QC Development
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February 1, 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) – CT1005
Farmdale Road, Waterbury, CT 06704
N 41-34-14.37
W 73-01-03.29

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 153-foot level of the existing 150-foot Guyed Monopole at Farmdale Road, Waterbury, CT. The tower is owned by American Tower. The property is owned by AT&T. AT&T now intends to install three (3) Ericsson remote radio units (RRUS-11) and three (3) Ericsson RRUS-E2 units in the shelter and replace three (3) TMAs with six (6) CCI triplexers at the 154-foot level of the tower.

This facility was approved by the Connecticut Siting Council in Docket # 44.5 on July 24, 1984. This approval included a condition that the tower and antennas not exceed 167 feet above ground level. Since no modification to the overall facility height is proposed, this modification therefore complies with the aforementioned approval.

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 Neil M. O'Leary, Mayor of the City of Waterbury, the Waterbury Planning & Zoning Department 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.

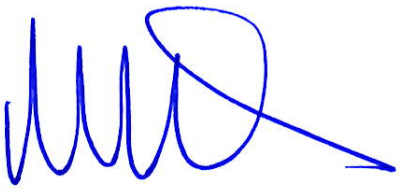
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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: The Honorable Neil M. O'Leary - as elected official (via e-mail)
Charles Morrison – as local Land Use Officer (via e-mail)
American Tower - as tower owner (via e-mail)
AT&T - as property 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*							2.63%
AT&T GSM	1	261	153	0.0043	880	0.5867	0.07%
AT&T UMTS	3	261	153	0.0130	880	0.5867	0.22%
AT&T UMTS	2	424	153	0.0141	1900	1.0000	0.14%
AT&T LTE	2	1476	153	0.0491	740	0.4933	1.00%
AT&T LTE	2	2421	153	0.0806	1900	1.0000	0.81%
AT&T LTE	2	1146	153	0.0381	2300	1.0000	0.38%
Site Total							5.25%

*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*							2.63%
AT&T UMTS	2	261	153	0.0087	880	0.5867	0.15%
AT&T UMTS	2	538	153	0.0179	1900	1.0000	0.18%
AT&T LTE	2	1227	153	0.0408	740	0.4667	0.88%
AT&T LTE	1	261	153	0.0043	880	0.5667	0.08%
AT&T LTE	2	3664	153	0.1220	1900	1.0000	1.22%
AT&T LTE	1	1227	153	0.0204	2300	1.0000	0.20%
Site Total							5.33%

*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

PROJECT INFORMATION

SCOPE OF WORK:	ON THE TOWER: SWAP (3) TMA'S FOR (6) CCI TPX-070821 TRIPLEXERS. IN THE EQUIPMENT ROOM: ADD (3) RRUS-11 850 & (3) RRUS-E2 700 REPLACE EXISTING SURGE ADD 2ND XMU WITH IDL2 LINK
SITE ADDRESS:	FARMDALE DRIVE WATERBURY, CT 06704
LATITUDE:	41° 34' 14.4" (NAD 83)*
LONGITUDE:	73° 01' 3.3" (NAD 83)* *PER AT&T EXISTING PLANS
JURISDICTION:	CONNECTICUT SITING COUNCIL
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
NAME OF APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
TOWER OWNER: TOWER NUMBER:	AMERICAN TOWER 302476

DRAWING INDEX

		REV
T01	TITLE SHEET	0
G01	GENERAL NOTES	0
A01	SITE PLAN	0
A02	EXISTING AND PROPOSED SHELTER LAYOUTS	0
A03	ANTENNA LAYOUTS & ELEVATIONS	0
A04	CONSTRUCTION DETAILS	0
E01	GROUNDING DETAILS	0

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STRUCTURAL NOTE:

1. AS REQUIRED THE TIA/EIA 222G – STANDARD, SAI COMMUNICATIONS, INC. 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, CABLES, 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, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

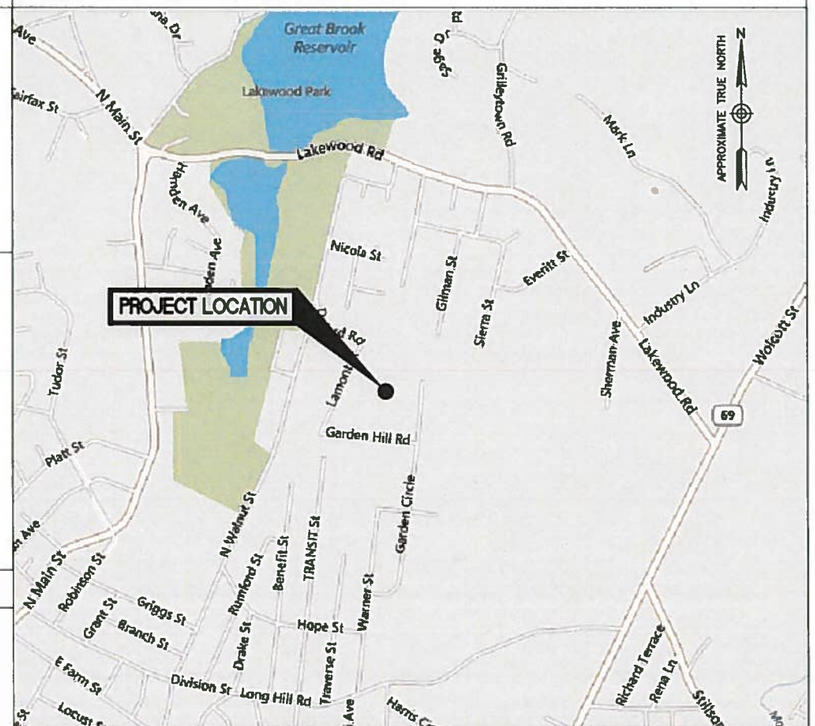
CONTACT INFORMATION

CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	GREG H. NAWROTZKI	DEWBERRY	(973) 576-9653
SAC:	WARREN KELLEHER	SAI	(978) 807-2700
CONST.:	SCOTT KELLEY	SAI	(978) 979-7638

SITE NAME: WOLCOTT WEST
SITE NUMBER: CT1005
SCOPE: LTE 4C + 5C

VICINITY MAP

DIRECTIONS: (FROM ROCKY HILL, CT) HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. 0.3 MILES TURN LEFT ONTO CAPITOL BLVD. 0.2 MILES TURN LEFT ONTO WEST ST. 0.3 MILES MERGE ONTO I-81 S VIA RAMP ON THE LEFT TOWARD NEW HAVEN. 9.0 MILES MERGE ONTO I-691 W VIA EXIT 18 TOWARD MERIDEN/WATERBURY. 7.9 MILES MERGE ONTO I-84 W VIA EXIT 1 ON THE LEFT TOWARD WATERBURY/DANBURY. 7.4 MILES TAKE THE UNION ST EXIT TOWARD DOWNTOWN WATERBURY. STAY STRAIGHT TO GO ONTO BRASS MILL DR. BRASS MILL DR BECOMES WELTON ST. 0.1 MILES TURN RIGHT ONTO WALNUT ST. 0.8 MILES TURN RIGHT ONTO DELFORD RD. DELFORD RD BECOMES LAMONT ST. 0.1 MILES TURN LEFT ONTO GARDEN HILL RD. TURN LEFT ONTO GARDEN HILL CIRCLE. TURN LEFT ONTO FARMDALE DR. SITE IS ON THE RIGHT.



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, AMENDMENTS TO THE 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-2005, 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.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

SAI
27 NORTHWESTERN DRIVE
SALEM, NH 03079

WOLCOTT WEST
SITE NO. CT1005

FARMDALE DRIVE
WATERBURY, CT 06704

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/3/17	ISSUED FOR CONSTRUCTION	GWY	GHN	GHN
A	12/12/16	PRELIMINARY SUBMISSION	GWY	GHN	GHN

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

STATE OF CONNECTICUT
JIANG YU
No. 28222
LICENSED PROFESSIONAL ENGINEER
CT LICENSE NO. PEN.0028222

TITLE SHEET

DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	T01	0

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – SAI COMMUNICATIONS, INC.
   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 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 LAND LORD. 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.

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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SUITE 3A
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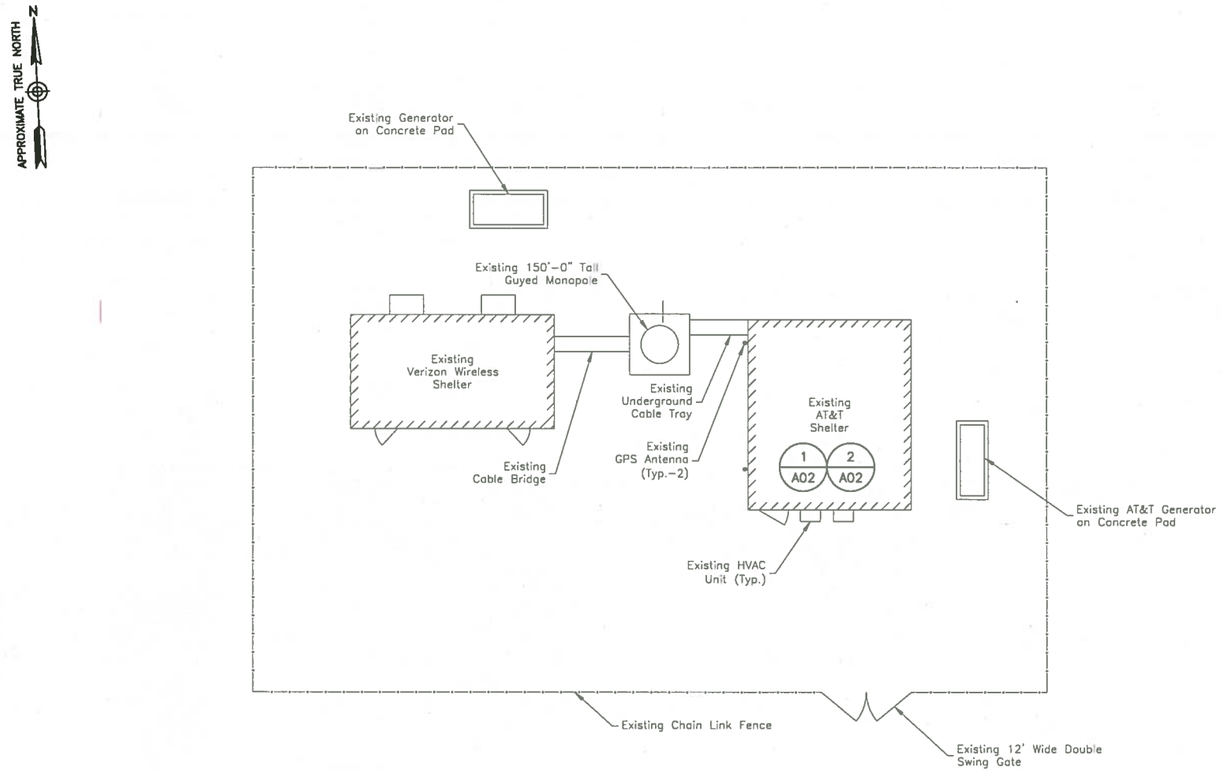
NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/3/17	ISSUED FOR CONSTRUCTION	GWY	GHN	GHN
A	12/12/16	PRELIMINARY SUBMISSION	GWY	GHN	GHN

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

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER
CT LICENSE NO. PEN.0023222

GENERAL NOTES

DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	G01	0



SITE PLAN 1
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'

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No. 23222
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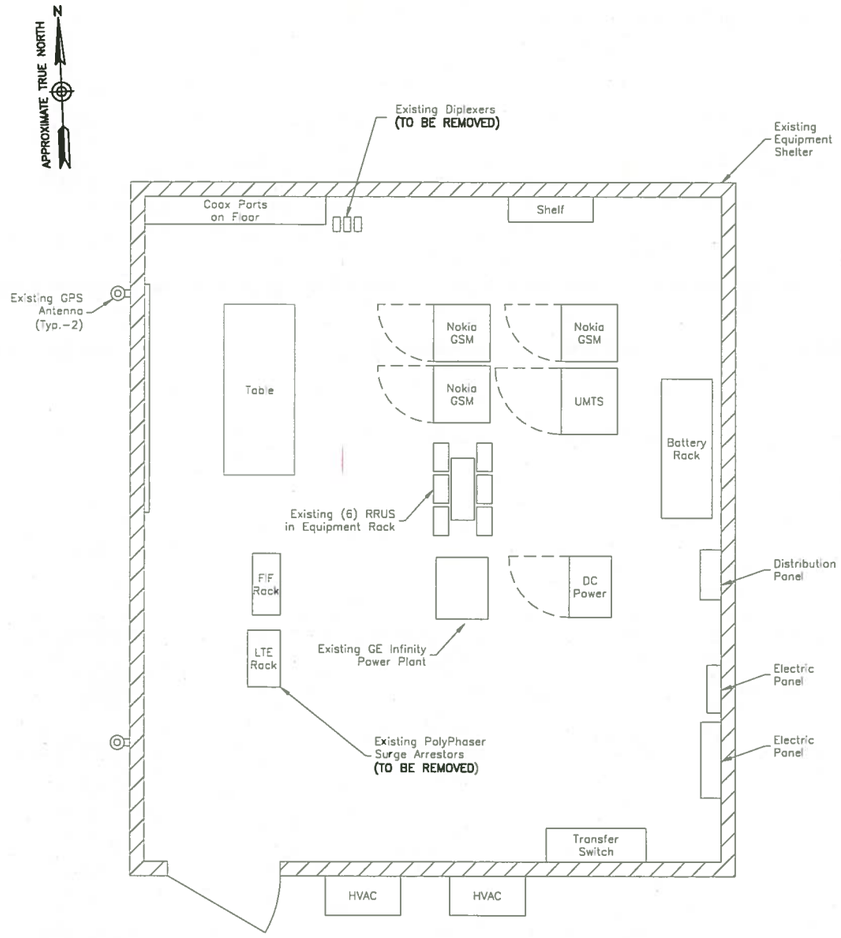
SITE PLAN

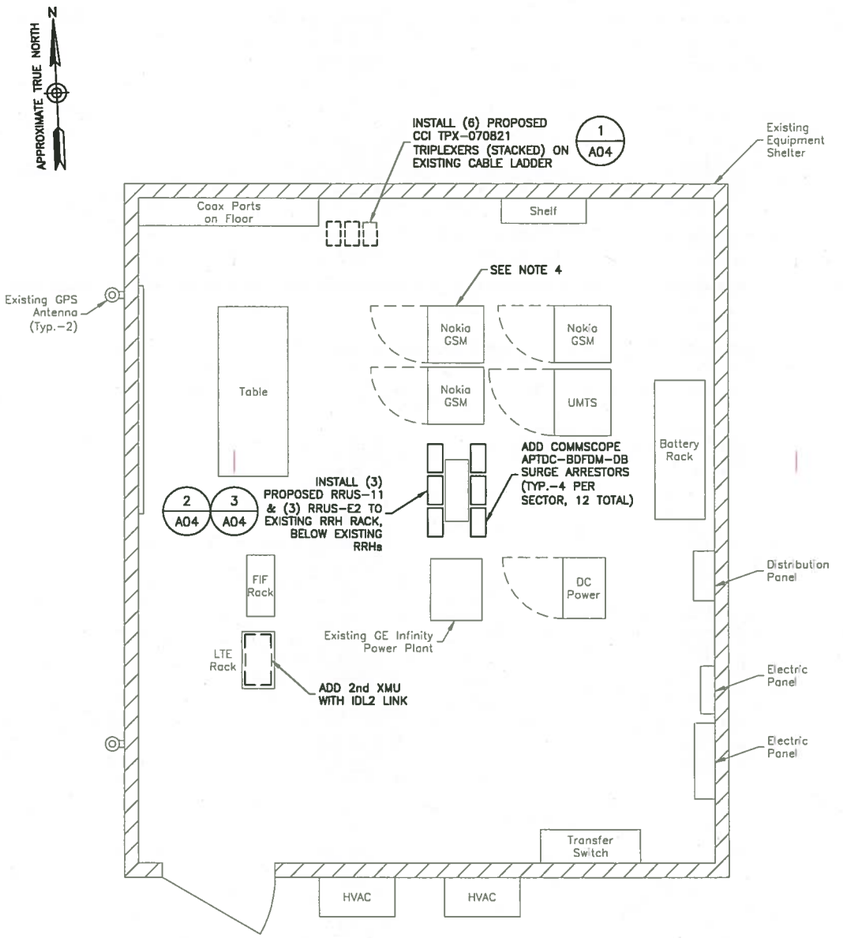
DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	A01	0



EXISTING SHELTER LAYOUT DETAIL (1)

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'



PROPOSED SHELTER LAYOUT DETAIL (2)

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. MOUNT ALL ANTENNAS, COAX, SURGE ARRESTORS, RRU'S, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS BY OTHERS.
3. NOT ALL INFORMATION SHOWN FOR CLARITY.
4. GSM 850 NEED TO BE DECOMMISSIONED FOR CARRIER ADD.

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

STATE OF CONNECTICUT
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No. 28222
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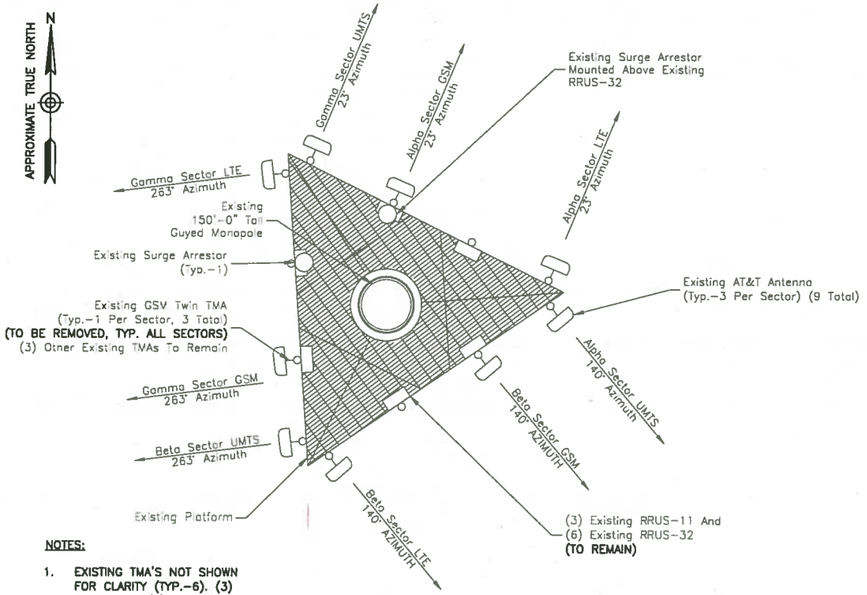
EXISTING AND PROPOSED SHELTER LAYOUTS

DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	A02	0

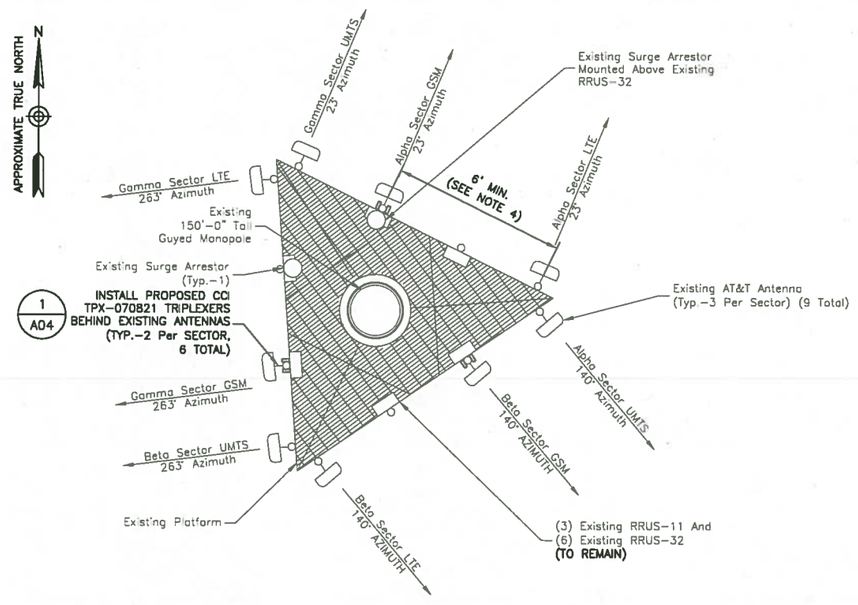


NOTES:

1. EXISTING TMA'S NOT SHOWN FOR CLARITY (TYP.-6). (3) TO REMAIN, (3) TO BE REMOVED.

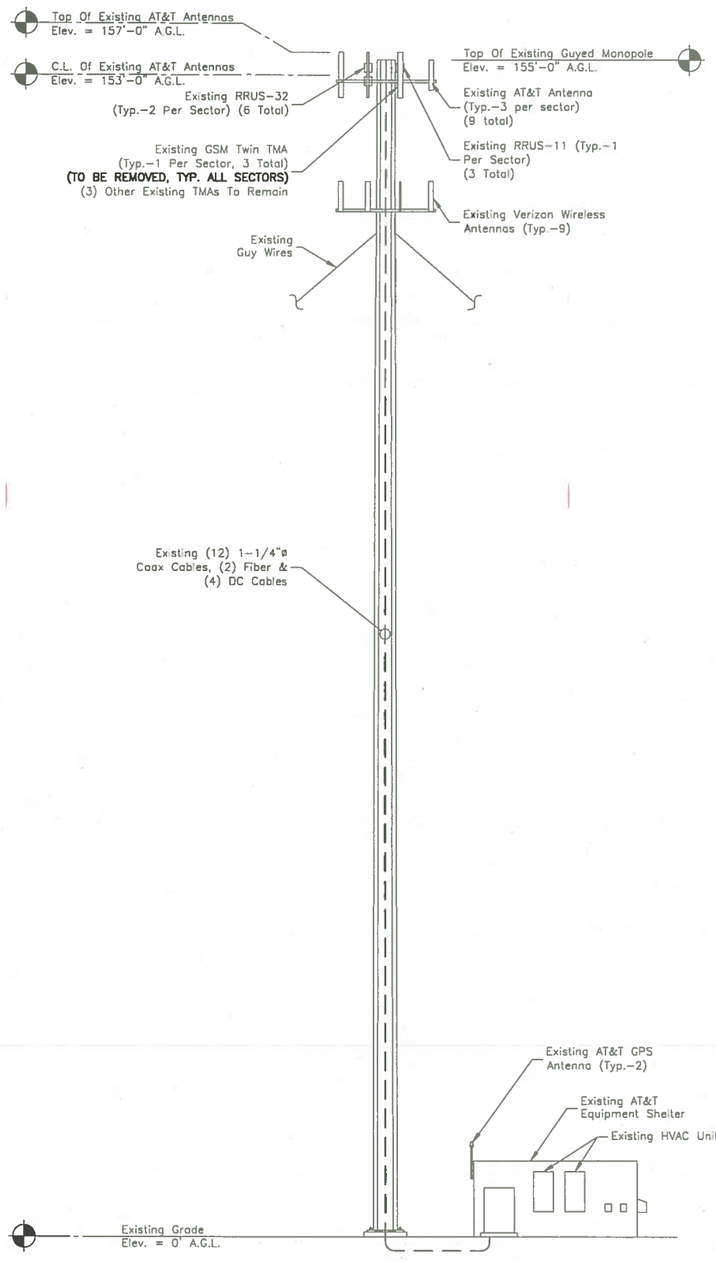
EXISTING ANTENNA LAYOUT (1)

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)

SCALE: N.T.S.

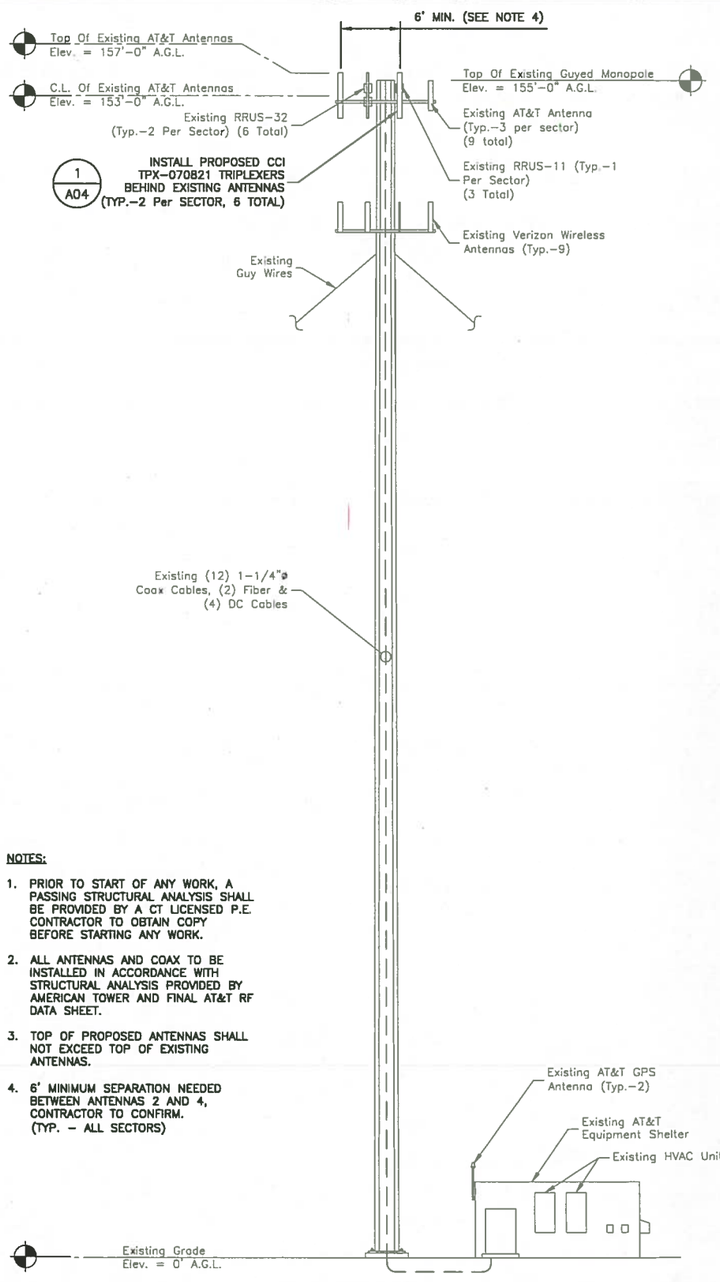


EXISTING SOUTH ELEVATION (3)

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

0' 10' 20'

A.G.L. = ABOVE GRADE LEVEL
C.L. = CENTER LINE



NOTES:

1. PRIOR TO START OF ANY WORK, A PASSING STRUCTURAL ANALYSIS SHALL BE PROVIDED BY A CT LICENSED P.E. CONTRACTOR TO OBTAIN COPY BEFORE STARTING ANY WORK.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY AMERICAN TOWER AND FINAL AT&T RF DATA SHEET.
3. TOP OF PROPOSED ANTENNAS SHALL NOT EXCEED TOP OF EXISTING ANTENNAS.
4. 6' MINIMUM SEPARATION NEEDED BETWEEN ANTENNAS 2 AND 4, CONTRACTOR TO CONFIRM. (TYP. - ALL SECTORS)

PROPOSED SOUTH ELEVATION (4)

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

0' 10' 20'

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STATE OF CONNECTICUT
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No. 23222
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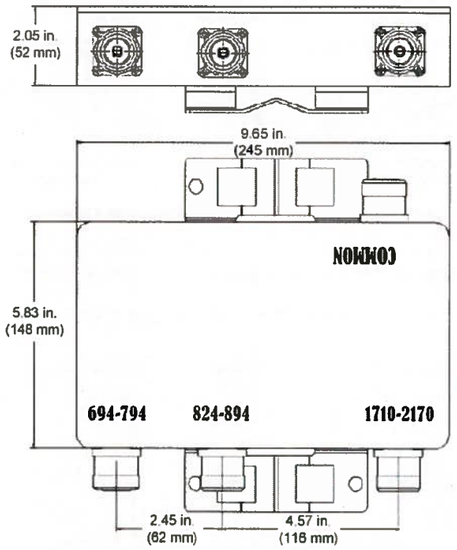
CT LICENSE

ANTENNA LAYOUTS & ELEVATIONS

DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	A03	0

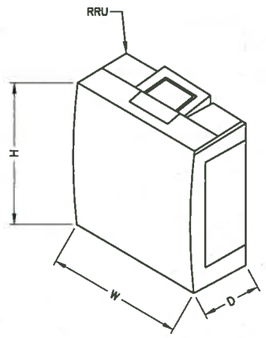


CCI TRIPLEXER		
MODEL #	DIMENSIONS (HxWxD)	WEIGHT
TPX-070821	5.83"X9.65"X2.05"	7.5 LBS

NOTE:

1. CONTRACTOR TO FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTION.

CCI TRIPLEXER DETAILS (1)
SCALE: N.T.S.

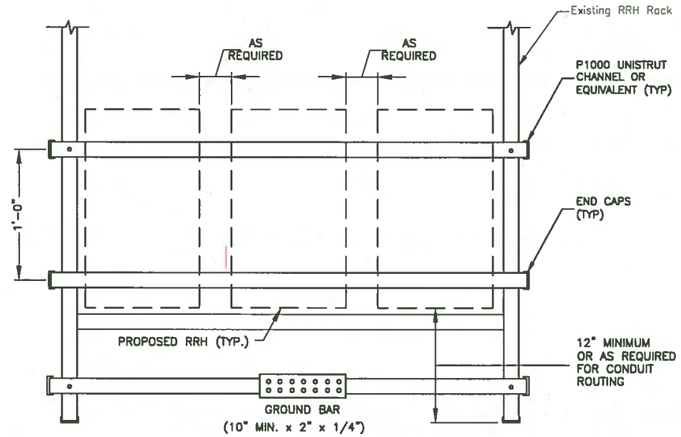


RRU MODEL & DIMENSIONS	
ERICSSON MODEL #	DIMENSIONS (HxWxD)
RRUS-11	19.7"x17.0"x7.2"
RRUS-12	20.4"x18.8"x7.5"
RRUS-E2	20.4"x18.8"x7.5"
RRUS-32	29.9"x13.3"x6.7"

RRU NOTES:

1. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND AT&T STANDARDS.
2. MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
3. CONFIRM REQUIRED EQUIPMENT WITH LATEST RFDS.

RRU & A2 MODULE (2)
SCALE: N.T.S.



ELEVATION

NOTES:

1. SUBCONTRACTOR SHALL SUPPLY AND INSTALL UNISTRUT (OR EQUIVALENT) MOUNTING CHANNELS.
2. A SUPPORT FOR A SINGLE RRH SHALL HAVE A MINIMUM OF TWO ANCHORS/FASTENERS FOR EACH UNISTRUT CHANNEL.
3. SUBCONTRACTOR SHALL SUPPLY 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER RRH. SUBCONTRACTOR SHALL BAG THE BOLTING HARDWARE AND HANG FROM INSTALLED UNISTRUT FRAME.
4. SPACING MAY VARY BASED ON SELECTED EQUIPMENT. ADJUSTMENTS TO SPACING WILL BE MADE BY RRH INSTALLER.
5. NO PAINTING OF THE RRH OR SOLAR SHIELD IS ALLOWED.
6. ALL EQUIPMENT MUST BE GROUNDED.

RRH/EQUIPMENT MOUNTING DETAIL (3)
SCALE: N.T.S.

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STATE OF CONNECTICUT
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No. 23222
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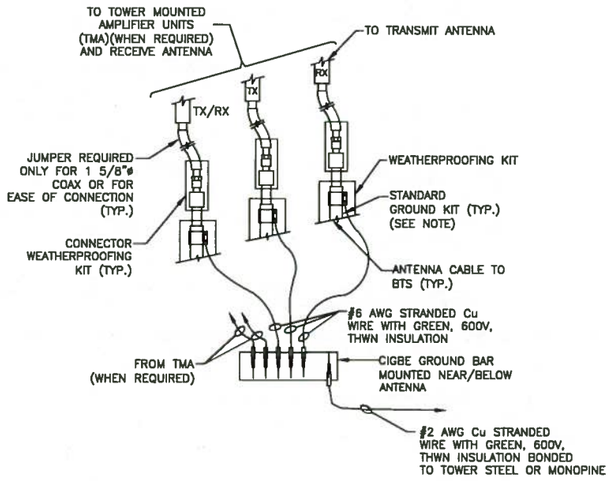
CT LICENSE NO.

CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	A04	0

GROUNDING NOTES:

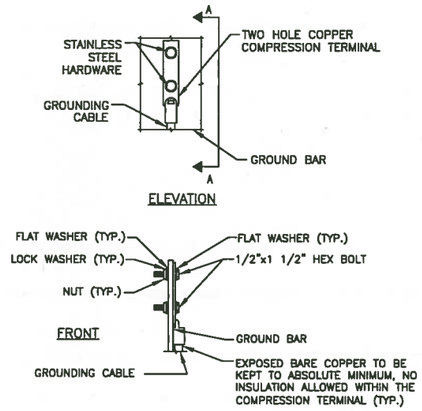
1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER 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 ENGINEER 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.



NOTE:

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

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) 1

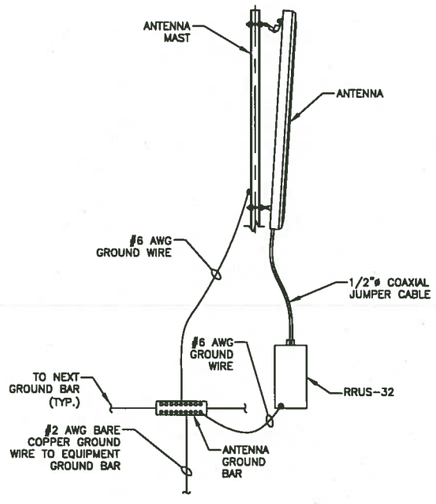


NOTES:

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

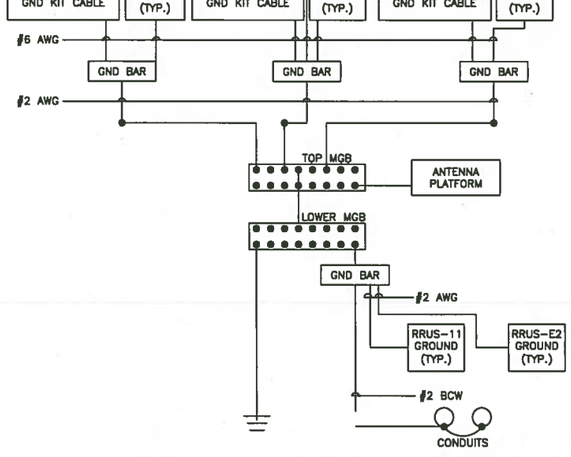
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 3

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
4. GROUND ALL EQUIPMENT PER MANUFACTURER RECOMMENDATIONS.

SCHEMATIC GROUNDING DIAGRAM

SCALE: N.T.S.

Dewberry®
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

SAI
27 NORTHWESTERN DRIVE
SALEM, NH 03079

WOLCOTT WEST
SITE NO. CT1005

FARMDALE DRIVE
WATERBURY, CT 06704

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/3/17	ISSUED FOR CONSTRUCTION	GWY	GHN	GHN
A	12/12/16	PRELIMINARY SUBMISSION	GWY	GHN	GHN

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

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER
CT LICENSE No. PEC.0023222

GROUNDING DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50055106/50065671	E01	0

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Structural Analysis Report

Structure	:	**150 ft Guyed Monopole**
ATC Site Name	:	**Wtbr - Waterbury, CT**
ATC Site Number	:	**302476**
Engineering Number	:	**OAA692335_C3_01**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**Waterbury**
Carrier Site Number	:	**CT1005**
Site Location	:	**Farmdale Drive** **Waterbury, CT 06704-2833** **41.570667,-73.017600**
County	:	**New Haven**
Date	:	**December 30, 2016**
Max Usage	:	**87%**
Result	:	**Pass**

Prepared By:
Blake Bartok
Structural Engineer III

Reviewed By:

COA: F-6274

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Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 150 ft guyed monopole to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	SpectraSite Site #CT-0012, Rev 1, dated November 18, 2004
Foundation Drawing	Girard & Co. Engineers Job #38926, dated July 10, 1984

Analysis

The tower was analyzed using tnxTower version 7.0.7.0 analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/EIA-222.

Basic Wind Speed:	97 mph (3-Second Gust Vasd) / 125 mph (3-Second Gust Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC w/ 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft

Conclusion

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

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

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	154.0	3	CCI DTMABP7819VG12A	Platform w/ Handrails	(12) 1 1/4" Coax (6) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk	AT&T Mobility
		2	Raycap DC6-48-60-18-8F			
		3	ADC DD1900			
		3	Ericsson RRUS 32			
		3	Ericsson RRUS 11 B5			
		3	Ericsson RRUS-32			
		3	Powerwave 7770.00			
		1	Quintel QS66512-3			
		1	CCI OPA-65R-LCUU-H6			
		2	CCI OPA-65R-LCUU-H8			
		2	CCI TPA-65R-LCUUUU-H8			
129.0	129.0	6	RFS FD9R6004/2C-3L	Platform w/ Handrails	(15) 1 5/8" Coax (1) 1 5/8" Hybriflex	Verizon Wireless
		3	Andrew DB948F85E-M			
		3	Antel BXA-80063-4CF-EDIN-X			
		1	RFS DB-T1-6Z-8AB-0Z			
		1	Commscope LNX-4514DS-A1M			
		2	Commscope LNX-6514DS-A1M			
		3	Alcatel-Lucent RRH2X60-1900			
		3	Alcatel-Lucent B66 RRH4x45			
		4	Commscope SBNHH-1D65B			
		2	Commscope SBNHH-1D45B			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	154.0	3	ADC DD1900	-	-	AT&T Mobility
		3	CCI DTMABP7819VG12A			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
150.0	154.0	6	CCI TPX-070821	Platform w/ Handrails	-	AT&T Mobility

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	20%	Pass
Shaft	86%	Pass
Base Plate	12%	Pass
Flanges	56%	Pass
Guys	71%	Pass

Foundations

Reaction Component	Analysis Reactions
Moment (Kips-Ft)	320.3
Axial (Kips)	74.1
Shear (Kips)	7.5
Anchor Uplift (Kips)	24.5
Anchor Shear (Kips)	23.3

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

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (in)	Sway (Rotation) (°)	Twist (°)
154.0	CCI DTMABP7819VG12A	AT&T Mobility	5.108	0.7850	0.0121
	Raycap DC6-48-60-18-8F				
	ADC DD1900				
	Ericsson RRUS 32				
	Ericsson RRUS 11 B5				
	Ericsson RRUS-32				
	Powerwave 7770.00				
	Quintel QS66512-3				
	CCI OPA-65R-LCUU-H6				
	CCI OPA-65R-LCUU-H8				
	CCI TPA-65R-LCUUUU-H8				
	CCI TPX-070821				

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

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Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

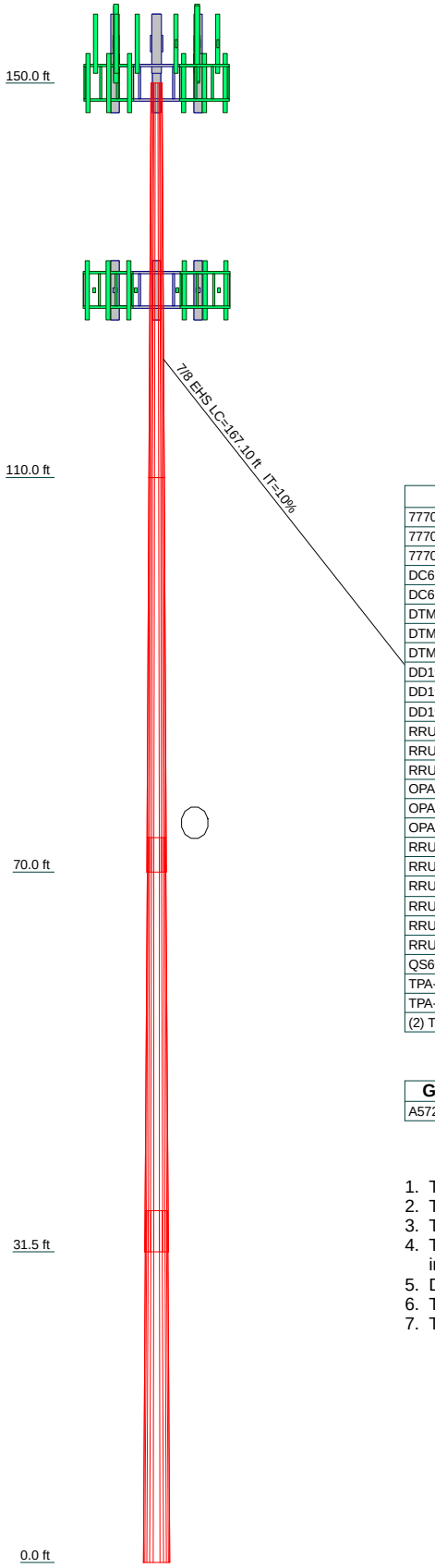
-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

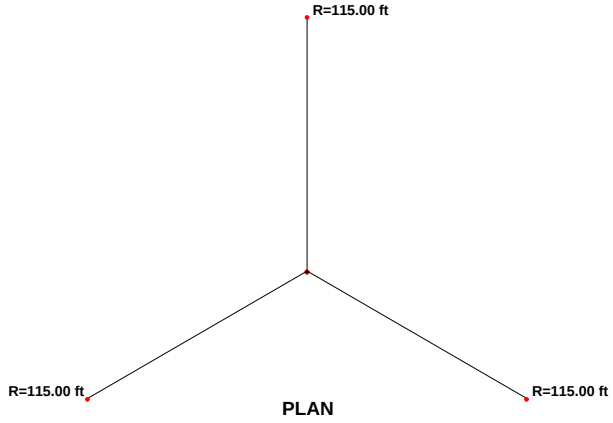
It is the responsibility of the client to ensure that the information provided to ATC Tower Services LLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Tower Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	40.00	12	0.1875		15.0000	21.2500		1474.1
2	40.00	12	0.2500	3.50	21.2500	27.6100		2649.4
3	42.00	12	0.3125	4.17	26.5535	33.1000		4244.5
4	35.67	12	0.3750		31.8255	37.3800		5016.1
							A572-65	13384.0





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
7770.00	150	(2) TPX-070821	150
7770.00	150	(2) TPX-070821	150
7770.00	150	Flat Platform w/ Handrails	150
DC6-48-60-18-8F	150	Flat Platform w/ Handrails	129
DC6-48-60-18-8F	150	(2) FD9R6004/2C-3L (3.1 lbs)	129
DTMABP7819VG12A	150	(2) FD9R6004/2C-3L (3.1 lbs)	129
DTMABP7819VG12A	150	(2) FD9R6004/2C-3L (3.1 lbs)	129
DTMABP7819VG12A	150	DB948F85E-M	129
DD1900	150	DB948F85E-M	129
DD1900	150	DB948F85E-M	129
DD1900	150	BXA-80063-4CF-EDIN-X	129
RRUS-32	150	BXA-80063-4CF-EDIN-X	129
RRUS-32	150	BXA-80063-4CF-EDIN-X	129
RRUS-32	150	DB-T1-6Z-8AB-0Z	129
OPA-65R-LCUU-H6	150	LNX-4514DS-A1M	129
OPA-65R-LCUU-H8 (92.7")	150	LNX-6514DS-A1M	129
OPA-65R-LCUU-H8 (92.7")	150	LNX-6514DS-A1M	129
RRUS 32	150	(2) SBNHH-1D45B	129
RRUS 32	150	(2) SBNHH-1D65B	129
RRUS 32	150	(2) SBNHH-1D65B	129
RRUS 11 B5	150	B66 RRH4x45	129
RRUS 11 B5	150	B66 RRH4x45	129
RRUS 11 B5	150	B66 RRH4x45	129
QS66512-3 (112 lbs.)	150	RRH2x60-1900	129
TPA-65R-LCUUUU-H8	150	RRH2x60-1900	129
TPA-65R-LCUUUU-H8	150	RRH2x60-1900	129
(2) TPX-070821	150		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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

R=115.00 ft

AMERICAN TOWER CORPORATION
ATC Engineering

ATC Engineering
3500 Regency Parkway
Cary, NC 27518
Phone: 919-466-5277
FAX:

Job: ***302476 - Wtbr-Waterbury, CT***			
Project: ***OAA692335_C3_01***			
Client: Verizon Wireless	Drawn by: Blake.Bartok	App'd:	
Code: TIA-222-G	Date: 12/30/16	Scale: NTS	
Path: X:\W-Z\Wtbr - Waterbury, CT (302476)\OAA692335 AT&T MOBILITY\OAA692335_01_CUST_STRUCTRL\302476.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy 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				

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-110.00	40.00	0.00	12	15.0000	21.2500	0.1875	4.0000	A572-65 (65 ksi)
L2	110.00-70.00	40.00	3.50	12	21.2500	27.6100	0.2500	4.0000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	70.00-31.50	42.00	4.17	12	26.5535	33.1000	0.3125	4.0000	A572-65 (65 ksi)
L4	31.50-0.00	35.67		12	31.8255	37.3800	0.3750	4.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.5291	8.9430	250.4541	5.3029	7.7700	32.2335	507.4880	4.4015	3.5175	18.76
	21.9996	12.7165	720.0669	7.5404	11.0075	65.4160	1459.0508	6.2587	5.1925	27.693
L2	21.9996	16.9050	951.5678	7.5180	11.0075	86.4472	1928.1342	8.3201	5.0250	20.1
	28.5840	22.0248	2104.4088	9.7949	14.3020	147.1411	4264.1028	10.8399	6.7295	26.918
L3	28.0550	26.4050	2320.7747	9.3943	13.7547	168.7258	4702.5188	12.9957	6.2788	20.092
	34.2676	32.9924	4527.0653	11.7379	17.1458	264.0335	9173.0615	16.2379	8.0333	25.707
L4	33.6200	37.9765	4794.6345	11.2593	16.4856	290.8376	9715.2293	18.6909	7.5242	20.065
	38.6986	44.6835	7810.0590	13.2478	19.3628	403.3530	15825.2970	21.9919	9.0128	24.034

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-110.00				1	1	1			
L2 110.00-70.00				1	1	1			
L3 70.00-31.50				1	1	1			
L4 31.50-0.00				1	1	1			

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
122	EHS	A	7/8	7.97	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%
		B	7/8	7.97	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%
		C	7/8	7.97	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
122	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
122.00	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	1 1/4

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
122	0.26	0.26	0.26		2.73 2.9 sec/pulse	2.73 2.9 sec/pulse	2.73 2.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
122	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
122	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
122	A	61.00	20	5	1.5950
	B	61.00	20	5	1.5950
	C	61.00	20	5	1.5950

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft
122	A	114.19	122.00	9.507	2.30	8.992	2.43	8.479	2.57	7.970	2.73	7.465	2.92	6.966	3.12	6.473	3.36
	B	114.19	122.00	9.507	2.30	8.992	2.43	8.479	2.57	7.970	2.73	7.465	2.92	6.966	3.12	6.473	3.36
	C	114.19	122.00	9.507	2.30	8.992	2.43	8.479	2.57	7.970	2.73	7.465	2.92	6.966	3.12	6.473	3.36

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
0.78" (19.7 mm) 8 AWG 6	A	Surface Ar (CaAa)	150.00 - 7.00	2	2	-0.200 0.200	0.7800		0.59
0.39" (10mm) Fiber Trunk **	A	Surface Ar (CaAa)	150.00 - 7.00	1	1	0.200 0.250	0.3900		0.07
1 5/8" Coax	C	Surface Ar (CaAa)	129.00 - 7.00	15	6	-0.250 0.250	1.9800		0.82
1 5/8" Hybriflex ***	C	Surface Ar (CaAa)	129.00 - 7.00	1	1	0.250 0.260	1.9800		1.30

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
1 1/4" Coax	A	No	Inside Pole	150.00 - 7.00	12	No Ice	0.00	0.63
						1/2" Ice	0.00	0.63
						1" Ice	0.00	0.63
0.39" (10mm) Fiber Trunk	A	No	Inside Pole	150.00 - 7.00	1	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
0.78" (19.7 mm) 8 AWG 6	A	No	Inside Pole	150.00 - 7.00	4	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
***								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-110.00	A	0.000	0.000	7.800	0.000	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	26.334	0.000	0.26

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L2	110.00-70.00	A	0.000	0.000	7.800	0.000	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	55.440	0.000	0.54
L3	70.00-31.50	A	0.000	0.000	7.507	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	53.361	0.000	0.52
L4	31.50-0.00	A	0.000	0.000	4.777	0.000	0.28
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	33.957	0.000	0.33

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-110.00	A	1.719	0.000	0.000	40.305	0.000	0.88
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	46.676	0.000	0.98
L2	110.00-70.00	A	1.657	0.000	0.000	39.191	0.000	0.86
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	97.151	0.000	2.01
L3	70.00-31.50	A	1.566	0.000	0.000	37.722	0.000	0.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	93.508	0.000	1.93
L4	31.50-0.00	A	1.390	0.000	0.000	22.994	0.000	0.50
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	58.495	0.000	1.18

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-110.00	-0.2063	0.7336	-0.4344	0.4193
L2	110.00-70.00	-0.2235	1.2810	-0.4563	0.9748
L3	70.00-31.50	-0.2409	1.3427	-0.5213	1.0763
L4	31.50-0.00	-0.2098	1.1507	-0.4904	1.0256

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	4	0.78" (19.7 mm) 8 AWG 6	110.00 - 150.00	1.0000	1.0000
L1	5	0.39" (10mm) Fiber Trunk	110.00 - 150.00	1.0000	1.0000
L1	7	1 5/8" Coax	110.00 - 129.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	8	1 5/8" Hybriflex	110.00 - 129.00	1.0000	1.0000
L2	4	0.78" (19.7 mm) 8 AWG 6	70.00 - 110.00	1.0000	1.0000
L2	5	0.39" (10mm) Fiber Trunk	70.00 - 110.00	1.0000	1.0000
L2	7	1 5/8" Coax	70.00 - 110.00	1.0000	1.0000
L2	8	1 5/8" Hybriflex	70.00 - 110.00	1.0000	1.0000
L3	4	0.78" (19.7 mm) 8 AWG 6	31.50 - 70.00	1.0000	1.0000
L3	5	0.39" (10mm) Fiber Trunk	31.50 - 70.00	1.0000	1.0000
L3	7	1 5/8" Coax	31.50 - 70.00	1.0000	1.0000
L3	8	1 5/8" Hybriflex	31.50 - 70.00	1.0000	1.0000

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
7770.00	A	From Leg	5.00		0.0000	150.00	No Ice	5.51	2.93	0.04
			0.00				1/2" Ice	5.87	3.	0.07
			4.00				1" Ice	6.23	3.63	0.11
7770.00	B	From Leg	5.00		0.0000	150.00	No Ice	5.51	2.93	0.04
			0.00				1/2" Ice	5.87	3.27	0.07
			4.00				1" Ice	6.23	3.63	0.11
7770.00	C	From Leg	5.00		0.0000	150.00	No Ice	5.51	2.93	0.04
			0.00				1/2" Ice	5.87	3.27	0.07
			4.00				1" Ice	6.23	3.63	0.11
DC6-48-60-18-8F	B	From Leg	5.00		0.0000	150.00	No Ice	1.11	1.47	0.03
			0.00				1/2" Ice	1.67	1.67	0.05
			4.00				1" Ice	1.88	1.88	0.07
DC6-48-60-18-8F	C	From Leg	5.00		0.0000	150.00	No Ice	1.11	1.47	0.03
			0.00				1/2" Ice	1.67	1.67	0.05
			4.00				1" Ice	1.88	1.88	0.07
DTMABP7819VG12A	A	From Leg	5.00		0.0000	150.00	No Ice	0.97	0.39	0.02
			0.00				1/2" Ice	0.00	0.49	0.03
			3.00				1" Ice	1.43	0.60	0.04
DTMABP7819VG12A	B	From Leg	5.00		0.0000	150.00	No Ice	0.97	0.39	0.02
			0.00				1/2" Ice	0.00	0.49	0.03
			3.00				1" Ice	1.43	0.60	0.04
DTMABP7819VG12A	C	From Leg	5.00		0.0000	150.00	No Ice	0.97	0.39	0.02
			0.00				1/2" Ice	0.00	0.49	0.03
			3.00				1" Ice	1.43	0.60	0.04
DD1900	A	From Leg	5.00		0.0000	150.00	No Ice	1.09	0.30	0.01
			0.00				1/2" Ice	1.43	0.40	0.02
			3.00				1" Ice	1.59	0.51	0.03
DD1900	B	From Leg	5.00		0.0000	150.00	No Ice	1.09	0.30	0.01
			0.00				1/2" Ice	1.43	0.40	0.02
			3.00				1" Ice	1.59	0.51	0.03
DD1900	C	From Leg	5.00		0.0000	150.00	No Ice	1.09	0.30	0.01
			0.00				1/2" Ice	1.43	0.40	0.02
			3.00				1" Ice	1.59	0.51	0.03
RRUS-32	A	From Leg	5.00		0.0000	150.00	No Ice	3.31	2.76	0.08
			0.00				1/2" Ice	4.15	3.02	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			3.00			1" Ice	4.44	3.29	0.14
RRUS-32	B	From Leg	5.00	0.0000	150.00	No Ice	3.31	2.76	0.08
			0.00			1/2" Ice	4.15	3.02	0.10
			3.00			1" Ice	4.44	3.29	0.14
RRUS-32	C	From Leg	5.00	0.0000	150.00	No Ice	3.31	2.76	0.08
			0.00			1/2" Ice	4.15	3.02	0.10
			3.00			1" Ice	4.44	3.29	0.14
OPA-65R-LCUU-H6	A	From Leg	5.00	0.0000	150.00	No Ice	9.66	5.52	0.07
			0.00			1/2" Ice	10.13	5.97	0.13
			4.00			1" Ice	10.61	6.43	0.20
OPA-65R-LCUU-H8 (92.7")	B	From Leg	5.00	0.0000	150.00	No Ice	12.75	7.25	0.09
			0.00			1/2" Ice	13.33	7.82	0.16
			4.00			1" Ice	13.92	8.40	0.24
OPA-65R-LCUU-H8 (92.7")	C	From Leg	5.00	0.0000	150.00	No Ice	12.75	7.25	0.09
			0.00			1/2" Ice	13.33	7.82	0.16
			4.00			1" Ice	13.92	8.40	0.24
RRUS 32	A	From Leg	5.00	0.0000	150.00	No Ice	2.69	1.57	0.05
			0.00			1/2" Ice	2.91	1.76	0.07
			4.00			1" Ice	3.14	1.95	0.09
RRUS 32	B	From Leg	5.00	0.0000	150.00	No Ice	2.69	1.57	0.05
			0.00			1/2" Ice	2.91	1.76	0.07
			4.00			1" Ice	3.14	1.95	0.09
RRUS 32	C	From Leg	5.00	0.0000	150.00	No Ice	2.69	1.57	0.05
			0.00			1/2" Ice	2.91	1.76	0.07
			4.00			1" Ice	3.14	1.95	0.09
RRUS 11 B5	A	From Leg	5.00	0.0000	150.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			4.00			1" Ice	3.21	1.50	0.10
RRUS 11 B5	B	From Leg	5.00	0.0000	150.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			4.00			1" Ice	3.21	1.50	0.10
RRUS 11 B5	C	From Leg	5.00	0.0000	150.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			4.00			1" Ice	3.21	1.50	0.10
QS66512-3 (112 lbs.)	A	From Leg	5.00	0.0000	150.00	No Ice	8.13	6.80	0.11
			0.00			1/2" Ice	8.59	7.27	0.17
			4.00			1" Ice	9.05	7.72	0.23
TPA-65R-LCUUUU-H8	B	From Leg	5.00	0.0000	150.00	No Ice	13.30	8.82	0.08
			0.00			1/2" Ice	13.90	9.42	0.16
			4.00			1" Ice	14.50	10.03	0.25
TPA-65R-LCUUUU-H8	C	From Leg	5.00	0.0000	150.00	No Ice	13.30	8.82	0.08
			0.00			1/2" Ice	13.90	9.42	0.16
			4.00			1" Ice	14.50	10.03	0.25
(2) TPX-070821	A	From Leg	5.00	0.0000	150.00	No Ice	0.47	0.18	0.01
			0.00			1/2" Ice	0.56	0.25	0.01
			4.00			1" Ice	0.66	0.32	0.02
(2) TPX-070821	B	From Leg	5.00	0.0000	150.00	No Ice	0.47	0.18	0.01
			0.00			1/2" Ice	0.56	0.25	0.01
			4.00			1" Ice	0.66	0.32	0.02
(2) TPX-070821	C	From Leg	5.00	0.0000	150.00	No Ice	0.47	0.18	0.01
			0.00			1/2" Ice	0.56	0.25	0.01
			4.00			1" Ice	0.66	0.32	0.02
Flat Platform w/ Handrails	A	None		0.0000	150.00	No Ice	42.40	42.40	2.00
						1/2" Ice	48.40	48.40	2.45
						1" Ice	54.40	54.40	2.90
***									
Flat Platform w/ Handrails	B	None		0.0000	129.00	No Ice	42.40	42.40	2.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1/2" Ice	48.40	48.40	2.45
							1" Ice	54.40	54.40	2.90
(2) FD9R6004/2C-3L (3.1 lbs)	A	From Leg	5.00	0.00	0.0000	129.00	No Ice	0.31	0.08	0.00
							1/2" Ice	0.39	0.12	0.01
				0.00			1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L (3.1 lbs)	B	From Leg	5.00	0.00	0.0000	129.00	No Ice	0.31	0.08	0.00
							1/2" Ice	0.39	0.12	0.01
				0.00			1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L (3.1 lbs)	C	From Leg	5.00	0.00	0.0000	129.00	No Ice	0.31	0.08	0.00
							1/2" Ice	0.39	0.12	0.01
				0.00			1" Ice	0.47	0.17	0.01
DB948F85E-M	A	From Leg	5.00	0.00	0.0000	129.00	No Ice	3.25	3.27	0.01
							1/2" Ice	2.19	3.63	0.03
				0.00			1" Ice	2.50	4.00	0.05
DB948F85E-M	B	From Leg	5.00	0.00	0.0000	129.00	No Ice	3.25	3.27	0.01
							1/2" Ice	2.19	3.63	0.03
				0.00			1" Ice	2.50	4.00	0.05
DB948F85E-M	C	From Leg	5.00	0.00	0.0000	129.00	No Ice	3.25	3.27	0.01
							1/2" Ice	2.19	3.63	0.03
				0.00			1" Ice	2.50	4.00	0.05
BXA-80063-4CF-EDIN-X	A	From Leg	5.00	0.00	0.0000	129.00	No Ice	4.71	2.25	0.01
							1/2" Ice	5.55	2.55	0.04
				0.00			1" Ice	5.94	2.85	0.07
BXA-80063-4CF-EDIN-X	B	From Leg	5.00	0.00	0.0000	129.00	No Ice	4.71	2.25	0.01
							1/2" Ice	5.55	2.55	0.04
				0.00			1" Ice	5.94	2.85	0.07
BXA-80063-4CF-EDIN-X	C	From Leg	5.00	0.00	0.0000	129.00	No Ice	4.71	2.25	0.01
							1/2" Ice	5.55	2.55	0.04
				0.00			1" Ice	5.94	2.85	0.07
DB-T1-6Z-8AB-0Z	B	From Leg	5.00	0.00	0.0000	129.00	No Ice	4.80	2.33	0.04
							1/2" Ice	5.92	2.56	0.08
				0.00			1" Ice	6.24	2.79	0.12
LNX-4514DS-A1M	A	From Leg	5.00	0.00	0.0000	129.00	No Ice	6.78	5.41	0.04
							1/2" Ice	8.96	5.86	0.09
				0.00			1" Ice	9.52	6.33	0.15
LNX-6514DS-A1M	B	From Leg	5.00	0.00	0.0000	129.00	No Ice	8.17	5.41	0.04
							1/2" Ice	8.96	5.86	0.09
				0.00			1" Ice	9.52	6.33	0.15
LNX-6514DS-A1M	C	From Leg	5.00	0.00	0.0000	129.00	No Ice	8.17	5.41	0.04
							1/2" Ice	8.96	5.86	0.09
				0.00			1" Ice	9.52	6.33	0.15
(2) SBNHH-1D45B	A	From Leg	5.00	0.00	0.0000	129.00	No Ice	11.40	5.28	0.06
							1/2" Ice	13.19	5.74	0.13
				0.00			1" Ice	13.78	6.20	0.20
(2) SBNHH-1D65B	B	From Leg	5.00	0.00	0.0000	129.00	No Ice	8.17	5.41	0.05
							1/2" Ice	8.96	5.86	0.10
				0.00			1" Ice	9.52	6.33	0.16
(2) SBNHH-1D65B	C	From Leg	5.00	0.00	0.0000	129.00	No Ice	8.17	5.41	0.05
							1/2" Ice	8.96	5.86	0.10
				0.00			1" Ice	9.52	6.33	0.16
B66 RRH4x45	A	From Leg	0.00	0.00	0.0000	129.00	No Ice	2.58	1.59	0.07
							1/2" Ice	2.88	1.77	0.09
				0.00			1" Ice	3.10	1.96	0.11
B66 RRH4x45	B	From Leg	0.00	0.00	0.0000	129.00	No Ice	2.58	1.59	0.07
							1/2" Ice	2.88	1.77	0.09
				0.00			1" Ice	3.10	1.96	0.11
B66 RRH4x45	C	From Leg	0.00	0.00	0.0000	129.00	No Ice	2.58	1.59	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	2.88	1.77	0.09
			0.00				1" Ice	3.10	1.96	0.11
RRH2x60-1900	A	From Leg	0.00		0.0000	129.00	No Ice	1.88	1.61	0.06
			0.00				1/2" Ice	2.20	1.79	0.08
			0.00				1" Ice	2.52	1.97	0.10
RRH2x60-1900	B	From Leg	0.00		0.0000	129.00	No Ice	1.88	1.61	0.06
			0.00				1/2" Ice	2.20	1.79	0.08
			0.00				1" Ice	2.52	1.97	0.10
RRH2x60-1900	C	From Leg	0.00		0.0000	129.00	No Ice	1.88	1.61	0.06
			0.00				1/2" Ice	2.20	1.79	0.08
			0.00				1" Ice	2.52	1.97	0.10

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 150.00-110.00	129.07	1.063	24	62.548	A	0.000	62.548	62.548	100.00	7.800	0.000
					B	0.000	62.548		100.00	0.000	0.000
					C	0.000	62.548		100.00	26.334	0.000
L2 110.00-70.00	89.45	0.957	22	84.306	A	0.000	84.306	84.306	100.00	7.800	0.000
					B	0.000	84.306		100.00	0.000	0.000
					C	0.000	84.306		100.00	55.440	0.000
L3 70.00-31.50	50.64	0.814	18	99.976	A	0.000	99.976	99.976	100.00	7.507	0.000
					B	0.000	99.976		100.00	0.000	0.000
					C	0.000	99.976		100.00	53.361	0.000
L4 31.50-0.00	15.38	0.7	16	94.918	A	0.000	94.918	94.918	100.00	4.777	0.000
					B	0.000	94.918		100.00	0.000	0.000
					C	0.000	94.918		100.00	33.957	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	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 150.00-110.00	129.07	1.063	6	1.7192	74.009	A	0.000	74.009	74.009	100.00	40.305	0.000
						B	0.000	74.009		100.00	0.000	0.000
						C	0.000	74.009		100.00	46.676	0.000
L2 110.00-70.00	89.45	0.957	6	1.6573	95.355	A	0.000	95.355	95.355	100.00	39.191	0.000
						B	0.000	95.355		100.00	0.000	0.000
						C	0.000	95.355		100.00	97.151	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
L3 70.00-31.50	50.64	0.814	5	1.5656	110.610	A	0.000	110.610	110.610	100.00	37.722	0.000
						B	0.000	110.610		100.00	0.000	0.000
						C	0.000	110.610		100.00	93.508	0.000
L4 31.50-0.00	15.38	0.7	4	1.3898	103.138	A	0.000	103.138	103.138	100.00	22.994	0.000
						B	0.000	103.138		100.00	0.000	0.000
						C	0.000	103.138		100.00	58.495	0.000

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	129.07	1.063	8	62.548	A	0.000	62.548	62.548	100.00	7.800	0.000
150.00-110.00					B	0.000	62.548		100.00	0.000	0.000
					C	0.000	62.548		100.00	26.334	0.000
L2	89.45	0.957	7	84.306	A	0.000	84.306	84.306	100.00	7.800	0.000
110.00-70.00					B	0.000	84.306		100.00	0.000	0.000
					C	0.000	84.306		100.00	55.440	0.000
L3 70.00-31.50	50.64	0.814	6	99.976	A	0.000	99.976	99.976	100.00	7.507	0.000
					B	0.000	99.976		100.00	0.000	0.000
					C	0.000	99.976		100.00	53.361	0.000
L4 31.50-0.00	15.38	0.7	5	94.918	A	0.000	94.918	94.918	100.00	4.777	0.000
					B	0.000	94.918		100.00	0.000	0.000
					C	0.000	94.918		100.00	33.957	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.71	1.47	A	1	1.2	24	1	1	62.548	2.53	63.23	B
150.00-110.00			B	1	1.2		1	1	62.548			
			C	1	1		1	1	62.548			
L2	0.99	2.65	A	1	1.2	22	1	1	84.306	3.38	84.60	A
110.00-70.00			B	1	1.2		1	1	84.306			
			C	1	1		1	1	84.306			
L3	0.96	4.24	A	1	1.2	18	1	1	99.976	3.22	83.53	A
70.00-31.50			B	1	1.2		1	1	99.976			
			C	1	1		1	1	99.976			
L4 31.50-0.00	0.61	5.02	A	1	1.2	16	1	1	94.918	2.01	63.71	A
			B	1	1.154		1	1	94.918			
			C	1	1		1	1	94.918			
Sum Weight:	3.27	13.38								11.14		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.71	1.47	A	1	1	24	1	1	62.548	2.53	63.23	C
150.00-110.00			B	1	1.2		1	1	62.548			
			C	1	1.2		1	1	62.548			
L2	0.99	2.65	A	1	1	22	1	1	84.306	3.38	84.60	B
110.00-70.00			B	1	1.2		1	1	84.306			
			C	1	1.2		1	1	84.306			
L3	0.96	4.24	A	1	1	18	1	1	99.976	3.22	83.53	B
70.00-31.50			B	1	1.2		1	1	99.976			
			C	1	1.2		1	1	99.976			
L4 31.50-0.00	0.61	5.02	A	1	1	16	1	1	94.918	2.01	63.71	B
			B	1	1.2		1	1	94.918			
			C	1	1.154		1	1	94.918			
Sum Weight:	3.27	13.38								11.14		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.71	1.47	A	1	1.076	24	1	1	62.548	1.92	48.11	C
150.00-110.00			B	1	1		1	1	62.548			
			C	1	1.151		1	1	62.548			
L2	0.99	2.65	A	1	1.185	22	1	1	84.306	3.15	78.65	C
110.00-70.00			B	1	1.097		1	1	84.306			
			C	1	1.2		1	1	84.306			
L3	0.96	4.24	A	1	1.094	18	1	1	99.976	2.44	63.39	C
70.00-31.50			B	1	1.022		1	1	99.976			
			C	1	1.2		1	1	99.976			
L4 31.50-0.00	0.61	5.02	A	1	1	16	1	1	94.918	1.81	57.52	C
			B	1	1		1	1	94.918			
			C	1	1.083		1	1	94.918			
Sum Weight:	3.27	13.38								9.32		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.86	3.18	A	1	1.2	6	1	1	74.009	0.92	23.01	B
150.00-110.00			B	1	1.2		1	1	74.009			
			C	1	1.2		1	1	74.009			
L2	2.86	4.81	A	1	1.2	6	1	1	95.355	1.11	27.85	B
110.00-70.00			B	1	1.2		1	1	95.355			
			C	1	1.2		1	1	95.355			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L3	2.76	6.63	A	1	1.2	5	1	1	110.610	1.03	26.74	B
70.00-31.50			B	1	1.2		1	1	110.610			
			C	1	1.2		1	1	110.610			
L4 31.50-0.00	1.68	7.01	A	1	1.2	4	1	1	103.138	0.75	23.73	B
			B	1	1.2		1	1	103.138			
			C	1	1.2		1	1	103.138			
Sum Weight:	9.16	21.64								3.81		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.86	3.18	A	1	1.2	6	1	1	74.009	0.92	23.01	C
150.00-110.00			B	1	1.2		1	1	74.009			
			C	1	1.2		1	1	74.009			
L2	2.86	4.81	A	1	1.2	6	1	1	95.355	1.11	27.85	C
110.00-70.00			B	1	1.2		1	1	95.355			
			C	1	1.2		1	1	95.355			
L3	2.76	6.63	A	1	1.2	5	1	1	110.610	1.03	26.74	C
70.00-31.50			B	1	1.2		1	1	110.610			
			C	1	1.2		1	1	110.610			
L4 31.50-0.00	1.68	7.01	A	1	1.2	4	1	1	103.138	0.75	23.73	C
			B	1	1.2		1	1	103.138			
			C	1	1.2		1	1	103.138			
Sum Weight:	9.16	21.64								3.81		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.86	3.18	A	1	1.2	6	1	1	74.009	0.83	20.71	A
150.00-110.00			B	1	1.2		1	1	74.009			
			C	1	1.2		1	1	74.009			
L2	2.86	4.81	A	1	1.2	6	1	1	95.355	1.02	25.40	C
110.00-70.00			B	1	1.2		1	1	95.355			
			C	1	1.2		1	1	95.355			
L3	2.76	6.63	A	1	1.2	5	1	1	110.610	0.95	24.66	C
70.00-31.50			B	1	1.2		1	1	110.610			
			C	1	1.2		1	1	110.610			
L4 31.50-0.00	1.68	7.01	A	1	1.2	4	1	1	103.138	0.58	18.39	C
			B	1	1.2		1	1	103.138			
			C	1	1.2		1	1	103.138			
Sum Weight:	9.16	21.64								3.37		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.71	1.47	A	1	1.2	8	1	1	62.548	0.87	21.65	B
150.00-110.00			B	1	1.2		1	1	62.548			
			C	1	1		1	1	62.548			
L2	0.99	2.65	A	1	1.2	7	1	1	84.306	1.16	28.96	A
110.00-70.00			B	1	1.2		1	1	84.306			
			C	1	1		1	1	84.306			
L3	0.96	4.24	A	1	1.2	6	1	1	99.976	1.10	28.59	A
70.00-31.50			B	1	1.2		1	1	99.976			
			C	1	1		1	1	99.976			
L4 31.50-0.00	0.61	5.02	A	1	1.2	5	1	1	94.918	0.69	21.81	A
			B	1	1.154		1	1	94.918			
			C	1	1		1	1	94.918			
Sum Weight:	3.27	13.38								3.81		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.71	1.47	A	1	1	8	1	1	62.548	0.87	21.65	C
150.00-110.00			B	1	1.2		1	1	62.548			
			C	1	1.2		1	1	62.548			
L2	0.99	2.65	A	1	1	7	1	1	84.306	1.16	28.96	B
110.00-70.00			B	1	1.2		1	1	84.306			
			C	1	1.2		1	1	84.306			
L3	0.96	4.24	A	1	1	6	1	1	99.976	1.10	28.59	B
70.00-31.50			B	1	1.2		1	1	99.976			
			C	1	1.2		1	1	99.976			
L4 31.50-0.00	0.61	5.02	A	1	1	5	1	1	94.918	0.69	21.81	B
			B	1	1.2		1	1	94.918			
			C	1	1.154		1	1	94.918			
Sum Weight:	3.27	13.38								3.81		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.71	1.47	A	1	1.076	8	1	1	62.548	0.66	16.47	C
150.00-110.00			B	1	1		1	1	62.548			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	1	1.151		1	1	62.548			
L2	0.99	2.65	A	1	1.185	7	1	1	84.306	1.08	26.92	C
110.00-70.00			B	1	1.097		1	1	84.306			
			C	1	1.2		1	1	84.306			
L3	0.96	4.24	A	1	1.094	6	1	1	99.976	0.84	21.70	C
70.00-31.50			B	1	1.022		1	1	99.976			
			C	1	1.2		1	1	99.976			
L4 31.50-0.00	0.61	5.02	A	1	1	5	1	1	94.918	0.62	19.69	C
			B	1	1		1	1	94.918			
			C	1	1.083		1	1	94.918			
Sum Weight:	3.27	13.38								3.19		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	13.38			
Bracing Weight	0.00			
Total Member Self-Weight	13.38			
Guy Weight	0.79			
Total Weight	23.74			
Wind 0 deg - No Ice		-0.02	-13.83	0.23
Wind 30 deg - No Ice		7.25	-12.57	0.59
Wind 60 deg - No Ice		14.97	-8.63	2.35
Wind 90 deg - No Ice		15.76	0.02	1.49
Wind 120 deg - No Ice		15.21	8.79	2.69
Wind 150 deg - No Ice		7.06	12.20	0.19
Wind 180 deg - No Ice		0.02	13.83	-0.23
Wind 210 deg - No Ice		-7.25	12.57	-0.59
Wind 240 deg - No Ice		-14.97	8.63	-2.35
Wind 270 deg - No Ice		-15.76	-0.02	-1.49
Wind 300 deg - No Ice		-15.21	-8.79	-2.69
Wind 330 deg - No Ice		-7.06	-12.20	-0.19
Member Ice	8.26			
Guy Ice	2.41			
Total Weight Ice	50.09			
Wind 0 deg - Ice		-0.01	-5.02	0.08
Wind 30 deg - Ice		2.82	-4.91	0.21
Wind 60 deg - Ice		5.33	-3.08	0.54
Wind 90 deg - Ice		5.52	0.01	0.41
Wind 120 deg - Ice		5.21	3.02	0.64
Wind 150 deg - Ice		2.61	4.52	0.06
Wind 180 deg - Ice		0.01	5.02	-0.08
Wind 210 deg - Ice		-2.82	4.91	-0.21
Wind 240 deg - Ice		-5.33	3.08	-0.54
Wind 270 deg - Ice		-5.52	-0.01	-0.41
Wind 300 deg - Ice		-5.21	-3.02	-0.64
Wind 330 deg - Ice		-2.61	-4.52	-0.06
Total Weight	23.74			
Wind 0 deg - Service		-0.01	-4.74	0.08
Wind 30 deg - Service		2.48	-4.30	0.20
Wind 60 deg - Service		5.13	-2.95	0.27

Load Case	*Vertical Forces K*	*Sum of Forces X K*	*Sum of Forces Z K*	*Sum of Torques kip-ft*
Wind 90 deg - Service		5.39	0.01	0.27
Wind 120 deg - Service		5.21	3.01	0.19
Wind 150 deg - Service		2.42	4.18	0.06
Wind 180 deg - Service		0.01	4.74	-0.08
Wind 210 deg - Service		-2.48	4.30	-0.20
Wind 240 deg - Service		-5.13	2.95	-0.27
Wind 270 deg - Service		-5.39	-0.01	-0.27
Wind 300 deg - Service		-5.21	-3.01	-0.19
Wind 330 deg - Service		-2.42	-4.18	-0.06

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

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	150 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-55.52	-140.45	-79.76
			Max. Mx	5	-8.85	-234.22	-1.39
			Max. My	2	-8.82	-0.00	226.88
			Max. Vy	5	12.71	-234.22	-1.39
			Max. Vx	2	-12.46	-0.00	226.88
			Max. Torque	4			-1.68
		Guy A	Bottom Tension	9	32.30		
			Top Tension	9	32.49		
			Top Cable Vert	9	23.80		
			Top Cable Norm	9	22.11		
			Top Cable Tan	9	0.02		
			Bot Cable Vert	9	-23.36		
			Bot Cable Norm	9	22.30		
			Bot Cable Tan	9	0.23		
		Guy B	Bottom Tension	12	33.81		
			Top Tension	12	34.00		
			Top Cable Vert	12	24.91		
			Top Cable Norm	12	23.14		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-24.46		
			Bot Cable Norm	12	23.34		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	5	33.77		
			Top Tension	5	33.96		
			Top Cable Vert	5	24.88		
			Top Cable Norm	5	23.13		
			Top Cable Tan	5	0.04		
			Bot Cable Vert	5	-24.44		
			Bot Cable Norm	5	23.31		
			Bot Cable Tan	5	0.24		
L2	110 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-59.36	-42.09	-23.89
			Max. Mx	5	-48.27	-154.69	-6.43
			Max. My	2	-49.64	-0.01	166.25
			Max. Vy	12	5.24	126.34	71.27
			Max. Vx	8	-4.53	-0.50	-153.87
			Max. Torque	12			2.76
L3	70 - 31.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-65.30	-95.91	-56.29
			Max. Mx	6	-65.30	-95.91	-56.29
			Max. My	2	-59.48	0.13	67.48
			Max. Vy	6	3.54	-95.91	-56.29
			Max. Vx	6	2.05	-95.91	-56.29
			Max. Torque	12			4.14
L4	31.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-74.13	43.07	-23.79
			Max. Mx	6	-72.75	-276.51	-161.68
			Max. My	3	-63.84	-57.06	173.49
			Max. Vy	6	6.50	-276.51	-161.68
			Max. Vx	2	-4.43	0.17	173.28
			Max. Torque	12			4.30

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	23	74.13	1.26	-0.65
	Max. H_x	12	56.62	6.26	3.66
	Max. H_z	2	66.92	-0.00	4.43
	Max. M_x	3	173.49	-2.24	4.33
	Max. M_z	6	276.51	-6.49	-3.76
	Max. Torsion	12	4.30	6.26	3.66
	Min. Vert	1	41.01	0.00	0.02
	Min. H_x	6	72.75	-6.49	-3.76
	Min. H_z	8	54.30	0.00	-4.13
	Min. M_x	6	-161.68	-6.49	-3.76
	Min. M_z	10	-266.49	6.21	-3.60
	Min. Torsion	6	-4.24	-6.49	-3.76
Guy C @ 115 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.17	-0.09	0.05
	Max. H_x	10	-0.17	-0.09	0.05
	Max. H_z	4	-24.33	-20.11	11.61
	Min. Vert	5	-24.44	-20.31	11.45
	Min. H_x	5	-24.44	-20.31	11.45
	Min. H_z	10	-0.17	-0.09	0.05
Guy B @ 115 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.17	0.09	0.05
	Max. H_x	11	-24.44	20.31	11.45
	Max. H_z	12	-24.46	20.21	11.67
	Min. Vert	12	-24.46	20.21	11.67
	Min. H_x	6	-0.17	0.09	0.05
	Min. H_z	6	-0.17	0.09	0.05
Guy A @ 115 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.19	0.00	-0.12
	Max. H_x	10	-21.94	0.40	-20.90
	Max. H_z	2	-0.19	0.00	-0.12
	Min. Vert	9	-23.36	0.23	-22.30
	Min. H_x	6	-22.10	-0.40	-21.05
	Min. H_z	9	-23.36	0.23	-22.30

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	41.01	-0.00	-0.02	-0.00	0.19	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	66.92	0.00	-4.43	-173.28	0.17	0.36
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	63.84	2.24	-4.33	-173.49	-57.06	1.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	56.51	5.98	-3.50	-115.05	-198.75	3.74
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	65.53	5.92	0.18	38.87	-229.70	2.31
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	72.75	6.49	3.76	161.68	-276.51	4.24
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	63.41	2.40	3.81	123.67	-109.51	0.33
1.2 Dead+1.6 Wind 180 deg -	54.30	-0.00	4.13	110.86	-0.30	-0.36

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
No Ice+1.0 Guy						
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	63.92	-2.57	4.10	137.98	119.47	-0.96
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	72.48	-6.21	3.60	155.67	266.49	-3.68
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	65.46	-5.92	0.19	38.85	229.97	-2.31
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	56.62	-6.26	-3.66	-121.30	208.64	-4.30
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	63.25	-2.08	-4.04	-157.91	49.81	-0.37
1.2 Dead+1.0 Ice+1.0 Temp+Guy	72.74	0.00	-0.08	-0.74	0.88	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.75	0.00	-0.93	-24.19	0.91	0.08
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.74	0.57	-1.07	-33.66	-17.46	0.25
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.68	1.25	-0.81	-24.23	-39.38	0.55
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.70	1.19	-0.08	-0.67	-38.17	0.40
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	74.06	1.23	0.64	22.89	-39.67	0.66
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.69	0.47	0.75	24.46	-13.42	0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.54	0.00	0.77	22.13	0.90	-0.08
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.80	-0.57	0.91	31.81	19.90	-0.24
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	74.13	-1.26	0.65	23.79	43.07	-0.55
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.70	-1.18	-0.08	-0.68	40.00	-0.40
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.64	-1.22	-0.79	-23.52	39.94	-0.66
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	73.64	-0.47	-0.90	-25.96	15.25	-0.11
Dead+Wind 0 deg - Service+Guy	41.12	-0.00	-0.90	-20.85	0.19	0.08
Dead+Wind 30 deg - Service+Guy	41.11	0.49	-0.89	-23.00	-12.80	0.21
Dead+Wind 60 deg - Service+Guy	41.12	1.27	-0.76	-23.04	-39.04	0.27
Dead+Wind 90 deg - Service+Guy	41.12	1.22	-0.02	-0.07	-35.95	0.26
Dead+Wind 120 deg - Service+Guy	41.18	1.33	0.76	24.24	-41.18	0.19
Dead+Wind 150 deg - Service+Guy	41.11	0.46	0.79	20.19	-11.00	0.07
Dead+Wind 180 deg - Service+Guy	41.10	-0.00	0.87	20.91	0.21	-0.08
Dead+Wind 210 deg - Service+Guy	41.11	-0.50	0.85	23.05	13.07	-0.21
Dead+Wind 240 deg - Service+Guy	41.17	-1.28	0.72	23.06	39.54	-0.27
Dead+Wind 270 deg - Service+Guy	41.12	-1.22	-0.02	-0.06	36.36	-0.26
Dead+Wind 300 deg - Service+Guy	41.13	-1.34	-0.79	-24.21	41.49	-0.19
Dead+Wind 330 deg - Service+Guy	41.10	-0.46	-0.82	-20.14	11.55	-0.07

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-23.74	0.00	0.00	23.74	0.00	0.000%
2	-0.03	-28.38	-23.17	0.03	28.38	23.17	0.001%
3	12.11	-28.33	-21.01	-12.11	28.33	21.01	0.000%
4	24.85	-28.28	-14.32	-24.85	28.28	14.32	0.000%
5	26.25	-28.33	0.03	-26.25	28.33	-0.03	0.000%
6	25.23	-28.38	14.58	-25.23	28.38	-14.58	0.000%
7	11.81	-28.33	20.42	-11.81	28.33	-20.42	0.000%
8	0.03	-28.28	23.17	-0.03	28.28	-23.17	0.000%
9	-12.11	-28.33	21.01	12.11	28.33	-21.01	0.000%
10	-24.85	-28.38	14.32	24.85	28.38	-14.32	0.000%
11	-26.25	-28.33	-0.03	26.25	28.33	0.03	0.000%
12	-25.23	-28.28	-14.58	25.23	28.28	14.58	0.000%
13	-11.81	-28.33	-20.42	11.81	28.33	20.42	0.000%
14	0.00	-55.16	0.00	0.00	55.16	0.00	0.000%
15	-0.01	-55.20	-5.82	0.01	55.20	5.82	0.001%
16	3.22	-55.16	-5.60	-3.22	55.16	5.60	0.001%
17	6.02	-55.12	-3.48	-6.02	55.12	3.48	0.000%
18	6.32	-55.16	0.01	-6.32	55.16	-0.01	0.001%
19	5.90	-55.20	3.42	-5.90	55.20	-3.42	0.000%
20	3.01	-55.16	5.21	-3.01	55.16	-5.21	0.001%
21	0.01	-55.12	5.82	-0.01	55.12	-5.82	0.000%
22	-3.22	-55.16	5.60	3.22	55.16	-5.60	0.001%
23	-6.02	-55.20	3.48	6.02	55.20	-3.48	0.000%
24	-6.32	-55.16	-0.01	6.32	55.16	0.01	0.001%
25	-5.90	-55.12	-3.42	5.90	55.12	3.42	0.000%
26	-3.01	-55.16	-5.21	3.01	55.16	5.21	0.001%
27	-0.01	-23.75	-4.96	0.01	23.75	4.96	0.000%
28	2.59	-23.74	-4.49	-2.59	23.74	4.49	0.000%
29	5.32	-23.73	-3.06	-5.32	23.73	3.06	0.000%
30	5.62	-23.74	0.01	-5.62	23.74	-0.01	0.000%
31	5.40	-23.75	3.12	-5.40	23.75	-3.12	0.001%
32	2.53	-23.74	4.37	-2.53	23.74	-4.37	0.000%
33	0.01	-23.73	4.96	-0.01	23.73	-4.96	0.000%
34	-2.59	-23.74	4.49	2.59	23.74	-4.49	0.000%
35	-5.32	-23.75	3.06	5.32	23.75	-3.06	0.001%
36	-5.62	-23.74	-0.01	5.62	23.74	0.01	0.000%
37	-5.40	-23.73	-3.12	5.40	23.73	3.12	0.000%
38	-2.53	-23.74	-4.37	2.53	23.74	4.37	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	5	0.00000001	0.00000275
2	Yes	8	0.00000001	0.00005163
3	Yes	8	0.00000001	0.00007004
4	Yes	7	0.00000001	0.00004081
5	Yes	8	0.00000001	0.00006221
6	Yes	9	0.00000001	0.00003190
7	Yes	8	0.00000001	0.00006373
8	Yes	6	0.00000001	0.00009199

9	Yes	8	0.00000001	0.00006874
10	Yes	9	0.00000001	0.00003169
11	Yes	8	0.00000001	0.00006155
12	Yes	7	0.00000001	0.00004731
13	Yes	8	0.00000001	0.00005998
14	Yes	4	0.00000001	0.00005836
15	Yes	6	0.00000001	0.00009177
16	Yes	6	0.00000001	0.00009061
17	Yes	6	0.00000001	0.00007429
18	Yes	6	0.00000001	0.00008747
19	Yes	7	0.00000001	0.00002719
20	Yes	6	0.00000001	0.00009057
21	Yes	6	0.00000001	0.00007620
22	Yes	6	0.00000001	0.00009695
23	Yes	7	0.00000001	0.00002814
24	Yes	6	0.00000001	0.00008512
25	Yes	6	0.00000001	0.00007144
26	Yes	6	0.00000001	0.00008124
27	Yes	5	0.00000001	0.00006174
28	Yes	5	0.00000001	0.00007587
29	Yes	5	0.00000001	0.00006735
30	Yes	5	0.00000001	0.00007990
31	Yes	5	0.00000001	0.00008505
32	Yes	5	0.00000001	0.00005768
33	Yes	5	0.00000001	0.00005429
34	Yes	5	0.00000001	0.00006509
35	Yes	5	0.00000001	0.00009628
36	Yes	5	0.00000001	0.00007899
37	Yes	5	0.00000001	0.00005685
38	Yes	5	0.00000001	0.00006269

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	5.108	31	0.7850	0.0121
L2	110 - 70	0.914	31	0.1557	0.0043
L3	73.5 - 31.5	0.475	37	0.0337	0.0017
L4	35.667 - 0	0.175	37	0.0379	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	7770.00	31	5.108	0.7850	0.0121	24971
129.00	Flat Platform w/ Handrails	31	2.516	0.4073	0.0074	5945
122.00	Guy	31	1.806	0.3005	0.0061	4459

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	36.134	6	4.3974	0.0812
L2	110 - 70	10.641	6	1.2779	0.0415
L3	73.5 - 31.5	4.713	6	0.5172	0.0224
L4	35.667 - 0	1.335	6	0.3151	0.0084

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	7770.00	6	36.134	4.3974	0.0812	5015
129.00	Flat Platform w/ Handrails	6	20.802	2.5367	0.0586	1192
122.00	Guy	6	16.460	2.0045	0.0521	893

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
L1	122.00 (A) (7)	7/8 EHS	7.97	79.70	32.49	47.82	1.000	1.472
	122.00 (B) (6)	7/8 EHS	7.97	79.70	34.00	47.82	1.000	1.407
	122.00 (C) (5)	7/8 EHS	7.97	79.70	33.96	47.82	1.000	1.408

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 110 (1)	TP21.25x15x0.1875	40.00	28.00	48.9	11.5845	-54.86	615.72	0.089
L2	110 - 70 (2)	TP27.61x21.25x0.25	40.00	122.00	194.7	16.9050	-55.61	100.71	0.552
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	42.00	122.00	152.7	26.9540	-60.01	261.26	0.230
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	35.67	122.00	110.5	44.6835	-72.75	826.59	0.088

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 $\frac{M_{uy}}{\phi M_{ny}}$

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	150 - 110 (1)	TP21.25x15x0.1875	224.59	315.01	0.713	0.00	315.01	0.000
L2	110 - 70 (2)	TP27.61x21.25x0.25	161.52	531.00	0.304	0.00	531.00	0.000
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	48.31	1080.20	0.045	0.00	1080.20	0.000
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	320.31	2374.80	0.135	0.00	2374.80	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	150 - 110 (1)	TP21.25x15x0.1875	5.47	403.66	0.014	1.25	638.74	0.002
L2	110 - 70 (2)	TP27.61x21.25x0.25	5.08	623.03	0.008	1.46	1076.71	0.001
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	0.40	993.39	0.000	2.72	2190.30	0.001
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	7.51	1578.48	0.005	4.24	4815.34	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 110 (1)	0.089	0.713	0.000	0.014	0.002	0.802	1.000	4.8.2
L2	110 - 70 (2)	0.552	0.304	0.000	0.008	0.001	0.856	1.000	4.8.2
L3	70 - 31.5 (3)	0.230	0.045	0.000	0.000	0.001	0.274	1.000	4.8.2
L4	31.5 - 0 (4)	0.088	0.135	0.000	0.005	0.001	0.223	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	150 - 110	Pole	TP21.25x15x0.1875	1	-54.86	615.72	80.2	Pass
L2	110 - 70	Pole	TP27.61x21.25x0.25	2	-55.61	100.71	85.6	Pass
L3	70 - 31.5	Pole	TP33.1x26.5535x0.3125	3	-60.01	261.26	27.4	Pass
L4	31.5 - 0	Pole	TP37.38x31.8255x0.375	4	-72.75	826.59	22.3	Pass
L1	150 - 110	Guy A@122	7/8	7	32.49	47.82	67.9	Pass
L1	150 - 110	Guy B@122	7/8	6	34.00	47.82	71.1	Pass
L1	150 - 110	Guy C@122	7/8	5	33.96	47.82	71.0	Pass
						Summary		
						Pole (L2)	85.6	Pass
						Guy A (L1)	67.9	Pass
						Guy B (L1)	71.1	Pass
						Guy C (L1)	71.0	Pass
						RATING =	**85.6**	**Pass**

Code Rev.	***G***	**Date**	12/30/2016
		Engineer	BB
		Site #	302476
Moment	320 k-ft	**Carrier**	Verizon Wireless
Axial	74 k-ft		

Base/Flange Plate	Plate Type	***Baseplate***	
	Pole Diameter	37.38	in
	Pole Thickness	0.375	in
	Plate Length	44	in
	Plate Thickness	2.5	in
	Plate Fy	60	ksi
	Weld Length	0.3125	in
	ϕ_s Resistance	1382.37	k-in
	Applied	170.15	k-in
Stiffeners	#	***0***	

Bolts	#	***8***	
	Bolt Circle	44	in
	(R)adial / (S)quare	S	
	Bolt Gap	6	in
●	Diameter	2.25	in
	Hole Diameter	2.75	in
	Type	A615-75	
	Fy	75	ksi
	Fu	100	ksi
	ϕ_s Resistance	259.82	k
	Applied	52.44	k
Reinforcement ●	#	***0***	
Extra Bolts O	#	***0***	

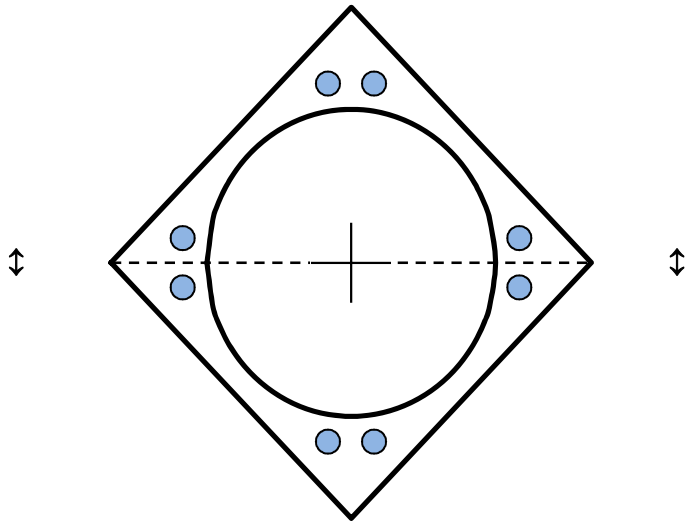


Plate Stress Ratio:

0.12 (Pass)

Bolt Stress Ratio:

0.20 (Pass)

Base/Flange Plate	Plate Type	***Flange***	***@ 110.0 ft***
	Pole Diameter	21.267	in
	Pole Thickness	0.1875	in
	Plate Diameter	28.5	in
	Plate Thickness	1	in
	Plate Fy	60	ksi
	Weld Length	0.3125	in
	Allowable	75.16	k-in
	Applied	41.40	k-in
Stiffeners	#	***0***	

Bolts	#	***12***	
	Bolt Circle	25.75	in
	(R)adial / (S)quare	R	
●	Diameter	1	in
	Hole Diameter	1.125	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	Allowable	54.52	k
	Applied	30.30	k
Reinforcement ●	#	***0***	
Extra Bolts O	#	***0***	

Code Rev. ***G***

Moment 225 k-ft

Axial 55 k-ft

Date 12/30/2016

Engineer BB

Site # 302476

Carrier Verizon Wireless

Required Flange Thickness:

0.74 in OK

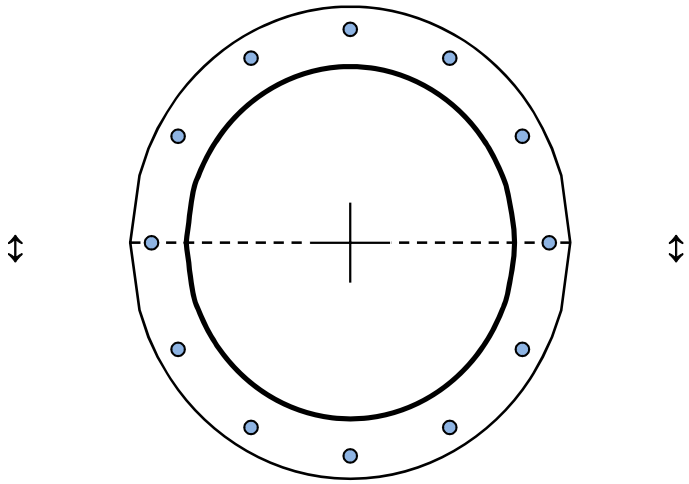
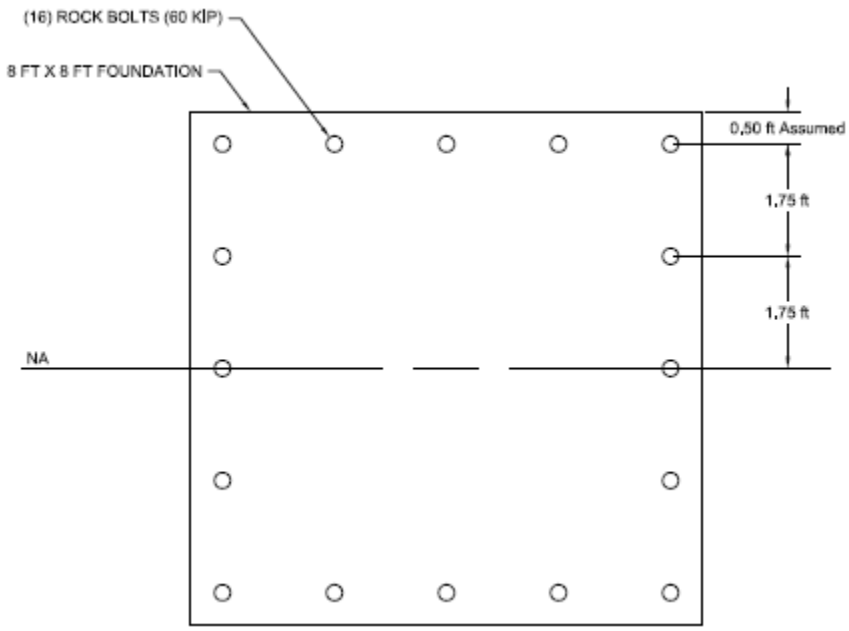


Plate Stress Ratio:

0.55 (Pass)

Bolt Stress Ratio:

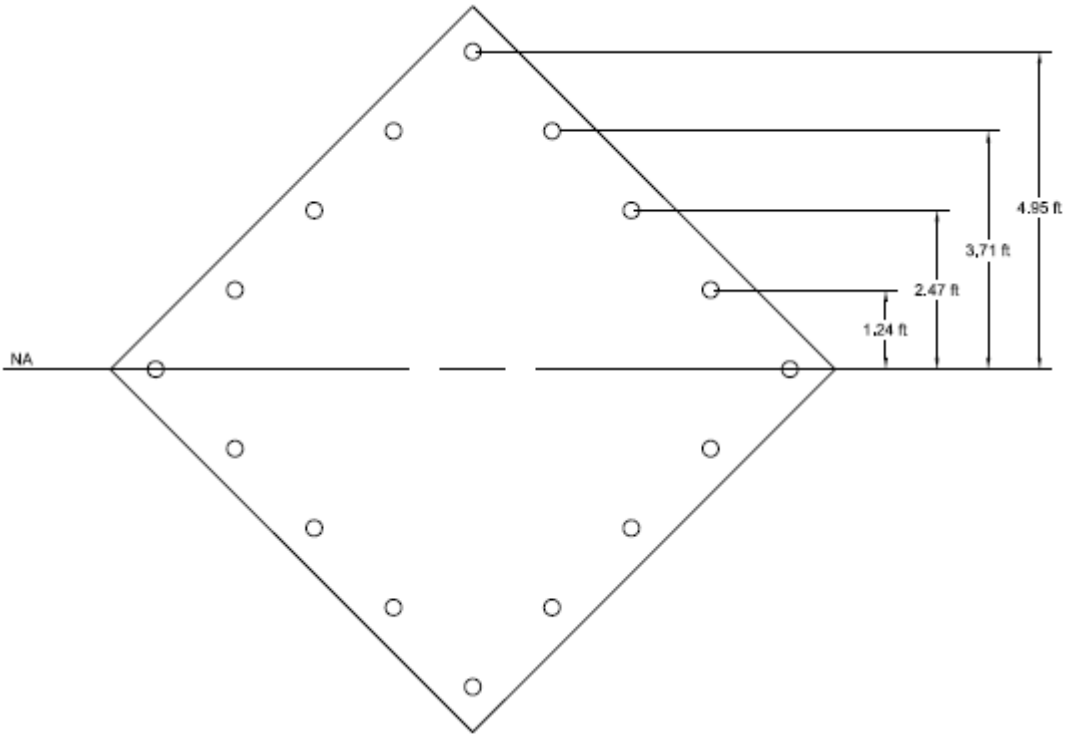
0.56 (Pass)



REF TIA-G 4.9.6.4

$I_0 = \sum d^2$

$I_0 = 4 * 1.75^2 + 10 * 3.5^2 = \mathbf{134.8}$



$I_0 = \sum d^2$

$I_0 = 4 * 1.24^2 + 4 * 2.47^2 + 4 * 3.71^2 + 2 * 4.95^2 = \mathbf{134.6}$

CONTROLLING USAGE

$$M_{Overturning} = M + V * D = 320 + 7.5 * 6 = \mathbf{365k - ft}$$

$$T_{U-Rock-Bolt} = \frac{M_{Overturning} * L_{Max}}{I_0} - \frac{P}{\#Rock\ Bolts}$$

$$T_{U-Rock-Bolt} = \frac{365 * 4.95}{134.6} - \frac{74}{16} = \mathbf{8.8k}$$

$$\frac{Tub}{\emptyset Rnt} = \frac{8.8k}{0.75(60k)} = \mathbf{0.20\ OK}$$

GUY ANCHOR ROD CHECK

$$\left.\begin{matrix}\text{Uplift} = 24\text{k} \\ \text{Shear} = 23\text{k}\end{matrix}\right\} \text{Guy Anchor Reactions}$$

Tub = Tapplied $= \sqrt{(24k)^2 + (23k)^2} = 33.2k$

1.5” Diameter Anchor Rod
A36 Grade Assumed Ant $= 1.405\ in^2$

$$\frac{Tub}{\emptyset Rnt} = \frac{33.2k}{0.9(36ksi * 1.77)in^2)} = \mathbf{0.58\ OK}$$

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2012.

CITY OF WATERBURY

Information on the Property Records for the Municipality of Waterbury was last updated on 2/1/2017.

Parcel Information

Location:	FARMDALE DR	Property Use:	Vacant Land	Primary Use:	Res Vac Land (5-1)
Unique ID:	016705590024	Map Block Lot:	0167-0559-0024	Acres:	4.75
490 Acres:	0.00	Zone:	RL	Volume / Page:	5156/ 333
Developers Map / Lot:		Census:			

Value Information

	Appraised Value	70% Assessed Value
Land	321,578	225,100

	Appraised Value	70% Assessed Value
Buildings	0	0
Detached Outbuildings	0	0
Total	321,578	225,100

Owner's Information

Owner's Data
SPRINGWICH CELLULAR TOWER HOLDINGS LLC C/O AT&T MOBILITY LLC 909 CHESTNUT, RM 36-M-1 ST LOUIS MO 63101

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
SPRINGWICH CELLULAR TOWER HOLDINGS LLC	5156	333	10/29/2004	Quit Claim	No	$0
SOUTHERN NEW ENGLAND TELEPHONE COMPANY	1710	182	08/23/1984		No	$20,000

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
2016.1522	Comm Renovations	05/26/2016		Closed	ATT MOBILITY CELL SITE, REPLACE ANTENNAS AND 3 REMOTE RADIO UNITS

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
2015.2331	Comm Renovations	08/26/2015		Closed	V-7, ADD 3 NEW ANTENNAS & 3 RRU'S, 1 FIBER CABLE, 2DC CABLES IN POLE
2015.0950	Comm Renovations	04/28/2015		Closed	CHANGE 3 ANTENNAS
2014.1587	Commercial Addition	06/20/2014		Closed	ADDING TOWER / ANTENNAES EQUIPMENT MODIFICATION
2014.0177	Comm Renovations	01/29/2014		Closed	INSTALL HYBRID CABLEREPLACE 6 ANTENNAS
2013.2198	Comm Renovations	08/09/2013		Closed	INSTALL GENERATOR - COMMUNICATIONS CELL SITE

Google Maps Garden Cir