Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

March 9, 2015

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

RE: **T-Mobile-Exempt Modification - Crown Site BU: 842864**
T-Mobile Site ID: CTNH510A
Located at: 201 Granite Road, Guilford, CT 06437

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their 700MHz technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mr. Joseph S. Mazza, First Selectman for the Town of Guilford and Guilford Retirement Residence LP, Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **201 Granite Road, Guilford, CT 06437**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the 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 tower. T-Mobile's replacement antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for T-Mobile's modified facility is included as Exhibit-3.

5. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.

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

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

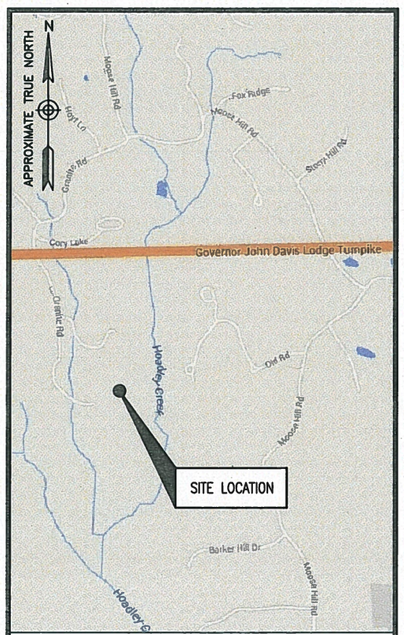
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Joseph S. Mazza, First Selectman
31 Park Street
Guilford, CT 06437

cc: Guilford Retirement Residence LP
201 Granite Road
Guilford, CT 06437

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CTNH510A
CROWN CASTLE BU #: 842864
SITE NAME: GUILFORD SW
201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY



VICINITY MAP

FROM PARSIPPANY, NJ:

DEPART SYLVAN WAY TOWARD CENTURY DR. TURN RIGHT ONTO US-202/LITTETON RD. TAKE RAMP LEFT FOR I-80 EAST. TAKE RAMP LEFT AND FOLLOW SIGNS FOR I-80 EAST. TAKE RAMP LEFT FOR I-95 NORTH TOWARD G WASHINGTON B/NEW YORK. KEEP LEFT TO STAY ON I-95 N. KEEP LEFT TO STAY ON I-95 N/NEW ENGLAND THROUGHWAY. AT EXIT 56, TAKE RAMP RIGHT FOR LEETES ISLAND RD TOWARD STONY CREEK. TURN LEFT ONTO LEETES ISLAND RD. TURN RIGHT ONTO US-1/E MAIN ST. TURN RIGHT ONTO MOOSE HILL RD. BEAR RIGHT ONTO GRANITE RD. DESTINATION WILL BE ON THE RIGHT.

ENGINEER
DEWBERRY ENGINEERS INC.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054

CONTACT: GREG NAWROTZKI
PHONE #: (973) 576-9653

CONSTRUCTION
CROWN CASTLE
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

CONTACT: WARREN KELLEHER
PHONE #: (781) 970-0055

CONSULTANT TEAM

SITE NAME:
GUILFORD SW

SITE NUMBER:
CTNH510A

TOWER OWNER:
CROWN CASTLE
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

COORDINATES:
LATITUDE: 41°-17'-31.14" N (NAD83)
LONGITUDE: 72°-43'-58.28" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
702Cu

PROJECT SUMMARY

SITE ADDRESS:
201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

PROJECT DIRECTORY

- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.

SCOPE OF WORK

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

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

SHEET INDEX

T-MOBILE NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
500 WEST CUMMINGS PARK, SUITE 3600
WOBURN, MA 01801

CTNH510A
GUILFORD SW

CONSTRUCTION DRAWINGS

0	03/04/15	ISSUED AS FINAL
A	02/26/15	ISSUED FOR REVIEW

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

STATE OF CONNECTICUT
JIANG YU
No. 23222
PROFESSIONAL ENGINEER
LICENSED

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071486
SITE ADDRESS:	

201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – CROWN CASTLE
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE
   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 CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

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 T–MOBILE 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.

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

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.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE 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.
4. GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.

T-Mobile

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CTNH510A
GUILFORD SW

CONSTRUCTION DRAWINGS		
0	03/04/15	ISSUED AS FINAL
A	02/26/15	ISSUED FOR REVIEW

Dewberry

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FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 23222

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071486
SITE ADDRESS:	

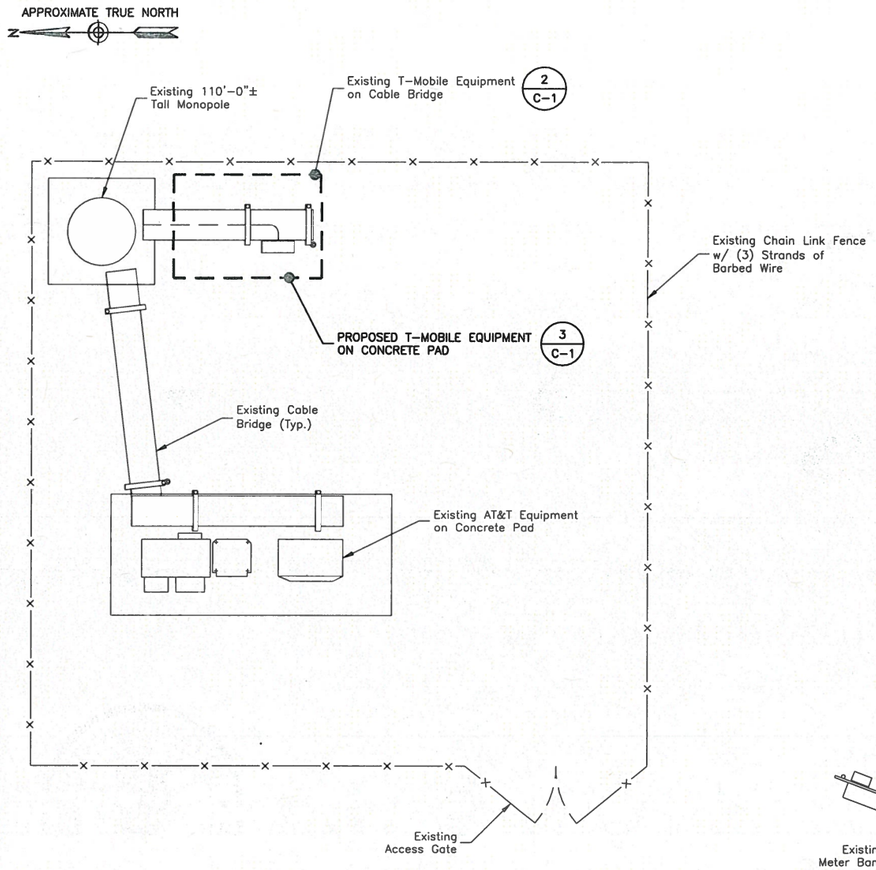
201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

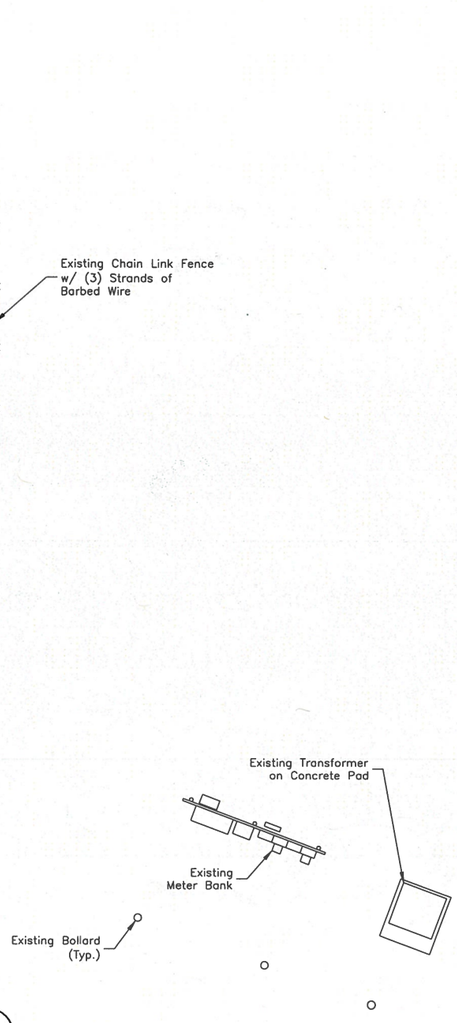
SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1

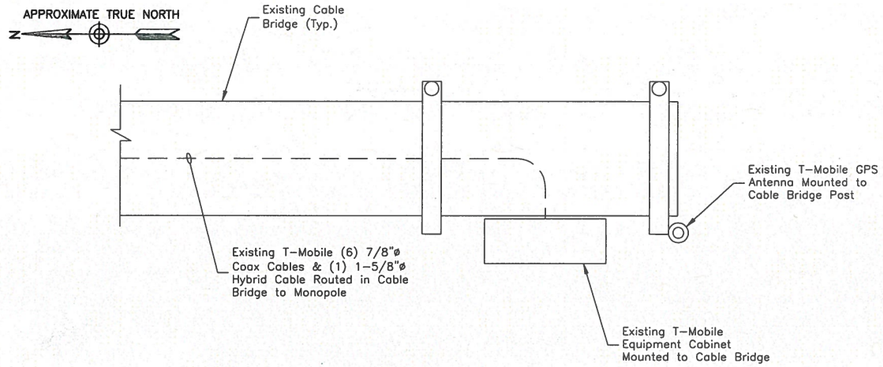




COMPOUND PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

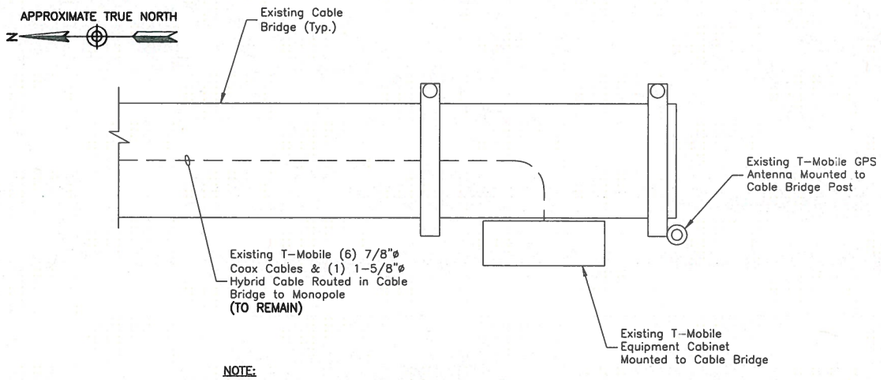
0' 5' 10'



EXISTING EQUIPMENT PLAN 2

SCALE: 3/8"=1' FOR 11"x17"
3/4"=1' FOR 22"x34"

0' 1' 2' 3'



NOTE:

1. NO EQUIPMENT IS PROPOSED AT GRADE.

PROPOSED EQUIPMENT PLAN 3

SCALE: 3/8"=1' FOR 11"x17"
3/4"=1' FOR 22"x34"

0' 1' 2' 3'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY B+T GROUP DATED FEBRUARY 11, 2015.

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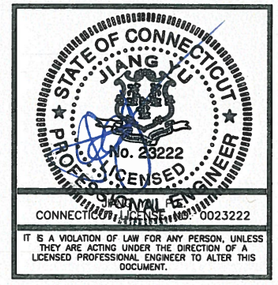


CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071486
SITE ADDRESS:	

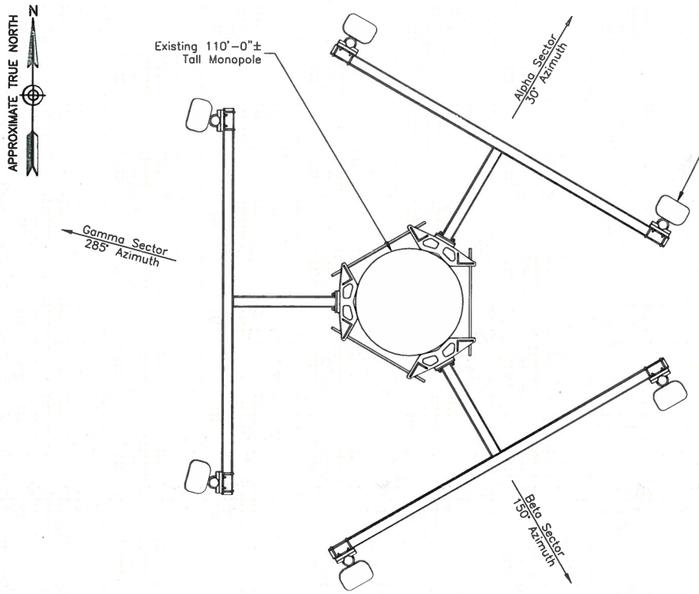
201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

SHEET TITLE

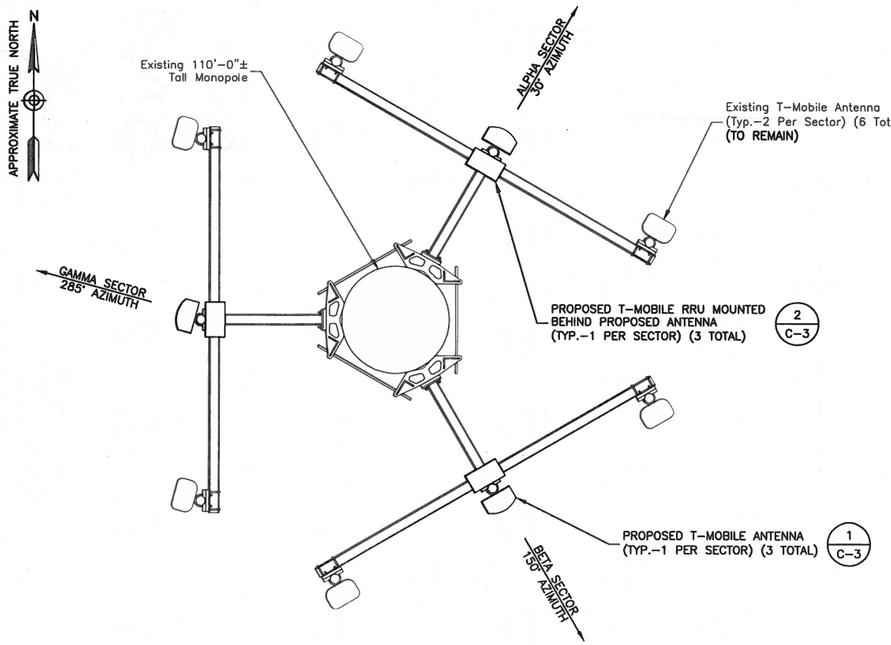
COMPOUND PLAN &
EQUIPMENT PLANS

SHEET NUMBER

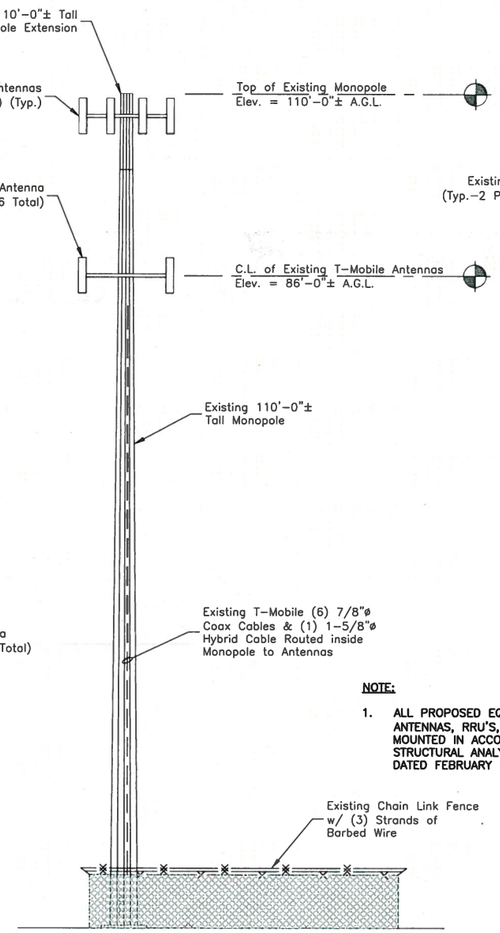
C-1



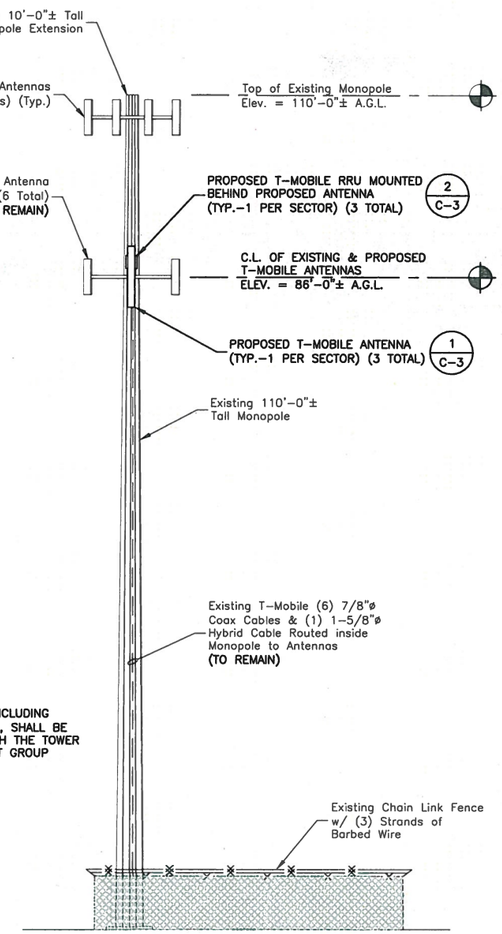
EXISTING ANTENNA LAYOUT (1)
SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT (2)
SCALE: N.T.S.



EXISTING ELEVATION (3)
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'



PROPOSED ELEVATION (4)
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'

NOTE:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY B+T GROUP DATED FEBRUARY 11, 2015.

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CTNH510A
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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 023222
IT IS A VIOLATION FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071486
SITE ADDRESS:	

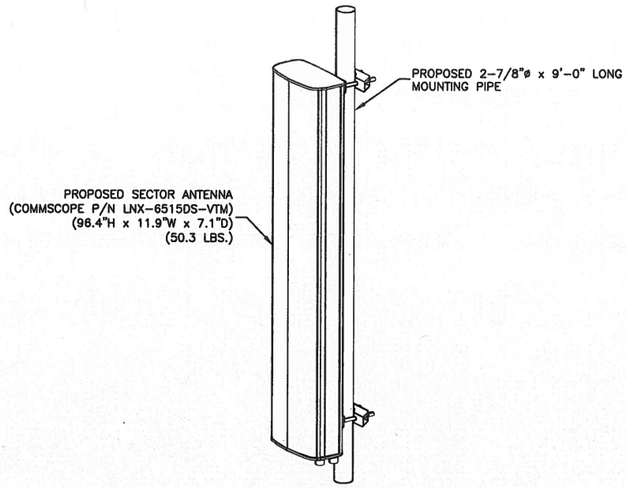
201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

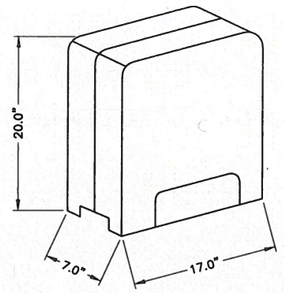
C-2



NOTES:

1. MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
3. CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

ISOMETRIC ANTENNA DETAIL 1
SCALE: N.T.S.



SPECIFICATIONS:

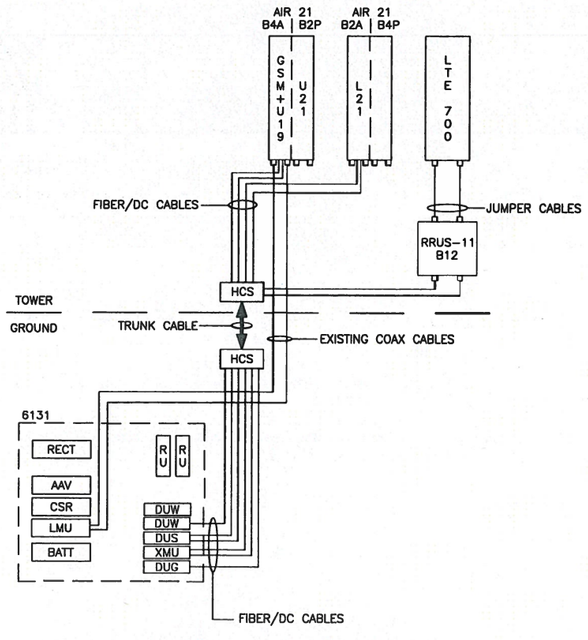
HEIGHT:	20.0"
WIDTH:	17.0"
DEPTH:	7.0"
WEIGHT:	50.7 LBS

ERICSSON RRUS-11 B12

RRU NOTES:

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

RRUS-11 - REMOTE RADIO UNIT 2
SCALE: N.T.S.



SITE CONFIGURATION 702Cu 3
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX/HCS LENGTH	EXISTING HCS
	EXISTING	PROPOSED	EXISTING	PROPOSED		
ALPHA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(2) 7/8"ø	–	136'-0"	(1) 1-5/8"ø
	–	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN				
BETA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(2) 7/8"ø	–	136'-0"	
	–	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN				
GAMMA	ERICSSON AIR21 B2A B4P	EXISTING TO REMAIN	(2) 7/8"ø	–	136'-0"	
	–	COMMSCOPE LNX-6515DS-VTM				
	ERICSSON AIR21 B4A B2P	EXISTING TO REMAIN				

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STATE OF CONNECTICUT
JIANG YU
0023222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

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201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

SHEET TITLE

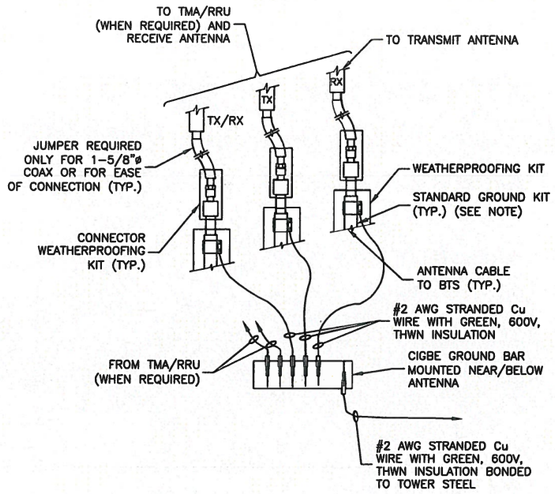
CONSTRUCTION DETAILS

SHEET NUMBER

C-3

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 THE 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 T-MOBILE 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.

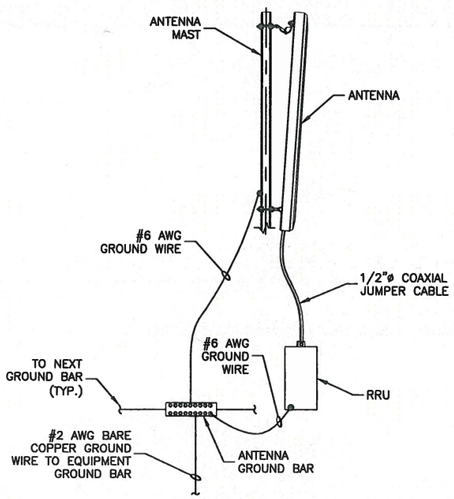


NOTE:

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

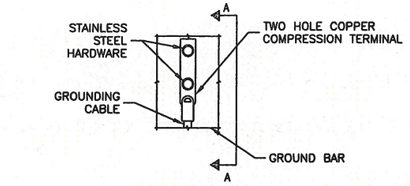
CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

SCALE: N.T.S.

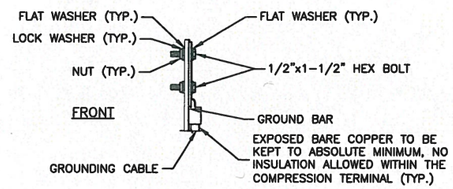


TYPICAL ANTENNA GROUNDING DETAIL — 3

SCALE: N.T.S



ELEVATION



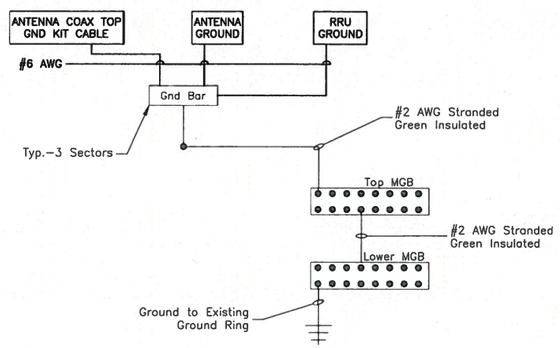
SECTION 'A-A'

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.



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. VERIFY EXISTING GROUND SYSTEM IS INSTALLED PER T-MOBILE STANDARDS.

SCHEMATIC GROUNDING DIAGRAM — 4

SCALE: N.T.S.

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GUILFORD SW

CONSTRUCTION DRAWINGS

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PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT — JIANG YU — 10/13/2022 — LICENSED PROFESSIONAL ENGINEER

CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	JC
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50071486
SITE ADDRESS:	

201 GRANITE ROAD
GUILFORD, CT 06437
NEW HAVEN COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

February 11, 2015

Charles McGuirt
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Charlotte, NC 28277
(704) 405-6607

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Metro PCS* Co-Locate**	
	Carrier Site Number:	CTNH510A
	Carrier Site Name:	AT&T Guilford
Monopole		
Crown Castle Designation:	**Crown Castle BU Number:**	842864
	Crown Castle Site Name:	Guilford SW
	Crown Castle JDE Job Number:	322294
	Crown Castle Work Order Number:	1006839
	Crown Castle Application Number:	282522 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	93996.002.01
Site Data:	**201 Granite Road, Guilford, New Haven County, CT** **Latitude *41° 17' 31.14"*, Longitude *-72° 43' 58.28"*** **109 Foot - Monopole Tower**	

Dear Charles McGuirt,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 754803, in accordance with application 282522, revision 0.

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

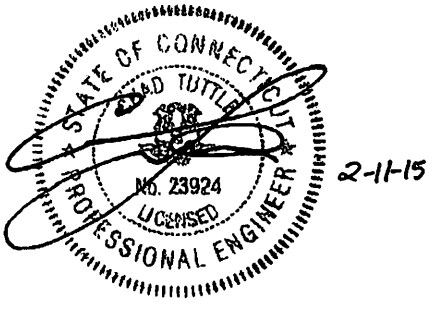
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

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

Respectfully submitted by:
B+T Engineering, Inc.



2-11-15

Leena Kantheti, E.I.T.
Project Engineer

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President

tnxTower Report - version 6.1.4.1

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1) INTRODUCTION

This tower is a 99 ft Monopole tower designed by Engineered Endeavors, Inc. in November of 2003. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified by B+T Group in February of 2014 by adding a 10ft extension and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
90.0	90.0	1	--	T-Arm Mount [TA 602-3]	1	1-5/8	--
	86.0	3	Commscope	LNX-6515DS-VTM			
		3	Ericsson	ERICSSON AIR 21 B2A B4P			
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	RRUS 11 B12			

Table 2 - Existing and Reserved Antenna and Cable Information

	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	107.0	3	Alcatel Lucent	RRH2X40-07-U	14	1-5/8	1
		3	Alcatel Lucent	RRH2X40-AWS			
		6	Amphenol	BXA-171063-12CF-EDIN-X			
		6	Amphenol	BXA-70063-6CF-EDIN-X			
		1	Rfs Celwave	DB-B1-6C-8AB-0Z			
		1	--	Platform Mount [LP 301-1]			
98.0	98.0	6	Ericsson	RBS 6601	12 3	1-1/4 1/2	1
		3	Kmw Comm.	AM-X-CD-16-65-00T-RET			
		6	Powerwave Tech.	7770.00			
		6	Powerwave Tech.	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	--	Platform Mount [LP 303-1]			
90.0	**90.0**	**3**	**Rfs Celwave**	**APXV18-206517S-C**	**--**	**--**	**2**
90.0	90.0	--	--	--	6	7/8	1

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
110	110	3	Generic	4 sf Antennas	--	--
		1	Generic	Low Profile Platforms		
100	100	3	Generic	4 sf Antennas	--	--
		1	Generic	Low Profile Platforms		
90	90	3	Generic	4 sf Antennas	--	--
		1	Generic	Low Visibility Mount		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Metro PCS Co-Locate Rev# 0	282522	CCI Sites
Tower Manufacturer Drawings	EEI, Project No: 12051-E02	4492171	CCI Sites
Tower Modification Drawings	B+T Group, Project No: 88725.002.01	4492170	CCI Sites
Post Modification Inspection	SGS, Project No.145188	5415537	CCI Sites
Tower Foundation Drawings	EEI, Project No: 12051 Rev 1	4492171	CCI Sites
Geotech Report	Jaworski Geotech, Inc., Project No: 03580G	4713222	CCI Sites
Antenna Configuration	Crown CAD Package	02/09/2015	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	110 - 100.5	Pole	TP24x24x0.375	1	-2.854	779.117	9.8	Pass
L2	100.5 - 100	Pole	TP26.42x24x0.375	2	-2.854	779.117	9.8	Pass
L3	100 - 47.93	Pole	TP37.12x26.42x0.313	3	-12.628	1843.499	49.9	Pass
L4	47.93 - 1	Pole	TP46x35.439x0.375	4	-23.379	2823.161	61.3	Pass
							Summary	
						Pole (L4)	61.3	Pass
						RATING =	**61.3**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flanges	100	24.0	Pass
1	Anchor Rods	Base	50.4	Pass
1	Base Plate	Base	64.8	Pass
1	Base Foundation	Base	55.4	Pass

Structure Rating (max from all components) =	**64.8%**

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

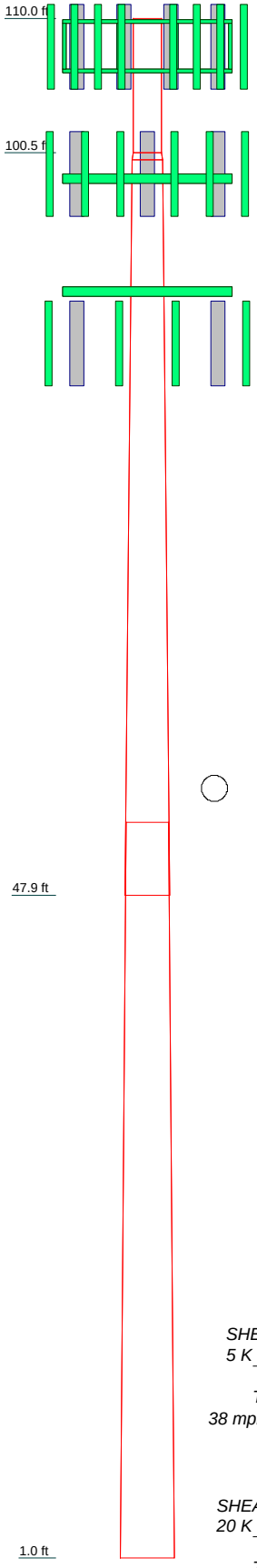
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	9.500	1	0.375		24.000	24.000		0.9
2	0.500	1	0.375		24.000	26.420		0.0
3	52.070	18	0.313	5.140	26.420	37.120	A53-B-35	5.5
4	52.070	18	0.375		35.439	46.000	A572-65	8.5



AXIAL 33 K
SHEAR 5 K
MOMENT 397 kip-ft
TORQUE 0 kip-ft
38 mph WIND - 0.750 in ICE
AXIAL 23 K
SHEAR 20 K
MOMENT 1601 kip-ft
TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) BXA-70063-6CF-EDIN-X (E)	108	(2) RBS 6601 (E)	99
(2) BXA-70063-6CF-EDIN-X (E)	108	(2) RBS 6601 (E)	99
(2) BXA-70063-6CF-EDIN-X (E)	108	DC6-48-60-18-8F (E)	99
(2) BXA-171063-12CF-EDIN-X (E)	108	4' x 2" Pipe Mount (E-TME)	99
(2) BXA-171063-12CF-EDIN-X (E)	108	4' x 2" Pipe Mount (E-TME)	99
(2) BXA-171063-12CF-EDIN-X (E)	108	4' x 2" Pipe Mount (E-TME)	99
RRH2X40-AWS (E)	108	5' x 2" Pipe Mount (E-TME)	99
RRH2X40-AWS (E)	108	Platform Mount [LP 303-1] (E)	99
RRH2X40-AWS (E)	108	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	91
RRH2X40-07-U (E)	108	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	91
RRH2X40-07-U (E)	108	ERICSSON AIR 21 B2A B4P w/ Mount Pipe (P)	91
RRH2X40-07-U (E)	108	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	91
DB-B1-6C-8AB-0Z (E)	108	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	91
Platform Mount [LP 301-1] (E-4M.P/Sector)	108	ERICSSON AIR 21 B4A B2P w/ Mount Pipe (P)	91
(2) 7770.00 w/ Mount Pipe (E)	99	LNX-6515DS-VTM w/ Mount Pipe (P)	91
(2) 7770.00 w/ Mount Pipe (E)	99	LNX-6515DS-VTM w/ Mount Pipe (P)	91
(2) 7770.00 w/ Mount Pipe (E)	99	LNX-6515DS-VTM w/ Mount Pipe (P)	91
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	99	RRUS 11 B12 (P)	91
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	99	RRUS 11 B12 (P)	91
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	99	RRUS 11 B12 (P)	91
(2) LGP21401 (E)	99	T-Arm Mount [TA 602-3] (P)	91
(2) LGP21401 (E)	99		
(2) LGP21401 (E)	99		
(2) RBS 6601 (E)	99		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

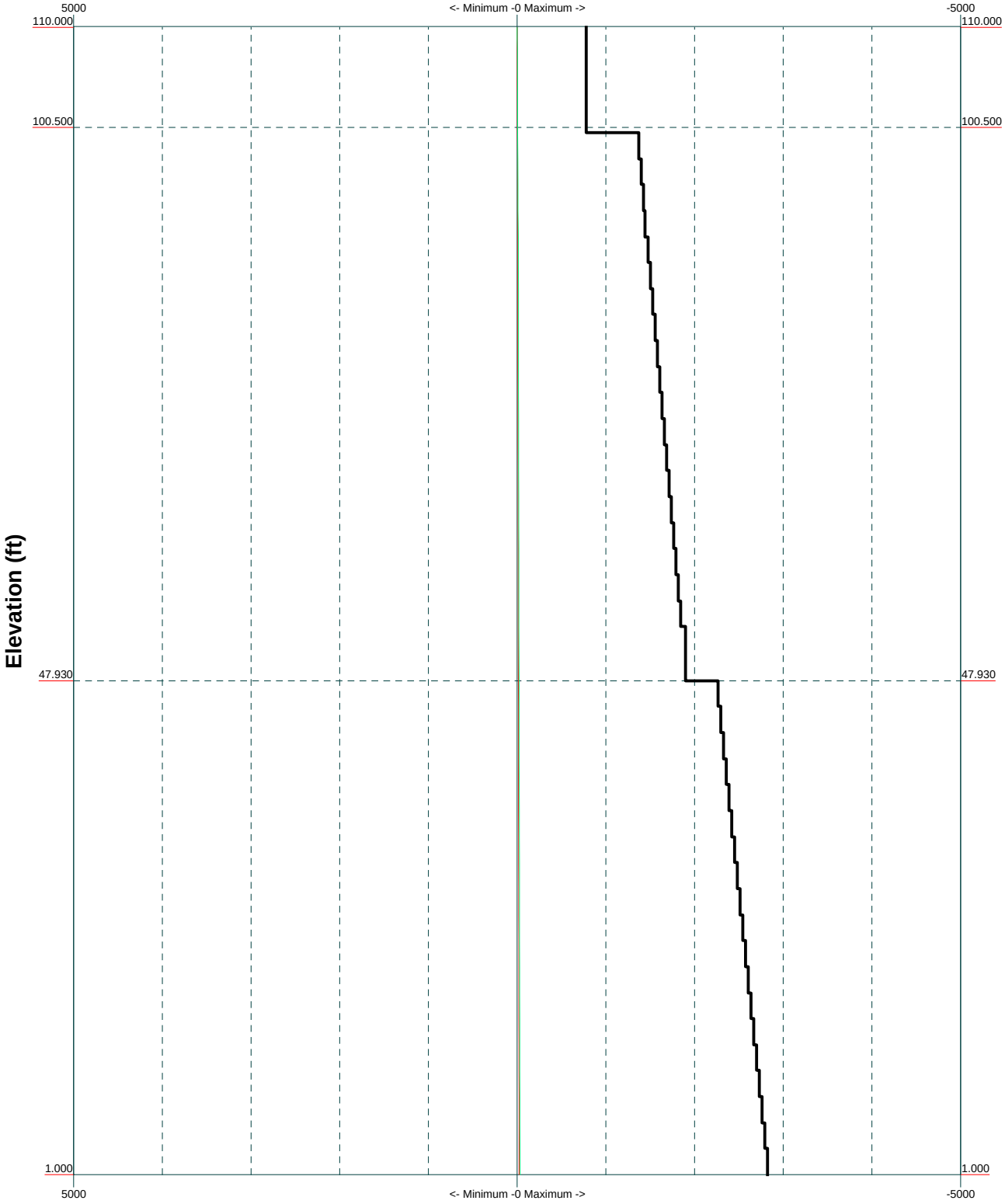
1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 61.3%

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 93996.002.01- GUILFORD SW, CT (BU# 842864			
Project:			
Client: Crown Castle	Drawn by: Lkantheti	App'd:	
Code: TIA/EIA-222-F	Date: 02/11/15	Scale: NTS	
Path: S:\Projects\Crown Castle\93996_842864_Guilford SW\Engineering\tnxTower\93996_002_01_GUILFORD_SW_CT.eri		Dwg No. E-1	

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Leg Capacity ——— **Leg Compression (K)**



B+T GRP

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Project:			
Client: Crown Castle	Drawn by: Lkantheti	App'd:	
Code: TIA/EIA-222-F	Date: 02/11/15	Scale: NTS	
Path: S:\Projects\Crown Castle\93996_842864_Guilford SW\Engineering\tnxTower\93996_002_01_GUILFORD_SW_CT.eri		Dwg No. E-3	

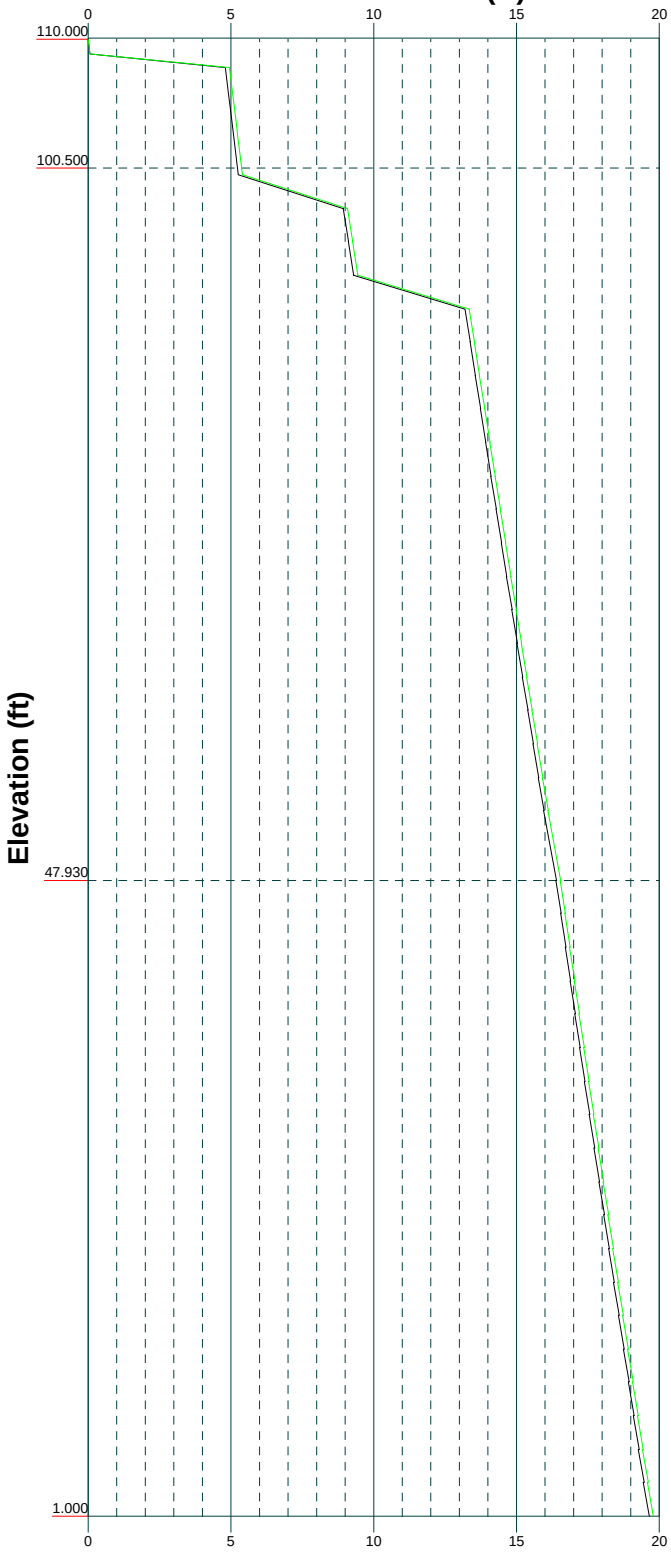
TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Vx Vz

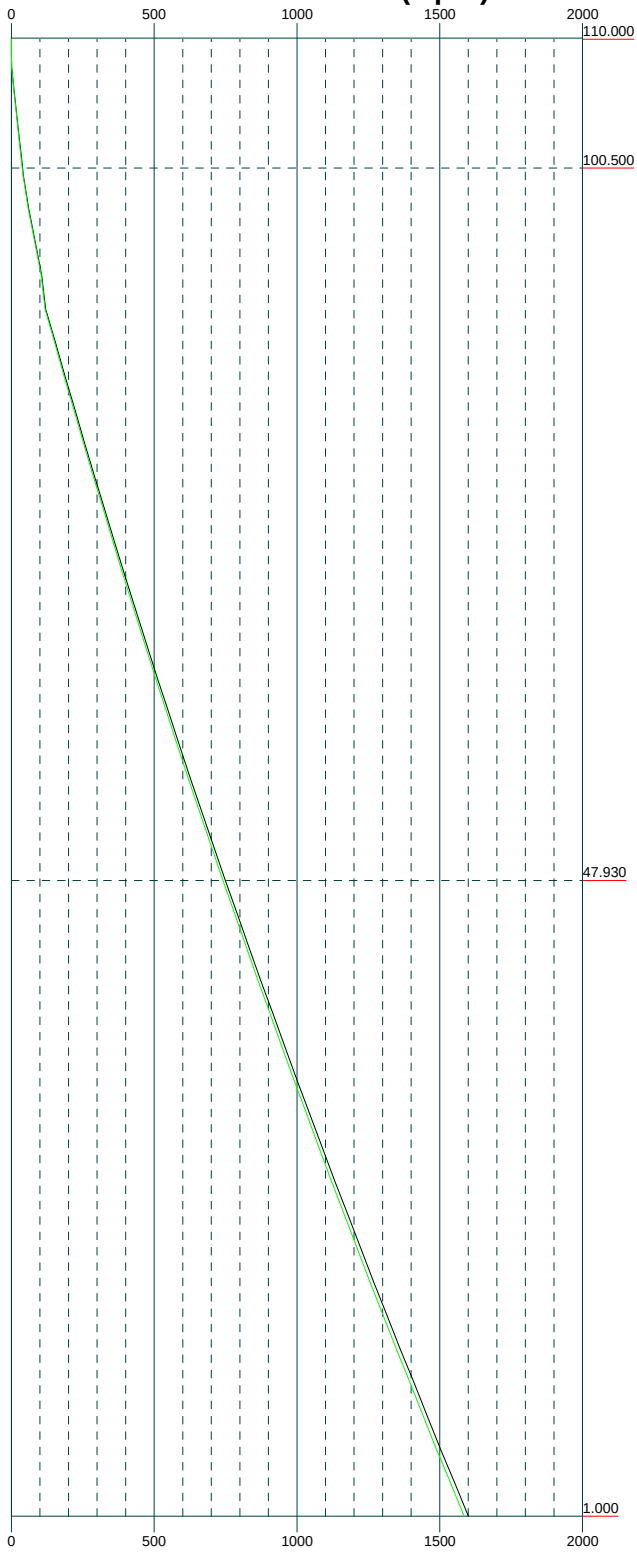
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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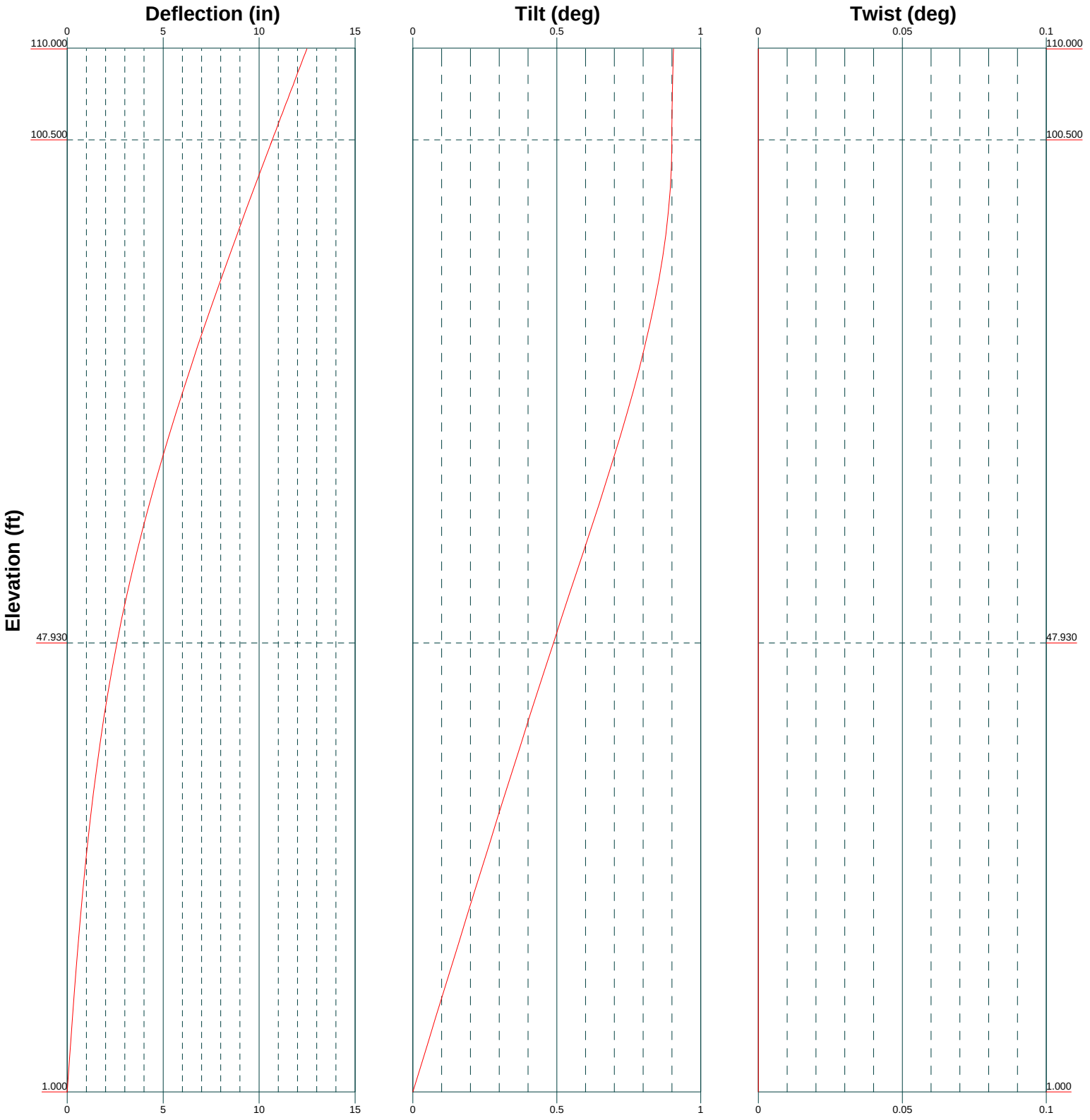
Job: 93996.002.01- GUILFORD SW, CT (BU# 842864			
Project:			
Client: Crown Castle	Drawn by: Lkantheti	App'd:	
Code: TIA/EIA-222-F	Date: 02/11/15	Scale: NTS	
Path: S:\Projects\Crown Castle\93996_842864_Guilford SW\Engineering\tnxTower\93996_002_01_GUILFORD_SW_CT.eri		Dwg No. E-4	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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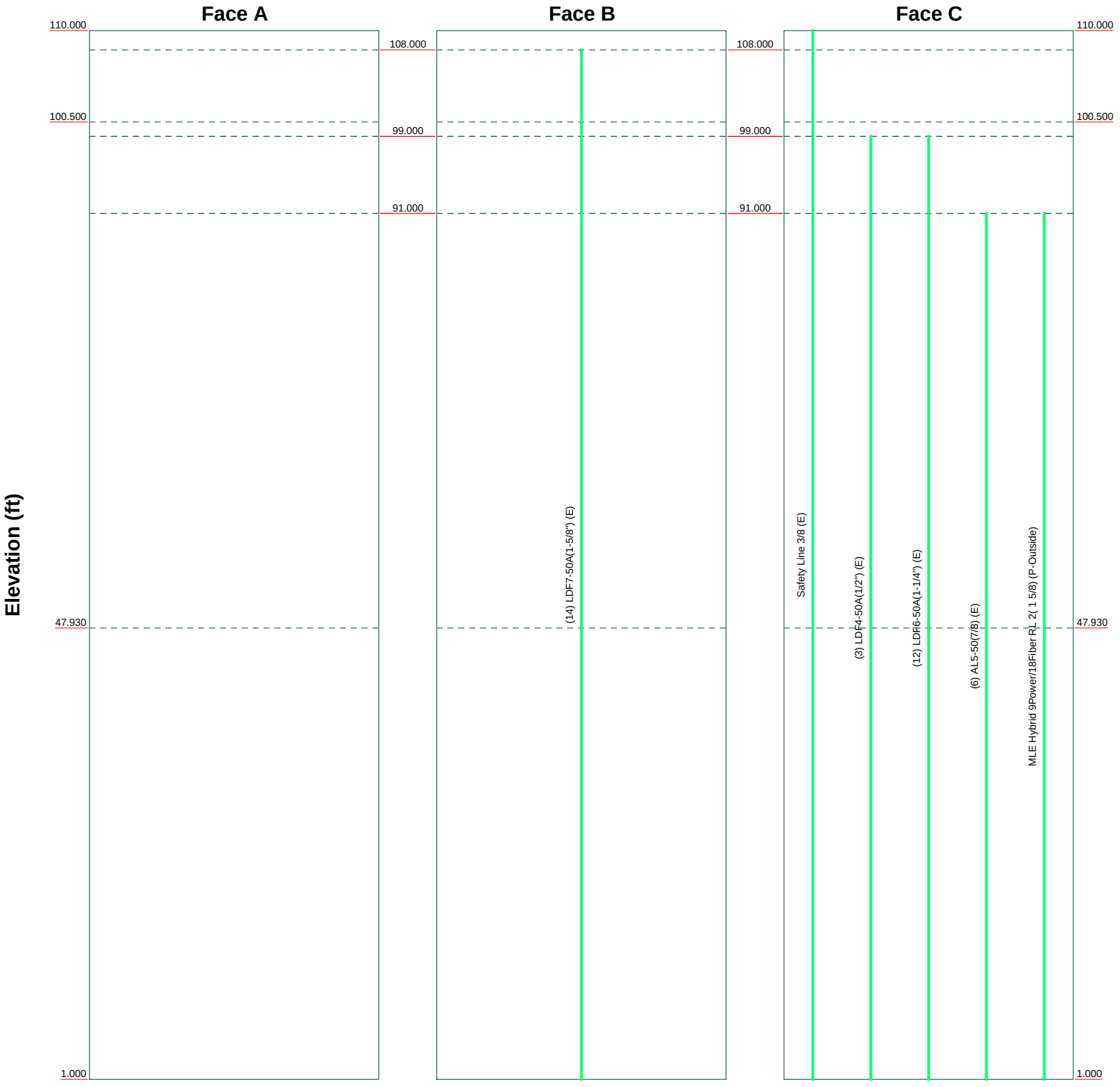
Job: 93996.002.01- GUILFORD SW, CT (BU# 842864			
Project:			
Client: Crown Castle	Drawn by: Lkantheti	App'd:	
Code: TIA/EIA-222-F	Date: 02/11/15	Scale: NTS	
Path: S:\Projects\Crown Castle\93996_842864_Guilford SW\Engineering\tnxTower\93996_002_01_GUILFORD_SW_CT.eri		Dwg No. E-5	

Feed Line Distribution Chart
1' - 110'

Round | Flat | App In Face | App Out Face | Truss Leg



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Project:			
Client: Crown Castle	Drawn by: Lkantheti	App'd:	
Code: TIA/EIA-222-F	Date: 02/11/15	Scale: NTS	
Path: S:\Projects\Crown Castle\93996_842864_Guilford SW\Engineering\tnxTower\93996_002_01_GUILFORD_SW_CT.eri		Dwg No. E-7	

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	110.000-100.500	9.500	0.000	Round	24.000	24.000	0.375		A53-B-35 (35 ksi)
L2	100.500-100.000	0.500	0.000	Round	24.000	26.420	0.375		A53-B-35 (35 ksi)
L3	100.000-47.930	52.070	5.140	18	26.420	37.120	0.313	1.250	A572-65 (65 ksi)
L4	47.930-1.000	52.070		18	35.439	46.000	0.375	1.500	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	24.000	27.833	1942.299	8.354	12.000	161.858	3884.597	13.908	0.000	0
	24.000	27.833	1942.299	8.354	12.000	161.858	3884.597	13.908	0.000	0
L2	24.000	27.833	1942.299	8.354	12.000	161.858	3884.597	13.908	0.000	0
	26.420	30.684	2602.281	9.209	13.210	196.993	5204.563	15.333	0.000	0
L3	26.828	25.895	2229.925	9.268	13.421	166.147	4462.784	12.950	4.100	13.12
	37.693	36.508	6248.897	13.067	18.857	331.384	12506.016	18.258	5.983	19.146
L4	37.044	41.735	6482.632	12.448	18.003	360.088	12973.795	20.871	5.577	14.873
	46.710	54.305	14281.844	16.197	23.368	611.171	28582.480	27.158	7.436	19.829

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 110.000-100.500				1	1	1		
L2 100.500-100.000				1	1	1		
L3 100.000-47.930				1	1	1		
L4 47.930-1.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
*******										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8 (E)	C	No	CaAa (Out Of Face)	110.000 - 1.000	1	No Ice	0.037	0.000
						1/2" Ice	0.137	0.001
						1" Ice	0.238	0.001
						2" Ice	0.437	0.002
						4" Ice	0.838	0.004
*******								
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	108.000 - 1.000	14	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
*******								
LDF4-50A(1/2") (E)	C	No	Inside Pole	99.000 - 1.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF6-50A(1-1/4") (E)	C	No	Inside Pole	99.000 - 1.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
*******								
AL5-50(7/8) (E)	C	No	Inside Pole	91.000 - 1.000	6	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) (P-Outside)	C	No	CaAa (Out Of Face)	91.000 - 1.000	1	No Ice	0.163	0.001
						1/2" Ice	0.263	0.002
						1" Ice	0.362	0.004
						2" Ice	0.562	0.010
						4" Ice	0.962	0.029
*******								

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	110.000-100.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.086
		C	0.000	0.000	0.000	0.356	0.002
L2	100.500-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.006
		C	0.000	0.000	0.000	0.019	0.000
L3	100.000-47.930	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.598
		C	0.000	0.000	0.000	8.952	0.552
L4	47.930-1.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.539
		C	0.000	0.000	0.000	9.386	0.527

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	110.000-100.500	A	0.862	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.086
		C		0.000	0.000	0.000	1.994	0.011
L2	100.500-100.000	A	0.857	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.006
		C		0.000	0.000	0.000	0.104	0.001
L3	100.000-47.930	A	0.825	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.598
		C		0.000	0.000	0.000	24.653	0.707
L4	47.930-1.000	A	0.750	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.539
		C		0.000	0.000	0.000	24.876	0.687

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	110.000-100.500	-0.048	0.028	-0.232	0.134
L2	100.500-100.000	-0.048	0.028	-0.232	0.134
L3	100.000-47.930	-0.214	0.124	-0.508	0.293
L4	47.930-1.000	-0.246	0.142	-0.577	0.333

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) BXA-70063-6CF-EDIN-X (E)	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.731 8.268 8.814 9.931 12.270	4.158 4.595 5.040 5.951 7.863	0.017 0.059 0.108 0.223 0.532
(2) BXA-70063-6CF-EDIN-X (E)	B	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.731 8.268 8.814 9.931 12.270	4.158 4.595 5.040 5.951 7.863	0.017 0.059 0.108 0.223 0.532
(2) BXA-70063-6CF-EDIN-X (E)	C	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.731 8.268 8.814 9.931 12.270	4.158 4.595 5.040 5.951 7.863	0.017 0.059 0.108 0.223 0.532
(2) BXA-171063-12CF-EDIN-X (E)	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.791 5.242 5.699 6.636 8.641	3.618 4.058 4.504 5.420 7.340	0.015 0.042 0.075 0.159 0.401
(2) BXA-171063-12CF-EDIN-X (E)	B	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.791 5.242 5.699 6.636 8.641	3.618 4.058 4.504 5.420 7.340	0.015 0.042 0.075 0.159 0.401
(2) BXA-171063-12CF-EDIN-X (E)	C	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.791 5.242 5.699 6.636 8.641	3.618 4.058 4.504 5.420 7.340	0.015 0.042 0.075 0.159 0.401
RRH2X40-AWS (E)	A	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS (E)	B	From Leg	4.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.044 0.061 0.082 0.132 0.275
RRH2X40-AWS (E)	C	From Leg	4.000 0.000	0.000	108.000	No Ice 1/2" Ice	2.522 2.753	1.589 1.795	0.044 0.061

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-07-U	A	From Leg	4.000	0.000	108.000	No Ice	2.246	1.228	0.050
(E)			0.000			1/2" Ice	2.447	1.385	0.067
			0.000			1" Ice	2.657	1.551	0.086
						2" Ice	3.103	1.909	0.134
						4" Ice	4.099	2.728	0.271
RRH2X40-07-U	B	From Leg	4.000	0.000	108.000	No Ice	2.246	1.228	0.050
(E)			0.000			1/2" Ice	2.447	1.385	0.067
			0.000			1" Ice	2.657	1.551	0.086
						2" Ice	3.103	1.909	0.134
						4" Ice	4.099	2.728	0.271
RRH2X40-07-U	C	From Leg	4.000	0.000	108.000	No Ice	2.246	1.228	0.050
(E)			0.000			1/2" Ice	2.447	1.385	0.067
			0.000			1" Ice	2.657	1.551	0.086
						2" Ice	3.103	1.909	0.134
						4" Ice	4.099	2.728	0.271
DB-B1-6C-8AB-0Z	A	From Leg	4.000	0.000	108.000	No Ice	5.600	2.333	0.044
(E)			0.000			1/2" Ice	5.915	2.558	0.080
			0.000			1" Ice	6.240	2.791	0.120
						2" Ice	6.914	3.284	0.213
						4" Ice	8.365	4.373	0.455
Platform Mount [LP 301-1]	C	None		0.000	108.000	No Ice	30.100	30.100	1.589
(E-4M.P/Sector)						1/2" Ice	40.800	40.800	2.029
						1" Ice	51.500	51.500	2.470
						2" Ice	72.900	72.900	3.351
						4" Ice	115.700	115.700	5.114
*******									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	99.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			0.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	99.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			0.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	99.000	No Ice	6.119	4.254	0.055
(E)			0.000			1/2" Ice	6.626	5.014	0.103
			0.000			1" Ice	7.128	5.711	0.157
						2" Ice	8.164	7.155	0.287
						4" Ice	10.360	10.412	0.665
AM-X-CD-16-65-00T-RET	A	From Leg	4.000	0.000	99.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.139
(E)			0.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET	B	From Leg	4.000	0.000	99.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.139
(E)			0.000			1" Ice	9.767	8.368	0.212
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
AM-X-CD-16-65-00T-RET	C	From Leg	4.000	0.000	99.000	No Ice	8.498	6.304	0.074
w/ Mount Pipe			0.000			1/2" Ice	9.149	7.479	0.139
(E)			0.000			1" Ice	9.767	8.368	0.212

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
						2" Ice	11.031	10.179	0.385
						4" Ice	13.679	14.024	0.874
(2) LGP21401 (E)	A	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) LGP21401 (E)	B	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) LGP21401 (E)	C	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.233 0.313 0.403 0.608 1.121	0.014 0.021 0.030 0.055 0.135
(2) RBS 6601 (E)	A	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.476 0.620 0.772 1.102 1.867	0.347 0.457 0.576 0.840 1.472	0.020 0.032 0.047 0.085 0.199
(2) RBS 6601 (E)	B	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.476 0.620 0.772 1.102 1.867	0.347 0.457 0.576 0.840 1.472	0.020 0.032 0.047 0.085 0.199
(2) RBS 6601 (E)	C	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.476 0.620 0.772 1.102 1.867	0.347 0.457 0.576 0.840 1.472	0.020 0.032 0.047 0.085 0.199
DC6-48-60-18-8F (E)	C	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.266 1.456 1.658 2.093 3.098	1.266 1.456 1.658 2.093 3.098	0.020 0.035 0.053 0.095 0.215
4' x 2" Pipe Mount (E-TME)	A	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
4' x 2" Pipe Mount (E-TME)	B	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
4' x 2" Pipe Mount (E-TME)	C	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
5' x 2" Pipe Mount (E-TME)	C	From Leg	4.000 0.000 0.000	0.000	99.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.393 1.703 2.351 3.778	1.000 1.393 1.703 2.351 3.778	0.029 0.037 0.048 0.082 0.196

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
Platform Mount [LP 303-1]	C	None		0.000	99.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
*******									
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	91.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			-4.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	91.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			-4.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	91.000	No Ice	6.825	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			-4.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	A	From Leg	4.000	0.000	91.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			-4.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	B	From Leg	4.000	0.000	91.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			-4.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A	C	From Leg	4.000	0.000	91.000	No Ice	6.825	5.642	0.112
B2P w/ Mount Pipe			0.000			1/2" Ice	7.347	6.480	0.169
(P)			-4.000			1" Ice	7.863	7.257	0.233
						2" Ice	8.926	8.864	0.383
						4" Ice	11.175	12.293	0.807
LNX-6515DS-VTM w/	A	From Leg	4.000	0.000	91.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			-4.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/	B	From Leg	4.000	0.000	91.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			-4.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
LNX-6515DS-VTM w/	C	From Leg	4.000	0.000	91.000	No Ice	11.683	9.842	0.083
Mount Pipe			0.000			1/2" Ice	12.404	11.366	0.173
(P)			-4.000			1" Ice	13.135	12.914	0.273
						2" Ice	14.601	15.267	0.506
						4" Ice	17.875	20.139	1.151
RRUS 11 B12	A	From Leg	4.000	0.000	91.000	No Ice	3.306	1.361	0.051
(P)			0.000			1/2" Ice	3.550	1.540	0.072
			-4.000			1" Ice	3.802	1.728	0.095
						2" Ice	4.334	2.130	0.153
						4" Ice	5.501	3.038	0.314
RRUS 11 B12	B	From Leg	4.000	0.000	91.000	No Ice	3.306	1.361	0.051

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
(P)			0.000 -4.000			1/2" Ice 1" Ice 2" Ice 4" Ice	3.550 3.802 4.334 5.501	1.540 1.728 2.130 3.038	0.072 0.095 0.153 0.314
RRUS 11 B12 (P)	C	From Leg	4.000 0.000 -4.000	0.000	91.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.306 3.550 3.802 4.334 5.501	1.361 1.540 1.728 2.130 3.038	0.051 0.072 0.095 0.153 0.314
T-Arm Mount [TA 602-3] (P) *******	C	None		0.000	91.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.590 15.440 19.290 26.990 42.390	11.590 15.440 19.290 26.990 42.390	0.774 0.990 1.206 1.639 2.503

Load Combinations

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

Comb. No.	Description
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	110 - 100.5	Pole	Max Tension	2	0.000	-0.000	-0.000
			Max. Compression	14	-5.145	0.009	0.541
			Max. Mx	11	-2.863	37.723	0.197
			Max. My	2	-2.854	0.004	39.024
			Max. Vy	11	-5.230	37.723	0.197
			Max. Vx	2	-5.374	0.004	39.024
			Max. Torque	11			-0.515
L2	100.5 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-5.215	0.010	0.541
			Max. Mx	11	-2.918	40.346	0.197
			Max. My	2	-2.908	0.005	41.719
			Max. Vy	11	-5.259	40.346	0.197
			Max. Vx	2	-5.404	0.005	41.719
			Max. Torque	11			-0.514
L3	100 - 47.93	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-19.964	0.643	0.176
			Max. Mx	11	-12.637	657.608	0.058
			Max. My	2	-12.628	0.284	665.438
			Max. Vy	11	-15.968	657.608	0.058
			Max. Vx	2	-16.115	0.284	665.438
			Max. Torque	9			-0.540
L4	47.93 - 1	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-32.650	0.996	-0.028
			Max. Mx	11	-23.379	1585.256	0.004
			Max. My	2	-23.379	0.386	1600.518
			Max. Vy	11	-19.650	1585.256	0.004
			Max. Vx	2	-19.794	0.386	1600.518
			Max. Torque	9			-0.586

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	21	32.650	0.000	-4.788
	Max. H_x	11	23.392	19.634	0.000
	Max. H_z	2	23.392	0.000	19.778
	Max. M_x	2	1600.518	0.000	19.778
	Max. M_z	5	1584.484	-19.634	0.000
	Max. Torsion	3	0.584	-9.817	17.128
	Min. Vert	1	23.392	0.000	0.000
	Min. H_x	5	23.392	-19.634	0.000
	Min. H_z	8	23.392	0.000	-19.778
	Min. M_x	8	-1600.509	0.000	-19.778
	Min. M_z	11	-1585.256	19.634	0.000
	Min. Torsion	9	-0.586	9.817	-17.128

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	23.392	0.000	0.000	-0.003	0.376	0.000
Dead+Wind 0 deg - No Ice	23.392	-0.000	-19.778	-1600.518	0.386	-0.568
Dead+Wind 30 deg - No Ice	23.392	9.817	-17.128	-1386.093	-792.044	-0.584
Dead+Wind 60 deg - No Ice	23.392	17.004	-9.889	-800.266	-1372.149	-0.445
Dead+Wind 90 deg - No Ice	23.392	19.634	0.000	-0.004	-1584.484	-0.187
Dead+Wind 120 deg - No Ice	23.392	17.004	9.889	800.258	-1372.149	0.121
Dead+Wind 150 deg - No Ice	23.392	9.817	17.128	1386.084	-792.044	0.398
Dead+Wind 180 deg - No Ice	23.392	-0.000	19.778	1600.509	0.386	0.568
Dead+Wind 210 deg - No Ice	23.392	-9.817	17.128	1386.085	792.815	0.586
Dead+Wind 240 deg - No Ice	23.392	-17.004	9.889	800.258	1372.920	0.447
Dead+Wind 270 deg - No Ice	23.392	-19.634	0.000	-0.004	1585.256	0.187
Dead+Wind 300 deg - No Ice	23.392	-17.004	-9.889	-800.266	1372.921	-0.123
Dead+Wind 330 deg - No Ice	23.392	-9.817	-17.128	-1386.093	792.816	-0.400
Dead+Ice+Temp	32.650	0.000	0.000	0.028	0.996	0.000
Dead+Wind 0 deg+Ice+Temp	32.650	0.000	-4.788	-396.562	1.036	-0.198
Dead+Wind 30 deg+Ice+Temp	32.650	2.379	-4.146	-343.430	-195.629	-0.174
Dead+Wind 60 deg+Ice+Temp	32.650	4.121	-2.394	-198.271	-339.598	-0.104
Dead+Wind 90 deg+Ice+Temp	32.650	4.758	0.000	0.021	-392.295	-0.006
Dead+Wind 120 deg+Ice+Temp	32.650	4.121	2.394	198.313	-339.598	0.094
Dead+Wind 150 deg+Ice+Temp	32.650	2.379	4.146	343.472	-195.629	0.168
Dead+Wind 180 deg+Ice+Temp	32.650	0.000	4.788	396.604	1.036	0.198
Dead+Wind 210 deg+Ice+Temp	32.650	-2.379	4.146	343.472	197.702	0.174
Dead+Wind 240 deg+Ice+Temp	32.650	-4.121	2.394	198.313	341.671	0.104
Dead+Wind 270 deg+Ice+Temp	32.650	-4.758	0.000	0.021	394.368	0.006
Dead+Wind 300 deg+Ice+Temp	32.650	-4.121	-2.394	-198.271	341.671	-0.094
Dead+Wind 330 deg+Ice+Temp	32.650	-2.379	-4.146	-343.430	197.702	-0.168
Dead+Wind 0 deg - Service	23.392	0.000	-6.843	-554.002	0.387	-0.197
Dead+Wind 30 deg - Service	23.392	3.397	-5.927	-479.780	-273.902	-0.203
Dead+Wind 60 deg - Service	23.392	5.884	-3.422	-277.003	-474.695	-0.154
Dead+Wind 90 deg - Service	23.392	6.794	0.000	-0.004	-548.191	-0.065
Dead+Wind 120 deg - Service	23.392	5.884	3.422	276.995	-474.695	0.042
Dead+Wind 150 deg - Service	23.392	3.397	5.927	479.772	-273.902	0.138
Dead+Wind 180 deg - Service	23.392	0.000	6.843	553.993	0.387	0.197
Dead+Wind 210 deg - Service	23.392	-3.397	5.927	479.772	274.675	0.203
Dead+Wind 240 deg - Service	23.392	-5.884	3.422	276.995	475.469	0.155
Dead+Wind 270 deg - Service	23.392	-6.794	0.000	-0.004	548.965	0.065
Dead+Wind 300 deg - Service	23.392	-5.884	-3.422	-277.003	475.469	-0.043
Dead+Wind 330 deg - Service	23.392	-3.397	-5.927	-479.780	274.675	-0.138

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-23.392	0.000	0.000	23.392	0.000	0.000%
2	0.000	-23.392	-19.778	0.000	23.392	19.778	0.000%
3	9.817	-23.392	-17.128	-9.817	23.392	17.128	0.000%
4	17.004	-23.392	-9.889	-17.004	23.392	9.889	0.000%
5	19.634	-23.392	0.000	-19.634	23.392	0.000	0.000%
6	17.004	-23.392	9.889	-17.004	23.392	-9.889	0.000%
7	9.817	-23.392	17.128	-9.817	23.392	-17.128	0.000%
8	0.000	-23.392	19.778	0.000	23.392	-19.778	0.000%
9	-9.817	-23.392	17.128	9.817	23.392	-17.128	0.000%
10	-17.004	-23.392	9.889	17.004	23.392	-9.889	0.000%
11	-19.634	-23.392	0.000	19.634	23.392	0.000	0.000%
12	-17.004	-23.392	-9.889	17.004	23.392	9.889	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
13	-9.817	-23.392	-17.128	9.817	23.392	17.128	0.000%
14	0.000	-32.650	0.000	0.000	32.650	0.000	0.000%
15	0.000	-32.650	-4.788	0.000	32.650	4.788	0.000%
16	2.379	-32.650	-4.146	-2.379	32.650	4.146	0.000%
17	4.121	-32.650	-2.394	-4.121	32.650	2.394	0.000%
18	4.758	-32.650	0.000	-4.758	32.650	0.000	0.000%
19	4.121	-32.650	2.394	-4.121	32.650	-2.394	0.000%
20	2.379	-32.650	4.146	-2.379	32.650	-4.146	0.000%
21	0.000	-32.650	4.788	0.000	32.650	-4.788	0.000%
22	-2.379	-32.650	4.146	2.379	32.650	-4.146	0.000%
23	-4.121	-32.650	2.394	4.121	32.650	-2.394	0.000%
24	-4.758	-32.650	0.000	4.758	32.650	0.000	0.000%
25	-4.121	-32.650	-2.394	4.121	32.650	2.394	0.000%
26	-2.379	-32.650	-4.146	2.379	32.650	4.146	0.000%
27	0.000	-23.392	-6.843	0.000	23.392	6.843	0.000%
28	3.397	-23.392	-5.927	-3.397	23.392	5.927	0.000%
29	5.884	-23.392	-3.422	-5.884	23.392	3.422	0.000%
30	6.794	-23.392	0.000	-6.794	23.392	0.000	0.000%
31	5.884	-23.392	3.422	-5.884	23.392	-3.422	0.000%
32	3.397	-23.392	5.927	-3.397	23.392	-5.927	0.000%
33	0.000	-23.392	6.843	0.000	23.392	-6.843	0.000%
34	-3.397	-23.392	5.927	3.397	23.392	-5.927	0.000%
35	-5.884	-23.392	3.422	5.884	23.392	-3.422	0.000%
36	-6.794	-23.392	0.000	6.794	23.392	0.000	0.000%
37	-5.884	-23.392	-3.422	5.884	23.392	3.422	0.000%
38	-3.397	-23.392	-5.927	3.397	23.392	5.927	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00028270
3	Yes	5	0.00000001	0.00009344
4	Yes	5	0.00000001	0.00010021
5	Yes	4	0.00000001	0.00016168
6	Yes	5	0.00000001	0.00009672
7	Yes	5	0.00000001	0.00009518
8	Yes	4	0.00000001	0.00028266
9	Yes	5	0.00000001	0.00010146
10	Yes	5	0.00000001	0.00009377
11	Yes	4	0.00000001	0.00016178
12	Yes	5	0.00000001	0.00009692
13	Yes	5	0.00000001	0.00009939
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00004093
16	Yes	5	0.00000001	0.00004629
17	Yes	5	0.00000001	0.00004634
18	Yes	5	0.00000001	0.00004032
19	Yes	5	0.00000001	0.00004617
20	Yes	5	0.00000001	0.00004623
21	Yes	5	0.00000001	0.00004086
22	Yes	5	0.00000001	0.00004682
23	Yes	5	0.00000001	0.00004639
24	Yes	5	0.00000001	0.00004062
25	Yes	5	0.00000001	0.00004653
26	Yes	5	0.00000001	0.00004684
27	Yes	4	0.00000001	0.00004946
28	Yes	4	0.00000001	0.00025032

29	Yes	4	0.00000001	0.00029725
30	Yes	4	0.00000001	0.00002891
31	Yes	4	0.00000001	0.00027129
32	Yes	4	0.00000001	0.00026013
33	Yes	4	0.00000001	0.00004944
34	Yes	4	0.00000001	0.00030579
35	Yes	4	0.00000001	0.00025344
36	Yes	4	0.00000001	0.00002897
37	Yes	4	0.00000001	0.00027316
38	Yes	4	0.00000001	0.00028981

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 100.5	12.485	27	0.907	0.001
L2	100.5 - 100	10.685	27	0.899	0.001
L3	100 - 47.93	10.591	27	0.899	0.001
L4	53.07 - 1	3.122	27	0.543	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
108.000	(2) BXA-70063-6CF-EDIN-X	27	12.105	0.906	0.001	63044
99.000	(2) 7770.00 w/ Mount Pipe	27	10.403	0.897	0.001	26395
91.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	8.920	0.869	0.001	13616

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 100.5	36.051	2	2.618	0.004
L2	100.5 - 100	30.855	2	2.597	0.004
L3	100 - 47.93	30.583	2	2.595	0.004
L4	53.07 - 1	9.018	2	1.569	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
108.000	(2) BXA-70063-6CF-EDIN-X	2	34.954	2.616	0.004	22294
99.000	(2) 7770.00 w/ Mount Pipe	2	30.040	2.589	0.004	9239
91.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	25.759	2.511	0.003	4740

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	110 - 100.5 (1)	TP24x24x0.375	9.500	0.000	0.0	21.000	27.833	-2.854	584.484	0.005
L2	100.5 - 100 (2)	TP26.42x24x0.375	0.500	0.000	0.0	21.000	27.833	-2.854	584.484	0.005
L3	100 - 47.93 (3)	TP37.12x26.42x0.313	52.070	0.000	0.0	39.000	35.461	-12.628	1382.970	0.009
L4	47.93 - 1 (4)	TP46x35.439x0.375	52.070	0.000	0.0	39.000	54.305	-23.379	2117.900	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	110 - 100.5 (1)	TP24x24x0.375	39.024	2.893	23.100	0.125	0.000	0.000	23.100	0.000
L2	100.5 - 100 (2)	TP26.42x24x0.375	39.024	2.893	23.100	0.125	0.000	0.000	23.100	0.000
L3	100 - 47.93 (3)	TP37.12x26.42x0.313	665.438	25.548	39.000	0.655	0.000	0.000	39.000	0.000
L4	47.93 - 1 (4)	TP46x35.439x0.375	1600.517	31.425	39.000	0.806	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	110 - 100.5 (1)	TP24x24x0.375	5.374	0.193	14.000	0.028	0.002	0.000	14.000	0.000
L2	100.5 - 100 (2)	TP26.42x24x0.375	5.404	0.194	14.000	0.025	0.002	0.000	14.000	0.000
L3	100 - 47.93 (3)	TP37.12x26.42x0.313	16.115	0.454	26.000	0.035	0.487	0.009	26.000	0.000
L4	47.93 - 1 (4)	TP46x35.439x0.375	19.794	0.364	26.000	0.028	0.568	0.005	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	110 - 100.5 (1)	0.005	0.125	0.000	0.028	0.000	0.130 ✔	1.333	H1-3+VT ✔
L2	100.5 - 100 (2)	0.005	0.125	0.000	0.025	0.000	0.130 ✔	1.333	H1-3+VT ✔
L3	100 - 47.93 (3)	0.009	0.655	0.000	0.035	0.000	0.665 ✔	1.333	H1-3+VT ✔
L4	47.93 - 1 (4)	0.011	0.806	0.000	0.028	0.000	0.817 ✔	1.333	H1-3+VT ✔

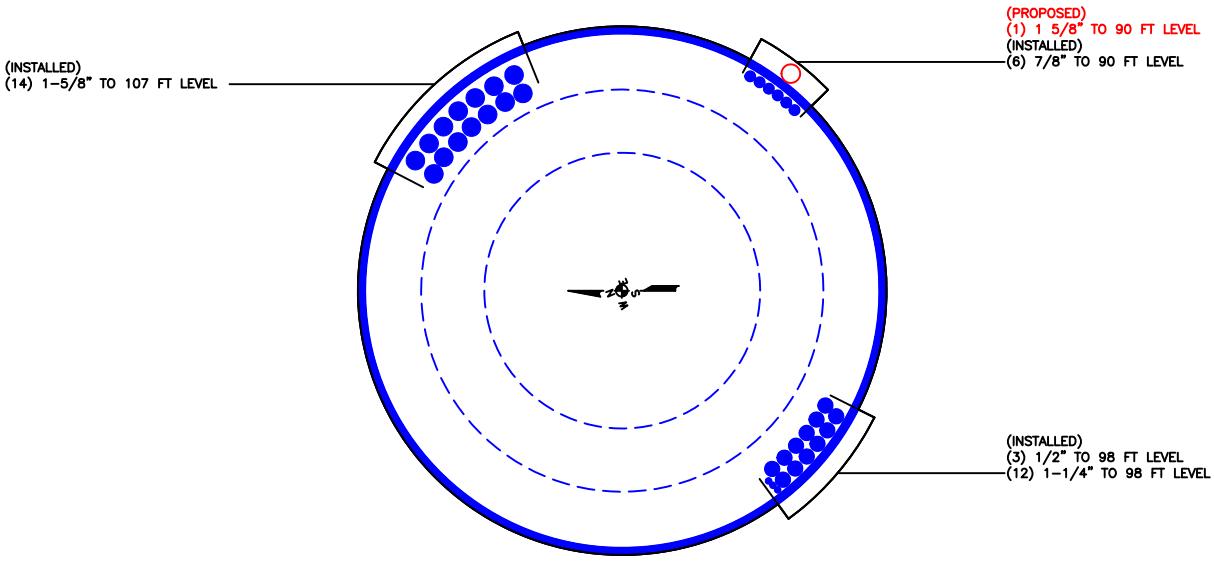
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	110 - 100.5	Pole	TP24x24x0.375	1	-2.854	779.117	9.8	Pass
L2	100.5 - 100	Pole	TP26.42x24x0.375	2	-2.854	779.117	9.8	Pass
L3	100 - 47.93	Pole	TP37.12x26.42x0.313	3	-12.628	1843.499	49.9	Pass
L4	47.93 - 1	Pole	TP46x35.439x0.375	4	-23.379	2823.161	61.3	Pass
							Summary	
						Pole (L4)	61.3	Pass
						RATING =	**61.3**	**Pass**

Program version: 6.1.4.1

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842864

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#	*842864*
Site Name:	*Guilford SW, CT*
Applicatio No:	*282522 Rev # 0*
Pole Manufacturer:	*Other*

Reactions

Moment:	1601	ft-kips
Axial:	23	kips
Shear:	20	kips

Anchor Rod Data

Qty:	14	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	55	in

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

Anchor Rod Results

Maximum Rod Tension:	98.2	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	50.4%	**Pass**

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	61	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.43	in

Base Plate Results

Flexural Check		
Base Plate Stress:	38.9	ksi
Allowable Plate Stress:	60.0	ksi
Base Plate Stress Ratio:	64.8%	**Pass**

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length: 30.15

Stiffener Data (Welding at both sides)

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

n/a

Stiffener Results

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

Pole Data

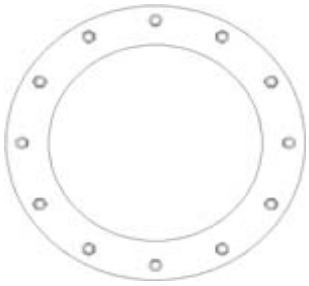
Diam:	46	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Pole Results

Pole Punching Shear Check:	n/a

Stress Increase Factor

ASIF:	1.333	



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

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

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

Site Data

Bu#:	*842864*
Site Name:	*Guilford SW, CT*
Application No:	*282522 Rev # 0*

Pole Manufacturer:	Other

Bolt Data

Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
Circle (in.):	30		

Plate Data

Diam:	33	in
Thick, t:	1	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.14	in

Stiffener Data (Welding at Both Sides)

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

Pole Data

Diam:	24	in
Thick:	0.25	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333	

Reactions

Moment:	39.024	ft-kips
Axial:	2.854	kips
Shear:	5.374	kips
Elevation:	100	feet

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

Flange Bolt Results — Non-Rigid, Service, ASD, Fty*ASIF

Bolt Tension Capacity, **B**:	46.07 kips	
Max Bolt directly applied T:	2.48 Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	2.472 in	
Min PL "treq" for actual **T w/ Pry**:	0.445 in	
Min PL "t1" for actual **T w/o Pry**:	0.574 in	
T allowable with Prying:	12.53 kips	α'>1 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	2.48 kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	5.4% **Pass**	

Exterior Flange Plate Results — Flexural Check — Non-Rigid, Service ASD, 0.75*Fy*ASIF, Comp. Y.L. Length: 18.00

Compression Side Plate Stress:	8.7 ksi	
Allowable Plate Stress:	36.0 ksi	
Compression Plate Stress Ratio:	24.0% **Pass**	
No Prying		
Tension Side Stress Ratio, (treq/t)^2:	19.8% **Pass**	

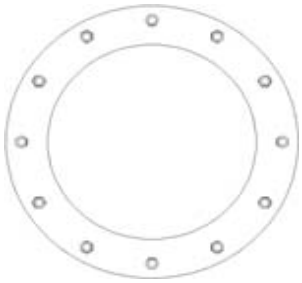
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

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

Site Data	
BU#:	*842864*
Site Name:	*Guilford SW, CT*
Application No:	*282522 Rev # 0*

Pole Manufacturer:	Other

Reactions		
Moment:	39.024	ft-kips
Axial:	2.854	kips
Shear:	5.374	kips
Elevation:	100	feet

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

Bolt Data			
Qty:	24		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
Circle (in.):	30		

Plate Data		
Diam:	33	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.47	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	26.52	in
Thick:	0.25	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	2.48	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.656	in	
Min PL "treq" for actual **T w/ Pry**:	0.295	in	
Min PL "t1" for actual **T w/o Pry**:	0.384	in	
T allowable with Prying:	42.90	kips	0≤α'≤1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	2.48	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	5.4%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	2.2	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	6.2%	**Pass**	Comp. Y.L. Length:
No Prying			14.02
Tension Side Stress Ratio, (treq/t)^2:	3.9%	**Pass**	

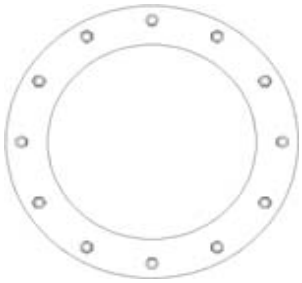
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

PROJECT	**842864 - Guilford SW, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**02/11/15**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74159
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

Rev. Type: F

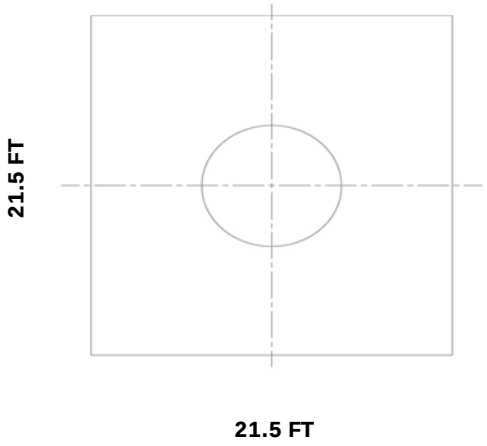
Design Loads:

Input unfactored loads

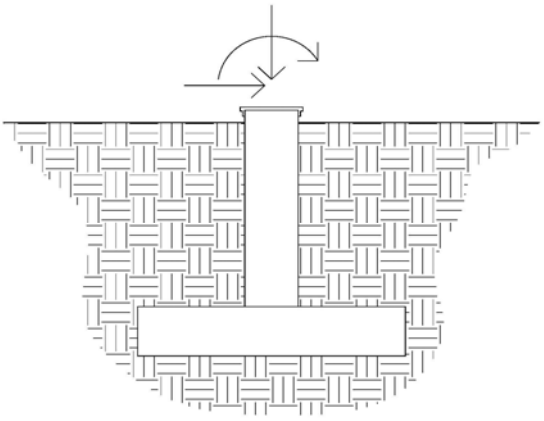
Shear:	20.0	kips
Moment:	1,601.0	ft-kips
Tower Height:	109.0	ft
Tower Weight:	23.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	46.00	in
Bearing Depth:	7.0	ft
Pad Width:	21.5	ft
Neglected Depth:	3.5	ft
Thickness:	3.0	ft
Pier Diameter:	7.0	ft
Pier Height Above Grade:	1.0	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	8	
Pier Rebar Quanity:	30	
Pad Rebar Size:	8	
Pad Rebar Quanity:	22	
Pier Tie Size:	4	
Tie Quanity:	10	
Rebar Yield Strength:	60000	psi
Concrete Strength:	4000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

Allowable Values

Soil Unit Weight:	0.120	kcf
Ult. Bearing Capacity:	60.000	ksf
Angle of Friction:	40.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.500	

Summary of Results

Req'd Pier Diam.	OK
Overturning	43.7%
Shear Capacity	14.8%
Bearing	5.1%
Pad Shear - 1-way	32.0%
Pad Shear - 2-way	4.0%
Pad Moment Capacity	25.7%
Pier Moment Capacity	55.4%

** Notes:

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

T-Mobile Existing Facility

Site ID: CTNH510A

AT&T Guilford Monopole
201 Granite Road
Guilford, CT 06437

March 2, 2015

EBI Project Number: 6215001237

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	94.75 %

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

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March 2, 2015

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CTNH510A – AT&T Guilford Monopole**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **201 Granite Road, Guilford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **201 Granite Road, Guilford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

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

7) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **86 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	86	Height (AGL):	86	Height (AGL):	86
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	2.62	Antenna B1 MPE%	2.62	Antenna C1 MPE%	2.62
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	86	Height (AGL):	86	Height (AGL):	86
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	2.62	Antenna B2 MPE%	2.62	Antenna C2 MPE%	2.62
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	86	Height (AGL):	86	Height (AGL):	86
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power:	30	Total TX Power:	30	Total TX Power:	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	1.04	Antenna B3 MPE%	1.04	Antenna C3 MPE%	1.04

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**18.86**
AT&T	34.17 %
Verizon Wireless	41.72 %
Site Total MPE %:	**94.75 %**

T-Mobile Sector 1 Total:	6.29 %
T-Mobile Sector 2 Total:	6.29 %
T-Mobile Sector 3 Total:	6.29 %
Site Total:	94.75 %

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Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	6.29 %
Sector 2:	6.29 %
Sector 3 :	6.29 %
T-Mobile Total:	18.86 %
Site Total:	94.75 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **94.75%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

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