	---	---	---	---	(2) 1.25" (1) FIBER	(2) 175'	
2	Gamma	EXISTING	LTE700b/CBC/SIRIUSXM	CCI	OPA65R-LCUU-H6	72.0x14.0x7.4	±152'	270°	1-CDU CBC2SRX3						
3	Gamma	EXISTING	LTE700b/UMTS850	QUINTEL	QS6651Z2	72.0x12.0x9.6	±152'	270°	2-DD RRH78B1						
4	Gamma														



COMPOUND PLAN — SCALE: 1" = 6' — 1/03

GRAPHIC SCALE
(IN FEET)
1 inch = 6 ft.



EQUIPMENT PLAN — SCALE: 1" = 2' — 2/03

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SITE NAME: BERLIN NE
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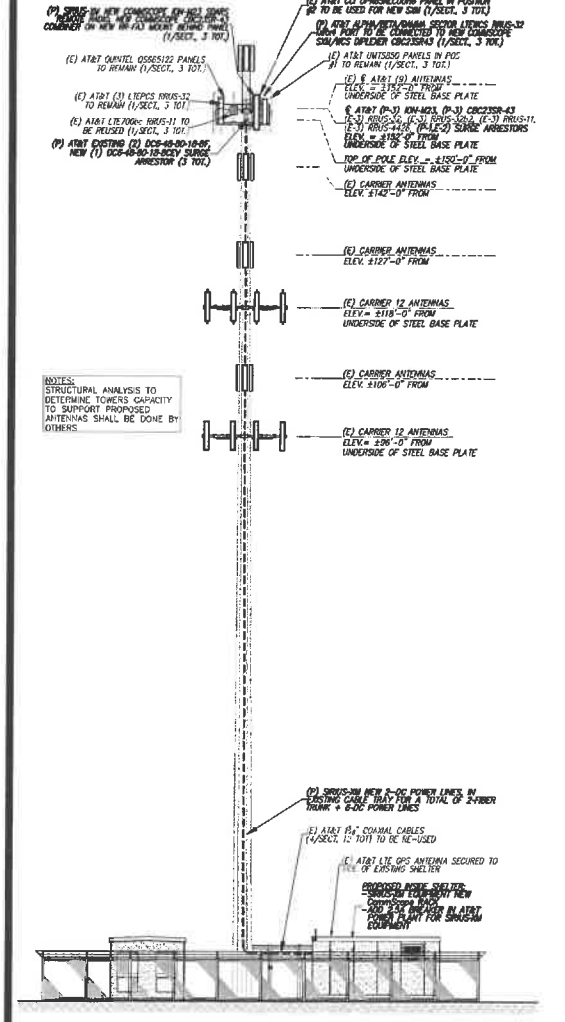
A	05/08/19	FOR CONSTRUCTION	E.L.P.	G.A.M.	

SCALE: | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

AT&T MOBILITY

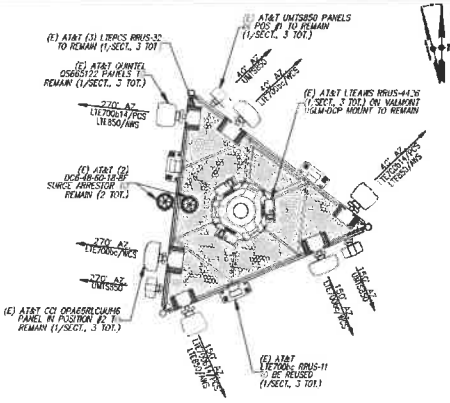
SITE PLAN & EQUIPMENT PLAN

JOB NUMBER	DRAWING NUMBER	REV
CT1014-IPRepeater	03	1



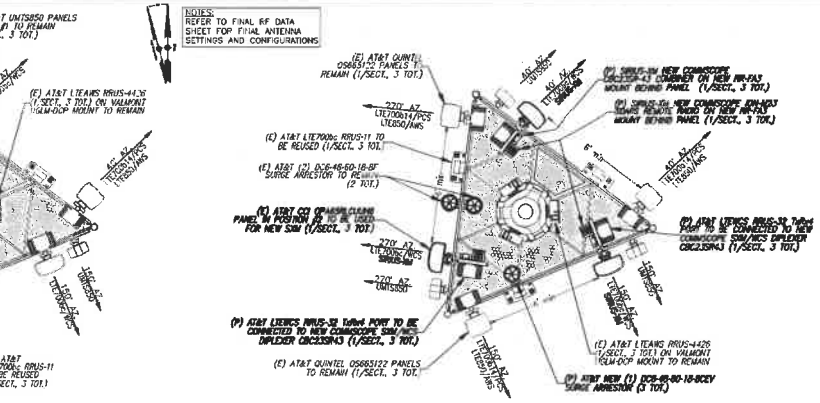
ELEVATION VIEW
SCALE: 1" = 10'
1 04

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.



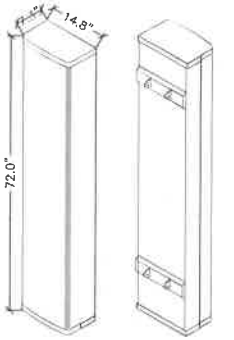
EXISTING

NOTES:
REFER TO FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS AND CONFIGURATIONS



PROPOSED

ANTENNA MOUNTING PLAN VIEW
SCALE: N.T.S.
2 04



ISOMETRIC FRONT VIEW | ISOMETRIC REAR VIEW

(E) LTE700bc/WCS ANTENNA DETAIL
SCALE: N.T.S.
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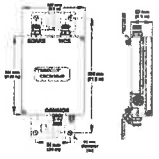

(P) LTEWCS/SDARS Commscope COMBINER
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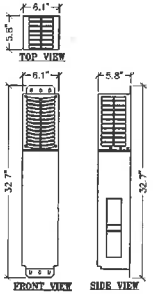

(P) SIRIUS-XM IONM23 SDARS RADIO
SCALE: N.T.S.
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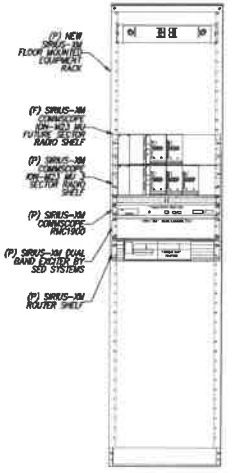

ELEVATION VIEW

(P) SIRIUS-XM EQUIPMENT RACK
SCALE: N.T.S.
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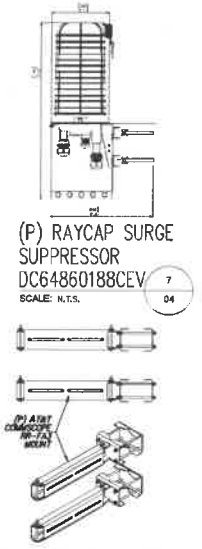
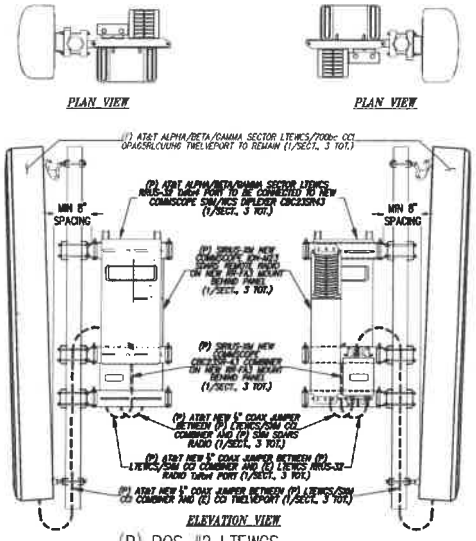


(P) RAYCAP SURGE SUPPRESSOR DC64860188CEV
SCALE: N.T.S.
7 04

(P) AT&T SIRIUS-XM TRI-BRACKET MOUNT
SCALE: N.T.S.
8 04



ELEVATION VIEW

(P) POS #2 LTEWCS SIRIUS-XM MOUNTING DETAIL
SCALE: N.T.S.
9 04

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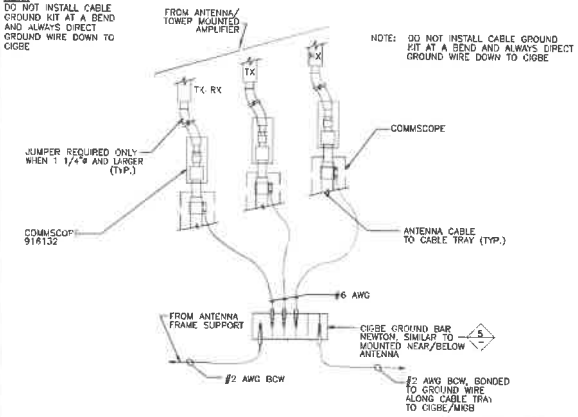
SCALE | DESIGNED BY: M.M. | DRAWN BY: G.A.M.

AT&T MOBILITY

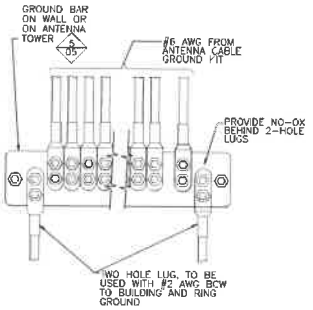
ELEVATION VIEW & ANTENNA LAYOUT

JOB NUMBER	DRAWING NUMBER	REV.
CT1014-IPRepeater	04	1

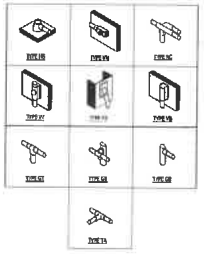
NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE



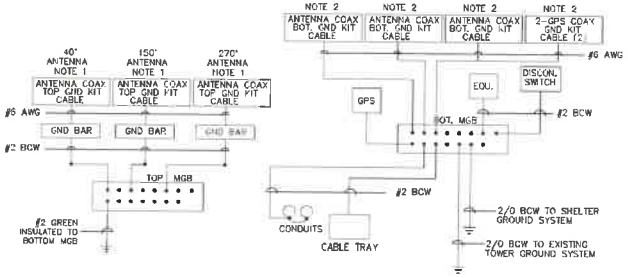
CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1/05
SCALE: N.T.S.



INSTALLATION OF GROUND WIRE TO GROUND BAR 2/05
SCALE: N.T.S.

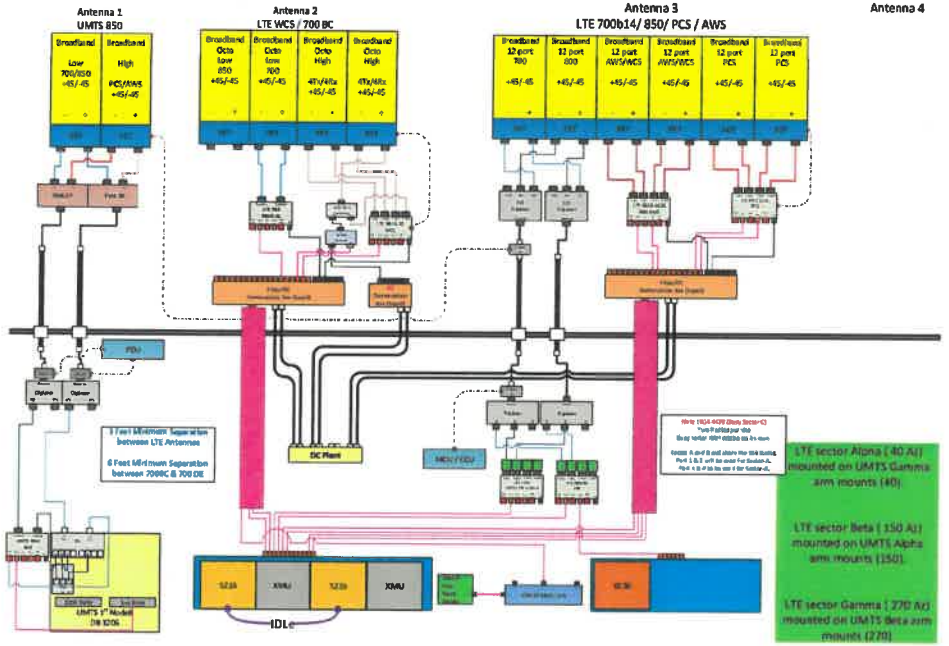


GROUNDING CONNECTION DETAIL 5/05
SCALE: N.T.S.



NOTE:
1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE

SCHEMATIC GROUNDING DIAGRAM 4/05
SCALE: N.T.S.

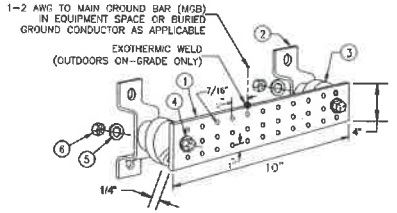


ALPHA/BETA/GAMMA SIRIUS-XM PLUMBING DIAGRAM 3/05
SCALE: N.T.S.

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS
2. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS

NEWTON INSTRUMENT COMPANY, INC.
BUTNER, N.C. OR APPROVED EQUAL

ITEM	REQ.	PART NO.	DESCRIPTION
1	1	1/4"x4"x12"	PRE DRILLED GND. BAR
2	2	A-6056	WALL MTG. BRKT.
3	2	3061-4	INSULATORS
4	2	3012-13	5/8"-11x4" H.H.C.S.
5	4	3015-8	5/8 LOCKWASHER
6	2	3014-8	5/8"-11 HEX NUT



GROUND BAR DETAIL 6/05
SCALE: N.T.S.

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SCALE: | DESIGNED BY: M.N. | DRAWN BY: G.A.M.

AT&T MOBILITY

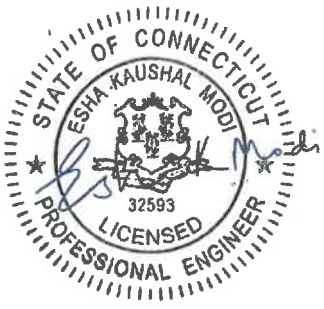
GROUNDING DETAILS

JOB NUMBER	DRAWING NUMBER	REV
CT1014-IPRepeater	05	1

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**151.5 ft Monopole**
ATC Site Name	:	**Brln - Berlin, CT**
ATC Asset Number	:	**302483**
Engineering Number	:	**OAA754987_C3_01**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**BERLIN NE**
Carrier Site Number	:	**CTL01014**
Site Location	:	**286 Beckley Road** **Berlin, CT 06037-2419** **41.631700,-72.729900**
County	:	**Hartford**
Date	:	**January 3, 2020**
Max Usage	:	**97%**
Result	:	**Pass**



Prepared By:
Garret D. Heath
Structural Engineer I

Reviewed By:

Authorized by "EOR"
03 Jan 2020 04:56:43 cosign

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 151.5 ft monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	ITT Meyer Type "B", dated July 21, 2001 Mapping by Smith Cullum Acq. #CT-0019, dated July 21, 2001 Mapping by ATC Report #0682, dated January 7, 2016
Foundation Drawing	SpectraSite Project #CT-0019, dated May 29, 2003
Geotechnical Report	Daniel G. Loucks Project #CT-0019, dated December 21, 2001
Modifications	Scientel Project #Berlin-CT0019, dated July 30, 2002 ATC Project #11912109_P5_02, dated October 3, 2017

Analysis

The tower was analyzed using tnxTower version 8.0.5.0 analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	97 mph (3-Second Gust V_{asd}) / 125 mph (3-Second Gust V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
152.0	2	Raycap DC6-48-60-18-8F(32.8 lbs)	Platform with Handrails	(2) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax (1) 3" conduit	AT&T MOBILITY
	6	Powerwave Allgon LGP21401			
	3	Ericsson RRUS 11 (Band 12) (55 lb)			
	3	Ericsson RRUS 32 (50.8 lbs)			
	3	Ericsson RRUS 32 B2			
	3	Powerwave Allgon 7770.00			
	3	Quintel QS66512-2			
	3	CCI OPA-65R-LCUU-H6			
	3	Ericsson RRUS 4426 B66			
	6	CCI TPX-070821			
142.0	3	Ericsson AIR32 B66Aa/B2a	Platform with Handrails	(2) 1 1/4" (1.25"-31.8mm) Fiber (1) 1 5/8" (1.63"-41.3mm) Fiber (12) 1 5/8" Coax	T-MOBILE
	3	RFS APXVAARR24_43-U-NA20			
	3	Ericsson KRY 112 489/2			
	3	Ericsson Radio 4449 B12,B71			
	3	Ericsson KRY 112 144/2			
134.0	3	Alcatel-Lucent 800 MHz 2X50W RRH w/ Filter	Flush	-	SPRINT NEXTEL
127.0	2	RFS APXVSPP18-C-A20	Platform with Handrails	(4) 1 1/4" Hybriflex Cable	
	1	RFS APXV9ERR18-C-A20			
	3	Commscope DT465B-2XR			
	3	Alcatel-Lucent 4x40W RRH (88 lb)			
	3	Alcatel-Lucent TD-RRH8x20			
	3	Alcatel-Lucent RRH2x50-08			
119.0	3	Alcatel-Lucent RRH2x60	Low Profile Platform	(2) 1 5/8" (1.63"-41.3mm) Fiber (18) 1 5/8" Coax	VERIZON WIRELESS
116.0	2	RFS DB-T1-6Z-8AB-0Z			
	3	Commscope LNX-6514DS-A1M			
	6	Amphenol Antel LPA-80063-6CF-EDIN-X			
115.0	6	Commscope SBNHH-1D65B			
	3	Alcatel-Lucent RRH2X60-1900			
	3	Alcatel-Lucent RRH2X60-AWS			
	3	Alcatel-Lucent RRH2x60 700			

Equipment to be Removed

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
No loading was considered as removed as part of this analysis.					

Proposed Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
152.0	3	Commscope ION-M23 SDARS	Platform with Handrails	(2) 0.82" (20.8mm) 8 AWG 6	AT&T MOBILITY
	3	Commscope CBC23SR-43			
	1	Raycap DC6-48-60-0-8C-EV			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	89%	Pass
Shaft	75%	Pass
Base Plate	20%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	4,022.2	97%
Axial (Kips)	51.1	68%
Shear (Kips)	39.8	68%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
152.0	Commscope CBC23SR-43	AT&T MOBILITY	1.957	1.307
	Raycap DC6-48-60-0-8C-EV			
	Commscope ION-M23 SDARS			

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

AMERICAN TOWER®
CORPORATION

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

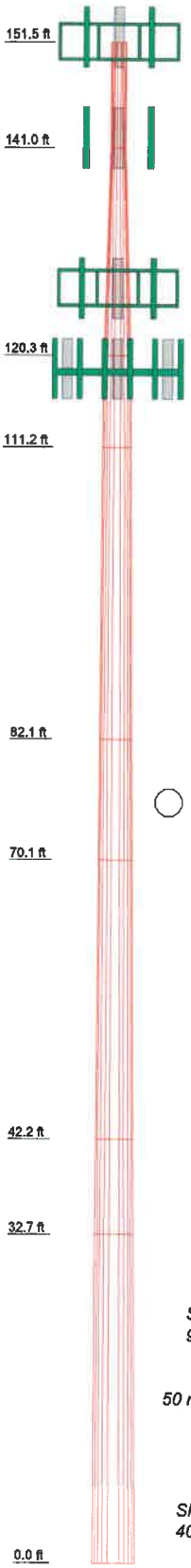
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	10.50	12	0.2400	17.1872	17.7841	A572-65	0.5
2	20.67	12	0.3059	17.7841	31.5570		1.7
3	9.14	12	0.3063	31.5570	33.0280		1.0
4	29.11	12	0.3141	33.0280	38.3470		3.5
5	12.02	12	0.3804	38.3470	39.7110		1.9
6	27.82	12	0.4014	39.7110	43.9500		5.1
7	9.53	12	0.4706	43.9500	45.0640		2.2
8	32.71	12	0.4906	45.0640	49.5520		8.2
							24.1



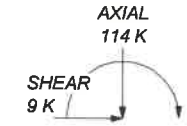
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
CBC23SR-43	152	KRY 112 144/2	142
CBC23SR-43	152	KRY 112 489/2	142
CBC23SR-43	152	KRY 112 489/2	142
DC6-48-60-0-8C-EV	152	KRY 112 489/2	142
ION-M23 SDARS	152	Radio 4449 B12,B71	142
ION-M23 SDARS	152	800 MHz 2X50W RRH w/ Filter	134
ION-M23 SDARS	152	800 MHz 2X50W RRH w/ Filter	134
DC6-48-60-18-8F(32.8 lbs)	151.5	800 MHz 2X50W RRH w/ Filter	134
RRUS 4426 B66	151.5	TD-RRH8x20	127
RRUS 4426 B66	151.5	TD-RRH8x20	127
RRUS 4426 B66	151.5	TD-RRH8x20	127
RRUS 11 (Band 12) (55 lb)	151.5	APXVSPP18-C-A20	127
RRUS 11 (Band 12) (55 lb)	151.5	APXVSPP18-C-A20	127
RRUS 11 (Band 12) (55 lb)	151.5	APXV9ERR18-C-A20	127
RRUS 32 (50.8 lbs)	151.5	DT465B-2XR	127
RRUS 32 (50.8 lbs)	151.5	DT465B-2XR	127
RRUS 32 (50.8 lbs)	151.5	DT465B-2XR	127
RRUS 32 B2	151.5	Round Platform w/ Handrails	127
RRUS 32 B2	151.5	Round Platform w/ Handrails	127
RRUS 32 B2	151.5	RRH2x50-08	127
7770.00	151.5	RRH2x50-08	127
7770.00	151.5	RRH2x50-08	127
7770.00	151.5	(2) 4x40W RRH (88 lb)	127
QS66512-2	151.5	(2) 4x40W RRH (88 lb)	127
QS66512-2	151.5	(2) 4x40W RRH (88 lb)	127
QS66512-2	151.5	(2) SBNHH-1D65B	119
OPA-65R-LCUU-H6	151.5	(2) SBNHH-1D65B	119
OPA-65R-LCUU-H6	151.5	DB-T1-6Z-8AB-0Z	119
OPA-65R-LCUU-H6	151.5	DB-T1-6Z-8AB-0Z	119
Flat Platform w/ Handrails	151.5	LNX-6514DS-A1M	119
(2) TPX-070821	151.5	LNX-6514DS-A1M	119
(2) TPX-070821	151.5	LNX-6514DS-A1M	119
(2) TPX-070821	151.5	RRH2x60 700	119
(2) LGP21401	151.5	RRH2x60 700	119
(2) LGP21401	151.5	RRH2x60 700	119
(2) LGP21401	151.5	(2) LPA-80063-6CF-EDIN-X	119
DC6-48-60-18-8F(32.8 lbs)	151.5	(2) LPA-80063-6CF-EDIN-X	119
Radio 4449 B12,B71	142	(2) LPA-80063-6CF-EDIN-X	119
Radio 4449 B12,B71	142	Round Low Profile Platform	119
AIR32 B66Aa/B2a	142	RRH2X60-AWS	119
AIR32 B66Aa/B2a	142	RRH2X60-AWS	119
AIR32 B66Aa/B2a	142	RRH2X60-AWS	119
APXVAARR24_43-U-NA20	142	RRH2X60-1900	119
APXVAARR24_43-U-NA20	142	RRH2X60-1900	119
APXVAARR24_43-U-NA20	142	RRH2X60-1900	119
KRY 112 144/2	142	(2) SBNHH-1D65B	119
KRY 112 144/2	142		

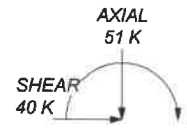
MATERIAL STRENGTH

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

ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 3 kip-ft
REACTIONS - 97 mph WIND

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Combined pole and wrap structure.
9. Sections modeled to have equivalent inertia to pole and wrap combined.
10. TOWER RATING: 75%

ATC Engineering
3500 Regency Parkway, Suite 100
Cary, NC 27518-7723
Engineering
Phone: (919) 466-5121
FAX: (919) 466-5415

Job: *Brln-Berlin (302483)*			
Project: *OAA754987_C3_01*			
Client: AT&T Mobility	Drawn by: Garret.Heath		App'd:
Code: TIA-222-G	Date: 01/03/20		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Combined pole and wrap structure..
Sections modeled to have equivalent inertia to pole and wrap combined..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

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	151.50-141.00	10.50	0.00	12	17.1872	17.7841	0.2400	0.9600	A572-65 (65 ksi)
L2	141.00-120.33	20.67	0.00	12	17.7841	31.5570	0.3059	2.0000	A572-65 (65 ksi)
L3	120.33-111.19	9.14	0.00	12	31.5570	33.0280	0.3063	2.0000	A572-65 (65 ksi)
L4	111.19-82.08	29.11	0.00	12	33.0280	38.3470	0.3141	2.2000	A572-65 (65 ksi)
L5	82.08-70.06	12.02	0.00	12	38.3470	39.7110	0.3804	2.4000	A572-65 (65 ksi)
L6	70.06-42.24	27.82	0.00	12	39.7110	43.9500	0.4014	2.6000	A572-65 (65 ksi)
L7	42.24-32.71	9.53	0.00	12	43.9500	45.0640	0.4706	2.8000	A572-65 (65 ksi)
L8	32.71-0.00	32.71		12	45.0640	49.5520	0.4906	3.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	17.7088	13.0968	480.1168	6.0671	8.9030	53.9277	972.8469	6.4458	3.9630	16.512
	18.3268	13.5581	532.6554	6.2808	9.2122	57.8209	1079.3043	6.6729	4.1229	17.179
L2	18.3035	17.2160	671.2919	6.2572	9.2122	72.8702	1360.2194	8.4732	3.9463	12.901
	32.5623	30.7823	3837.2246	11.1879	16.3465	234.7425	7775.2574	15.1501	7.6375	24.967
L3	32.5622	30.8221	3842.0947	11.1878	16.3465	235.0404	7785.1256	15.1697	7.6364	24.931
	34.0851	32.2730	4410.5870	11.7144	17.1085	257.8009	8937.0451	15.8838	8.0306	26.218
L4	34.0823	33.0869	4519.6700	11.7116	17.1085	264.1768	9158.0767	16.2844	8.0097	25.501
	39.5889	38.4666	7102.1213	13.6158	19.8637	357.5419	14390.8231	18.9321	9.4352	30.039
L5	39.5655	46.5048	8556.3285	13.5920	19.8637	430.7510	17337.4413	22.8883	9.2575	24.336
	40.9777	48.1756	9512.0483	14.0804	20.5703	462.4166	19273.9886	23.7106	9.6231	25.297
L6	40.9703	50.8080	10021.0923	14.0728	20.5703	487.1632	20305.4499	25.0061	9.5668	23.834
	45.3588	56.2869	13625.1654	15.5904	22.7661	598.4848	27608.2791	27.7027	10.7028	26.664
L7	45.3344	65.8857	15898.0688	15.5656	22.7661	698.3220	32213.7975	32.4270	10.5174	22.349
	46.4877	67.5738	17151.6341	15.9644	23.3432	734.7608	34753.8607	33.2578	10.8159	22.983
L8	46.4806	70.4140	17856.5130	15.9573	23.3432	764.9572	36182.1365	34.6556	10.7623	21.937
	51.1269	77.5039	23811.6328	17.5640	25.6679	927.6801	48248.8237	38.1450	11.9651	24.389

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 151.50-141.00				1	1	1			
L2 141.00-120.33				1	1	1			
L3 120.33-111.19				1	1	1			
L4 111.19-82.08				1	1	1			
L5 82.08-70.06				1	1	1			
L6 70.06-42.24				1	1	1			
L7 42.24-32.71				1	1	1			
L8 32.71-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
1 5/8" Coax	B	No	Surface Ar (CaAa)	119.00 - 5.00	12	6	0.300 0.500	1.9800		0.82
1 5/8" (1.63"-41.3mm) Fiber	C	No	Surface Ar (CaAa)	119.00 - 5.00	2	2	-0.490 -0.480	1.6300		1.61
***										
4" Wrap Seams	A	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00
4" Wrap Seams	B	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00
4" Wrap Seams	C	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 1/4" Coax	C	No	No	Inside Pole	151.50 - 5.00	12	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
0.39" (10mm) Fiber Trunk	C	No	No	Inside Pole	151.50 - 5.00	2	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
0.78" (19.7mm) 8 AWG 6	C	No	No	Inside Pole	151.50 - 5.00	4	No Ice	0.00	0.59
							1/2" Ice	0.00	0.59
							1" Ice	0.00	0.59
3" conduit	C	No	No	Inside Pole	151.50 - 5.00	1	No Ice	0.00	1.78
							1/2" Ice	0.00	1.78
							1" Ice	0.00	1.78
***									
1 5/8" (1.63"-41.3mm) Fiber	C	No	No	Inside Pole	142.00 - 5.00	1	No Ice	0.00	1.61
							1/2" Ice	0.00	1.61
							1" Ice	0.00	1.61
1 1/4" (1.25"-31.8mm) Fiber	C	No	No	Inside Pole	142.00 - 5.00	2	No Ice	0.00	1.05
							1/2" Ice	0.00	1.05
							1" Ice	0.00	1.05
1 5/8" Coax	C	No	No	Inside Pole	142.00 - 5.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
***									
1 1/4" Hybriflex	C	No	No	Inside Pole	127.00 - 5.00	4	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
***									
0.82" (20.8mm) 8 AWG 6	C	No	No	Inside Pole	151.50 - 0.00	2	No Ice	0.00	0.62
							1/2" Ice	0.00	0.62
							1" Ice	0.00	0.62

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	151.50-141.00	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	0.000	0.15
L2	141.00-120.33	A	0.000	0.000	8.268	0.000	0.00
		B	0.000	0.000	8.268	0.000	0.00
		C	0.000	0.000	8.268	0.000	0.58
L3	120.33-111.19	A	0.000	0.000	3.656	0.000	0.00
		B	0.000	0.000	12.934	0.000	0.08
		C	0.000	0.000	6.202	0.000	0.30
L4	111.19-82.08	A	0.000	0.000	11.644	0.000	0.00
		B	0.000	0.000	46.227	0.000	0.29
		C	0.000	0.000	21.134	0.000	0.96
L5	82.08-70.06	A	0.000	0.000	4.808	0.000	0.00
		B	0.000	0.000	19.088	0.000	0.12
		C	0.000	0.000	8.727	0.000	0.39
L6	70.06-42.24	A	0.000	0.000	11.128	0.000	0.00
		B	0.000	0.000	44.178	0.000	0.27
		C	0.000	0.000	20.197	0.000	0.91
L7	42.24-32.71	A	0.000	0.000	3.812	0.000	0.00
		B	0.000	0.000	15.134	0.000	0.09
		C	0.000	0.000	6.919	0.000	0.31
L8	32.71-0.00	A	0.000	0.000	11.084	0.000	0.00
		B	0.000	0.000	44.003	0.000	0.27
		C	0.000	0.000	20.117	0.000	0.92

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	151.50-141.00	A	2.321	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	0.000	0.15
L2	141.00-120.33	A	2.293	0.000	0.000	17.749	0.000	0.36
		B		0.000	0.000	17.749	0.000	0.36
		C		0.000	0.000	17.749	0.000	0.94
L3	120.33-111.19	A	2.267	0.000	0.000	7.801	0.000	0.16
		B		0.000	0.000	23.826	0.000	0.52
		C		0.000	0.000	15.410	0.000	0.56
L4	111.19-82.08	A	2.226	0.000	0.000	24.604	0.000	0.49
		B		0.000	0.000	84.032	0.000	1.82
		C		0.000	0.000	52.666	0.000	1.84
L5	82.08-70.06	A	2.174	0.000	0.000	10.035	0.000	0.20
		B		0.000	0.000	34.417	0.000	0.73
		C		0.000	0.000	21.466	0.000	0.75
L6	70.06-42.24	A	2.108	0.000	0.000	22.859	0.000	0.44
		B		0.000	0.000	78.834	0.000	1.65
		C		0.000	0.000	48.858	0.000	1.70
L7	42.24-32.71	A	2.025	0.000	0.000	7.673	0.000	0.14
		B		0.000	0.000	26.650	0.000	0.54
		C		0.000	0.000	16.382	0.000	0.57

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
L8	32.71-0.00	A	1.861	0.000	0.000	21.400	0.000	0.37
		B		0.000	0.000	75.445	0.000	1.46
		C		0.000	0.000	45.587	0.000	1.58

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	151.50-141.00	0.0000	0.0000	0.0000	0.0000
L2	141.00-120.33	0.0000	0.0000	0.0000	0.0000
L3	120.33-111.19	3.8072	1.4468	4.1174	1.6832
L4	111.19-82.08	4.4232	1.6820	4.7869	1.9569
L5	82.08-70.06	4.6508	1.7695	5.0417	2.0604
L6	70.06-42.24	4.8305	1.8387	5.2400	2.1396
L7	42.24-32.71	4.9945	1.9017	5.4167	2.2088
L8	32.71-0.00	4.7241	1.7993	5.1291	2.0846

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	15	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	16	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	17	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L3	12	1 5/8" Coax	111.19 - 119.00	1.0000	1.0000
L3	13	1 5/8" (1.63"-41.3mm) Fiber	111.19 - 119.00	1.0000	1.0000
L3	15	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	16	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	17	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L4	12	1 5/8" Coax	82.08 - 111.19	1.0000	1.0000
L4	13	1 5/8" (1.63"-41.3mm) Fiber	82.08 - 111.19	1.0000	1.0000
L4	15	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	16	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	17	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L5	12	1 5/8" Coax	70.06 - 82.08	1.0000	1.0000
L5	13	1 5/8" (1.63"-41.3mm) Fiber	70.06 - 82.08	1.0000	1.0000
L5	15	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	16	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L5	17	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L6	12	1 5/8" Coax	42.24 - 70.06	1.0000	1.0000
L6	13	1 5/8" (1.63"-41.3mm) Fiber	42.24 - 70.06	1.0000	1.0000
L6	15	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	16	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	17	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L7	12	1 5/8" Coax	32.71 - 42.24	1.0000	1.0000
L7	13	1 5/8" (1.63"-41.3mm) Fiber	32.71 - 42.24	1.0000	1.0000
L7	15	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	16	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	17	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L8	12	1 5/8" Coax	5.00 - 32.71	1.0000	1.0000
L8	13	1 5/8" (1.63"-41.3mm) Fiber	5.00 - 32.71	1.0000	1.0000
L8	15	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000
L8	16	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000
L8	17	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) TPX-070821	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.18	0.01
			0.00			1/2" Ice	0.00	0.25	0.01
			0.50			1" Ice	0.00	0.32	0.02
(2) TPX-070821	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.18	0.01
			0.00			1/2" Ice	0.00	0.25	0.01
			0.50			1" Ice	0.00	0.32	0.02
(2) TPX-070821	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.18	0.01
			0.00			1/2" Ice	0.00	0.25	0.01
			0.50			1" Ice	0.00	0.32	0.02
(2) LGP21401	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			0.50			1" Ice	1.61	0.60	0.03
(2) LGP21401	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			0.50			1" Ice	1.61	0.60	0.03
(2) LGP21401	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	0.36	0.01
			0.00			1/2" Ice	1.45	0.48	0.02
			0.50			1" Ice	1.61	0.60	0.03
DC6-48-60-18-8F(32.8 lbs)	B	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	0.02
			0.00			1/2" Ice	1.27	1.27	0.04
			0.50			1" Ice	1.45	1.45	0.05
DC6-48-60-18-8F(32.8 lbs)	C	From Leg	0.50	0.0000	151.50	No Ice	1.28	0.79	0.02
			0.00			1/2" Ice	1.27	1.27	0.04
			0.50			1" Ice	1.45	1.45	0.05
RRUS 4426 B66	A	From Leg	3.00	0.0000	151.50	No Ice	1.65	0.73	0.05
			0.00			1/2" Ice	1.81	0.84	0.06
			0.50			1" Ice	1.98	0.97	0.08
RRUS 4426 B66	B	From Leg	3.00	0.0000	151.50	No Ice	1.65	0.73	0.05
			0.00			1/2" Ice	1.81	0.84	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.50			1" Ice	1.98	0.97	0.08
RRUS 4426 B66	C	From Leg	3.00	0.0000	151.50	No Ice	1.65	0.73	0.05
			0.00			1/2" Ice	1.81	0.84	0.06
			0.50			1" Ice	1.98	0.97	0.08
RRUS 11 (Band 12) (55 lb)	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.07	0.06
			0.00			1/2" Ice	2.72	1.21	0.07
			0.50			1" Ice	2.92	1.36	0.10
RRUS 11 (Band 12) (55 lb)	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.07	0.06
			0.00			1/2" Ice	2.72	1.21	0.07
			0.50			1" Ice	2.92	1.36	0.10
RRUS 11 (Band 12) (55 lb)	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.07	0.06
			0.00			1/2" Ice	2.72	1.21	0.07
			0.50			1" Ice	2.92	1.36	0.10
RRUS 32 (50.8 lbs)	B	From Leg	3.00	0.0000	151.50	No Ice	0.00	2.42	0.08
			0.00			1/2" Ice	0.00	2.64	0.10
			0.50			1" Ice	0.00	2.86	0.14
RRUS 32 (50.8 lbs)	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	2.42	0.08
			0.00			1/2" Ice	0.00	2.64	0.10
			0.50			1" Ice	0.00	2.86	0.14
RRUS 32 (50.8 lbs)	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	2.42	0.08
			0.00			1/2" Ice	0.00	2.64	0.10
			0.50			1" Ice	0.00	2.86	0.14
RRUS 32 B2	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.67	0.05
			0.00			1/2" Ice	0.00	1.86	0.07
			0.50			1" Ice	0.00	2.05	0.10
RRUS 32 B2	A	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.67	0.05
			0.00			1/2" Ice	0.00	1.86	0.07
			0.50			1" Ice	0.00	2.05	0.10
RRUS 32 B2	C	From Leg	3.00	0.0000	151.50	No Ice	0.00	1.67	0.05
			0.00			1/2" Ice	0.00	1.86	0.07
			0.50			1" Ice	0.00	2.05	0.10
7770.00	A	From Leg	3.00	0.0000	151.50	No Ice	5.51	2.93	0.04
			0.00			1/2" Ice	6.31	3.27	0.07
			0.50			1" Ice	6.75	3.63	0.11
7770.00	B	From Leg	3.00	0.0000	151.50	No Ice	5.51	2.93	0.04
			0.00			1/2" Ice	6.31	3.27	0.07
			0.50			1" Ice	6.75	3.63	0.11
7770.00	C	From Leg	3.00	0.0000	151.50	No Ice	5.51	2.93	0.04
			0.00			1/2" Ice	6.31	3.27	0.07
			0.50			1" Ice	6.75	3.63	0.11
QS66512-2	A	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	0.11
			0.00			1/2" Ice	9.23	5.80	0.17
			0.50			1" Ice	10.33	6.60	0.23
QS66512-2	B	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	0.11
			0.00			1/2" Ice	9.23	5.80	0.17
			0.50			1" Ice	10.33	6.60	0.23
QS66512-2	C	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	0.11
			0.00			1/2" Ice	9.23	5.80	0.17
			0.50			1" Ice	10.33	6.60	0.23
OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	0.07
			0.00			1/2" Ice	10.13	5.97	0.13
			0.50			1" Ice	10.61	6.43	0.20
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	0.07
			0.00			1/2" Ice	10.13	5.97	0.13
			0.50			1" Ice	10.61	6.43	0.20
OPA-65R-LCUU-H6	C	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	0.07
			0.00			1/2" Ice	10.13	5.97	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.50			1" Ice	10.61	6.43	0.20
Flat Platform w/ Handrails	C	None		0.0000	151.50	No Ice	42.40	42.40	2.00
						1/2" Ice	48.40	48.40	2.45
						1" Ice	54.40	54.40	2.90
***									
KRY 112 144/2	A	From Leg	3.00	0.0000	142.00	No Ice	0.00	0.23	0.01
			0.00			1/2" Ice	0.00	0.30	0.01
			0.00			1" Ice	0.00	0.38	0.02
KRY 112 144/2	B	From Leg	3.00	0.0000	142.00	No Ice	0.00	0.23	0.01
			0.00			1/2" Ice	0.00	0.30	0.01
			0.00			1" Ice	0.00	0.38	0.02
KRY 112 144/2	C	From Leg	3.00	0.0000	142.00	No Ice	0.00	0.23	0.01
			0.00			1/2" Ice	0.00	0.30	0.01
			0.00			1" Ice	0.00	0.38	0.02
KRY 112 489/2	A	From Leg	3.00	0.0000	142.00	No Ice	0.00	0.36	0.02
			0.00			1/2" Ice	0.00	0.44	0.02
			0.00			1" Ice	0.00	0.54	0.03
KRY 112 489/2	B	From Leg	3.00	0.0000	142.00	No Ice	0.00	0.36	0.02
			0.00			1/2" Ice	0.00	0.44	0.02
			0.00			1" Ice	0.00	0.54	0.03
KRY 112 489/2	C	From Leg	3.00	0.0000	142.00	No Ice	0.00	0.36	0.02
			0.00			1/2" Ice	0.00	0.44	0.02
			0.00			1" Ice	0.00	0.54	0.03
Radio 4449 B12,B71	A	From Leg	3.00	0.0000	142.00	No Ice	1.64	1.16	0.07
			0.00			1/2" Ice	2.20	1.55	0.90
			0.00			1" Ice	2.76	1.94	1.73
Radio 4449 B12,B71	B	From Leg	3.00	0.0000	142.00	No Ice	1.64	1.16	0.07
			0.00			1/2" Ice	2.20	1.55	0.90
			0.00			1" Ice	2.76	1.94	1.73
Radio 4449 B12,B71	C	From Leg	3.00	0.0000	142.00	No Ice	1.64	1.16	0.07
			0.00			1/2" Ice	2.20	1.55	0.90
			0.00			1" Ice	2.76	1.94	1.73
AIR32 B66Aa/B2a	A	From Leg	3.00	0.0000	142.00	No Ice	6.51	2.70	0.13
			0.00			1/2" Ice	7.78	3.22	0.18
			0.00			1" Ice	9.05	3.74	0.22
AIR32 B66Aa/B2a	B	From Leg	3.00	0.0000	142.00	No Ice	6.51	2.70	0.13
			0.00			1/2" Ice	7.78	3.22	0.18
			0.00			1" Ice	9.05	3.74	0.22
AIR32 B66Aa/B2a	C	From Leg	3.00	0.0000	142.00	No Ice	6.51	2.70	0.13
			0.00			1/2" Ice	7.78	3.22	0.18
			0.00			1" Ice	9.05	3.74	0.22
APXVAARR24_43-U-NA20	A	From Leg	3.00	0.0000	142.00	No Ice	20.24	5.15	0.13
			0.00			1/2" Ice	23.53	5.99	0.24
			0.00			1" Ice	26.82	6.83	0.35
APXVAARR24_43-U-NA20	B	From Leg	3.00	0.0000	142.00	No Ice	20.24	5.15	0.13
			0.00			1/2" Ice	23.53	5.99	0.24
			0.00			1" Ice	26.82	6.83	0.35
APXVAARR24_43-U-NA20	C	From Leg	3.00	0.0000	142.00	No Ice	20.24	5.15	0.13
			0.00			1/2" Ice	23.53	5.99	0.24
			0.00			1" Ice	26.82	6.83	0.35
Round Platform w/ Handrails	C	None		0.0000	127.00	No Ice	27.20	27.20	2.00
						1/2" Ice	34.20	34.20	2.40
						1" Ice	41.20	41.20	2.80
***									
RRH2x50-08	A	From Face	3.00	0.0000	127.00	No Ice	1.70	1.10	0.05
			0.00			1/2" Ice	2.27	1.80	0.07
			0.00			1" Ice	2.84	2.50	0.09

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
RRH2x50-08	B	From Face	3.00	0.0000	127.00	No Ice	1.70	1.10	0.05
			0.00			1/2" Ice	2.27	1.80	0.07
			0.00			1" Ice	2.84	2.50	0.09
RRH2x50-08	C	From Face	3.00	0.0000	127.00	No Ice	1.70	1.10	0.05
			0.00			1/2" Ice	2.27	1.80	0.07
			0.00			1" Ice	2.84	2.50	0.09
800 MHz 2X50W RRH w/ Filter	A	From Leg	3.00	0.0000	134.00	No Ice	0.00	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
800 MHz 2X50W RRH w/ Filter	B	From Leg	3.00	0.0000	134.00	No Ice	0.00	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
800 MHz 2X50W RRH w/ Filter	C	From Leg	3.00	0.0000	134.00	No Ice	0.00	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
(2) 4x40W RRH (88 lb)	A	From Leg	3.00	0.0000	127.00	No Ice	0.00	3.80	0.09
			0.00			1/2" Ice	0.00	4.06	0.12
			0.00			1" Ice	0.00	4.34	0.15
(2) 4x40W RRH (88 lb)	C	From Leg	3.00	0.0000	127.00	No Ice	0.00	3.80	0.09
			0.00			1/2" Ice	0.00	4.06	0.12
			0.00			1" Ice	0.00	4.34	0.15
(2) 4x40W RRH (88 lb)	B	From Leg	3.00	0.0000	127.00	No Ice	0.00	3.80	0.09
			0.00			1/2" Ice	0.00	4.06	0.12
			0.00			1" Ice	0.00	4.34	0.15
TD-RRH8x20	A	From Face	3.00	0.0000	127.00	No Ice	0.00	1.40	0.07
			0.00			1/2" Ice	4.59	1.61	0.09
			0.00			1" Ice	4.88	1.82	0.12
TD-RRH8x20	B	From Face	3.00	0.0000	127.00	No Ice	0.00	1.40	0.07
			0.00			1/2" Ice	4.59	1.61	0.09
			0.00			1" Ice	4.88	1.82	0.12
TD-RRH8x20	C	From Face	3.00	0.0000	127.00	No Ice	0.00	1.40	0.07
			0.00			1/2" Ice	4.59	1.61	0.09
			0.00			1" Ice	4.88	1.82	0.12
APXVSPP18-C-A20	A	From Leg	3.00	0.0000	127.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	B	From Leg	3.00	0.0000	127.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXV9ERR18-C-A20	C	From Leg	3.00	0.0000	127.00	No Ice	8.02	5.81	0.06
			0.00			1/2" Ice	8.48	6.27	0.11
			0.00			1" Ice	8.94	6.73	0.17
DT465B-2XR	A	From Leg	3.00	0.0000	127.00	No Ice	9.10	5.97	0.06
			0.00			1/2" Ice	9.56	6.43	0.12
			0.00			1" Ice	10.04	6.90	0.18
DT465B-2XR	B	From Leg	3.00	0.0000	127.00	No Ice	9.10	5.97	0.06
			0.00			1/2" Ice	9.56	6.43	0.12
			0.00			1" Ice	10.04	6.90	0.18
DT465B-2XR	C	From Leg	3.00	0.0000	127.00	No Ice	9.10	5.97	0.06
			0.00			1/2" Ice	9.56	6.43	0.12
			0.00			1" Ice	10.04	6.90	0.18
Round Platform w/ Handrails	C	None		0.0000	127.00	No Ice	27.20	27.20	2.00
						1/2" Ice	34.20	34.20	2.40
						1" Ice	41.20	41.20	2.80
***									
RRH2X60-AWS	A	From Leg	3.00	0.0000	119.00	No Ice	0.00	1.49	0.04
			0.00			1/2" Ice	0.00	1.67	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				0.00			1" Ice	2.61	1.86	0.08
RRH2X60-AWS	B	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.49	0.04
				0.00			1/2" Ice	0.00	1.67	0.06
				0.00			1" Ice	2.61	1.86	0.08
RRH2X60-AWS	C	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.49	0.04
				0.00			1/2" Ice	0.00	1.67	0.06
				0.00			1" Ice	2.61	1.86	0.08
RRH2X60-1900	A	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.22	0.04
				0.00			1/2" Ice	0.00	1.31	0.05
				0.00			1" Ice	2.14	1.40	0.06
RRH2X60-1900	B	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.22	0.04
				0.00			1/2" Ice	0.00	1.31	0.05
				0.00			1" Ice	2.14	1.40	0.06
RRH2X60-1900	C	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.22	0.04
				0.00			1/2" Ice	0.00	1.31	0.05
				0.00			1" Ice	2.14	1.40	0.06
(2) SBNHH-1D65B	A	From Leg	3.00		0.0000	119.00	No Ice	8.17	5.41	0.05
				0.00			1/2" Ice	8.63	5.86	0.10
				0.00			1" Ice	9.10	6.33	0.16
(2) SBNHH-1D65B	B	From Leg	3.00		0.0000	119.00	No Ice	8.17	5.41	0.05
				0.00			1/2" Ice	8.63	5.86	0.10
				0.00			1" Ice	9.10	6.33	0.16
(2) SBNHH-1D65B	C	From Leg	3.00		0.0000	119.00	No Ice	8.17	5.41	0.05
				0.00			1/2" Ice	8.63	5.86	0.10
				0.00			1" Ice	9.10	6.33	0.16
DB-T1-6Z-8AB-0Z	B	From Leg	0.50		0.0000	119.00	No Ice	4.80	2.00	0.04
				0.00			1/2" Ice	5.07	2.19	0.08
				0.00			1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	C	From Leg	0.50		0.0000	119.00	No Ice	4.80	2.00	0.04
				0.00			1/2" Ice	5.07	2.19	0.08
				0.00			1" Ice	5.35	2.39	0.12
LNX-6514DS-A1M	A	From Leg	3.00		0.0000	119.00	No Ice	8.17	5.41	0.04
				0.00			1/2" Ice	8.63	5.86	0.09
				0.00			1" Ice	9.10	6.33	0.15
LNX-6514DS-A1M	B	From Leg	3.00		0.0000	119.00	No Ice	8.17	5.41	0.04
				0.00			1/2" Ice	8.63	5.86	0.09
				0.00			1" Ice	9.10	6.33	0.15
LNX-6514DS-A1M	C	From Leg	3.00		0.0000	119.00	No Ice	8.17	5.41	0.04
				0.00			1/2" Ice	8.63	5.86	0.09
				0.00			1" Ice	9.10	6.33	0.15
RRH2x60 700	A	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.61	0.06
				0.00			1/2" Ice	0.00	1.72	0.07
				0.00			1" Ice	2.43	1.83	0.08
RRH2x60 700	B	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.61	0.06
				0.00			1/2" Ice	0.00	1.72	0.07
				0.00			1" Ice	2.43	1.83	0.08
RRH2x60 700	C	From Leg	3.00		0.0000	119.00	No Ice	0.00	1.61	0.06
				0.00			1/2" Ice	0.00	1.72	0.07
				0.00			1" Ice	2.43	1.83	0.08
(2) LPA-80063-6CF-EDIN-X	A	From Leg	3.00		0.0000	119.00	No Ice	9.73	9.06	0.03
				0.00			1/2" Ice	11.07	9.61	0.10
				0.00			1" Ice	11.64	10.16	0.18
(2) LPA-80063-6CF-EDIN-X	B	From Leg	3.00		0.0000	119.00	No Ice	9.73	9.06	0.03
				0.00			1/2" Ice	11.07	9.61	0.10
				0.00			1" Ice	11.64	10.16	0.18
(2) LPA-80063-6CF-EDIN-X	C	From Leg	3.00		0.0000	119.00	No Ice	9.73	9.06	0.03
				0.00			1/2" Ice	11.07	9.61	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Round Low Profile Platform	C	None	0.00	0.0000	119.00	1" Ice	11.64	10.16	0.18
						No Ice	21.70	21.70	1.50
						1/2" Ice	27.20	27.20	1.70
						1" Ice	32.70	32.70	1.90
***									
CBC23SR-43	A	From Leg	3.00	0.0000	152.00	No Ice	0.00	0.15	0.01
			0.00			1/2" Ice	0.00	0.17	0.01
			0.00			1" Ice	0.54	0.19	0.01
CBC23SR-43	B	From Leg	3.00	0.0000	152.00	No Ice	0.00	0.15	0.01
			0.00			1/2" Ice	0.00	0.17	0.01
			0.00			1" Ice	0.54	0.19	0.01
CBC23SR-43	C	From Leg	3.00	0.0000	152.00	No Ice	0.00	0.15	0.01
			0.00			1/2" Ice	0.00	0.17	0.01
			0.00			1" Ice	0.54	0.19	0.01
DC6-48-60-0-8C-EV	A	From Leg	3.00	0.0000	152.00	No Ice	1.02	1.02	0.02
			0.00			1/2" Ice	1.10	1.10	0.02
			0.00			1" Ice	1.18	1.18	0.02
ION-M23 SDARS	A	From Leg	3.00	0.0000	152.00	No Ice	1.84	1.76	0.05
			0.00			1/2" Ice	2.02	1.94	0.06
			0.00			1" Ice	2.20	2.12	0.07
ION-M23 SDARS	B	From Leg	3.00	0.0000	152.00	No Ice	1.84	1.76	0.05
			0.00			1/2" Ice	2.02	1.94	0.06
			0.00			1" Ice	2.20	2.12	0.07
ION-M23 SDARS	C	From Leg	3.00	0.0000	152.00	No Ice	1.84	1.76	0.05
			0.00			1/2" Ice	2.02	1.94	0.06
			0.00			1" Ice	2.20	2.12	0.07

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	151.5 - 141	1.861	40	1.2295	0.0018
L2	141 - 120.33	1.639	40	1.1929	0.0010
L3	120.33 - 111.19	1.228	40	1.0935	0.0013
L4	111.19 - 82.08	1.057	40	1.0457	0.0013
L5	82.08 - 70.06	0.583	40	0.8030	0.0011
L6	70.06 - 42.24	0.425	40	0.6942	0.0010
L7	42.24 - 32.71	0.155	40	0.4134	0.0005
L8	32.71 - 0	0.093	40	0.3226	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
152.00	CBC23SR-43	40	1.861	1.2295	0.0018	19852
151.50	(2) TPX-070821	40	1.861	1.2295	0.0018	19852
142.00	KRY 112 144/2	40	1.660	1.1968	0.0011	11032
134.00	800 MHz 2X50W RRH w/ Filter	40	1.496	1.1620	0.0011	10721
127.00	Round Platform w/ Handrails	40	1.357	1.1272	0.0012	12383

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
119.00	RRH2X60-AWS	40	1.203	1.0869	0.0013	12734

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	151.5 - 141	8.761	4	5.7910	0.0087
L2	141 - 120.33	7.715	4	5.6248	0.0052
L3	120.33 - 111.19	5.779	4	5.1582	0.0061
L4	111.19 - 82.08	4.974	4	4.9312	0.0062
L5	82.08 - 70.06	2.742	4	3.7839	0.0051
L6	70.06 - 42.24	2.001	4	3.2700	0.0044
L7	42.24 - 32.71	0.728	4	1.9459	0.0025
L8	32.71 - 0	0.439	4	1.5183	0.0019

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
152.00	CBC23SR-43	4	8.761	5.7910	0.0087	4372
151.50	(2) TPX-070821	4	8.761	5.7910	0.0087	4372
142.00	KRY 112 144/2	4	7.813	5.6428	0.0055	2428
134.00	800 MHz 2X50W RRH w/ Filter	4	7.039	5.4812	0.0054	2343
127.00	Round Platform w/ Handrails	4	6.385	5.3178	0.0059	2675
119.00	RRH2X60-AWS	4	5.659	5.1270	0.0061	2738

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	151.5 - 141 (1)	TP17.7841x17.1872x0.24	10.50	0.00	0.0	13.5581	-5.86	999.37	0.006
L2	141 - 120.33 (2)	TP31.557x17.7841x0.3059	20.67	0.00	0.0	30.7823	-14.58	2146.63	0.007
L3	120.33 - 111.19 (3)	TP33.028x31.557x0.3063	9.14	0.00	0.0	32.2730	-18.69	2210.95	0.008
L4	111.19 - 82.08 (4)	TP38.347x33.028x0.3141	29.11	0.00	0.0	38.4666	-24.48	2491.00	0.010
L5	82.08 - 70.06 (5)	TP39.711x38.347x0.3804	12.02	0.00	0.0	48.1756	-27.54	3343.96	0.008
L6	70.06 - 42.24 (6)	TP43.95x39.711x0.4014	27.82	0.00	0.0	56.2869	-35.54	3831.48	0.009

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L7	42.24 - 32.71 (7)	TP45.064x43.95x0.4706	9.53	0.00	0.0	67.5738	-38.85	4843.91	0.008
L8	32.71 - 0 (8)	TP49.552x45.064x0.4906	32.71	0.00	0.0	77.5039	-51.09	5448.80	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	151.5 - 141 (1)	TP17.7841x17.1872x0.24	59.387	355.165	0.167	0.000	355.165	0.000
L2	141 - 120.33 (2)	TP31.557x17.7841x0.3059	274.543	1364.167	0.201	0.000	1364.167	0.000
L3	120.33 - 111.19 (3)	TP33.028x31.557x0.3063	460.516	1471.783	0.313	0.000	1471.783	0.000
L4	111.19 - 82.08 (4)	TP38.347x33.028x0.3141	1187.117	1929.458	0.615	0.000	1929.458	0.000
L5	82.08 - 70.06 (5)	TP39.711x38.347x0.3804	1534.967	2674.767	0.574	0.000	2674.767	0.000
L6	70.06 - 42.24 (6)	TP43.95x39.711x0.4014	2437.783	3394.933	0.718	0.000	3394.933	0.000
L7	42.24 - 32.71 (7)	TP45.064x43.95x0.4706	2776.933	4389.167	0.633	0.000	4389.167	0.000
L8	32.71 - 0 (8)	TP49.552x45.064x0.4906	4022.275	5434.942	0.740	0.000	5434.942	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	151.5 - 141 (1)	TP17.7841x17.1872x0.24	7.68	499.68	0.015	0.294	723.490	0.000
L2	141 - 120.33 (2)	TP31.557x17.7841x0.3059	14.99	1073.31	0.014	0.522	2775.267	0.000
L3	120.33 - 111.19 (3)	TP33.028x31.557x0.3063	22.23	1105.48	0.020	0.088	2993.775	0.000
L4	111.19 - 82.08 (4)	TP38.347x33.028x0.3141	27.82	1245.50	0.022	1.169	3923.292	0.000
L5	82.08 - 70.06 (5)	TP39.711x38.347x0.3804	30.07	1671.98	0.018	1.675	5441.350	0.000
L6	70.06 - 42.24 (6)	TP43.95x39.711x0.4014	34.86	1915.74	0.018	2.831	6905.350	0.000
L7	42.24 - 32.71 (7)	TP45.064x43.95x0.4706	36.33	2421.95	0.015	3.205	8931.667	0.000
L8	32.71 - 0 (8)	TP49.552x45.064x0.4906	39.80	2724.40	0.015	3.202	11057.667	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	151.5 - 141 (1)	0.006	0.167	0.000	0.015	0.000	0.173 ✔	1.000	4.8.2 ✔
L2	141 - 120.33 (2)	0.007	0.201	0.000	0.014	0.000	0.208 ✔	1.000	4.8.2 ✔
L3	120.33 - 111.19 (3)	0.008	0.313	0.000	0.020	0.000	0.322 ✔	1.000	4.8.2 ✔
L4	111.19 - 82.08 (4)	0.010	0.615	0.000	0.022	0.000	0.626 ✔	1.000	4.8.2 ✔
L5	82.08 - 70.06 (5)	0.008	0.574	0.000	0.018	0.000	0.582 ✔	1.000	4.8.2 ✔
L6	70.06 - 42.24 (6)	0.009	0.718	0.000	0.018	0.000	0.728 ✔	1.000	4.8.2 ✔
L7	42.24 - 32.71 (7)	0.008	0.633	0.000	0.015	0.000	0.641 ✔	1.000	4.8.2 ✔
L8	32.71 - 0 (8)	0.009	0.740	0.000	0.015	0.000	0.750 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	151.5 - 141	Pole	TP17.7841x17.1872x0.24	1	-5.86	999.37	17.3	Pass
L2	141 - 120.33	Pole	TP31.557x17.7841x0.3059	2	-14.58	2146.63	20.8	Pass
L3	120.33 - 111.19	Pole	TP33.028x31.557x0.3063	3	-18.69	2210.95	32.2	Pass
L4	111.19 - 82.08	Pole	TP38.347x33.028x0.3141	4	-24.48	2491.00	62.6	Pass
L5	82.08 - 70.06	Pole	TP39.711x38.347x0.3804	5	-27.54	3343.96	58.2	Pass
L6	70.06 - 42.24	Pole	TP43.95x39.711x0.4014	6	-35.54	3831.48	72.8	Pass
L7	42.24 - 32.71	Pole	TP45.064x43.95x0.4706	7	-38.85	4843.91	64.1	Pass
L8	32.71 - 0	Pole	TP49.552x45.064x0.4906	8	-51.09	5448.80	75.0	Pass
							Summary	
						Pole (L8)	75.0	Pass
						RATING =	**75.0**	**Pass**

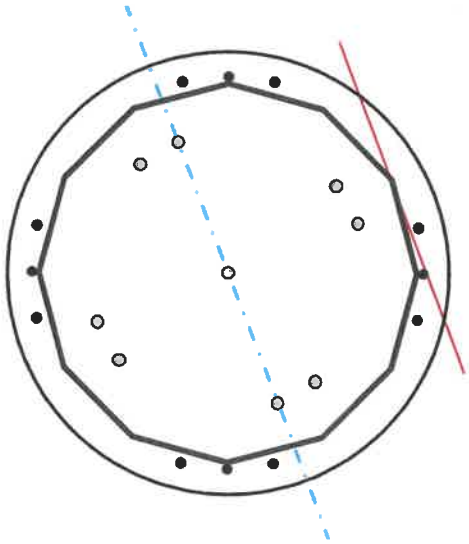
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	12	-
Diameter	51	in
Thickness	0.75	in
Orientation Offset		°

Base Reactions		
Moment, Mu	4022.2	k-ft
Axial, Pu	51.1	k
Shear, Vu	39.8	k
Neutral Axis	291	°

Report Capacities		
Component	Capacity	Result
Base Plate	20%	Pass
Anchor Rods	89%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, ø	62	in
Thickness	2	in
Grade	A633 Gr. E	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	80	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	313.7	k
Bending Stress, ϕMn	1563.2	k



Original Anchor Rods		
Arrangement	Cluster	-
Quantity	12	-
Diameter, ø	1 3/4	in
Bolt Circle	55	in
Grade	Other	
Yield Strength, Fy	128	ksi
Tensile Strength, Fu	150	ksi
Spacing	6.5	in
Orientation Offset	45	°
Applied Force, Pu	185.9	k
Anchor Rods, ϕPn	227.9	k

Additional Anchor Rods		
Quantity	8	-
Diameter, ø	2.25	in
Bolt Circle	39	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Bypass Base?	No	
Orientation Offset		°
Applied Force, Pu	226.2	k
Additional Rod, ϕPn	259.8	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	39.8	4022.2	1.00
Anchor Rod Forces	35.9	2555.9	0.64
Additional Bolt (Grp1) Forces	3.9	1466.3	0.36
Additional Bolt (Grp2) Forces			
Dywidag Forces			
Stiffener Forces			

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	117.0509	9.7542	1.8426		36967.22
Bolt	2.4053	1.8995	0.2871	5	8622.24
Bolt1	3.9761	3.2477	0.8393	4.5	4946.45
Bolt2					
Dywidag					
Stiffener					

Base Plate		
Shape	Round	-
Diameter, D	62	in
Thickness, t	2	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	80	ksi
Base Plate Chord	35.256	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

External Base Plate		
Chord Length AA	24.949	in
Additional AA	4.000	in
Section Modulus, Z	28.949	in^3
Applied Moment, Mu	313.7	k-ft
Bending Capacity, ϕMn	1563.2	k-ft
Capacity, Mu/ϕMn	0.201	OK
Chord Length AB	20.829	in
Additional AB	4.000	in
Section Modulus, Z	24.829	in^3
Applied Moment, Mu	137.2	k-ft
Bending Capacity, ϕMn	1340.8	k-ft
Capacity, Mu/ϕMn	0.102	OK
Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in^3
Applied Moment, Mu	#N/A	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

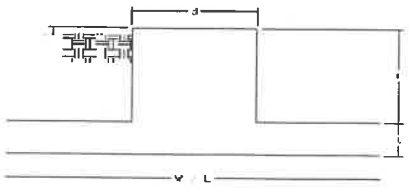
Internal Base Plate		
Arc Length	0.000	in
Section Modulus, Z	0.000	in^3
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

Anchor Rods		
Anchor Rod Quantity, N	12	-
Rod Diameter, d	1.75	in
Bolt Circle, BC	55	in
Yield Strength, Fy	127.7	ksi
Tensile Strength, Fu	150	ksi
Applied Axial, Pu	185.9	k
Applied Shear, Vu	0.6	k
Compressive Capacity, ϕPn	227.9	k
Tensile Capacity, ϕRnt	0.815	OK
Interaction Capacity	0.820	OK

Additional Bolt Group 1		
Bolt Quantity, N	8	-
Bolt Diameter, d	2.25	in
Bolt Circle, BC	39	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	226.2	k
Applied Shear, Vu	2.5	k
Compressive Capacity, ϕPn	259.8	k
Compressive Capacity, ϕPn	0.871	OK
Interaction Capacity	0.888	OK

Site Name:	Brln-Berlin
Site Number:	302483
Engineering Number:	OAA754987
Engineer:	GDH
Date:	01/03/20
Tower Type:	MP

Program Last Updated: *10/17/2019*



Design Loads (Factored) - Analysis per TIA-222-G Standards

Design / Analysis / Mapping:	Mapping	
Compression/Leg:	51.09	k
Total Shear:	39.8	k
Moment:	4022.2	k-ft
Tower + Appurtenance Weight:	51.09	k
Depth to Base of Foundation (l + t - h):	8	ft
Diameter of Pier (d):	7	ft
Height of Pier above Ground (h):	0.5	ft
Width of Pad (W):	11	ft
Length of Pad (L):	11	ft
Thickness of Pad (t):	2.6	ft
Tower Leg Center to Center:	0	ft
Number of Tower Legs:	1	-
Tower Center from Mat Center:	0	ft
Depth Below Ground Surface to Water Table:	99	ft
Unit Weight of Concrete:	150	pcf
Unit Weight of Soil Above Water Table:	135	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	72.6	pcf
Friction Angle of Uplift:	35	°
Ultimate Coefficient of Shear Friction:	0.35	-
Ultimate Compressive Bearing Pressure:	26000	psf
Ultimate Passive Pressure on Pad Face:	500	psf
Factored Moment Applied to Rock Anchors	**3170**	**k-ft**
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9	-
ϕ_{Soil}:	0.75	-

Rock Anchor Usage		
Rock Anchor Resistance:	3360.0	k
Rock Anchor Tensile Resistance:	0.992	Result: OK

Overturning Moment Usage		
Design OTM:	4360.5	k-ft
Weight of Soil and Concrete OTM Resistance:	141.4	k
OTM Resistance from Soil and Concrete:	777.6	k-ft
OTM Resistance from Tower:	234.2	k-ft
OTM Resistance from Soil Facture:	428.1	k-ft
OTM Resistance from Passive Pressure on Pad Face:	16.5	k-ft
OTM Resistance:	4480.8	k-ft
Design OTM / OTM Resistance:	0.973	Result: OK

Soil Bearing Pressure Usage		
Total Weight (Foundation, Soil, Tower):	188.0	k
Factored Nominal Bearing Pressure:	19500	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.68	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

Sliding Factor of Safety		
Total Factored Sliding Resistance:	58.9	k
Sliding Design / Sliding Resistance:	0.68	Result: OK

SITESAFE®
RF COMPLIANCE EXPERTS

8618 Westwood Center Drive, Suite 315, Vienna, VA 22182
703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com

Empire Telecom on behalf of AT&T Mobility, LLC Site FA – 10034969 Site ID – CTL01014 USID – 25935 Site Name – BERLIN NE (MRCTB037929)

260 BECKLEY ROAD
BERLIN, CT 06037

Latitude: N41-37-54.17
Longitude: W72-43-47.70
Structure Type: Monopole

Report generated date: January 30, 2020
Report by: Leo Romero
Customer Contact: Nora Oliver

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

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Table of Contents

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1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Max Cumulative Simulated RFE Level at Antenna Level	3,439.0% General Public Limit
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
Compliant per FCC Rules and Regulations?	Will Be Compliant
Compliant per AT&T Mobility, LLC's Policy?	Yes

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

RFDS: 10034969.PM201.RFDS.01-09-2019_As-Built-In-Progress.CT1014

CD's: 10034969.AE201.FINAL S&S CDS.RFMod IP REPEATER.Rev1.09232019

RF Powers Used: MAX RRH Powers

1.2 Fall Arrest Anchor Point Summary

Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	N/A	N

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1.3 Signage Summary

a. Pre-Site Visit AT&T Signage (Existing Signage)

AT&T Signage Locations	 Information 1	 Information 2	 Notice	 Notice 2	 Caution	 Caution 2	 Warning	 Warning 2	 Barriers
Access Point(s)									
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

b. Proposed AT&T Signage

AT&T Signage Locations	 Information 1	 Information 2	 Notice	 Notice 2	 Caution	 Caution 2	 Warning	 Warning 2	 Barriers
Access Point(s)						1			
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

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2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- RF Exposure Diagram – Elevation View
- AT&T Mobility, LLC Contribution
- RF Exposure Diagram – Elevation View

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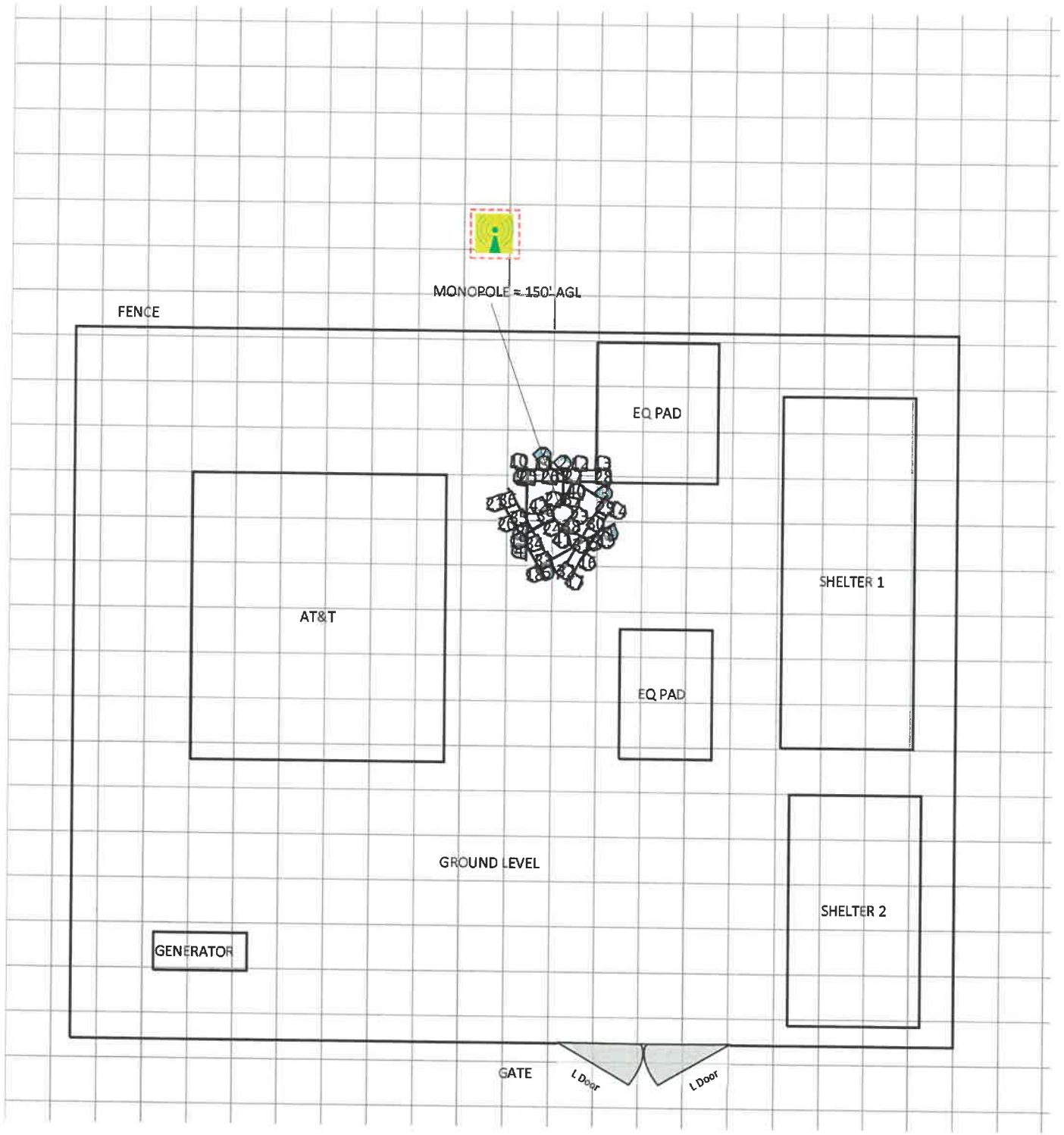
Site Scale Map For: BERLIN NE



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

(Feet)

0 5.8 11.6

www.sitesafe.com
Site Name:BERLIN NE
1/30/2020 11:55:59 AM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Warning 2 | Info 1 | Info 2 | RSP (RF Safety Plan)

Barrier

Proposed Barriers/ Signs

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)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Misc Loss	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	150	82	4.6	40	TPO	Watt	0	1	566.3	11.51	149.7'	0°	7°
2	AT&T MOBILITY LLC	Cci OPA-65R-LCUU-H6	Panel	737	LTE	40	66.4	6	60	TPO	Watt	0	1	942.2	11.96	149'	0°	9°
2	AT&T MOBILITY LLC	Cci OPA-65R-LCUU-H6*	Panel	2300	LTE	40	63.7	6	100	TPO	Watt	0	1	3206.3	15.06	149'	0°	6°
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	763	LTE	40	69	6	160	TPO	Watt	0	1	2239.3	11.46	149'	0°	9°
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	850	LTE	40	63	6	80	TPO	Watt	0	1	997.9	10.96	149'	0°	9°
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	5G 850	LTE	40	63	6	80	TPO	Watt	0	1	997.9	10.96	149'	0°	9°
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	40	68	6	160	TPO	Watt	0	1	4169.8	14.16	149'	0°	6°
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	2100	LTE	40	57	6	240	TPO	Watt	0	1	7181.4	14.76	149'	0°	6°
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	270	82	4.6	40	TPO	Watt	0	1	566.3	11.51	149.7'	2°	8°
5	AT&T MOBILITY LLC	Cci OPA-65R-LCUU-H6	Panel	737	LTE	150	66.4	6	60	TPO	Watt	0	1	942.2	11.96	149'	0°	6°
5	AT&T MOBILITY LLC	Cci OPA-65R-LCUU-H6*	Panel	2300	LTE	150	63.7	6	100	TPO	Watt	0	1	3206.3	15.06	149'	0°	5°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	763	LTE	150	69	6	160	TPO	Watt	0	1	2239.3	11.46	149'	0°	6°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	850	LTE	150	63	6	80	TPO	Watt	0	1	997.9	10.96	149'	0°	6°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	5G 850	LTE	150	63	6	80	TPO	Watt	0	1	997.9	10.96	149'	0°	6°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	150	68	6	160	TPO	Watt	0	1	4169.8	14.16	149'	0°	5°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	2100	LTE	150	57	6	240	TPO	Watt	0	1	7181.4	14.76	149'	0°	5°
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	40	82	4.6	40	TPO	Watt	0	1	566.3	11.51	149.7'	1°	6°
8	AT&T MOBILITY LLC	Cci OPA-65R-LCUU-H6	Panel	737	LTE	270	66.4	6	60	TPO	Watt	0	1	942.2	11.96	149'	0°	8°
8	AT&T MOBILITY LLC	Cci OPA-65R-LCUU-H6*	Panel	2300	LTE	270	63.7	6	100	TPO	Watt	0	1	3206.3	15.06	149'	0°	6°
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	763	LTE	270	69	6	160	TPO	Watt	0	1	2239.3	11.46	149'	0°	8°
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	850	LTE	270	63	6	80	TPO	Watt	0	1	997.9	10.96	149'	0°	8°
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	5G 850	LTE	270	63	6	80	TPO	Watt	0	1	997.9	10.96	149'	0°	8°
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	270	68	6	160	TPO	Watt	0	1	4169.8	14.16	149'	0°	6°
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	2100	LTE	270	57	6	240	TPO	Watt	0	1	7181.4	14.76	149'	0°	6°
10	UNKNOWN CARRIER	Generic Panel	Panel	850		0	65	6.3	120	TPO	Watt	0	0	2643.5	13.43	92.9'	0°	0°
11	UNKNOWN CARRIER	Generic Panel	Panel	1900		0	65	6.3	120	TPO	Watt	0	0	5072	16.26	92.9'	0°	0°
12	UNKNOWN CARRIER	Generic Panel	Panel	700		0	65	6.3	120	TPO	Watt	0	0	2163.6	12.56	92.9'	0°	0°
13	UNKNOWN CARRIER	Generic Panel	Panel	2100		0	65	6.3	120	TPO	Watt	0	0	4287.3	15.53	92.9'	0°	0°
14	UNKNOWN CARRIER	Generic Panel	Panel	850		120	65	6.3	120	TPO	Watt	0	0	2643.5	13.43	92.9'	0°	0°
15	UNKNOWN CARRIER	Generic Panel	Panel	1900		120	65	6.3	120	TPO	Watt	0	0	5072	16.26	92.9'	0°	0°
16	UNKNOWN CARRIER	Generic Panel	Panel	700		120	65	6.3	120	TPO	Watt	0	0	2163.6	12.56	92.9'	0°	0°
17	UNKNOWN CARRIER	Generic Panel	Panel	2100		120	65	6.3	120	TPO	Watt	0	0	4287.3	15.53	92.9'	0°	0°

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Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Misc Loss	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
18	UNKNOWN CARRIER	Generic Panel	Panel	850		240	65	6.3	120	TPO	Watt	0	0	2643.5	13.43	92.9'	0°	0°
19	UNKNOWN CARRIER	Generic Panel	Panel	1900		240	65	6.3	120	TPO	Watt	0	0	5072	16.26	92.9'	0°	0°
20	UNKNOWN CARRIER	Generic Panel	Panel	700		240	65	6.3	120	TPO	Watt	0	0	2163.6	12.56	92.9'	0°	0°
21	UNKNOWN CARRIER	Generic Panel	Panel	2100		240	65	6.3	120	TPO	Watt	0	0	4287.3	15.53	92.9'	0°	0°
22	UNKNOWN CARRIER	Generic Panel	Panel	1900		0	65	6.3	120	TPO	Watt	0	0	5072	16.26	102.9'	0°	0°
23	UNKNOWN CARRIER	Generic Panel	Panel	1900		120	65	6.3	120	TPO	Watt	0	0	5072	16.26	102.9'	0°	0°
24	UNKNOWN CARRIER	Generic Panel	Panel	1900		240	65	6.3	120	TPO	Watt	0	0	5072	16.26	102.9'	0°	0°
25	UNKNOWN CARRIER	Generic Panel	Panel	850		0	65	6.3	80	TPO	Watt	0	0	1762.3	13.43	114.9'	0°	0°
26	UNKNOWN CARRIER	Generic Panel	Panel	1900		0	65	6.3	80	TPO	Watt	0	0	3381.3	16.26	114.9'	0°	0°
27	UNKNOWN CARRIER	Generic Panel	Panel	850		0	65	6.3	80	TPO	Watt	0	0	1762.3	13.43	114.9'	0°	0°
28	UNKNOWN CARRIER	Generic Panel	Panel	1900		0	65	6.3	80	TPO	Watt	0	0	3381.3	16.26	114.9'	0°	0°
29	UNKNOWN CARRIER	Generic Panel	Panel	850		120	65	6.3	80	TPO	Watt	0	0	1762.3	13.43	114.9'	0°	0°
30	UNKNOWN CARRIER	Generic Panel	Panel	1900		120	65	6.3	80	TPO	Watt	0	0	3381.3	16.26	114.9'	0°	0°
31	UNKNOWN CARRIER	Generic Panel	Panel	850		120	65	6.3	80	TPO	Watt	0	0	1762.3	13.43	114.9'	0°	0°
32	UNKNOWN CARRIER	Generic Panel	Panel	1900		120	65	6.3	80	TPO	Watt	0	0	3381.3	16.26	114.9'	0°	0°
33	UNKNOWN CARRIER	Generic Panel	Panel	850		240	65	6.3	80	TPO	Watt	0	0	1762.3	13.43	114.9'	0°	0°
34	UNKNOWN CARRIER	Generic Panel	Panel	1900		240	65	6.3	80	TPO	Watt	0	0	3381.3	16.26	114.9'	0°	0°
35	UNKNOWN CARRIER	Generic Panel	Panel	850		240	65	6.3	80	TPO	Watt	0	0	1762.3	13.43	114.9'	0°	0°
36	UNKNOWN CARRIER	Generic Panel	Panel	1900		240	65	6.3	80	TPO	Watt	0	0	3381.3	16.26	114.9'	0°	0°
37	UNKNOWN CARRIER	Generic Panel	Panel	1900		0	65	6.3	120	TPO	Watt	0	0	5072	16.26	123.9'	0°	0°
38	UNKNOWN CARRIER	Generic Panel	Panel	1900		120	65	6.3	120	TPO	Watt	0	0	5072	16.26	123.9'	0°	0°
39	UNKNOWN CARRIER	Generic Panel	Panel	1900		240	65	6.3	120	TPO	Watt	0	0	5072	16.26	123.9'	0°	0°
40	UNKNOWN CARRIER	Generic Panel	Panel	1900		0	65	6.3	120	TPO	Watt	0	0	5072	16.26	138.9'	0°	0°
41	UNKNOWN CARRIER	Generic Panel	Panel	1900		120	65	6.3	120	TPO	Watt	0	0	5072	16.26	138.9'	0°	0°
42	UNKNOWN CARRIER	Generic Panel	Panel	1900		240	65	6.3	120	TPO	Watt	0	0	5072	16.26	138.9'	0°	0°

Note: The Z reference indicates the bottom of the antenna height **above the ground level (AGL).** 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. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

***Note:** A SDARS Remote radio is being added to an existing antenna.

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4 Emission Predictions

In the RF Exposure 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 total analyzed elevations in the below RF Exposure Simulations are listed below.

- Ground Level = 0'

The Antenna Inventory heights are referenced to the same level.

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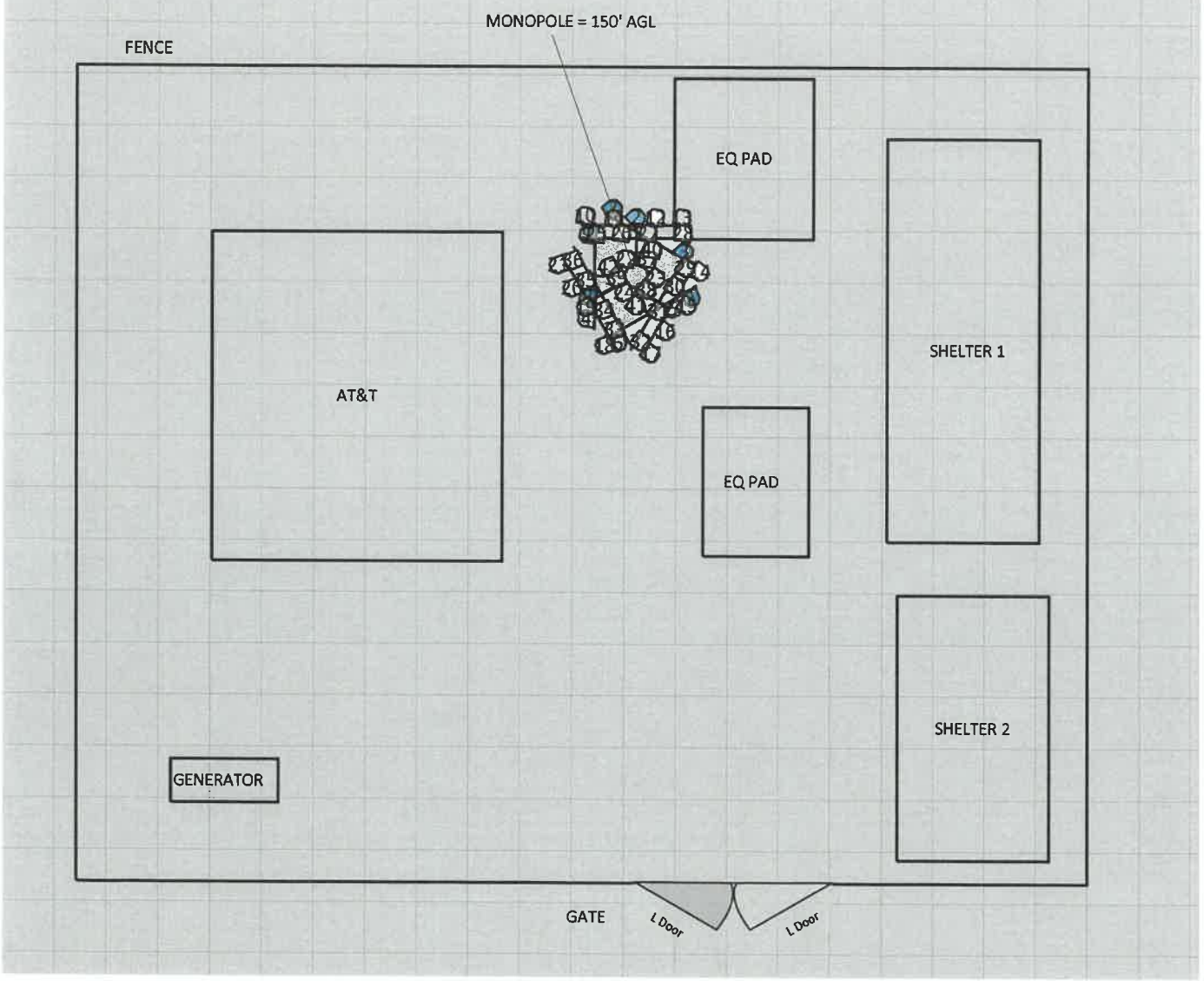
RF Exposure Simulation For: BERLIN NE
Composite Diagram



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

% of FCC Public Exposure Limit
>= 5000 | >= 500 | >= 100 | >= 5 | < 5

Carrier Identification
AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

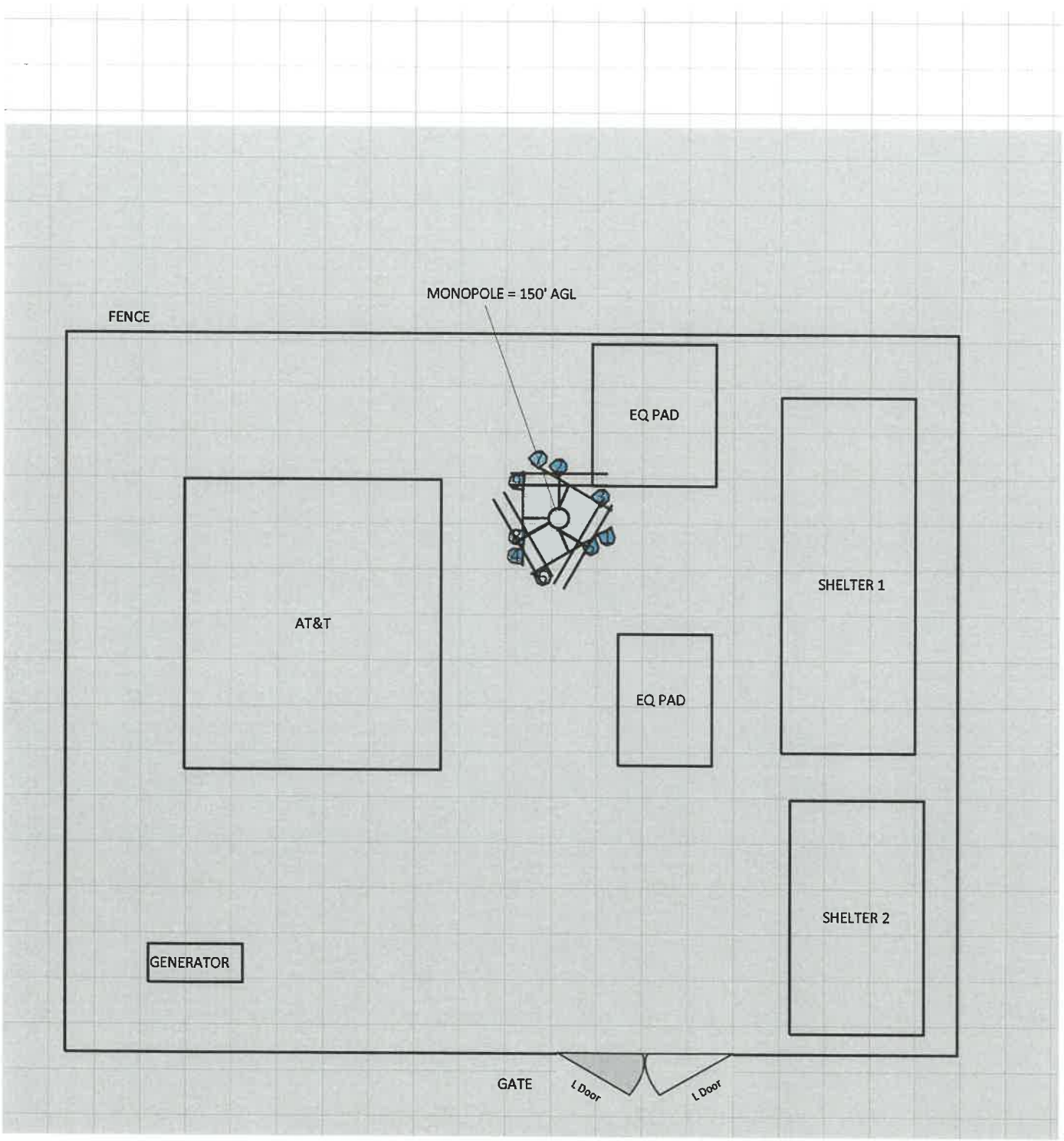
Proposed Barriers/ Signs

(Feet)
0 5.8 11.6

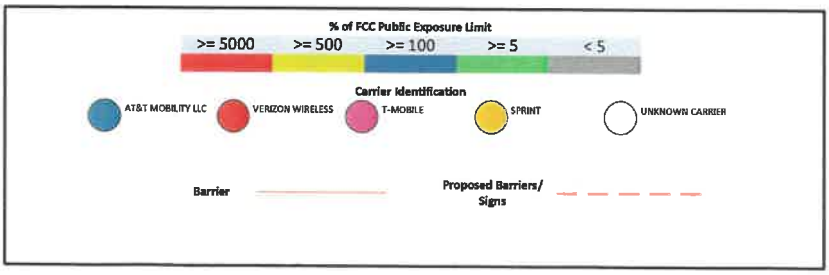
www.sitesafe.com
Site Name:BERLIN NE
1/30/2020 11:17:18 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: BERLIN NE
AT&T Mobility, LLC Contribution



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



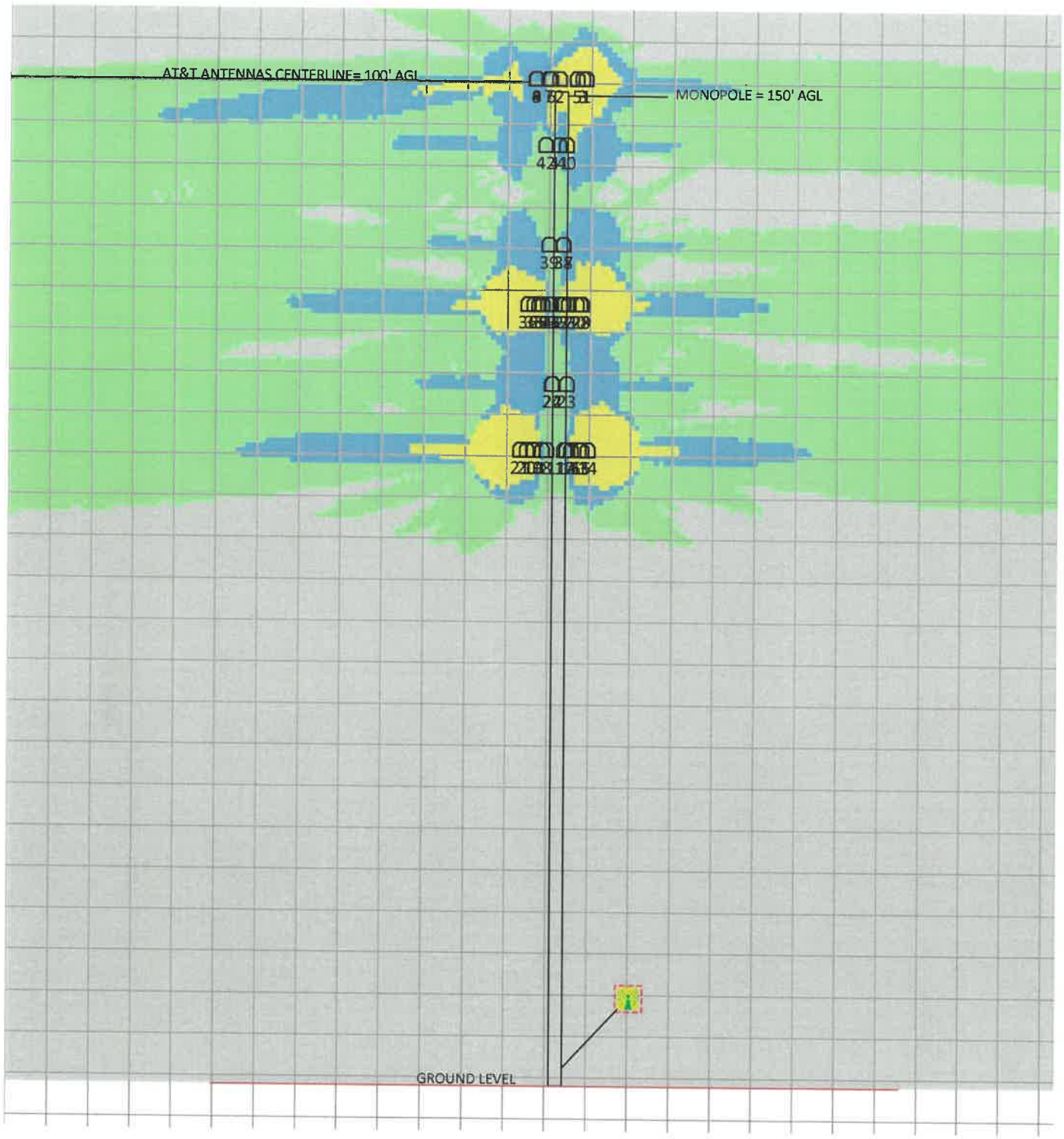
(Feet)

0 5.8 11.6

www.sitesafe.com
Site Name:BERLIN NE
1/30/2020 11:18:18 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: BERLIN NE
Elevation View



% of FCC Public Exposure Limit

% of FCC Public Exposure Limit
>= 5000 | >= 500 | >= 100 | >= 5 | < 5

Carrier Identification
AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

(Feet)
0 11.2 22.5

www.sitesafe.com
Site Name:BERLIN NE
1/30/2020 11:41:55 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

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 in Section 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.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Base of Monopole

(1) Yellow Caution 2B sign(s) required.

Notes:

- Any existing signage that conflicts with the proposed signage in this report should be removed per AT&T Signage Posting Rules.
- Signage may already be in place. Sitesafe does not have record of any existing signage because there were no previous visits or data supplied regarding them. All remediation is based on a worst-case scenario.

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6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Site Safe, LLC, in Vienna, 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 Electromagnetic Fields; 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 Leo Romero.

January 30, 2020

Young Min Kim

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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.

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Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications 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.

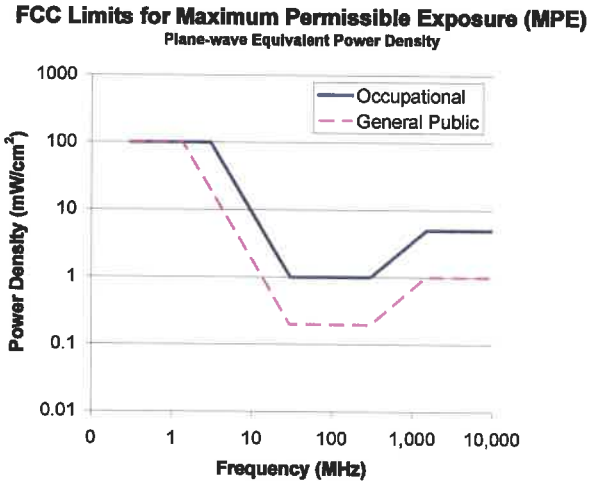
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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:



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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 Lockout/Tagout procedure aimed to control the unexpected energization or startup of machines when maintenance or service is being performed.

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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 worker's 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.

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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. **Gray areas are accessible to anyone.**
- 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.

If trained occupational personnel require access to areas that are delineated as above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the carriers to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

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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 modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

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.

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Appendix F – 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 for taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site complies with FCC standards with regards to Human Exposure to Radio Frequency Electromagnetic Fields 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) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to a half-wave dipole antenna.

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

General Population/Uncontrolled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **unaware** of the potential for exposure and who have no control over 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 its 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 rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

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Occupational/Controlled Environment – Defined by the FCC as an area where RF 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 RF exposure 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 Exposure or Electromagnetic Fields – Electromagnetic waves that are propagated from antennas through space.

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 energy a 6-foot tall human body will absorb while present in an electromagnetic field of energy.

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.

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Appendix G – References

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

Site Safe, LLC
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-Ionizing Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

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Create Label | Preferences | Shipping History | Address Book

Label Details

Account # 161958927

Label Number:
9405503699300257513338

SCAN® Form: 947570369930034305911 8

Terms
Acceptance Cutoff: 02/14/2020 4:30 PM
Acceptance Time: 02/21/2020 9:33 AM
Expected Date: 02/18/2020 11:59 PM
Delivery Status: Delivered, In/At Mailbox
Label Actions 2020-02-24 11:58:00.0

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
MORIAH KING
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
moking@empiretelecomm.com

Delivery Address:
ELAINE & JOHN MATULIS
260 BECKLEY RD
BERLIN, CT 06037-2506

Package:
Ship Date: 02/14/20
Value: $50.00
Weight: 1 lbs 0 oz
From: 01862
Label Type: Batch

Service:
Priority Mail® 2-Day
USPS Tracking®

Feedback

Transaction Number: 484233230
Transaction Type: Label
Payment Method: VISA-4325
Payment Status: Account Charged

Postage Cost	$7.50
USPS Tracking®	Free
Label Total:	**$7.50**
Order Total:	**$30.00**

Timestamp	Message
02-14-2020 08:48:47	LABEL REPRINTED
02-14-2020 08:47:56	LABEL PRINTED
02-14-2020 08:47:21	Getting Payment
02-14-2020 08:46:45	Setting Payment

Tracking for this label is available until June 13, 2020. Need to keep Tracking history longer? Find out if your label is eligible for Premium Tracking today!

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Account # 161958927

Label Details

Label Number:
9405503699300257513307

SCAN® Form: 947570369930034305911 8

Terms
Acceptance Cutoff: 02/14/2020 4:30 PM
Acceptance Time: 02/21/2020 9:33 AM
Expected Date: 02/18/2020 11:59 PM
Delivery Status: Delivered, In/At Mailbox
Label Actions 2020-02-24 14:04:00.0

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
MORIAH KING
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
moking@empiretelecomm.com

Delivery Address:
MARK H KACZYNSKI
187 CASTLEWOOD DR
BERLIN, CT 06037-2911

Package:
Ship Date: 02/14/20
Value: $50.00
Weight: 1 lbs 0 oz
From: 01862

Service:
Priority Mail® 2-Day
USPS Tracking®

Feedback

Transaction Number: 484233230
Transaction Type: Label
Payment Method: VISA-4325
Payment Status: Account Charged

Postage Cost	$7.50
USPS Tracking®	Free
Label Total:	**$7.50**
Order Total:	**$30.00**

Timestamp	Message
02-14-2020 08:48:47	LABEL REPRINTED
02-14-2020 08:47:55	LABEL PRINTED
02-14-2020 08:47:21	Getting Payment
02-14-2020 08:46:45	Setting Payment

Tracking for this label is available until June 13, 2020. Need to keep Tracking history longer? Find out if your label is eligible for Premium Tracking today!

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Account # 161958927

Label Details

Label Number:
9405503699300257513321

SCAN® Form: 947570369930034305911 8

Terms
Acceptance Cutoff: 02/14/2020 4:30 PM
Acceptance Time: 02/21/2020 9:33 AM
Expected Date: 02/18/2020 11:59 PM
Delivery Status: Delivered, In/At Mailbox
Label Actions 2020-02-24 10:13:00.0

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
MORIAH KING
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
moking@empiretelecomm.com

Delivery Address:
MAUREEN GIUSTI
ZONING ENFORCEMENT OFFICER
240 KENSINGTON RD
BERLIN, CT 06037-2655

Package:
Ship Date: 02/14/20
Value: $50.00
Weight: 1 lbs 0 oz
From: 01862
Label Type: Batch

Service:
Priority Mail® 2-Day
USPS Tracking®

Feedback

Transaction Number: 484233230
Transaction Type: Label
Payment Method: VISA-4325
Payment Status: Account Charged

Postage Cost $7.50
USPS Tracking® Free
Label Total: $7.50
Order Total: $30.00

Timestamp	Message
02-14-2020 08:48:47	LABEL REPRINTED
02-14-2020 08:47:55	LABEL PRINTED
02-14-2020 08:47:21	Getting Payment
02-14-2020 08:46:45	Setting Payment

Tracking for this label is available until June 13, 2020. Need to keep Tracking history longer? Find out if your label is eligible for Premium Tracking today!

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Label Details

Account # 161958927

Label Number:
9405503699300257513352

SCAN® Form: 947570369930034305911 8

Terms
Acceptance Cutoff: 02/14/2020 4:30 PM
Acceptance Time: 02/21/2020 9:33 AM
Expected Date: 02/15/2020 11:59 PM
Delivery Status: Delivered, Front Desk/Reception/Mail Room 2020-02-24 11:30:00.0
Label Actions

USPS Tracking®
Ship Again

Need help

File an insurance claim
Request A Service Refund

Return Address:
MORIAH KING
EMPIRE TELECOM
16 ESQUIRE RD
N BILLERICA, MA 01862-2527
moking@empiretelecomm.com

Delivery Address:
RYAN TIERNEY
AMERICAN TOWER CORPORATION
10 PRESIDENTIAL WAY
WOBURN, MA 01801-1053

Package:
Ship Date: 02/14/20
Value: $50.00
Weight: 1 lbs 0 oz
From: 01862
Label Type: Batch

Service:
Priority Mail® 1-Day
USPS Tracking®

Feedback

Transaction Number: 484233230
Transaction Type: Label
Payment Method: VISA-4325
Payment Status: Account Charged

Postage Cost	$7.50
USPS Tracking®	Free
Label Total:	**$7.50**
Order Total:	**$30.00**

Timestamp	Message
02-14-2020 08:48:47	LABEL REPRINTED
02-14-2020 08:47:57	LABEL PRINTED
02-14-2020 08:47:21	Getting Payment
02-14-2020 08:46:45	Setting Payment

Tracking for this label is available until June 13, 2020. Need to keep Tracking history longer? Find out if your label is eligible for Premium Tracking today!

Back to Shipping History