QC Development
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January 7, 2017

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT1193
28 Brewer Drive, Bloomfield, CT 06002
N 41-50-06.60
W 72-44-28.26

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 100-foot level of the existing 120-foot Monopole at 28 Brewer Drive, Bloomfield, CT. The structure is owned by Crown Castle and the property is owned by the Town of Bloomfield. AT&T now intends to remove three (3) Ericsson Remote Radio Units (RRU) and replace them with three (3) new Ericsson RRUs. The new RRUs would be installed on the existing radio mounts immediately below the 100-foot level of the tower.

This facility was approved by the Town of Bloomfield Zoning Board of Appeals on August 5th, 1996 and by the Town Plan and Zoning Commission on August 22nd, 1996. The ZBA Variance limited the height of the structure to 120 feet. No increase in the tower's total height is proposed by AT&T. This modification therefore complies with the aforementioned approvals.

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

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

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

2. The proposed modifications will not require the extension of the site boundary.

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Honorable Joan A. Gamble - as elected official and property owner (via e-mail)
Crown Castle - as structure owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							3.99%
AT&T GSM	2	500	100	0.0407	880	0.5867	0.69%
AT&T UMTS	1	500	100	0.0203	1900	1.0000	0.20%
AT&T LTE	1	500	100	0.0203	700	0.4667	0.44%
AT&T LTE	1	500	100	0.0203	1900	1.0000	0.20%
AT&T LTE	1	500	100	0.0203	2300	1.0000	0.20%
Site Total							5.73%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							3.99%
AT&T GSM	1	317	100	0.0129	850	0.5667	0.23%
AT&T GSM	1	615	100	0.0250	1900	1.0000	0.25%
AT&T UMTS	2	317	100	0.0258	850	0.5667	0.46%
AT&T UMTS	2	615	100	0.0501	1900	1.0000	0.50%
AT&T LTE	1	1476	100	0.0601	700	1.0000	0.60%
AT&T LTE	1	3664	100	0.1491	1900	1.0000	1.49%
AT&T LTE	1	1146	100	0.0466	2300	1.0000	0.47%
Site Total							7.98%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

PROJECT INFORMATION

SCOPE OF WORK:	REPLACE (3) EXISTING RRUS WITH (3) PROPOSED RRUS.
SITE ADDRESS:	28 BREWER DRIVE BLOOMFIELD, CT 06002
LATITUDE:	41° 50' 06.60" N (NAD 83)*
LONGITUDE:	72° 44' 28.11" W (NAD 83)* *PER HANDHELD GPS
JURISDICTION:	TOWN OF BLOOMFIELD
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NAME OF APPLICANT:	AT&T MOBILITY 550 COCHITUATE ROAD SUITES 13 & 14 FRAMINGHAM, MA 01701
TOWER OWNER: TOWER NUMBER:	CROWN CASTLE 876329

DRAWING INDEX

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

STRUCTURAL NOTE:

1. AS REQUIRED UNDER TIA/EIA 222G – STANDARD, SAI COMMUNICATIONS SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED CONNECTICUT STRUCTURAL ENGINEER CERTIFYING THAT, THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS AND APPURTENANCES AND COMPLIES WITH THE CURRENT CONNECTICUT STATE BUILDING CODE AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

CONTACT & UTILITY INFORMATION

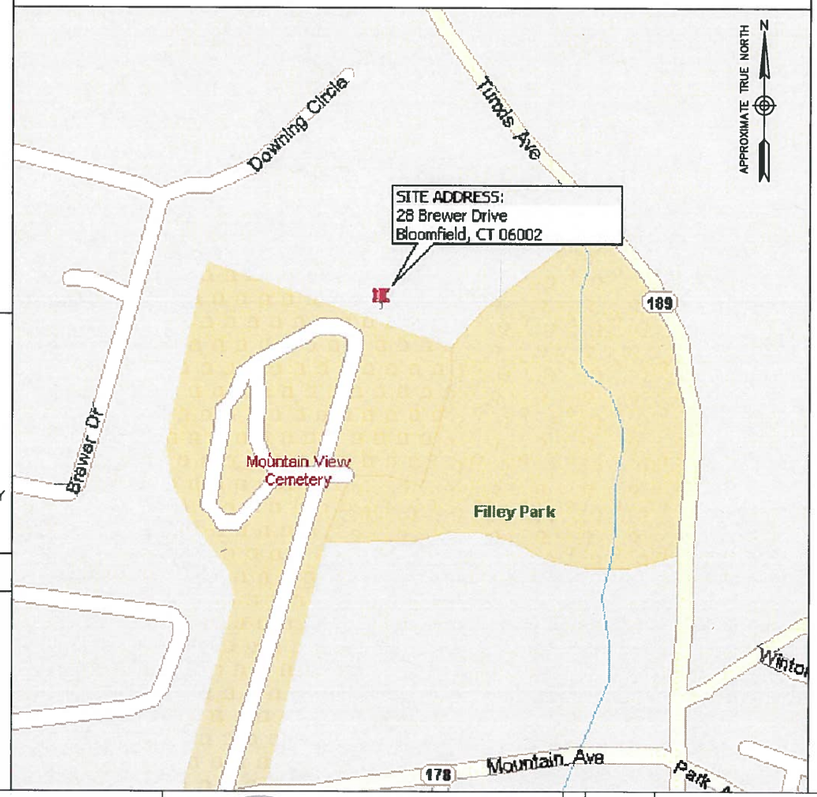
CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	DAMIAN SCHMALZ, P.E.	DEWBERRY	(617) 531–0823
SAC:	MEREDITH PAYNTER	SAI COMMUNICATIONS	(603) 952–8468
CONST.:	RICO MARTELL	SAI COMMUNICATIONS	(774) 454–3788
UTILITIES			
POWER:		CONNECTICUT LIGHT & POWER	(860) 286–2000
TELCO:		AT&T	(888) 944–0447

at&t Mobility

SITE NAME: BLOOMFIELD
SITE NUMBER: CT1193 LTE BWE

VICINITY MAP

DIRECTIONS: FROM FRAMINGHAM, MA: TAKE I–90 W. TAKE EXIT 9 TO MERGE ONTO I–84 TOWARD RT–20/HARTFORD. TAKE EXIT 61 TO MERGE ONTO I–291 W. TAKE EXIT 1 FOR RT–218 W TOWARD BLOOMFIELD. TURN LEFT ONTO RT–218 W/PUTNAM HWY. SLIGHT RIGHT ONTO MAPLE AVE. CONTINUE ONTO BROWN STREET. TURN RIGHT ONTO DOWNING CIRCLE. TURN RIGHT ONTO BREWER DRIVE. THE SITE WILL BE ON THE LEFT.



APPLICABLE BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARD NOTES, SYMBOLS AND DETAILS (SEE DRAWING INDEX FOR STANDARD NOTES AND DETAILS INCLUDED WITH TYPICAL DRAWING PACKAGE). CONTRACTOR 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:
2016 CONNECTICUT STATE BUILDING CODE (2012 INTERNATIONAL BUILDING CODE)

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE (NEC 2014)

CONTRACTOR'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
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–G, 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.

Dewberry®
Dewberry Engineers Inc.
280 SUMMER ST.
10TH FLOOR
BOSTON, MA 02210
PHONE: 617.695.3400
FAX: 617.695.3310

SAI
27 NORTHWESTERN DRIVE
SALEM, NH 03079

BLOOMFIELD SPRINT
SITE NO. CT1193 LTE BWE

28 BREWER DRIVE
BLOOMFIELD, CT 06002

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	12/22/16	ISSUED FOR CONSTRUCTION	JCM	DAS	BBR
0	11/30/16	ISSUED FOR CONSTRUCTION	JCM	DAS	BBR

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

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
LICENSED
PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

TITLE SHEET

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083663	T01	1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – SAI
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR 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.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING & PROPOSED IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR 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 CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR 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. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE AT&T 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 SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S 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.

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. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
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 (UNO). 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 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" 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 RAMSET/REDHEAD 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 CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS 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.
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 RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION & 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 & 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 PROOFROLL 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.

COMPACTION EQUIPMENT:

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

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, AT&T ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
7. 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, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC 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).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (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; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. 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.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. 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.
16. 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).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. 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.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. 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.
23. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. 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.
28. 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.
29. 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.
30. 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.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR 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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at&t Mobility
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SUITES 13 & 14
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	12/22/16	ISSUED FOR CONSTRUCTION	JCM	DAS	BBR
0	11/30/16	ISSUED FOR CONSTRUCTION	JCM	DAS	BBR

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

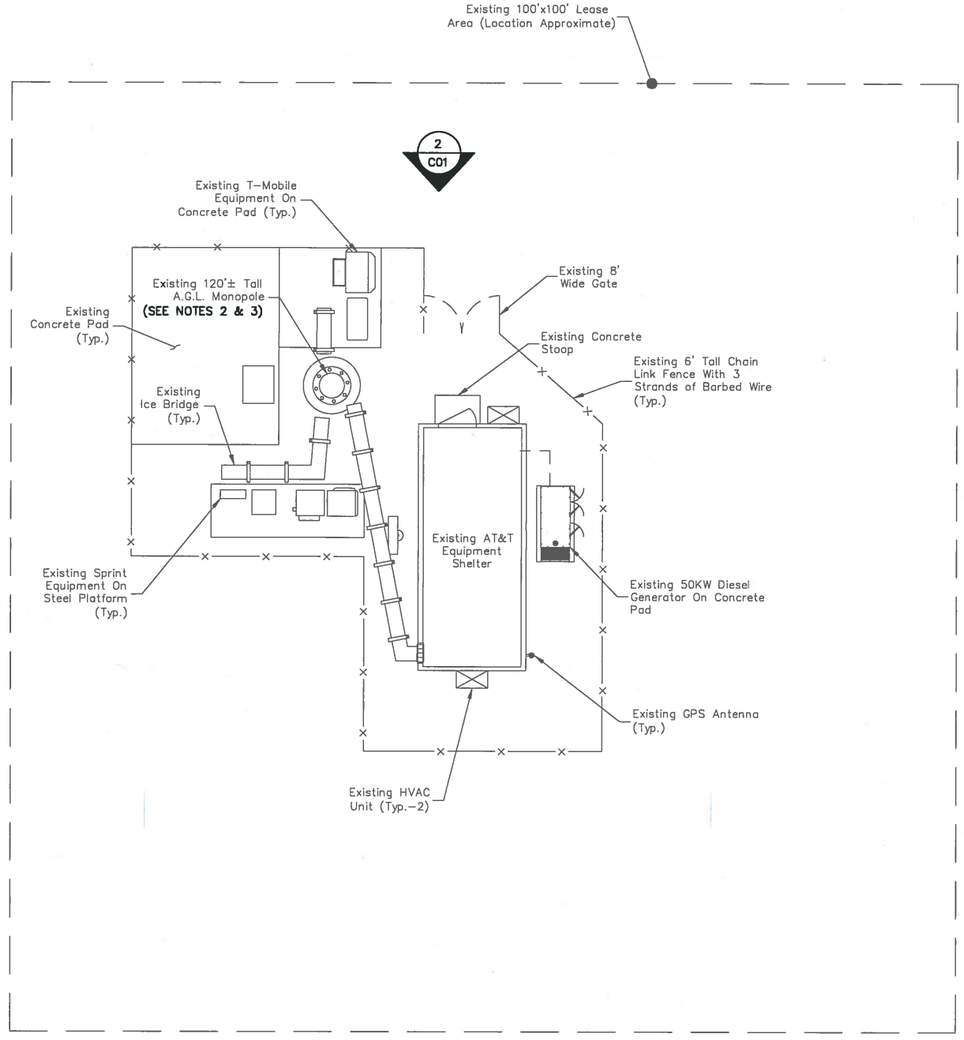
STATE OF CONNECTICUT
BENJAMIN B. REVETTE
29997
PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

GENERAL NOTES

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083663	G01	1

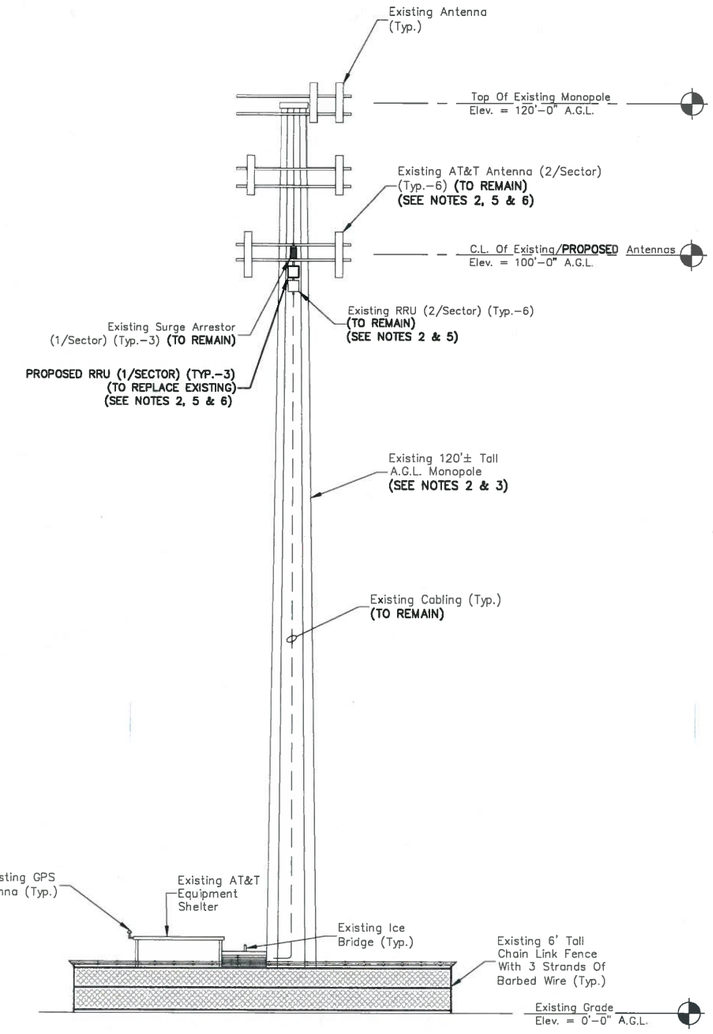
APPROXIMATE TRUE NORTH



PROPOSED SITE PLAN 1

SCALE:1/16"=1' FOR 11"x17"
1/8"=1' FOR 22"x34"

0' 4' 8' 16'



PROPOSED ELEVATION 2

SCALE:1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE & FINAL AT&T RF DATA SHEET.
3. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
4. NOT ALL INFORMATION SHOWN FOR CLARITY.
5. CONTRACTOR TO VERIFY RRU TO BE REPLACED WITH LATEST AT&T RFDS PRIOR TO CONSTRUCTION.
6. ALL SPACING REQUIREMENTS FOR ANTENNAS SHALL BE CONFIRMED PRIOR TO CONSTRUCTION AND SHALL NOT IMPEDE CLIMBING PEGS, TIE OFF FEATURES, OR OTHER EXISTING SAFETY FEATURES. ALL MOUNTS SHALL MAINTAIN EXISTING/PROPOSED MANUFACTURER REQUIREMENTS AND SHALL NOT EXCEED THE TOP OF THE TOWER OR INTERFERE WITH OTHER RAD CENTERS.

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0	11/30/16	ISSUED FOR CONSTRUCTION	JCM	DAS	BBR

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

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
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LICENSED
PROFESSIONAL ENGINEER

AT&T MOBILITY
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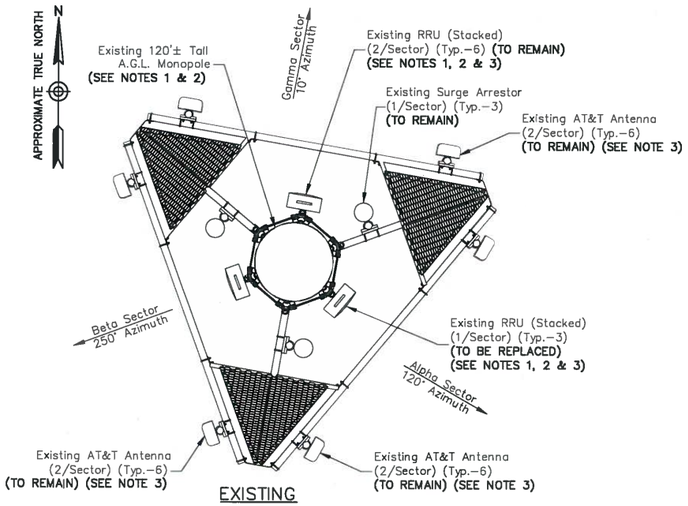
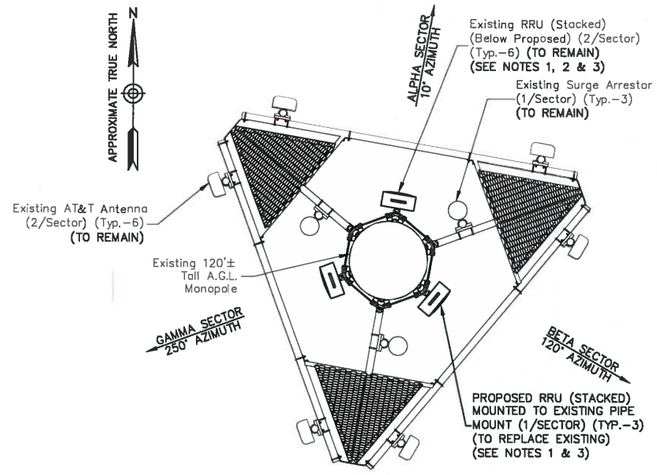
PROPOSED SITE PLAN & ELEVATION

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083663	C01	1



EXISTING



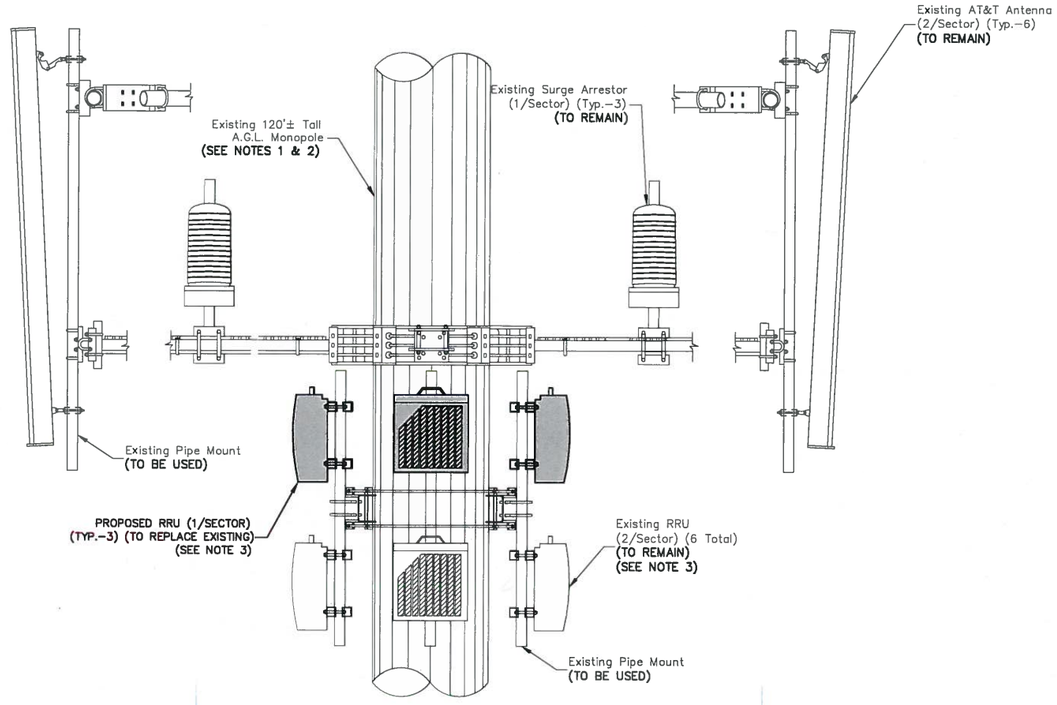
PROPOSED

NOTES:

1. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND MANUFACTURER SPECIFICATIONS.
2. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
3. CONTRACTOR TO VERIFY RRU TO BE REPLACED WITH AT&T RFDS PRIOR TO CONSTRUCTION.

ANTENNA ORIENTATION PLAN 1

SCALE: N.T.S.



NOTES:

1. ALL PROPOSED EQUIPMENT INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND MANUFACTURER SPECIFICATIONS.
2. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.
3. CONTRACTOR TO VERIFY RRU TO BE REPLACED WITH AT&T RFDS PRIOR TO CONSTRUCTION.
4. ALL SPACING REQUIREMENTS FOR ANTENNAS SHALL BE CONFIRMED PRIOR TO CONSTRUCTION AND SHALL NOT IMPEDE CLIMBING PEGS, TIE OFF FEATURES, OR OTHER EXISTING SAFETY FEATURES. ALL MOUNTS SHALL MAINTAIN EXISTING/PROPOSED MANUFACTURER REQUIREMENTS AND SHALL NOT EXCEED THE TOP OF THE TOWER OR INTERFERE WITH OTHER RAD CENTERS.

PROPOSED ANTENNA MOUNTING DETAIL 2

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

STATE OF CONNECTICUT
BENJAMIN B. REVETTE
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LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
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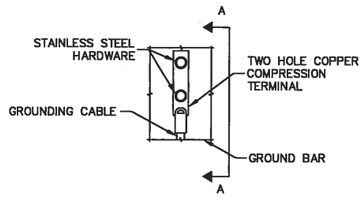
PROPOSED ELEVATION & CONSTRUCTION DETAILS

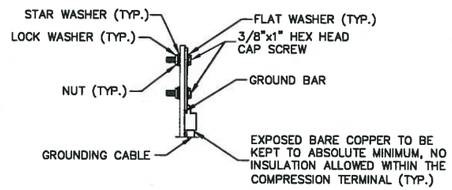
DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083663	C02	1

GROUNDING NOTES:

1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY CONTRACTOR IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM SAI COMMUNICATIONS MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.



ELEVATION

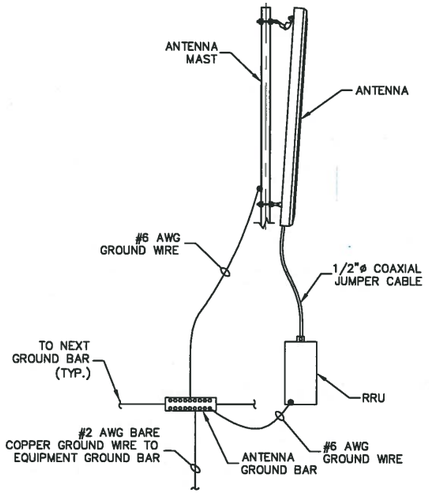


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

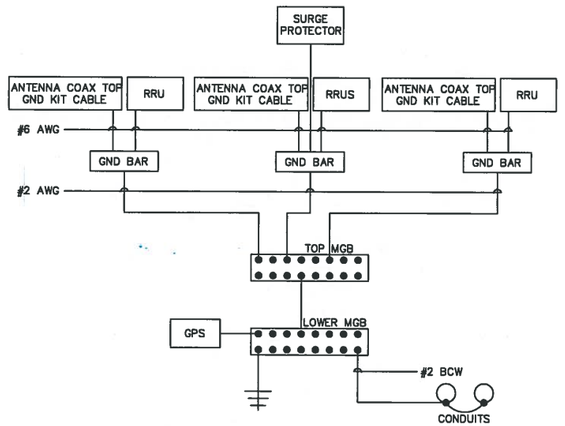
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 1

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 2

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. TIE NEW GENERATOR INTO EXISTING GROUND RING.

SCHEMATIC GROUNDING DIAGRAM 3

SCALE: N.T.S.

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AT&T MOBILITY
FRAMINGHAM, MA 01701

GROUNDING DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50019239/50083663	E01	1

PJF PAUL J. FORD & COMPANY

Date: **November 16, 2016**

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

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
614.221.6679

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT1193
	Carrier Site Name:	Bloomfield Cemetary
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	Mtn. View Cem. (Filley Park)
	Crown Castle JDE Job Number:	397967
	Crown Castle Work Order Number:	1325463
	Crown Castle Application Number:	362443 Rev. 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-0115.008.7805
Site Data:	**28 Brewer Dr., BLOOMFIELD, Hartford County, CT** **Latitude *41° 50' 6.57"*, Longitude *-72° 44' 28.2"*** **120 Foot - Monopole Tower**	

Dear Charles McGuirt,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 970885, in accordance with application 362443, revision 0.

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

LC4.7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the proposed modifications drawings, referenced in Table 3 of this report, for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Thomas J. Dehnke, EI
Project Designer
tdehnke@pjfweb.com

STATE OF CONNECTICUT JUSTIN T. KLEIN No. 30301 LICENSED PROFESSIONAL ENGINEER

11/16

Date: **November 16, 2016**

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

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
614.221.6679

Subject: **Structural Analysis Report**

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT1193
	Carrier Site Name:	Bloomfield Cemetary
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	Mtn. View Cem. (Filley Park)
	Crown Castle JDE Job Number:	397967
	Crown Castle Work Order Number:	1325463
	Crown Castle Application Number:	362443 Rev. 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37516-0115.008.7805
Site Data:	**28 Brewer Dr., BLOOMFIELD, Hartford County, CT** **Latitude *41° 50' 6.57"*, Longitude *-72° 44' 28.2"*** **120 Foot - Monopole Tower**	

Dear Charles McGuirt,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 970885, in accordance with application 362443, revision 0.

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

LC4.7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the proposed modifications drawings, referenced in Table 3 of this report, for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Thomas J. Dehnke, EI
Project Designer
tdehnke@pjfweb.com

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ROHN in January of 1998. The tower was originally designed for a wind speed of 70 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, “Structural Standard for Antenna Supporting Structures and Antennas”, with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
99.0	100.0	6	cci antennas	TPX-070821	1 (I) 2 (I)	3/8 3/4	--
		3	ericsson	RRUS 32 B2			
		3	ericsson	WCS RRUS-32-B30			
		6	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			

Notes:
1) Proposed Equipment

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	120.0	3	alcatel lucent	TD-RRH8x20-25	1 (I) 3 (I) 2 (E)	5/8 1-1/4 1/2	1
		1	rfs celwave	APXV9ERR18-C-A20 w/ MP			
		2	rfs celwave	APXVSPP18-C-A20 w/ MP			
		3	rfs celwave	APXVTM14-C-120 w/ MP			
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
	118.0	1	tower mounts	Platform Mount [LP 501-1]			
	116.0	1	andrew	VHLP1-18			
		1	andrew	VHLP1-23-DW1			
		2	dragonwave	HORIZON COMPACT			
114.0	115.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	--	--	1
	114.0	1	tower mounts	Pipe Mount [PM 601-3]			
	113.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
107.0	108.0	3	commscope	LNX-6515DS-A1M w/ MP	--	--	2
		3	ericsson	RRUS 11 B12			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6 (I) 7 (E)	1-5/8 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	107.0	1	tower mounts	Platform Mount [LP 712-1]			
99.0	100.0	2	kmw	AM-X-CD-14-65-00T-RET w/ Mount Pipe	1 (I)	3/8	3
		2	kmw	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave	7770.00 w/ Mount Pipe			
		2	powerwave	P65-17-XLH-RR w/ Mount Pipe			
		3	ericsson	RRUS-11			
		3	commn comp.	DTMABP7819VG12A	1 (I) 2 (I) 12 (I)	3/8 3/4 7/8	1
		3	ericsson	RRUS-11			
		6	kathrein	782-10250			
		1	raycap	DC6-48-60-18-8F			
	99.0	1	tower mounts	Platform Mount [LP 501-1]			
59.0	59.0	1	tower mounts	Side Arm Mount [SO 702-1]	--	--	1
48.0	50.0	1	gps	GPS_A	3 (E)	1/2	1
	48.0	1	tower mounts	Side Arm Mount [SO 702-1]			

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

Table 3 - Design Antenna and Cable Information

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

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C., 08/09/96	88065	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 10/11/96	1616549	CCISITES
4-TOWER MANUFACTURER DRAWINGS	UNR-Rohn, A963248, 10/23/96	2158527	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Semaan ENgineering, CT03SC076, 8/25/03	3386189	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080063.001, 1/18/08	2205450	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 79582, 11/3/08	2343686	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, 2011111.27, 5/31/11	4092494	CCISITES
TOWER MAPPING	HIGHTOWER, 876329, 08/01/2016	-	PJF

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was reinforced in conformance with the referenced modification drawings.
5) The bridge stiffeners carry the entire load through the flange connections at 30' and 60'.
6) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.
7) Monopole will be reinforced in conformance with the referenced modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 90	Pole	P24x0.25	1	-10.27	662.26	82.3	Pass
L2	90 - 80.25	Pole	P24x0.375	2	-11.77	1052.07	80.0	Pass
L3	80.25 - 68.5	Pole	RPS 24" x 0.64677"	3	-14.50	1257.27	92.2	Pass
L4	68.5 - 63.5	Pole	RPS 24" x 0.61306"	4	-15.63	1339.80	98.0	Pass
L5	63.5 - 60	Pole	RPS 24" x 1.13718"	5	-16.94	2083.30	69.9	Pass
L6	60 - 56.5	Pole	RPS 30" x 0.90733"	6	-18.24	2232.33	55.8	Pass
L7	56.5 - 45.417	Pole	RPS 30" x 0.55714"	7	-21.05	1550.04	99.7	Pass
L8	45.417 - 36.417	Pole	RPS 30" x 0.70733"	8	-23.84	1947.31	94.0	Pass
L9	36.417 - 33.5	Pole	RPS 30" x 0.86188"	9	-24.91	2348.91	82.3	Pass
L10	33.5 - 30	Pole	RPS 30" x 1.23648"	10	-26.66	2971.52	69.8	Pass
L11	30 - 26.5	Pole	RPS 36" x 0.7835"	11	-28.03	2411.44	74.5	Pass
L12	26.5 - 20.583	Pole	RPS 36" x 0.62423"	12	-29.97	1961.77	99.8	Pass
L13	20.583 - 2	Pole	RPS 36" x 0.8638"	13	-38.06	2759.79	92.1	Pass
L14	2 - 0	Pole	RPS 36" x 0.95358"	14	-39.01	2964.20	88.1	Pass
							Summary	
						Pole (L12)	99.8	Pass
						RATING =	99.8	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	73.3	Pass
1	Base Plate	0	64.7	Pass
1	Base Foundation Soil Interaction	0	30.7	Pass
1	Base Foundation Structural Steel	0	77.3	Pass
1	Flange Connection	30	66.4	Pass
1	Flange Connection	60	69.9	Pass
1	Flange Connection	90	56.5	Pass

Structure Rating (max from all components) =	

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

4.1) Recommendations

The monopole and its foundation will have sufficient capacity to carry the proposed loading configuration once the following load changes are met.

- Install the proposed modifications per the referenced drawings.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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 C.
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.
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				

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	120.00-90.00	30.00	P24x0.25	A36M-42 (42 ksi)	
L2	90.00-80.25	9.75	P24x0.375	A36M-42 (42 ksi)	
L3	80.25-68.50	11.75	RPS 24" x 0.64677"	Reinf 29.44 ksi (29 ksi)	
L4	68.50-63.50	5.00	RPS 24" x 0.61306"	Reinf 33.05 ksi (33 ksi)	
L5	63.50-60.00	3.50	RPS 24" x 1.13718"	Reinf 28.34 ksi (28 ksi)	
L6	60.00-56.50	3.50	RPS 30" x 0.90733"	Reinf 29.91 ksi (30 ksi)	
L7	56.50-45.42	11.08	RPS 30" x	Reinf 33.42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
			0.55714''	ksi (33 ksi)	
L8	45.42-36.42	9.00	RPS 30'' x 0.70733''	Reinf 33.24 ksi (33 ksi)	
L9	36.42-33.50	2.92	RPS 30'' x 0.86188''	Reinf 33.08 ksi (33 ksi)	
L10	33.50-30.00	3.50	RPS 30'' x 1.23648''	Reinf 29.55 ksi (30 ksi)	
L11	30.00-26.50	3.50	RPS 36'' x 0.7835''	Reinf 30.91 ksi (31 ksi)	
L12	26.50-20.58	5.92	RPS 36'' x 0.62423''	Reinf 31.42 ksi (31 ksi)	
L13	20.58-2.00	18.58	RPS 36'' x 0.8638''	Reinf 32.16 ksi (32 ksi)	
L14	2.00-0.00	2.00	RPS 36'' x 0.95358''	Reinf 31.37 ksi (31 ksi)	

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HB058-M12-XXXF(5/8'')	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.24
						1/2'' Ice	0.00	0.24
						1'' Ice	0.00	0.24
HB114-1-08U4-M5J(1 1/4'')	C	No	Inside Pole	118.00 - 0.00	3	No Ice	0.00	1.08
						1/2'' Ice	0.00	1.08
						1'' Ice	0.00	1.08
FSJ4-50B(1/2'')	C	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.00	0.14
						1/2'' Ice	0.00	0.76
						1'' Ice	0.00	2.00
FSJ4-50B(1/2'')	C	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.00	0.14
						1/2'' Ice	0.00	0.76
						1'' Ice	0.00	2.00
***								
561(1-5/8'')	C	No	CaAa (Out Of Face)	107.00 - 70.00	1	No Ice	0.16	1.35
						1/2'' Ice	0.26	2.65
						1'' Ice	0.36	4.56
561(1-5/8'')	C	No	CaAa (Out Of Face)	70.00 - 0.00	1	No Ice	0.16	1.35
						1/2'' Ice	0.26	2.65
						1'' Ice	0.36	4.56
FLC 158-50J(1-5/8'')	C	No	CaAa (Out Of Face)	107.00 - 0.00	6	No Ice	0.00	0.92
						1/2'' Ice	0.00	2.46
						1'' Ice	0.00	4.60
FLC 158-50J(1-5/8'')	C	No	Inside Pole	107.00 - 0.00	6	No Ice	0.00	0.92
						1/2'' Ice	0.00	0.92
						1'' Ice	0.00	0.92
***								
FB-L98B-034-XXX(3/8'')	C	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06
						1/2'' Ice	0.00	0.06
						1'' Ice	0.00	0.06
WR-VG86ST-BRD(3/4'')	C	No	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.58
						1/2'' Ice	0.00	0.58
						1'' Ice	0.00	0.58
FB-L98B-002-75000(3/8'')	C	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06
						1/2'' Ice	0.00	0.06
						1'' Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.59
						1/2'' Ice	0.00	0.59
						1'' Ice	0.00	0.59
LDF5-50A(7/8'')	C	No	Inside Pole	99.00 - 0.00	12	No Ice	0.00	0.33
						1/2'' Ice	0.00	0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.33
***								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	48.00 - 0.00	3	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
***								
C8x18.75	C	No	CaAa (Out Of Face)	26.50 - 0.00	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00
C8x11.5 brace	C	No	CaAa (Out Of Face)	56.50 - 33.50	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00
C8x11.5 brace	C	No	CaAa (Out Of Face)	70.00 - 63.50	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.00	0.0000	118.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			2.00			1" Ice	7.47	6.47	0.19
(2) APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.00	0.0000	118.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			2.00			1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Face	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			2.00			1" Ice	4.56	1.90	0.13
(2) TD-RRH8x20-25	B	From Face	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			2.00			1" Ice	4.56	1.90	0.13
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Face	4.00	0.0000	118.00	No Ice	8.26	7.47	0.09
			0.00			1/2" Ice	8.82	8.66	0.16
			2.00			1" Ice	9.35	9.56	0.24
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00	0.0000	118.00	No Ice	8.26	6.95	0.08
			0.00			1/2" Ice	8.82	8.13	0.15
			2.00			1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00	0.0000	118.00	No Ice	8.26	6.95	0.08
			0.00			1/2" Ice	8.82	8.13	0.15
			2.00			1" Ice	9.35	9.02	0.23
IBC1900HG-2A	A	From Face	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2" Ice	1.09	0.56	0.03
			2.00			1" Ice	1.22	0.66	0.04
IBC1900HG-2A	B	From Face	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2" Ice	1.09	0.56	0.03
			2.00			1" Ice	1.22	0.66	0.04
IBC1900HG-2A	C	From Face	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2" Ice	1.09	0.56	0.03
			2.00			1" Ice	1.22	0.66	0.04
IBC1900BB-1	A	From Face	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2" Ice	1.09	0.56	0.03
			2.00			1" Ice	1.22	0.66	0.04

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
IBC1900BB-1	B	From Face	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	C	From Face	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
(2) HORIZON COMPACT	B	From Face	4.00 0.00 -2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.72 0.83 0.94	0.37 0.45 0.54	0.01 0.02 0.03
Platform Mount [LP 501-1]	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	32.04 45.28 58.51	32.04 45.28 58.51	0.98 1.28 1.57
***									
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 1.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 1.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 1.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 -1.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 -1.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 -1.00	0.0000	114.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
Pipe Mount [PM 601-3]	C	None		0.0000	114.00	No Ice 1/2" Ice 1" Ice	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.42 7.12	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.42 7.12	0.11 0.17 0.23

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
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	6.32 6.76 7.20	5.63 6.42 7.12	0.11 0.17 0.23
KRY 112 144/1	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.17 0.23 0.30	0.01 0.01 0.02
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
RRUS 11 B12	A	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 1.00	0.0000	107.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
Platform Mount [LP 712-1]	C	None		0.0000	107.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96
**									
RRUS-11	A	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.09
RRUS-11	B	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.09
RRUS-11	C	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.09
DTMABP7819VG12A	A	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23	0.34 0.42 0.51	0.02 0.03 0.04
DTMABP7819VG12A	B	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23	0.34 0.42 0.51	0.02 0.03 0.04
DTMABP7819VG12A	C	From Leg	4.00	0.0000	99.00	No Ice	0.98	0.34	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.10	0.42	0.03
			1.00			1" Ice	1.23	0.51	0.04
(2) 782-10250	A	From Leg	4.00	0.0000	99.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			1.00			1" Ice	0.64	0.40	0.02
(2) 782-10250	B	From Leg	4.00	0.0000	99.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			1.00			1" Ice	0.64	0.40	0.02
(2) 782-10250	C	From Leg	4.00	0.0000	99.00	No Ice	0.45	0.25	0.01
			0.00			1/2" Ice	0.54	0.32	0.01
			1.00			1" Ice	0.64	0.40	0.02
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	99.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			1.00			1" Ice	1.64	1.64	0.06
(2) QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	99.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			1.00			1" Ice	9.46	10.55	0.30
(2) QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	99.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			1.00			1" Ice	9.46	10.55	0.30
(2) QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	99.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			1.00			1" Ice	9.46	10.55	0.30
(2) TPX-070821	A	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
RRUS 32 B2	A	From Leg	4.00	0.0000	99.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Leg	4.00	0.0000	99.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
RRUS 32 B2	C	From Leg	4.00	0.0000	99.00	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			1.00			1" Ice	3.18	2.05	0.10
WCS RRUS-32-B30	A	From Leg	4.00	0.0000	99.00	No Ice	3.31	2.42	0.08
			0.00			1/2" Ice	3.56	2.64	0.10
			1.00			1" Ice	3.81	2.86	0.14
WCS RRUS-32-B30	B	From Leg	4.00	0.0000	99.00	No Ice	3.31	2.42	0.08
			0.00			1/2" Ice	3.56	2.64	0.10
			1.00			1" Ice	3.81	2.86	0.14
WCS RRUS-32-B30	C	From Leg	4.00	0.0000	99.00	No Ice	3.31	2.42	0.08
			0.00			1/2" Ice	3.56	2.64	0.10
			1.00			Ice	3.81	2.86	0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
Platform Mount [LP 501-1]	C	None		0.0000	99.00	No Ice 1/2" Ice 1" Ice	32.04 45.28 58.51	32.04 45.28 58.51	0.98 1.28 1.57
**									
Side Arm Mount [SO 702-1]	A	None		0.0000	59.00	No Ice 1/2" Ice 1" Ice	1.00 1.00 1.00	1.43 2.05 2.67	0.03 0.04 0.05
**									
GPS_A	A	From Leg	4.00 0.00 2.00	0.0000	48.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01
Side Arm Mount [SO 702-1]	A	None		0.0000	48.00	No Ice 1/2" Ice 1" Ice	1.00 1.00 1.00	1.43 2.05 2.67	0.03 0.04 0.05
**									
(2) bridge stiffener	C	None		0.0000	60.00	No Ice 1/2" Ice 1" Ice	8.62 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00
(2) bridge stiffener	C	None		0.0000	30.00	No Ice 1/2" Ice 1" Ice	8.62 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-23-DW1	B	Paraboloid w/o Radome	From Leg	4.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03
VHLP1-18	B	Paraboloid w/o Radome	From Leg	4.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03
***											

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.00-90.00	105.00	1.279	29	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	2.763
L2 90.00-80.25	85.13	1.223	28	19.500	A	0.000	19.500	19.500	100.00	0.000	0.000
					B	0.000	19.500		100.00	0.000	0.000
					C	0.000	19.500		100.00	0.000	1.584
L3 80.25-	74.38	1.189	27	23.500	A	0.000	23.500	23.500	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
68.50					B	0.000	23.500		100.00	0.000	0.000
					C	0.000	23.500		100.00	0.000	3.173
L4 68.50-63.50	66.00	1.16	27	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.000	5.024
L5 63.50-60.00	61.75	1.143	26	7.000	A	0.000	7.000	7.000	100.00	0.000	0.000
					B	0.000	7.000		100.00	0.000	0.000
					C	0.000	7.000		100.00	0.000	0.569
L6 60.00-56.50	58.25	1.13	26	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.569
L7 56.50-45.42	50.96	1.098	25	27.708	A	0.000	27.708	27.708	100.00	0.000	0.000
					B	0.000	27.708		100.00	0.000	0.000
					C	0.000	27.708		100.00	0.000	11.137
L8 45.42-36.42	40.92	1.049	24	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	9.043
L9 36.42-33.50	34.96	1.014	23	7.293	A	0.000	7.293	7.293	100.00	0.000	0.000
					B	0.000	7.293		100.00	0.000	0.000
					C	0.000	7.293		100.00	0.000	2.931
L10 33.50-30.00	31.75	0.994	23	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.569
L11 30.00-26.50	28.25	0.97	22	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500		100.00	0.000	0.000
					C	0.000	10.500		100.00	0.000	0.569
L12 26.50-20.58	23.54	0.933	21	17.751	A	0.000	17.751	17.751	100.00	0.000	0.000
					B	0.000	17.751		100.00	0.000	0.000
					C	0.000	17.751		100.00	0.000	5.946
L13 20.58-2.00	11.29	0.85	19	55.749	A	0.000	55.749	55.749	100.00	0.000	0.000
					B	0.000	55.749		100.00	0.000	0.000
					C	0.000	55.749		100.00	0.000	18.673
L14 2.00-0.00	1.00	0.85	19	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000		100.00	0.000	0.000
					C	0.000	6.000		100.00	0.000	2.010

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.00-90.00	105.00	1.279	8	2.2454	71.227	A	0.000	71.227	71.227	100.00	0.000	0.000
						B	0.000	71.227		100.00	0.000	0.000
						C	0.000	71.227		100.00	0.000	10.397
L2 90.00-80.25	85.13	1.223	7	2.1988	23.073	A	0.000	23.073	23.073	100.00	0.000	0.000
						B	0.000	23.073		100.00	0.000	0.000
						C	0.000	23.073		100.00	0.000	5.872
L3 80.25-68.50	74.38	1.189	7	2.1693	27.748	A	0.000	27.748	27.748	100.00	0.000	0.000
						B	0.000	27.748		100.00	0.000	0.000
						C	0.000	27.748		100.00	0.000	9.717
L4 68.50-63.50	66.00	1.16	7	2.1435	11.786	A	0.000	11.786	11.786	100.00	0.000	0.000
						B	0.000	11.786		100.00	0.000	0.000
						C	0.000	11.786		100.00	0.000	11.931
L5 63.50-60.00	61.75	1.143	7	2.1293	8.242	A	0.000	8.242	8.242	100.00	0.000	0.000
						B	0.000	8.242		100.00	0.000	0.000
						C	0.000	8.242		100.00	0.000	2.059
L6 60.00-56.50	58.25	1.13	7	2.1169	9.985	A	0.000	9.985	9.985	100.00	0.000	0.000
						B	0.000	9.985		100.00	0.000	0.000
						C	0.000	9.985		100.00	0.000	2.051
L7 56.50-45.42	50.96	1.098	7	2.0888	31.566	A	0.000	31.566	31.566	100.00	0.000	0.000
						B	0.000	31.566		100.00	0.000	0.000
						C	0.000	31.566		100.00	0.000	26.056
L8 45.42-36.42	40.92	1.049	6	2.0435	25.565	A	0.000	25.565	25.565	100.00	0.000	0.000
						B	0.000	25.565		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	25.565		100.00	0.000	20.896
L9 36.42-33.50	34.96	1.014	6	2.0116	8.270	A	0.000	8.270	8.270	100.00	0.000	0.000
						B	0.000	8.270		100.00	0.000	0.000
						C	0.000	8.270		100.00	0.000	6.713
L10 33.50-30.00	31.75	0.994	6	1.9923	9.912	A	0.000	9.912	9.912	100.00	0.000	0.000
						B	0.000	9.912		100.00	0.000	0.000
						C	0.000	9.912		100.00	0.000	1.963
L11 30.00-26.50	28.25	0.97	6	1.9692	11.649	A	0.000	11.649	11.649	100.00	0.000	0.000
						B	0.000	11.649		100.00	0.000	0.000
						C	0.000	11.649		100.00	0.000	1.947
L12 26.50-20.58	23.54	0.933	6	1.9336	19.658	A	0.000	19.658	19.658	100.00	0.000	0.000
						B	0.000	19.658		100.00	0.000	0.000
						C	0.000	19.658		100.00	0.000	13.319
L13 20.58-2.00	11.29	0.85	5	1.7966	61.313	A	0.000	61.313	61.313	100.00	0.000	0.000
						B	0.000	61.313		100.00	0.000	0.000
						C	0.000	61.313		100.00	0.000	40.188
L14 2.00-0.00	1.00	0.85	5	1.4099	6.470	A	0.000	6.470	6.470	100.00	0.000	0.000
						B	0.000	6.470		100.00	0.000	0.000
						C	0.000	6.470		100.00	0.000	3.827

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.00-90.00	105.00	1.279	10	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	2.763
L2 90.00-80.25	85.13	1.223	10	19.500	A	0.000	19.500	19.500	100.00	0.000	0.000
					B	0.000	19.500		100.00	0.000	0.000
					C	0.000	19.500		100.00	0.000	1.584
L3 80.25-68.50	74.38	1.189	9	23.500	A	0.000	23.500	23.500	100.00	0.000	0.000
					B	0.000	23.500		100.00	0.000	0.000
					C	0.000	23.500		100.00	0.000	3.173
L4 68.50-63.50	66.00	1.16	9	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.000	5.024
L5 63.50-60.00	61.75	1.143	9	7.000	A	0.000	7.000	7.000	100.00	0.000	0.000
					B	0.000	7.000		100.00	0.000	0.000
					C	0.000	7.000		100.00	0.000	0.569
L6 60.00-56.50	58.25	1.13	9	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.569
L7 56.50-45.42	50.96	1.098	9	27.708	A	0.000	27.708	27.708	100.00	0.000	0.000
					B	0.000	27.708		100.00	0.000	0.000
					C	0.000	27.708		100.00	0.000	11.137
L8 45.42-36.42	40.92	1.049	8	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	9.043
L9 36.42-33.50	34.96	1.014	8	7.293	A	0.000	7.293	7.293	100.00	0.000	0.000
					B	0.000	7.293		100.00	0.000	0.000
					C	0.000	7.293		100.00	0.000	2.931
L10 33.50-30.00	31.75	0.994	8	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.569
L11 30.00-26.50	28.25	0.97	8	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500		100.00	0.000	0.000
					C	0.000	10.500		100.00	0.000	0.569
L12 26.50-20.58	23.54	0.933	7	17.751	A	0.000	17.751	17.751	100.00	0.000	0.000
					B	0.000	17.751		100.00	0.000	0.000
					C	0.000	17.751		100.00	0.000	5.946
L13 20.58-2.00	11.29	0.85	7	55.749	A	0.000	55.749	55.749	100.00	0.000	0.000
					B	0.000	55.749		100.00	0.000	0.000
					C	0.000	55.749		100.00	0.000	18.673

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L14 2.00-0.00	1.00	0.85	7	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000		100.00	0.000	0.000
					C	0.000	6.000		100.00	0.000	2.010

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
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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 90	Pole	Max Tension	2	0.00	0.00	-0.00
			Max. Compression	26	-32.09	-1.90	5.54

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-10.26	318.83	0.73
			Max. My	2	-10.32	0.47	311.02
			Max. Vy	20	-17.37	318.83	0.73
			Max. Vx	2	-17.01	0.47	311.02
			Max. Torque	11			2.92
L2	90 - 80.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.09	-0.98	5.11
			Max. Mx	20	-11.77	491.35	0.59
			Max. My	2	-11.81	1.12	479.95
			Max. Vy	20	-18.01	491.35	0.59
			Max. Vx	2	-17.65	1.12	479.95
			Max. Torque	11			2.89
L3	80.25 - 68.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.61	0.12	4.58
			Max. Mx	20	-14.50	708.12	0.42
			Max. My	2	-14.54	1.91	692.41
			Max. Vy	20	-18.87	708.12	0.42
			Max. Vx	2	-18.52	1.91	692.41
			Max. Torque	11			2.82
L4	68.5 - 63.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.46	0.58	4.34
			Max. Mx	20	-15.63	804.40	0.34
			Max. My	2	-15.67	2.24	786.85
			Max. Vy	20	-19.63	804.40	0.34
			Max. Vx	2	-19.28	2.24	786.85
			Max. Torque	11			2.69
L5	63.5 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.28	0.90	4.18
			Max. Mx	20	-16.94	873.52	0.28
			Max. My	2	-16.97	2.48	854.69
			Max. Vy	20	-19.87	873.52	0.28
			Max. Vx	2	-19.51	2.48	854.69
			Max. Torque	11			2.48
L6	60 - 56.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.25	1.29	3.98
			Max. Mx	20	-18.24	946.49	0.22
			Max. My	2	-18.27	2.73	926.37
			Max. Vy	20	-21.01	946.49	0.22
			Max. Vx	2	-20.66	2.73	926.37
			Max. Torque	11			2.46
L7	56.5 - 45.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.92	2.56	3.44
			Max. Mx	20	-21.05	1190.00	0.04
			Max. My	2	-21.08	3.49	1165.78
			Max. Vy	20	-22.95	1190.00	0.04
			Max. Vx	2	-22.60	3.49	1165.78
			Max. Torque	11			2.43
L8	45.417 - 36.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.22	3.67	2.80
			Max. Mx	20	-23.84	1402.95	-0.12
			Max. My	2	-23.86	4.11	1375.41
			Max. Vy	20	-24.36	1402.95	-0.12
			Max. Vx	2	-24.01	4.11	1375.41
			Max. Torque	21			-2.08
L9	36.417 - 33.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.76	4.02	2.60
			Max. Mx	20	-24.91	1474.66	-0.17
			Max. My	2	-24.92	4.31	1446.05
			Max. Vy	20	-24.81	1474.66	-0.17
			Max. Vx	2	-24.46	4.31	1446.05
			Max. Torque	21			-1.84
L10	33.5 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.07	4.43	2.36
			Max. Mx	20	-26.66	1561.85	-0.24
			Max. My	2	-26.67	4.56	1531.96
			Max. Vy	20	-25.02	1561.85	-0.24
			Max. Vx	2	-24.67	4.56	1531.96

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	21			-1.77
L11	30 - 26.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.07	4.91	2.08
			Max. Mx	20	-28.03	1652.21	-0.31
			Max. My	2	-28.04	4.81	1621.03
			Max. Vy	20	-25.94	1652.21	-0.31
			Max. Vx	2	-25.59	4.81	1621.03
			Max. Torque	21			-1.76
L12	26.5 - 20.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.00	5.71	1.61
			Max. Mx	20	-29.97	1808.42	-0.42
			Max. My	2	-29.98	5.23	1775.06
			Max. Vy	20	-26.86	1808.42	-0.42
			Max. Vx	2	-26.51	5.23	1775.06
			Max. Torque	21			-1.74
L13	20.583 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.89	8.00	0.26
			Max. Mx	20	-38.06	2331.69	-0.79
			Max. My	2	-38.06	6.54	2291.56
			Max. Vy	20	-29.41	2331.69	-0.79
			Max. Vx	2	-29.07	6.54	2291.56
			Max. Torque	4			1.63
L14	2 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.06	8.19	0.15
			Max. Mx	20	-39.01	2390.76	-0.83
			Max. My	2	-39.01	6.68	2349.92
			Max. Vy	20	-29.67	2390.76	-0.83
			Max. Vx	2	-29.33	6.68	2349.92
			Max. Torque	4			1.68

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90	14.734	41	1.0974	0.0084
L2	90 - 80.25	8.136	48	0.9301	0.0040
L3	80.25 - 68.5	6.358	48	0.8060	0.0029
L4	68.5 - 63.5	4.529	48	0.6739	0.0020
L5	63.5 - 60	3.861	48	0.5999	0.0017
L6	60 - 56.5	3.433	48	0.5668	0.0015
L7	56.5 - 45.417	3.026	48	0.5449	0.0014
L8	45.417 - 36.417	1.904	48	0.4170	0.0010
L9	36.417 - 33.5	1.210	48	0.3161	0.0007
L10	33.5 - 30	1.026	48	0.2858	0.0006
L11	30 - 26.5	0.827	48	0.2581	0.0005
L12	26.5 - 20.583	0.647	48	0.2328	0.0005
L13	20.583 - 2	0.393	48	0.1757	0.0003
L14	2 - 0	0.004	48	0.0177	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	APXVTM14-C-120 w/ Mount Pipe	41	14.269	1.0924	0.0084	28621
116.00	VHLP1-23-DW1	41	13.804	1.0873	0.0080	28621
114.00	PCS 1900MHz 4x45W-65MHz	41	13.341	1.0818	0.0077	23851
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	41	11.741	1.0577	0.0066	11008
99.00	RRUS-11	41	9.979	1.0136	0.0054	6814
60.00	(2) bridge stiffener	48	3.433	0.5668	0.0016	6594
59.00	Side Arm Mount [SO 702-1]	48	3.315	0.5604	0.0015	6862

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
48.00	GPS_A	48	2.140	0.4502	0.0011	4986
30.00	(2) bridge stiffener	48	0.827	0.2581	0.0005	7239

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	120 - 90	69.101	20	5.1187	0.0352
L2	90 - 80.25	38.251	20	4.3668	0.0146
L3	80.25 - 68.5	29.889	20	3.7890	0.0098
L4	68.5 - 63.5	21.285	20	3.1706	0.0065
L5	63.5 - 60	18.145	20	2.8217	0.0050
L6	60 - 56.5	16.134	20	2.6655	0.0045
L7	56.5 - 45.417	14.218	20	2.5623	0.0041
L8	45.417 - 36.417	8.944	20	1.9604	0.0025
L9	36.417 - 33.5	5.685	20	1.4856	0.0016
L10	33.5 - 30	4.820	20	1.3431	0.0014
L11	30 - 26.5	3.883	20	1.2125	0.0012
L12	26.5 - 20.583	3.038	20	1.0935	0.0011
L13	20.583 - 2	1.846	20	0.8252	0.0008
L14	2 - 0	0.018	20	0.0833	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
118.00	APXVTM14-C-120 w/ Mount Pipe	20	66.930	5.0980	0.0338	6332
116.00	VHLP1-23-DW1	20	64.763	5.0766	0.0323	6332
114.00	PCS 1900MHz 4x45W-65MHz	20	62.601	5.0536	0.0309	5277
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	55.127	4.9493	0.0258	2434
99.00	RRUS-11	20	46.892	4.7511	0.0203	1505
60.00	(2) bridge stiffener	20	16.134	2.6655	0.0045	1410
59.00	Side Arm Mount [SO 702-1]	20	15.578	2.6354	0.0044	1467
48.00	GPS_A	20	10.053	2.1166	0.0029	1063
30.00	(2) bridge stiffener	20	3.883	1.2125	0.0012	1541

Pole Design Data

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	
L1	120 - 90 (1)	P24x0.25	30.00	0.00	0.0	18.6532	-10.27	662.26	0.016
L2	90 - 80.25 (2)	P24x0.375	9.75	0.00	0.0	27.8325	-11.77	1052.07	0.011
L3	80.25 - 68.5 (3)	RPS 24" x 0.64677"	11.75	0.00	0.0	47.4511	-14.50	1257.27	0.012
L4	68.5 - 63.5 (4)	RPS 24" x 0.61306"	5.00	0.00	0.0	45.0429	-15.63	1339.80	0.012
L5	63.5 - 60 (5)	RPS 24" x 1.13718"	3.50	0.00	0.0	81.6787	-16.94	2083.30	0.008
L6	60 - 56.5 (6)	RPS 30" x 0.90733"	3.50	0.00	0.0	82.9275	-18.24	2232.33	0.008
L7	56.5 - 45.417 (7)	RPS 30" x 0.55714"	11.08	0.00	0.0	51.5340	-21.05	1550.04	0.014
L8	45.417 - 36.417 (8)	RPS 30" x 0.70733"	9.00	0.00	0.0	65.0925	-23.84	1947.31	0.012
L9	36.417 - 33.5 (9)	RPS 30" x 0.86188"	2.92	0.00	0.0	78.8966	-24.91	2348.91	0.011
L10	33.5 - 30 (10)	RPS 30" x 1.23648"	3.50	0.00	0.0	111.73	-26.66	2971.52	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L11	30 - 26.5 (11)	RPS 36" x 0.7835"	3.50	0.00	0.0	20 86.683 2	-28.03	2411.44	0.012
L12	26.5 - 20.583 (12)	RPS 36" x 0.62423"	5.92	0.00	0.0	69.374 6	-29.97	1961.77	0.015
L13	20.583 - 2 (13)	RPS 36" x 0.8638"	18.58	0.00	0.0	95.349 4	-38.06	2759.79	0.014
L14	2 - 0 (14)	RPS 36" x 0.95358"	2.00	0.00	0.0	104.99 10	-39.01	2964.20	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 90 (1)	P24x0.25	319.02	396.68	0.804	0.00	396.68	0.000
L2	90 - 80.25 (2)	P24x0.375	491.35	623.72	0.788	0.00	623.72	0.000
L3	80.25 - 68.5 (3)	RPS 24" x 0.64677"	708.12	779.03	0.909	0.00	779.03	0.000
L4	68.5 - 63.5 (4)	RPS 24" x 0.61306"	804.39	831.35	0.968	0.00	831.35	0.000
L5	63.5 - 60 (5)	RPS 24" x 1.13718"	873.52	1264.47	0.691	0.00	1264.47	0.000
L6	60 - 56.5 (6)	RPS 30" x 0.90733"	946.49	1723.26	0.549	0.00	1723.26	0.000
L7	56.5 - 45.417 (7)	RPS 30" x 0.55714"	1190.00	1210.72	0.983	0.00	1210.72	0.000
L8	45.417 - 36.417 (8)	RPS 30" x 0.70733"	1402.95	1513.38	0.927	0.00	1513.38	0.000
L9	36.417 - 33.5 (9)	RPS 30" x 0.86188"	1474.66	1816.03	0.812	0.00	1816.03	0.000
L10	33.5 - 30 (10)	RPS 30" x 1.23648"	1561.85	2268.60	0.688	0.00	2268.60	0.000
L11	30 - 26.5 (11)	RPS 36" x 0.7835"	1652.22	2253.01	0.733	0.00	2253.01	0.000
L12	26.5 - 20.583 (12)	RPS 36" x 0.62423"	1808.43	1841.07	0.982	0.00	1841.07	0.000
L13	20.583 - 2 (13)	RPS 36" x 0.8638"	2331.68	2572.69	0.906	0.00	2572.69	0.000
L14	2 - 0 (14)	RPS 36" x 0.95358"	2390.76	2756.31	0.867	0.00	2756.31	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 90 (1)	P24x0.25	17.29	331.13	0.052	1.36	648.61	0.002
L2	90 - 80.25 (2)	P24x0.375	18.01	526.03	0.034	2.57	1019.71	0.003
L3	80.25 - 68.5 (3)	RPS 24" x 0.64677"	18.87	628.63	0.030	2.49	1191.33	0.002
L4	68.5 - 63.5 (4)	RPS 24" x 0.61306"	19.63	669.90	0.029	2.39	1273.10	0.002
L5	63.5 - 60 (5)	RPS 24" x 1.13718"	19.87	1041.65	0.019	2.36	1895.22	0.001
L6	60 - 56.5 (6)	RPS 30" x 0.90733"	21.01	1116.16	0.019	2.34	2626.72	0.001
L7	56.5 - 45.417 (7)	RPS 30" x 0.55714"	22.95	775.02	0.030	2.11	1866.93	0.001
L8	45.417 - 36.417 (8)	RPS 30" x 0.70733"	24.36	973.65	0.025	1.87	2322.06	0.001
L9	36.417 - 33.5 (9)	RPS 30" x 0.86188"	24.81	1174.45	0.021	1.80	2772.28	0.001
L10	33.5 - 30 (10)	RPS 30" x 1.23648"	25.02	1485.76	0.017	1.75	3420.83	0.001
L11	30 - 26.5 (11)	RPS 36" x 0.7835"	25.94	1205.72	0.022	1.74	3463.14	0.001
L12	26.5 - 20.583 (12)	RPS 36" x 0.62423"	26.86	980.89	0.027	1.60	2842.38	0.001
L13	20.583 - 2 (13)	RPS 36" x 0.8638"	29.41	1379.90	0.021	1.11	3945.80	0.000
L14	2 - 0 (14)	RPS 36" x 0.95358"	29.67	1482.10	0.020	1.06	4216.99	0.000

Pole Interaction Design Data

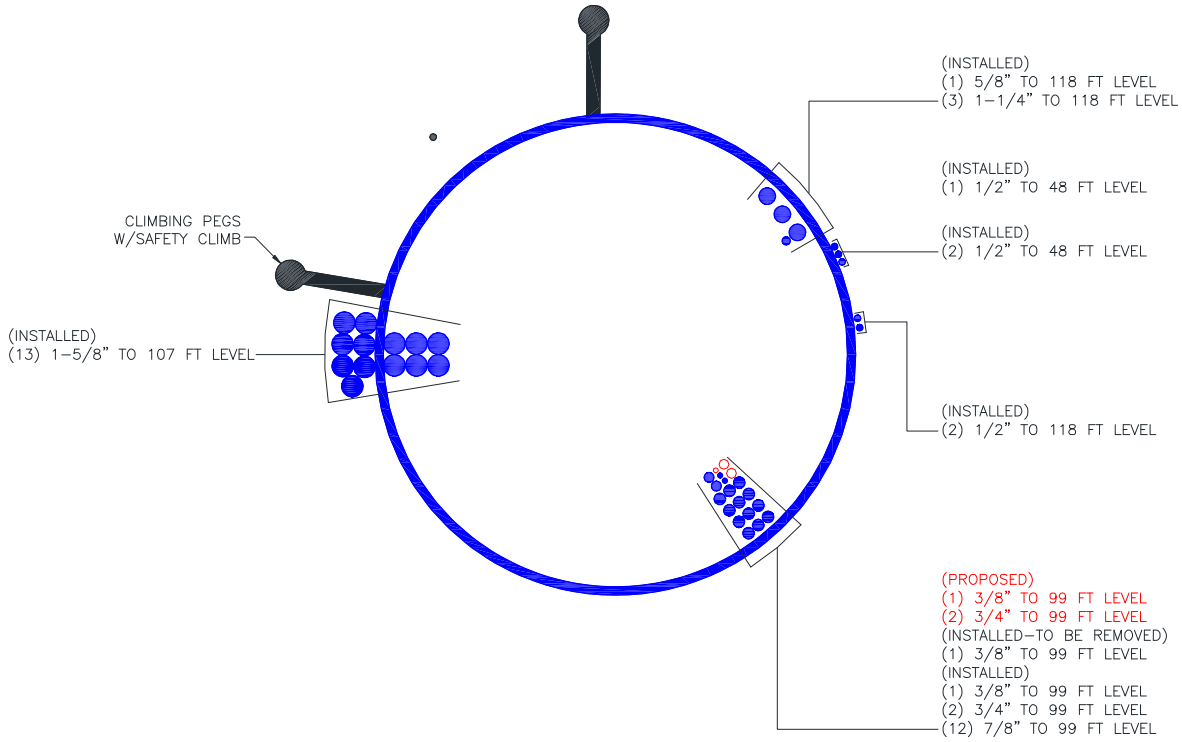
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 90 (1)	0.016	0.804	0.000	0.052	0.002	0.823 ✔	1.000	4.8.2 ✔
L2	90 - 80.25 (2)	0.011	0.788	0.000	0.034	0.003	0.800 ✔	1.000	4.8.2 ✔
L3	80.25 - 68.5 (3)	0.012	0.909	0.000	0.030	0.002	0.922 ✔	1.000	4.8.2 ✔
L4	68.5 - 63.5 (4)	0.012	0.968	0.000	0.029	0.002	0.980 ✔	1.000	4.8.2 ✔
L5	63.5 - 60 (5)	0.008	0.691	0.000	0.019	0.001	0.699 ✔	1.000	4.8.2 ✔
L6	60 - 56.5 (6)	0.008	0.549	0.000	0.019	0.001	0.558 ✔	1.000	4.8.2 ✔
L7	56.5 - 45.417 (7)	0.014	0.983	0.000	0.030	0.001	0.997 ✔	1.000	4.8.2 ✔
L8	45.417 - 36.417 (8)	0.012	0.927	0.000	0.025	0.001	0.940 ✔	1.000	4.8.2 ✔
L9	36.417 - 33.5 (9)	0.011	0.812	0.000	0.021	0.001	0.823 ✔	1.000	4.8.2 ✔
L10	33.5 - 30 (10)	0.009	0.688	0.000	0.017	0.001	0.698 ✔	1.000	4.8.2 ✔
L11	30 - 26.5 (11)	0.012	0.733	0.000	0.022	0.001	0.745 ✔	1.000	4.8.2 ✔
L12	26.5 - 20.583 (12)	0.015	0.982	0.000	0.027	0.001	0.998 ✔	1.000	4.8.2 ✔
L13	20.583 - 2 (13)	0.014	0.906	0.000	0.021	0.000	0.921 ✔	1.000	4.8.2 ✔
L14	2 - 0 (14)	0.013	0.867	0.000	0.020	0.000	0.881 ✔	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	120 - 90	Pole	P24x0.25	1	-10.27	662.26	82.3	Pass
L2	90 - 80.25	Pole	P24x0.375	2	-11.77	1052.07	80.0	Pass
L3	80.25 - 68.5	Pole	RPS 24" x 0.64677"	3	-14.50	1257.27	92.2	Pass
L4	68.5 - 63.5	Pole	RPS 24" x 0.61306"	4	-15.63	1339.80	98.0	Pass
L5	63.5 - 60	Pole	RPS 24" x 1.13718"	5	-16.94	2083.30	69.9	Pass
L6	60 - 56.5	Pole	RPS 30" x 0.90733"	6	-18.24	2232.33	55.8	Pass
L7	56.5 - 45.417	Pole	RPS 30" x 0.55714"	7	-21.05	1550.04	99.7	Pass
L8	45.417 - 36.417	Pole	RPS 30" x 0.70733"	8	-23.84	1947.31	94.0	Pass
L9	36.417 - 33.5	Pole	RPS 30" x 0.86188"	9	-24.91	2348.91	82.3	Pass
L10	33.5 - 30	Pole	RPS 30" x 1.23648"	10	-26.66	2971.52	69.8	Pass
L11	30 - 26.5	Pole	RPS 36" x 0.7835"	11	-28.03	2411.44	74.5	Pass
L12	26.5 - 20.583	Pole	RPS 36" x 0.62423"	12	-29.97	1961.77	99.8	Pass
L13	20.583 - 2	Pole	RPS 36" x 0.8638"	13	-38.06	2759.79	92.1	Pass
L14	2 - 0	Pole	RPS 36" x 0.95358"	14	-39.01	2964.20	88.1	Pass
						Summary		
						Pole (L12)	99.8	Pass
						RATING =	**99.8**	**Pass**

APPENDIX B

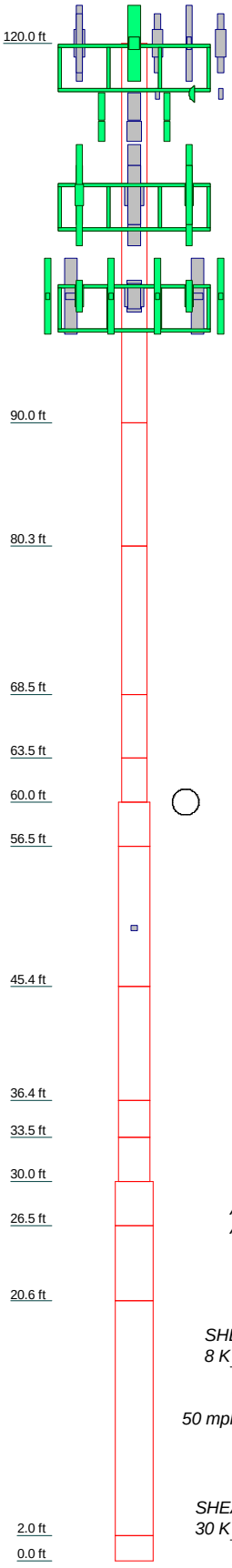
BASE LEVEL DRAWING


(INSTALLED)
(1) 5/8" TO 118 FT LEVEL
(3) 1-1/4" TO 118 FT LEVEL
(INSTALLED)
(1) 1/2" TO 48 FT LEVEL
(INSTALLED)
(2) 1/2" TO 48 FT LEVEL
CLIMBING PEGS
W/SAFETY CLIMB
(INSTALLED)
(13) 1-5/8" TO 107 FT LEVEL
(INSTALLED)
(2) 1/2" TO 118 FT LEVEL
(PROPOSED)
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 3/8" TO 99 FT LEVEL
(INSTALLED)
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(12) 7/8" TO 99 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	30.00	A36M-42	1.9
2	P24x0.375	9.75		0.9
3	RPS 24" x 0.64677"	11.75	Reinf 29.44 ksi	1.9
4	RPS 24" x 0.61308"	5.00	Reinf 33.05 ksi	0.8
5	RPS 30" x 0.57373"	3.50	Reinf 28.34 ksi	1.0
6	RPS 30" x 0.57373"	3.50	Reinf 29.91 ksi	1.0
7	RPS 30" x 0.55788"	11.08	Reinf 33.42 ksi	1.9
8	RPS 30" x 0.70733"	9.00	Reinf 33.24 ksi	2.0
9	RPS 30" x 0.70733"	2.92	Reinf 33.08 ksi	0.8
10	RPS 30" x 0.70733"	3.50	Reinf 29.55 ksi	1.3
11	RPS 30" x 0.70733"	3.50	Reinf 30.91 ksi	1.0
12	RPS 36" x 0.8638"	5.92	Reinf 31.42 ksi	1.4
13	RPS 36" x 0.8638"	18.58	Reinf 32.16 ksi	6.0
14	RPS 36" x 0.95358"	2.00	Reinf 31.37 ksi	0.7
				22.7



ALL REACTIONS ARE FACTORED

AXIAL 75 K

SHEAR 8 K *MOMENT 775 kip-ft*

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

AXIAL 39 K

SHEAR 30 K *MOMENT 2391 kip-ft*

TORQUE 2 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe	118	RRUS 11 B12	107
(2) APXVTM14-C-120 w/ Mount Pipe	118	RRUS 11 B12	107
TD-RRH8x20-25	118	RRUS 11 B12	107
(2) TD-RRH8x20-25	118	Platform Mount [LP 712-1]	107
APXV9ERR18-C-A20 w/ Mount Pipe	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
APXVSPP18-C-A20 w/ Mount Pipe	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
APXVSPP18-C-A20 w/ Mount Pipe	118	RRUS-11	99
IBC1900HG-2A	118	DTMABP7819VG12A	99
IBC1900HG-2A	118	DTMABP7819VG12A	99
IBC1900HG-2A	118	DTMABP7819VG12A	99
IBC1900BB-1	118	(2) 782-10250	99
IBC1900BB-1	118	(2) 782-10250	99
IBC1900BB-1	118	(2) 782-10250	99
(2) HORIZON COMPACT	118	DC6-48-60-18-8F	99
Platform Mount [LP 501-1]	118	(2) QS66512-2 w/ Mount Pipe	99
VHLP1-23-DW1	118	(2) QS66512-2 w/ Mount Pipe	99
VHLP1-18	118	(2) QS66512-2 w/ Mount Pipe	99
PCS 1900MHz 4x45W-65MHz	114	(2) TPX-070821	99
800MHz 2X50W RRH W/FILTER	114	(2) TPX-070821	99
800MHz 2X50W RRH W/FILTER	114	(2) TPX-070821	99
800MHz 2X50W RRH W/FILTER	114	RRUS 32 B2	99
Pipe Mount [PM 601-3]	114	RRUS 32 B2	99
PCS 1900MHz 4x45W-65MHz	114	RRUS 32 B2	99
PCS 1900MHz 4x45W-65MHz	114	WCS RRUS-32-B30	99
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107	WCS RRUS-32-B30	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	WCS RRUS-32-B30	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	DC6-48-60-18-8F	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	Platform Mount [LP 501-1]	99
KRY 112 144/1	107	RRUS-11	99
KRY 112 144/1	107	RRUS-11	99
KRY 112 144/1	107	(2) bridge stiffener	60
LNX-6515DS-A1M w/ Mount Pipe	107	Side Arm Mount [SO 702-1]	59
LNX-6515DS-A1M w/ Mount Pipe	107	Side Arm Mount [SO 702-1]	48
LNX-6515DS-A1M w/ Mount Pipe	107	GPS_A	48
		(2) bridge stiffener	30

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-42	42 ksi	60 ksi	Reinf 33.08 ksi	33 ksi	42 ksi
Reinf 29.44 ksi	29 ksi	37 ksi	Reinf 29.55 ksi	30 ksi	37 ksi
Reinf 33.05 ksi	33 ksi	42 ksi	Reinf 30.91 ksi	31 ksi	39 ksi
Reinf 28.34 ksi	28 ksi	36 ksi	Reinf 31.42 ksi	31 ksi	40 ksi
Reinf 29.91 ksi	30 ksi	38 ksi	Reinf 32.16 ksi	32 ksi	41 ksi
Reinf 33.42 ksi	33 ksi	42 ksi	Reinf 31.37 ksi	31 ksi	40 ksi
Reinf 33.24 ksi	33 ksi	42 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C 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. TOWER RATING: 99.8%

Paul J. Ford and Company
250 East Broad St, Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX:

Job:	***120 ft. Monopole / Mtn. View Cem. (Filley Park)***		
Project:	***BU876329 / PJF# 37516-0115***		
Client: Crown Castle USA	Drawn by: TDehnke	App'd:	
Code: TIA-222-G	Date: 11/16/16	Scale: NTS	
Path:		Dwg No. E-1	

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v4.4 - Effective 7-12-13

Date: 11/16/2016
PJF Project: 37516-0115.008.7805
Client Ref. # 876329
Site Name: MTN. View Cem. (Filley Park)
Description: 120' Pole
Owner: CCI
Engineer: NZP

Asymmetric Anchor Rod Analysis

Moment =	2391	k-ft	TIA Ref.	G	Location =	Base Plate		
Axial =	39.0	kips	ASIF =	1.0000	η =	0.55	for BP, Rev. G Sect. 4.9.9	
Shear =	30.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	24							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
2	1.500	A354 Gr BC	109	125	22.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
3	1.500	A354 Gr BC	109	125	45.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
4	1.500	A354 Gr BC	109	125	67.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
5	1.500	A354 Gr BC	109	125	90.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
6	1.500	A354 Gr BC	109	125	112.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
7	1.500	A354 Gr BC	109	125	135.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
8	1.500	A354 Gr BC	109	125	157.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
9	1.500	A354 Gr BC	109	125	180.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
10	1.500	A354 Gr BC	109	125	202.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
11	1.500	A354 Gr BC	109	125	225.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
12	1.500	A354 Gr BC	109	125	247.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
13	1.500	A354 Gr BC	109	125	270.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
14	1.500	A354 Gr BC	109	125	292.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
15	1.500	A354 Gr BC	109	125	315.0	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
16	1.500	A354 Gr BC	109	125	337.5	41.00	0.00	1.77	101.05	97.75	103.37	0.00	141.00	73.3%
17	1.375	Williams R71	127.7	150	33.8	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
18	1.375	Williams R71	127.7	150	56.3	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
19	1.375	Williams R71	127.7	150	123.8	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
20	1.375	Williams R71	127.7	150	146.3	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
21	1.375	Williams R71	127.7	150	213.8	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
22	1.375	Williams R71	127.7	150	236.3	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
23	1.375	Williams R71	127.7	150	303.8	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
24	1.375	Williams R71	127.7	150	326.3	51.88	0.00	1.68	120.99	117.85	123.19	180.02	180.02	68.4%
								41.70						

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

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data	
BU#:	
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Mu:	1332.8199	ft-kips
Axial, Pu:	39	kips
Shear, Vu:	30	kips
Eta Factor, η	0.55	TIA G (Fig. 4-4)

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	41	in

If No stiffeners, Criteria: AISC LRFD <-Only Applcable to Unstiffened Cases

Plate Data		
Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.75	in
Fillet V. Weld:	0.375	in
Width:	5.5	in
Height:	20.5	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	103.4 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	141.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	73.3% **Pass**	

Base Plate Results Flexural Check

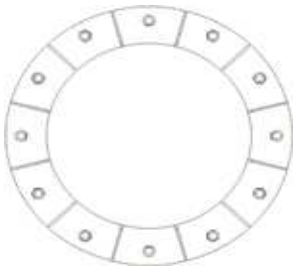
		Stiffened
Base Plate Stress:	21.0 ksi	AISC LRFD
Allowable Plate Stress:	32.4 ksi	φ*Fy
Base Plate Stress Ratio:	64.7% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	40.9% **Pass**
Vertical Weld:	21.0% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	6.7% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	41.8% **Pass**
Plate Comp. (AISC Bracket):	38.5% **Pass**

Pole Results

Pole Punching Shear Check:	8.3% **Pass**



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

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v4.4 - Effective 7-12-13

Date: 11/16/2016
PJF Project: 37516-0115.008.7805
Client Ref. # 876329
Site Name: MTN. View Cem. (Filley Park)
Description: 30' Flange
Owner: CCI
Engineer: NZP

Asymmetric Bolt Analysis

Moment =	1561.85	k-ft	TIA Ref.	G	Location =	Flange Plate	
Axial =	26.66	kips	ASIF =	1.0000	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	25.02	kips	Max Ratio =	100.0%	Threads =	X-Excluded	for FP, Rev. G
Anchor Qty =	8						

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	0.000				50.0	52.19	8.00	8.00	219.62	211.60	219.62	330.51	330.51	66.4%
2	0.000				140.0	52.19	8.00	8.00	219.62	211.60	219.62	330.51	330.51	66.4%
3	0.000				230.0	52.19	8.00	8.00	219.62	211.60	219.62	330.51	330.51	66.4%
4	0.000				320.0	52.19	8.00	8.00	219.62	211.60	219.62	330.51	330.51	66.4%
5	0.000	Other			0.0	52.25	5.31	5.31	146.01	140.69	146.01	288.05	288.05	50.7%
6	0.000	Other			90.0	52.25	5.31	5.31	146.01	140.69	146.01	288.05	288.05	50.7%
7	0.000	Other			180.0	52.25	5.31	5.31	146.01	140.69	146.01	288.05	288.05	50.7%
8	0.000	Other			270.0	52.25	5.31	5.31	146.01	140.69	146.01	288.05	288.05	50.7%
								53.25						

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

v4.4 - Effective 7-12-13

Date: 11/16/2016
PJF Project: 37516-0115.008.7805
Client Ref. # 876329
Site Name: MTN. View Cem. (Filley Park)
Description: 60' Flange
Owner: CCI
Engineer: NZP

Asymmetric Bolt Analysis

Moment =	873.52	k-ft	TIA Ref.	G		Location =	Flange Plate	
Axial =	16.94	kips	ASIF =	1.0000		η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	19.87	kips	Max Ratio =	100.0%		Threads =	N-Included	for FP, Rev. G
Anchor Qty =	4							

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	0.000				50.0	46.19	8.00	8.00	231.18	222.71	231.18	330.51	330.51	69.9%
2	0.000				140.0	46.19	8.00	8.00	231.18	222.71	231.18	330.51	330.51	69.9%
3	0.000				230.0	46.19	8.00	8.00	231.18	222.71	231.18	330.51	330.51	69.9%
4	0.000				320.0	46.19	8.00	8.00	231.18	222.71	231.18	330.51	330.51	69.9%
								32.00						

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#:	
Site Name:	
App #:	

Reactions		
Mu	319.02	ft-kips
Axial, Pu:	10.27	kips
Shear, Vu:	17.29	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria:	TIA G

<-Only Applcable to Unstiffened Cases

Bolt Data

Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	29		

Plate Data

Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)

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

Pole Data

Diam:	24	in
Thick:	0.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	Rigid
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	25.89	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.488	in	
Min PL "treq" for actual **T w/ Pry**:	0.782	in	
Min PL "t1" for actual **T w/o Pry**:	1.025	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	25.89	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	47.5%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	18.3	ksi	Rigid
Allowable Plate Stress:	32.4	ksi	TIA G
Compression Plate Stress Ratio:	56.5%	**Pass**	φ*Fy
No Prying			Comp. Y.L. Length:
Tension Side Stress Ratio, (treq/t)^2:	27.2%	**Pass**	16.28

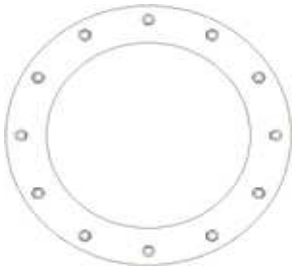
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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

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Job Number:	37516-0115.008.7805	**Page:**	1
Site Number:	876329	**By:**	NZP
Site Name:	MTN. View CEM. (Filley Park)	**Date:**	11/16/2016

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	2391.0		k-ft
Shear, Vu =	30.0		kips
Axial Load, Pu1 =	39.0		kips (from 1.2D + 1.6W)*
Axial Load, Pu2 =	29.3	0.0	kips (from 0.9D + 1.6W)**
OTMu =	2406.0	0.0	k-ft @ Ground

***Axial Load, Pu1 will be used for Soil Compression Analysis.**

****Axial Load, Pu2 will be used for Steel Analysis.**

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-08
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

Drilled Pier Parameters

Diameter =	6	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	25	ft
fc' =	3	ksi
εc =	0.003	in/in
L / D Ratio =	4.25	
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA-222-G

1. (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
2. (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Steel Parameters

Number of Bars =	24	
Rebar Size =	#9	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	3	in

Soil Parameters

Water Table Depth =	15.00 ft
Depth to Ignore Soil =	3.00 ft
Depth to Full Cohesion =	0 ft
Full Cohesion Starts at?*	Ground

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)

Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Define Soil Layers

Note: Cohesion = Undrained Shear Strengh = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	15	135		36	Sand	8000			15
2	15	137.4		36	Sand	8000			30
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	17.66	ft, from Grade	Shear, Vu =	30.00	kips
Bending Moment, Mu =	2935.78	k-ft, from COR	Resisting Shear, ΦVn =	97.79	kips
Resisting Moment, ΦMn =	9569.54	k-ft, from COR			
MOMENT RATIO =	**30.7%**	**OK**	**SHEAR RATIO =**	**30.7%**	**OK**

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	81.46	kips
UPLIFT RATIO =	**0.0%**	**OK**

Soil Results: Compression

Compression, Cu =	39.00	kips
Comp. Capacity, ΦCn =	155.19	kips
COMPRESSION RATIO =	**25.1%**	**OK**

Steel Results (ACI 318-08):

Minimum Steel Area =	13.57	sq in	Axial Load, Pu =	52.15	kips @ 5.50 ft Below Grade
Actual Steel Area =	24.00	sq in	Moment, Mu =	2545.20	k-ft @ 5.50 ft Below Grade
			Moment, ΦMn =	3294.70	k-ft
Axial, ΦPn (min) =	-1296.00	kips, Where ΦMn = 0 k-ft	**MOMENT RATIO =**	**77.3%**	**OK**
Axial, ΦPn (max) =	6115.79	kips, Where ΦMn = 0 k-ft			

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876329*
Site Name: *MTN. View CEM. (Filley Park)*
App #:

Loads Already Factored		
For M (WL)	1	<----Disregard
For P (DL)	1	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	6.0	ft
Concrete Area =	4071.5	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	5.30	ft
Vert. Cage Diameter =	63.62	in
Vertical Bar Size =	9	
Bar Diameter =	1.13	in
Bar Area =	1	in^2
Number of Bars =	24	
As Total=	24	in^2
A s/ Aconc, Rho:	0.0059	0.59%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.59%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	6115.79	kips
at Mu=(ϕ=0.65)Mn=	3187.43	ft-kips
Max Tu, (φ=0.9) Tn =	1296	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	2545.2	ft-kips **(* Note)**
Max. Factored Shaft Pu:	52.15	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.00	Mu:	2545.2	ft-kips
1.00	Pu:	52.15	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2008

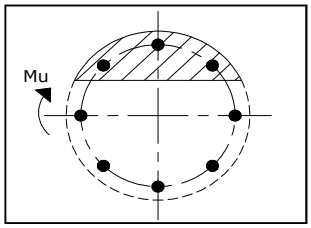
Seismic Properties

Seismic Design Category =	D
Seismic Risk =	**High**

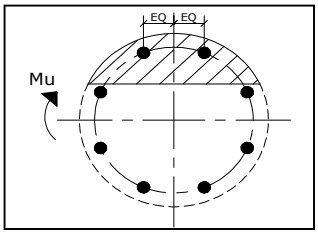
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**11.94**	in
Extreme Steel Strain, ϵt:	**0.0140**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	52.15	kips
Drilled Shaft Moment Capacity, φMn:	**3294.69**	ft-kips
Drilled Shaft Superimposed Mu:	**2545.20**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**77.3%**

TOWN OF BLOOMFIELD

Council-Manager Government Since 1941

800 Bloomfield Avenue
P.O. BOX 337 BLOOMFIELD, CONNECTICUT 06002
(860)769-3515

TOWN PLAN & ZONING COMMISSION

PERMIT TO DEVELOP

Permission is hereby granted to Sprint Spectrum L.P.

to develop premises located at 28 Brewer Drive (rear of Filley Pond)

in accordance with site plan dated August 1996

as approved by the Town Plan & Zoning commission on August 22, 1996.

Installation of Sprint Tower

All improvements required as part of site plan approval shall be installed within a twelve (12) month period. Under special circumstances, the Commission may extend the installation of improvements an additional twelve (12) months.

When development of these premises has been completed, a Certificate of Occupancy/Use/Completion must be issued by the Building Department of the Town of Bloomfield PRIOR TO USE OR OCCUPANCY OF THE PREMISES.

In addition to this Permit to Develop, a building permit is required for any building, sign, or other structure to be erected on the site.

ALL SITE WORK MUST BE COMPLETED IN ACCORDANCE WITH THE APPROVED SITE PLAN PRIOR TO ISSUANCE OF A C.O. FOR THE BUILDING.

This Permit to Develop is subject to the following conditions:

SEE PLAN: Road way to be removed upon completion of construction

THIS SITE MAY BE SUBJECT TO REGULATION BY ARMY CORPS OF ENGINEERS

TOWN PLAN & ZONING COMMISSION

Shirley P. Williams /mmf

Shirley P. Williams
Secretary

Date November 15, 1996

8/75; rev. 1/17/85, 4/88

cc: Building
Engineering (2)
PZP

ZONING BOARD OF APPEALS

TOWN OF BLOOMFIELD

LOCATION: FILLEY PARK BLOOMFIELD
Please type or print

OWNER OF RECORD: TOWN OF BLOOMFIELD

The foregoing application for /XX/ Variance; /XX/ Special Exception pursuant to Section 10B.2.b. of the Bloomfield Zoning Regulations, pertains to premises bounded and described as follows:
(Type or attach written legal boundary description)

PLEASE SEE ATTACHED

7/23/96
Date

Signature of Owner of Record

PLEASE NOTE REQUIREMENTS BELOW FOR RECORDING APPROVAL ON LAND RECORDS

To be completed by Zoning Board of Appeals following approval:

I hereby certify that the Zoning Board of Appeals, at a meeting held on August 5, 1996, approved /XX/ Variance ~~XX~~ and /XX/ Special Exception of Sprint Spectrum L.P. for

Variance for 120 ft. height of tower; and Special exception for telecommunications tower in a residential zone. ~~Town of Bloomfield property - Brewer Drive(Filley Park~~ at the above premises, pursuant to Section III.M.4.P/IV.B.2 of the Bloomfield Zoning Regulations, subject to the following conditions (if any):

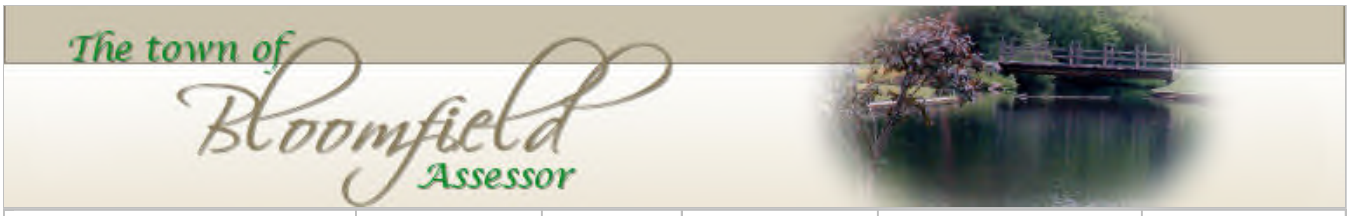
1. Construction shall take place only between the hours of 7:30 a.m. and 5:00 p.m., Monday through Friday.
2. Construction entrance shall be blocked at the end of each work day.

Woodrow Dyson/mmf
Secretary - ZBA

NOTE: PURSUANT TO SECTION 8-3d OF THE CONN. GENERAL STATUTES, THIS VARIANCE/SPECIAL EXCEPTION WILL NOT BECOME EFFECTIVE UNTIL IT HAS BEEN RECORDED ON THE LAND RECORDS OF THE TOWN OF BLOOMFIELD. IT IS THE RESPONSIBILITY OF THE OWNER TO RECORD THIS FORM AND PAY THE RECORDING FEE. ($10.00 FOR THE FIRST PAGE, $5.00 EACH ADDITIONAL PAGE

NO BUILDING PERMITS REQUIRED IN CONNECTION WITH THE ABOVE VARIANCE OR SPECIAL EXCEPTION MAY BE ISSUED UNTIL THIS APPROVAL HAS BEEN RECORDED.

Rev. 1/91



Owner and Parcel Information			
Owner Name	BLOOMFIELD TOWN OF TOWN HALL	**Today's Date**	January 6, 2017
Mailing Address	800 BLOOMFIELD AVE	**Parcel ID**	7622 (Account #: R12968)
	BLOOMFIELD, CT 06002	**Fire District**	C
Location Address	28 BREWER DR	**Census Tract**	
Map / Lot	176-1 / 1168	**Acreage**	3.37
Use Class / Description	921 Mun Lnd Res	**Parcel Map**	Show Parcel Map / Owner List By Radius
Assessing Neighborhood	0001A	**Utilities**	

Current Appraised Value Information							
Building Value	**XF Value**	**OB Value**	**Land Value**	**Special Land Value**	**Total Appraised Value**	**Net Appraised Value**	**Current Assessment**
$ 0	$ 0	$ 3,400	$ 327,300		$ 330,700	$ 330,700	$ 231,490

Assessment History				
Year	**Building**	**OB/Misc**	**Land**	**Total Assessment**
Current	0	$ 2,380	$ 229,110	$ 231,490
2013	0	$ 2,380	$ 195,860	$ 198,240
2009	0	$ 2,380	$ 195,860	$ 198,240

Land Information				
Use	**Class**	**Zoning**	**Area**	**Value**
Mun Lnd Res	E	R-15	0.34 AC	$ 107,200
Res Cell Site	R	R-15	1 BL	$ 200,000
Mun Lnd Res	E		3.03 AC	$ 20,100

Building Information
No Building Information available for this parcel.

Out Buildings / Extra Features				
Description	**Sub Description**	**Area**	**Year Built**	**Value**
Shed	1 Stry Frame	286 S.F.	1998	$ 3,400

Sale Information						
Sale Date	**Sale Price**	**Deed Book/Page**	**Sale Qualification**	**Reason**	**Vacant or Improved**	**Owner**
00/00/0000		113/ 751	Unqualified	Old sale- Validity unknown	Vacant	BLOOMFIELD TOWN OF TOWN HALL

Permit Information								
Permit ID	**Issue Date**	**Type**	**Description**	**Amount**	**Inspection Date**	**% Complete**	**Date Complete**	**Comments**
B19770	05/06/1998					100		12X26 SHED TENANT ON TOWER;

Town of Bloomfield			
Parcel: 7622 Acres: 3.37			
Name:	BLOOMFIELD TOWN OF	Land Value	327300
Site:	28 BREWER DR	Building Value	0
Sale:	0 on 0000-00-00 Reason=U Qual=34	Misc Value	0
Mail:	800 BLOOMFIELD AVE BLOOMFIELD, CT 06002	Just Value	330700
		Assessed Value	0
		Exempt Value	0
		Taxable Value	0

Date printed: 01/06/17 : 12:05:23