Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

January 19, 2016

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

RE: **Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 873128**
T-Mobile Site ID: CT11203B
800 Booth Hill Road, Trumbull, CT 06611
Latitude: 41° 16' 44.26" / Longitude: -73° 11' 6.4"

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 247 foot level of the existing 460 foot guyed tower at 800 Booth Hill Road in Trumbull, CT. The tower is owned by Crown Castle and the property is owned by the Estate of F. Francis D'Addario. T-Mobile now intends to replace six (6) existing antennas with new 700MHz antennas. Consolidating all existing coax on position 1 and adding six (6) new coax. Replacing six (6) TMAs with three (3) new TMAs and adding three (3) BiasT's. These antennas would be installed at the 247 foot level of the tower.

Please be advised I have included an email from Gail Andreyka with the zoning department at the Town of Trumbull indicating they no longer have the original zoning approval on file as well as an email from myself indicating the same. Please use both emails to replace the zoning approval requirement.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Timothy M. Herbst, First Selectman for the Town of Trumbull and the Estate of F. Francis D'Addario as the property owner.

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

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

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

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

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

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Kimberly Myl.

Sincerely,

Kimberly Myl
Real Estate Specialist
Crown Castle
1200 MacArthur Boulevard, Suite 200
Mahwah, New Jersey 07430
201-236-9069
kimberly.myl@crowncastle.com

Attachments:

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: The Honorable Timothy M. Herbst, First Selectman for the Town of Trumbull
Town Hall – 2nd Floor
5866 Main Street
Trumbull, CT 06611

Estate of F. Francis D'Addario
c/o D'Addario Industries
Attn: David D'Addario
PO Box 756
Bridgeport, CT 06601

From:	Holzschuh, Cymon
To:	Myl, Kimberly; CSC-DL Siting Council
Cc:	Helton, Heather (Contractor)
Subject:	RE: Existing Telecommunication Facility 800 Booth Hill Road, Trumbull (Crown: 873128 | T-Mobile: CT11203B)
Date:	Tuesday, January 19, 2016 2:40:02 PM

Thank you for your submission.

Although Docket 77 is the first filing the Council has on record for this facility, it appears that this facility was not certificated by the Council.

Docket 77 was filed by Metro Mobile CTS (now Verizon) to install antennas on the existing tower. T-Mobile is not bound to the conditions of approval for Docket 77.

I will note for our records that according to the Trumbull Zoning Officer, records of this facility's approval have not been retained.

Thanks,

Cymon Holzschuh
Siting Analyst
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051
P: 860.827.2941 | F: 860.827.2950

http://www.ct.gov/csc/

From: Myl, Kimberly [mailto:Kimberly.Myl@crowncastle.com]
Sent: Tuesday, January 19, 2016 11:43 AM
To: CSC-DL Siting Council
Cc: Helton, Heather (Contractor)
Subject: Existing Telecommunication Facility 800 Booth Hill Road, Trumbull (Crown: 873128 | T-Mobile: CT11203B)

To Whom It May Concern:

Please be advised both the township (email below) and Crown Castle as the tower owner, do not have the original zoning resolution on file. Please use this email as notification to waive this requirement as we will include this and the email from the township within our submission.

Please let me know if you have any questions or need additional information. Thank you in advance.

KIMBERLY MYL
Real Estate Specialist
T: (201) 236-9069 | M: (201) 993-3697

CROWN CASTLE
1200 MacArthur Blvd, Suite 200
Mahwah, NJ 07430

From: Gail Andreyka [mailto:gandreyka@trumbull-ct.gov]
Sent: Tuesday, January 19, 2016 9:59 AM
To: Myl, Kimberly
Subject: RE: INFO NEEDED

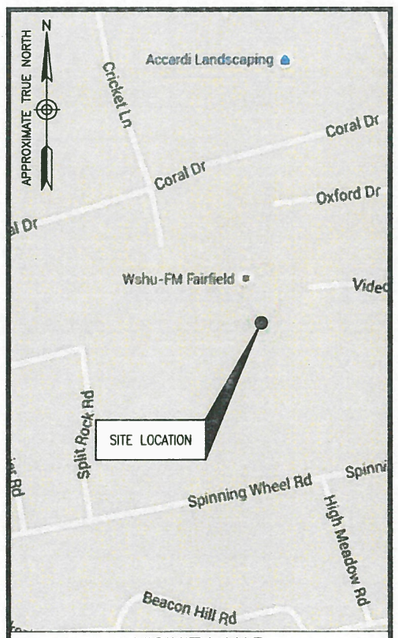
Hi Kimberly,

Doug Wenz, our Zoning Officer said that this application predates our records. Only copies of building permits would be available. The Building Department phone number is 203-452-5020.

Gail

T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11203B
CROWN CASTLE BU #: 873128
SITE NAME: TRUMBULL
0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY



VICINITY MAP

FROM BLOOMFIELD, CT:

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN RIGHT ONTO DAY HILL RD. USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD. MERGE ONTO I-91 S. TAKE EXIT 32A-32B FOR I-84 W TOWARD WATERBURY. MERGE ONTO I-84. KEEP LEFT TO STAY ON I-84. USE THE LEFT LANE TO TAKE EXIT 19 FOR CONNECTICUT 8 S TOWARD NAUGATUCK/BRIDGEPORT. MERGE ONTO CT-8 S. TAKE EXIT 11 FOR BRIDGEPORT AVENUE. TURN LEFT ONTO BRIDGEPORT AVE (SIGNS FOR STRATFORD/TRUMBULL). CONTINUE ONTO SHELTON RD. TURN RIGHT ONTO GOLDEN HILL. CONTINUE ONTO PRIMROSE DR. TURN RIGHT ONTO HUNTINGTON TURNPIKE. TURN LEFT ONTO MACDONALD RD. TURN RIGHT ONTO BOOTH HILL RD. TURN LEFT ONTO VIDEO LN. SITE WILL BE STRAIGHT AHEAD.

CONSULTANT TEAM

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

CONTACT: BRYAN HUFF
PHONE #: (973) 576-0147

CONSTRUCTION
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CONTACT: PATRICIA PELON
PHONE #: (518) 373-3507

PROJECT SUMMARY

SITE NAME:
TRUMBULL

SITE NUMBER:
CT11203B

TOWER OWNER:
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

APPLICANT/DEVELOPER:
T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

COORDINATES:
LATITUDE: 41°-16'-44.26" N (NAD83)
LONGITUDE: 73°-11'-6.4" W (NAD83)
(PER CROWN CASTLE)

CONFIGURATION
704Bu

PROJECT DIRECTORY

SITE ADDRESS:
0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY

SCOPE OF WORK

- REMOVE AND REPLACE (6) EXISTING ANTENNAS WITH (6) NEW ANTENNAS.
- INSTALL (6) NEW TMA'S.
- INSTALL (3) NEW BIAS TEE'S.
- INSTALL (3) NEW RRU'S ON A UNISTRUT RACK AT GRADE.
- INSTALL (6) NEW LINES OF COAX
- REMOVE EXISTING ANTENNAS AND MOUNTS AT CENTERLINE ELEVATIONS OF 269'-0"±, 264'-0"±, 251'-0"± AND 214'-0"± A.G.L.

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.

SHEET INDEX

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

T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11203B
TRUMBULL

CONSTRUCTION DRAWINGS

1	12/02/15	ISSUED AS FINAL
0	11/24/15	ISSUED AS FINAL

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
LICENSED
PROFESSIONAL ENGINEER

JIANG YU
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078103
SITE ADDRESS:	

0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD 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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BLOOMFIELD, CT 06002

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11203B
TRUMBULL

CONSTRUCTION DRAWINGS		
1	12/02/15	ISSUED AS FINAL
0	11/24/15	ISSUED AS FINAL

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600 PARSIPPANY ROAD
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PARSIPPANY, NJ 07054
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CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078103

SITE ADDRESS:

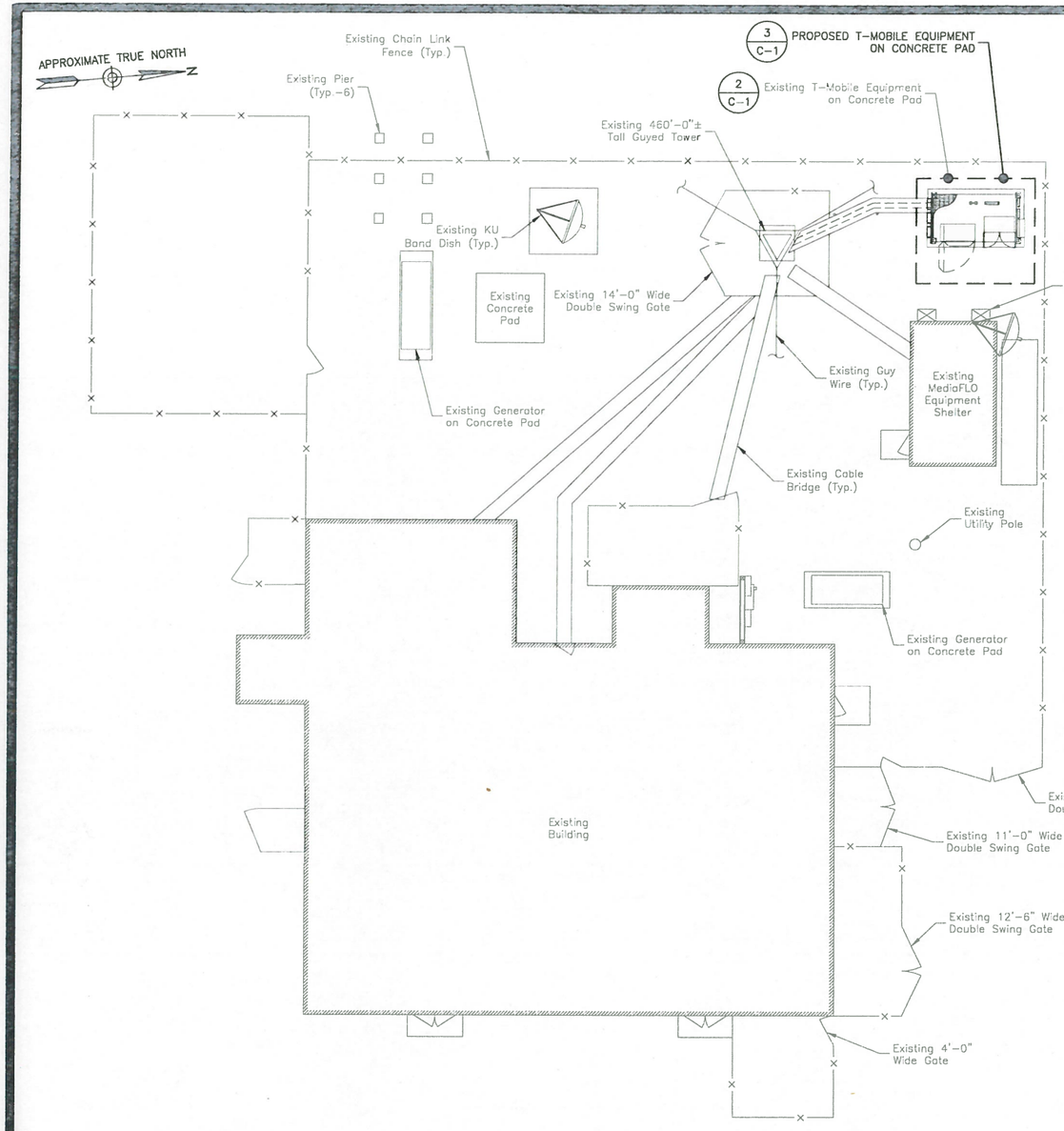
0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G–1

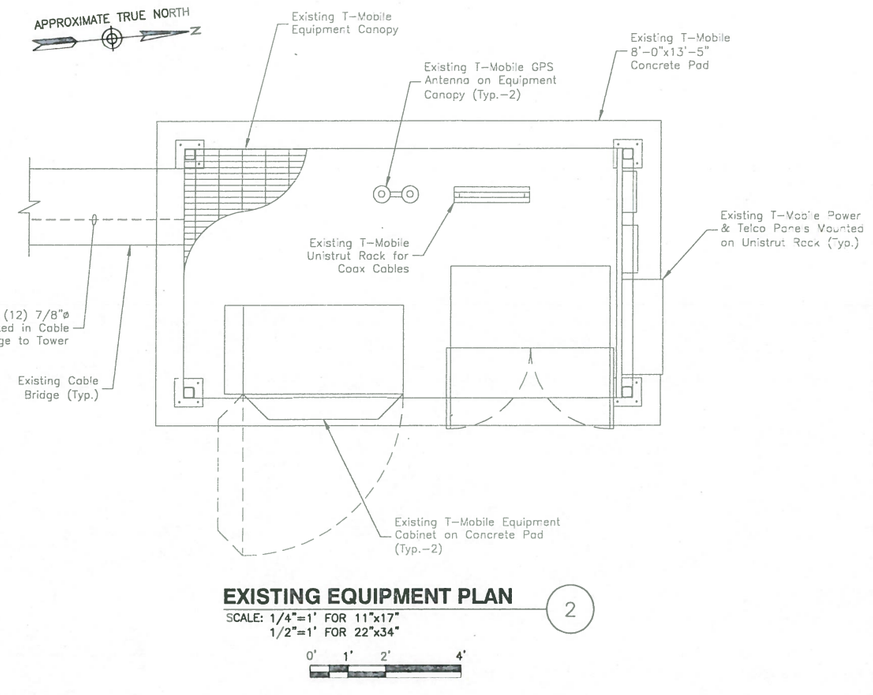


COMPOUND PLAN

1

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

0' 10' 20'

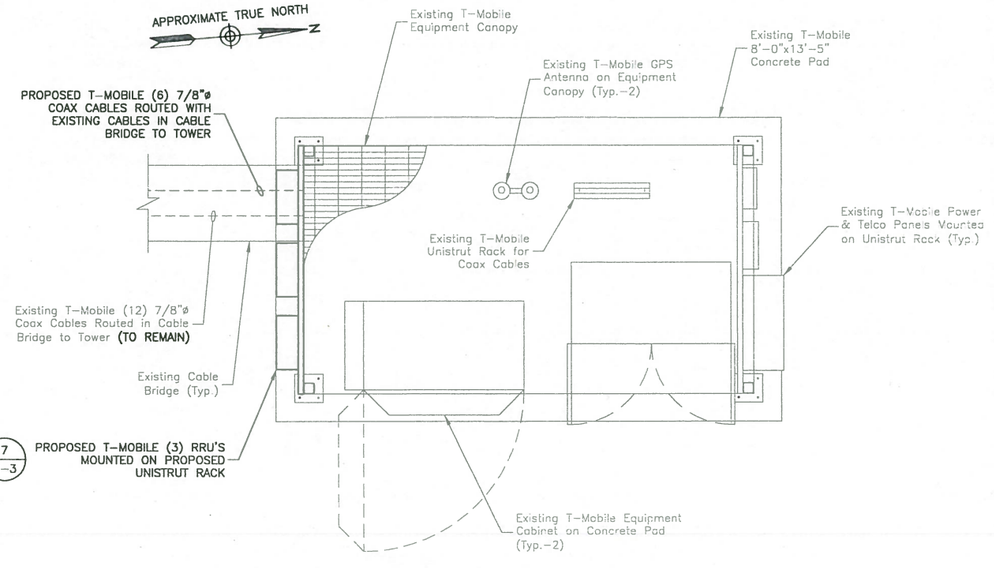


EXISTING EQUIPMENT PLAN

2

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'



PROPOSED EQUIPMENT PLAN

3

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'

NOTES:

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY TOWER ENGINEERING PROFESSIONALS DATED OCTOBER 26, 2015.

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TRUMBULL

CONSTRUCTION DRAWINGS

1	12/02/15	ISSUED AS FINAL
0	11/24/15	ISSUED AS FINAL

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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078103
SITE ADDRESS:	

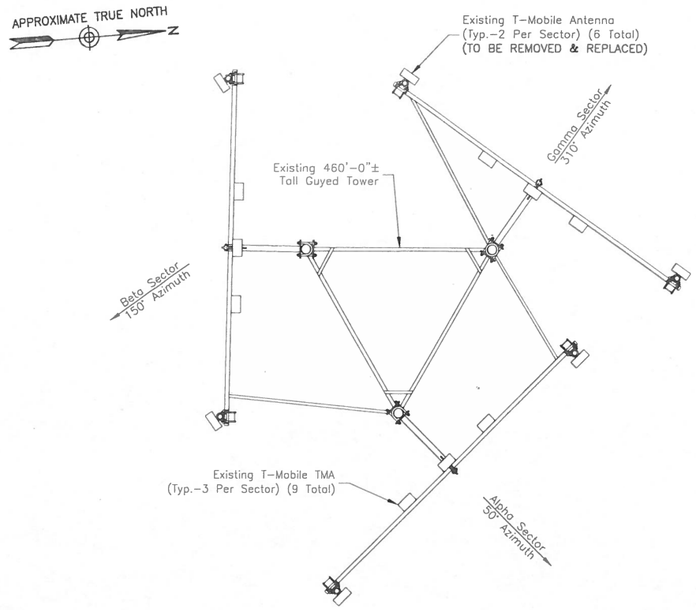
0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY

SHEET TITLE

COMPOUND PLAN & EQUIPMENT PLANS

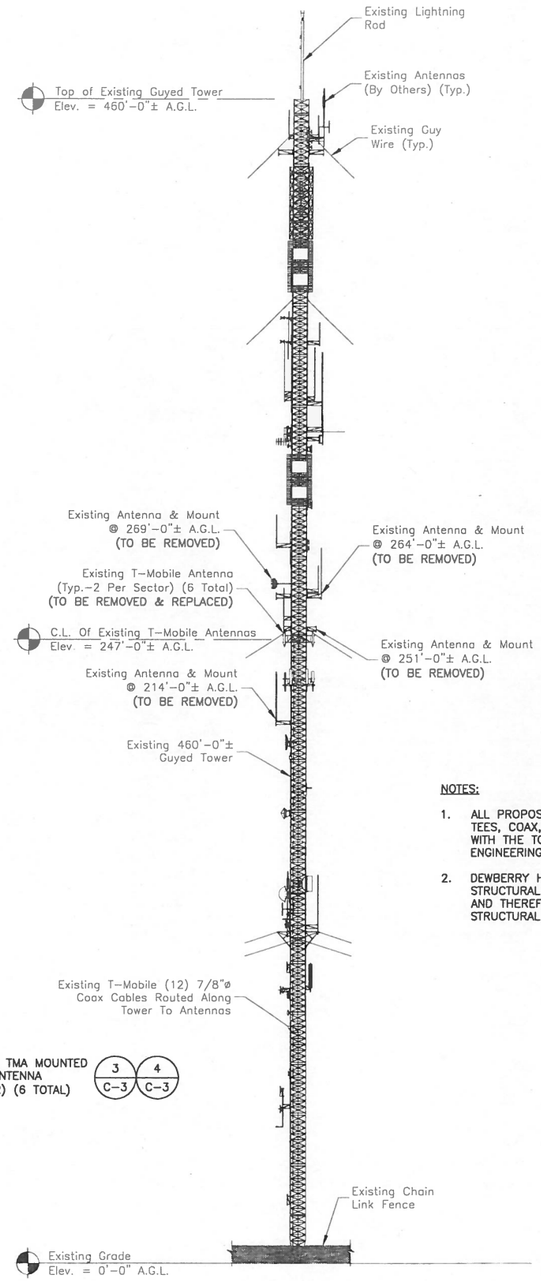
SHEET NUMBER

C-1



EXISTING ANTENNA LAYOUT 1

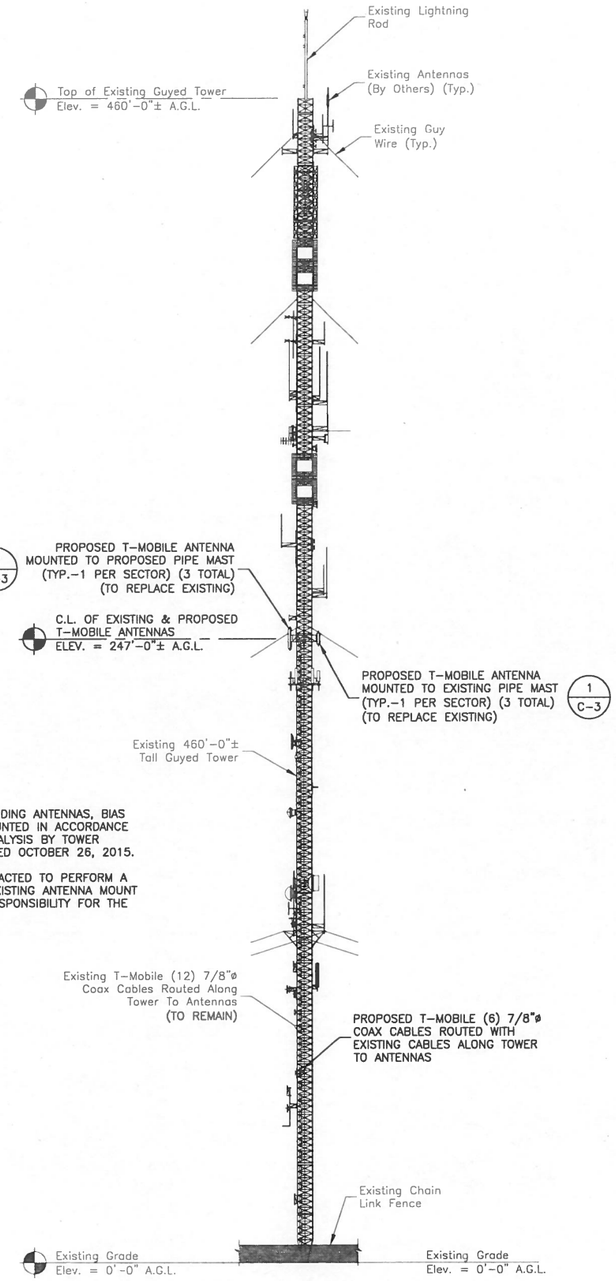
SCALE: N.T.S.



EXISTING ELEVATION 3

SCALE: 1"=60' FOR 11"x17"
1"=30' FOR 22"x34"

0' 30' 60'



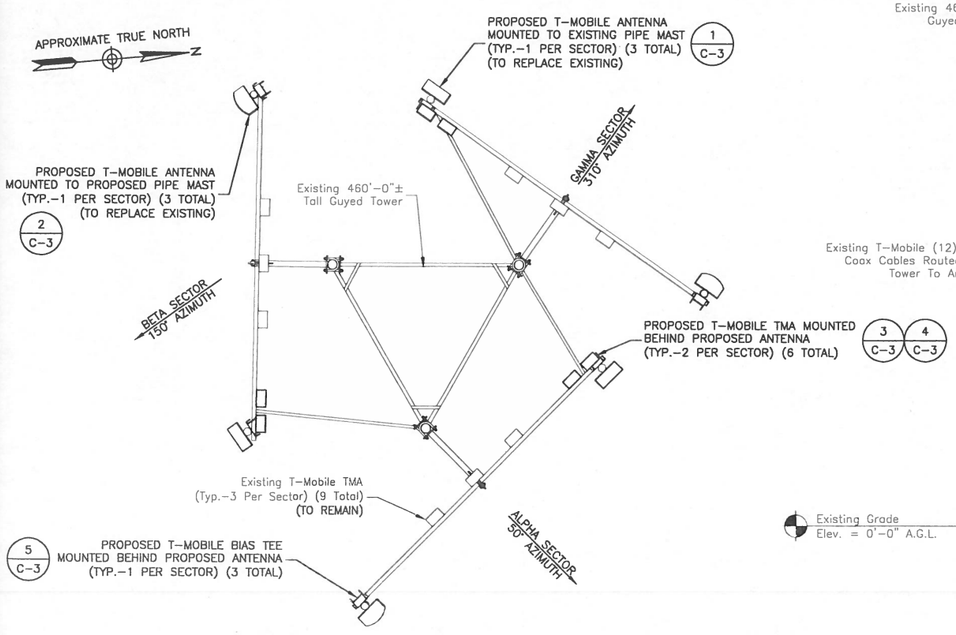
EXISTING ELEVATION 4

SCALE: 1"=60' FOR 11"x17"
1"=30' FOR 22"x34"

0' 30' 60'

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, BIAS TEES, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY TOWER ENGINEERING PROFESSIONALS DATED OCTOBER 26, 2015.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.



PROPOSED ANTENNA LAYOUT 2

SCALE: N.T.S.

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CONSTRUCTION DRAWINGS

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0	11/24/15	ISSUED AS FINAL

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STATE OF CONNECTICUT
JIANG YU
No. 0023222
LICENSED
PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
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SITE ADDRESS:	

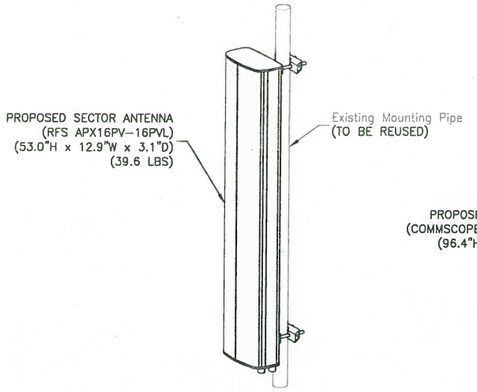
0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY

SHEET TITLE

ANTENNA LAYOUTS & ELEVATIONS

SHEET NUMBER

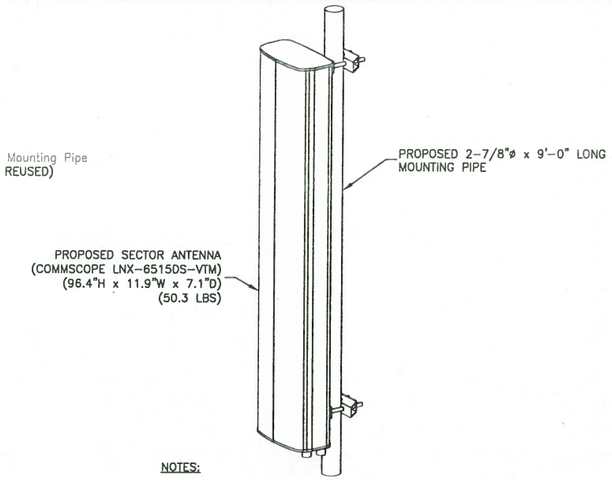
C-2



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.

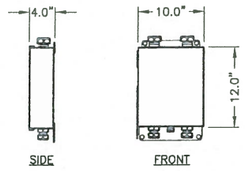
ISOMETRIC ANTENNA DETAIL 1
SCALE: N.T.S.



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 2
SCALE: N.T.S.

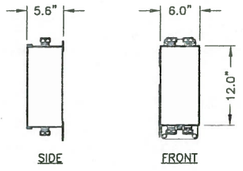


RFS ATMAA1412D-1A20

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.

DUAL-PORT TMA DETAIL 3
SCALE: N.T.S.

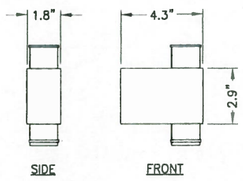


KRY 112 489/2

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.

DUAL-PORT TMA DETAIL 4
SCALE: N.T.S.

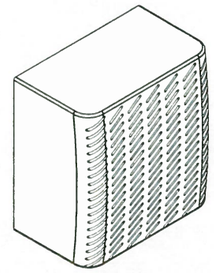


ANDREW ATBT-BOTTOM-24V

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.

BIAS TEE DETAIL 5
SCALE: N.T.S.



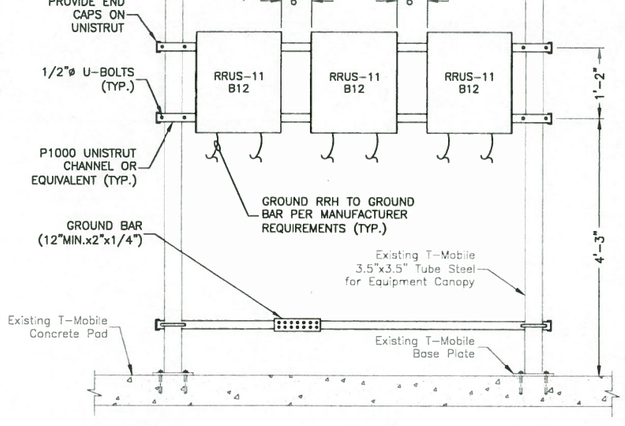
SPECIFICATIONS:
HEIGHT: 20.0"
WIDTH: 17.0"
DEPTH: 7.0"
WEIGHT: 50.7 LBS

ERICSSON RRUS-11 B12

RRU NOTES:

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

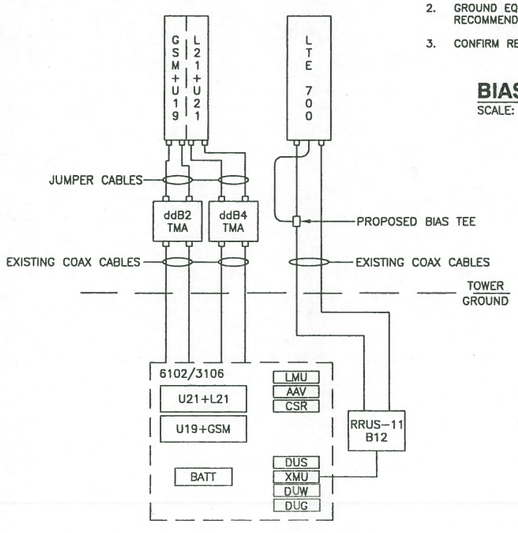
RRUS-11 - REMOTE RADIO UNIT 6
SCALE: N.T.S.



NOTES:

1. CONTRACTOR SHALL SUPPLY AND INSTALL UNISTRUT (OR EQUIVALENT) MOUNTING CHANNELS.
2. CONTRACTOR SHALL SUPPLY (BUT NOT INSTALL) 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER RRU. CONTRACTOR SHALL BAG THE BOLTING HARDWARE AND HANG FROM INSTALLED UNISTRUT FRAME.
3. SPACING MAY VARY BASED ON SELECTED EQUIPMENT. ADJUSTMENTS TO SPACING WILL BE MADE BY RRU INSTALLER.
4. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

RRU RACK DETAIL 7
SCALE: N.T.S



SITE CONFIGURATION 704Bu 8
SCALE: N.T.S.

DESIGN CONFIGURATION

	ANTENNAS		COAX		COAX LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED	
ALPHA	EMS RR90-17-02DP	RFS APX16PV-16PVL	(4) 7/8"ø	(2) 7/8"ø	297'-0"
	RFS APXV18-206516S-C-A20	COMMSCOPE LNX-6515DS-VTM			
BETA	EMS RR90-17-02DP	RFS APX16PV-16PVL	(4) 7/8"ø	(2) 7/8"ø	297'-0"
	RFS APXV18-206516S-C-A20	COMMSCOPE LNX-6515DS-VTM			
GAMMA	EMS RR90-17-02DP	RFS APX16PV-16PVL	(4) 7/8"ø	(2) 7/8"ø	297'-0"
	RFS APXV18-206516S-C-A20	COMMSCOPE LNX-6515DS-VTM			

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CONSTRUCTION DRAWINGS

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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	RA
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JOB NUMBER:	50078103
SITE ADDRESS:	

0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY

SHEET TITLE

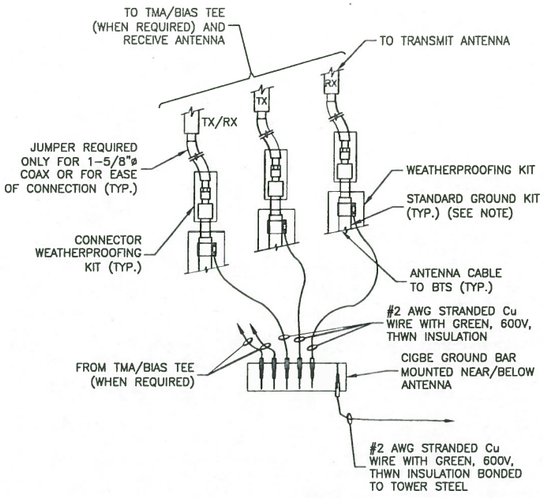
CONSTRUCTION DETAILS

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.

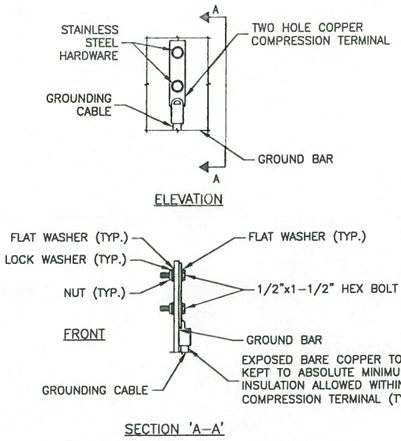


NOTE:

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.

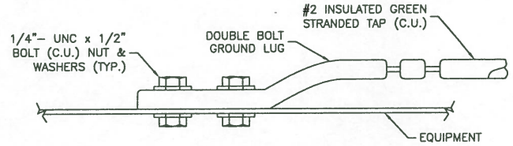


NOTES:

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

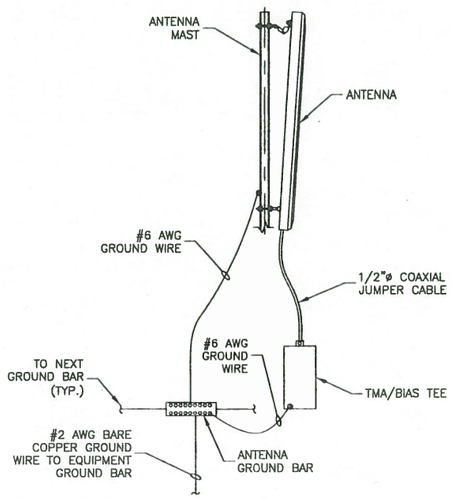
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 2

SCALE: N.T.S.



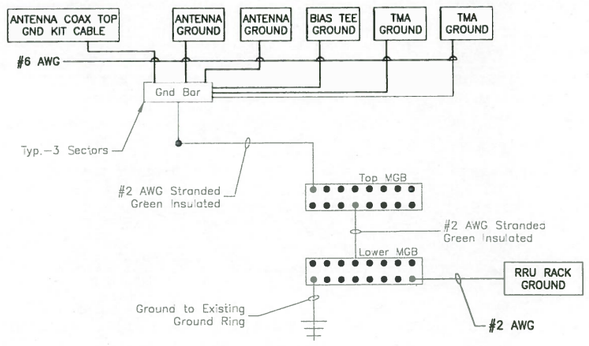
CONNECTION TO EQUIPMENT DETAIL 3

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL 4

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 5

SCALE: N.T.S.

T-Mobile

T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11203B
TRUMBULL

CONSTRUCTION DRAWINGS		
1	12/02/15	ISSUED AS FINAL
0	11/24/15	ISSUED AS FINAL

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

STATE OF CONNECTICUT
JIANG YU
LICENSED PROFESSIONAL ENGINEER

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

DRAWN BY:	RA
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50066258
JOB NUMBER:	50078103
SITE ADDRESS:	

0 BOOTH HILL ROAD
SHELTON, CT 06611
FAIRFIELD COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Date: **December 11, 2015**

Sean Dempsey
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6565

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11203B
	Carrier Site Name:	CT11203B_Shelton_VideoLn
Crown Castle Designation:	**Crown Castle BU Number:**	873128
	Crown Castle Site Name:	Trumbull
	Crown Castle JDE Job Number:	340887
	Crown Castle Work Order Number:	1162026
	Crown Castle Application Number:	303766 Rev. 8
Engineering Firm Designation:	**TEP Project Number:**	25575.40946
Site Data:	**800 Booth Hill Rd., Shelton, Fairfield County, CT 06611** **Latitude *41° 16' 44.26"*, Longitude *-73° 11' 6.40"*** **457 Foot - Guyed Tower**	

Dear Sean Dempsey,

Tower Engineering Professionals 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 852560, in accordance with application 303766, revision 8.

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

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

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, ASCE 7-05 Minimum Design Loads for Buildings and Other Structures and the 2005 Connecticut State Building Code (2003 International Building Code) with 2009 amendment based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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.

Analysis prepared by: Matthew G Young, E.I. / ZRH

Respectfully submitted by:

Graham M. Andres, P.E.

STATE OF CONNECTICUT · GRAHAM M. ANDRES · 29538 · LICENSED PROFESSIONAL ENGINEER

12/11/15

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 457-ft guyed tower designed by Blaw Knox, and mapped by Pinnacle Towers in July of 2003. The original design standard and wind speed are unknown. The tower has been modified multiple times in the past to accommodate additional loading. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch escalating 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
247.0	247.0	3	RFS Celwave	APX16PV-16PVL w/ Mount Pipe	6	7/8	1
		3	Commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	Ericsson	KRY 112 489/2			
		3	Commscope	ATBT-BOTTOM-24V			

Notes:
1) See “Appendix B – Base Level Drawing” for assumed feed line configuration.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
460.0	477.0	1	Dielectric	TFU-20JDAS	1	4-1/16	1
445.0	452.0	1	Antel	BCD-87077	-	-	2
	450.0	1	Antel	BCD-87077			
	445.0	1	Tower Mounts	Side Arm Mount [SO 306-1]			
		1	Tower Mounts	Side Arm Mount [SO 304-1]			
444.0	454.0	1	Sinclair	SRL-235-2	1	7/8	1
	444.0	1	Tower Mounts	Side Arm Mount [SO 308-1]			
441.0	447.0	1	Antel	BCD-87077	-	-	2
	441.0	1	Tower Mounts	Side Arm Mount [SO 308-1]			
419.0	419.0	3	ERI	1183-3CP	1	3	1
388.0	388.0	3	Shively Labs	6014-2	1	1-5/8	1
367.0	367.0	1	ERI	SHP-2AE	1	3	1
364.0	368.0	1	Andrew	DB806E-XT	1	1-5/8	2
	364.0	1	Tower Mounts	Side Arm Mount [SO 601-1]			
344.0	354.0	1	RFS Celwave	455-6	1	1/2	2
	344.0	1	Tower Mounts	Side Arm Mount [SO 601-1]			
342.0	352.0	1	RFS Celwave	455-6	1	1-1/4	2
	347.0	1	RFS Celwave	AO9009-3	-	-	
	342.0	1	Tower Mounts	Side Arm Mount [SO 601-1]			
		1	Tower Mounts	Side Arm Mount [SO 302-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
339.0	349.0	1	RFS Celwave	455-6	1	7/8	2
	339.0	1	Tower Mounts	Side Arm Mount [SO 308-1]			
330.0	335.0	1	Andrew	PG1N0F-0090-310	1	1-1/4	1
	330.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
		-	-	-	1	1-5/8	2
328.0	328.0	1	Dielectric	7P-C1-2-CP-L	1	3-1/2	1
		3	Tower Mounts	Side Arm Mount [SO 701-1]			
326.0	329.0	1	Decibel	DB201-A	1	7/8	1
	326.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
325.0	325.0	1	Laird Tech.	PLC-1296	-	-	2
322.0	327.0	1	Sinclair	SRL-310C-4HD	1	1/2	1
	322.0	1	Radiowaves	SPD3-5.8	1	1-1/4	
		1	Tower Mounts	Side Arm Mount [SO 308-1]			
310.0	312.0	3	Shively Labs	6014-2	1	1-5/8	1
284.0	290.0	1	Austin Antenna Company	APC-301	1	1-1/4	1
	284.0	1	Tower Mounts	Side Arm Mount [SO 308-1]			
		1	Andrew	DB404-B	-	-	2
277.0	283.0	1	RFS Celwave	BMR10-A-B1	1	1-5/8	1
269.0	269.0	1	Sinclair	SRL-227	-	-	3
		1	Tower Mounts	Side Arm Mount [SO 602-1]			
264.0	273.0	1	Telewave	ANT150F6	1	1-5/8	1
	264.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
		1	Tower Mounts	Side Arm Mount [SO 602-1]	-	-	3
255.0	261.0	1	Decibel	DB809KT3E-Y	1	1-1/4	1
	255.0	1	Tower Mounts	Side Arm Mount [SO 203-1]			
251.0	256.0	1	Andrew	PG1N0F-0090-310	-	-	3
	251.0	2	Tower Mounts	Side Arm Mount [SO 203-1]			
247.0	247.0	3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	-	-	4
		3	RFS Celwave	APXV18-206516S-C-A20 w/ Mount Pipe			
		4	Commscope	ATMAP1412D-1A20			
		2	Commscope	ATMAA1412D-1A20			
		3	RFS Celwave	ATMAA1412D-1A20	12	7/8	1
		1	Tower Mounts	Sector Mount [SM 301-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
230.0	232.0	1	RFS Celwave	DB-T1-6Z-8AB-0Z	-	-	5
		3	Alcatel Lucent	RRH2x60-700			
		3	Commscope	HBXX-6516DS-VTM w/ Mount Pipe	2 18	1-5/8 7/8	1
		3	Andrew	SBNHH-1D65B w/ Mount Pipe			
		2	Andrew	LNX-8513DS-VTM w/ Mount Pipe			
		1	Andrew	LNX-6514DS-VTM w/ Mount Pipe			
		3	Alcatel Lucent	RRH2X60-PCS			
		3	Alcatel Lucent	RRH2X60-AWS			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
	230.0	1	Tower Mounts	Sector Mount [SM 407-3]			
214.0	224.0	1	RFS Celwave	220-1N	-	-	4
	214.0	1	Tower Mounts	Side Arm Mount [SO 307-1]			
206.0	206.0	1	Mark	P-9A72GN-U	1	7/8	1
200.0	200.0	1	Gabriel Elec.	DFPD1-52 w/ Mount Pipe	1	1/4	1
188.0	188.0	1	PCTEL	BMYD745K	-	-	2
186.0	186.0	1	Decibel	ASP-960	-	-	2
178.0	178.0	1	Radiowaves	SPD4-5.2	1	1/2	1
150.0	150.0	1	Andrew	HPX6-65-P3A	2	EW63	1
146.0	146.0	1	Andrew	PL6-65-PXA	1	EW63	1
		1	Tower Mounts	Pipe Mount [PM 601-1]			
136.0	138.0	1	RFS Celwave	MGA2-16N	3	3/8	1
	136.0	1	CSI-Cellular Specialties	CSI-AY/809-960/11			
		1	Tower Mounts	2.4”Ø x 8’ Mount Pipe			
	134.0	1	RFS Celwave	MGAR3-23N			
133.0	145.0	1	Sinclair	SRL-235-2	1 1	7/8 1/2	1
	143.0	1	RFS Celwave	220-5			
	133.0	1	Tower Mounts	Side Arm Mount [SO 602-1]			
117.0	117.0	1	Mark	P-9A48GN-U	1	7/8	1
109.0	113.0	1	RFS Celwave	PD1132-D	1	7/8	1
108.0	108.0	1	Mark	SSH-9A72GN	1	1/4	1
		1	Tower Mounts	Side Arm Mount [SO 303-1]			
106.0	106.0	1	Kathrein	PR-950	2	3/8	1
		1	Tower Mounts	Pipe Mount [PM 601-1]			
99.0	99.0	1	Ligowave	PTP 900-13	1 1	7/8 1/4	1
		1	Radiowaves	SPD2-5.8			
		1	Tower Mounts	Pipe Mount [PM 601-1]			
75.0	75.0	-	-	-	1	1-5/8	2

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
62.0	68.0	1	Mark	P-9A48GN-U	1	7/8	1
	62.0	2	Tower Mounts	Side Arm Mount [SO 601-1]			
		-	-	-	2	1/4	2
	61.0	1	Mark	SSH-9A72GN	2	7/8	1
	54.0	1	CSI-Cellular Specialties	CSI-AY/809-960/11			

Notes:
1) Existing equipment
2) Abandoned equipment; considered in this analysis
3) Abandoned equipment to be removed; not considered in this analysis
4) Existing equipment to be removed; not considered in this analysis
5) Reserved equipment

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)
Unknown						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	FDH Engineering	1418454	CCISites
Tower Foundation Mapping	Tower Engineering Professionals	1520339	CCISites
Tower Mapping	Pinnacle Towers Inc.	1327906	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	2407618	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	2633757	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	2755396	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	3006419	CCISites
Tower Reinforcement Design	Tower Engineering Professionals	5592838	CCISites
Post-Modification Inspection	Pinnacle Towers Inc.	1956007	CCISites
Post-Modification Inspection	Tower Engineering Professionals	2438393	CCISites
Post-Modification Inspection	Tower Engineering Professionals	3417531	CCISites
Post-Modification Inspection	Tower Engineering Professionals	3442609	CCISites
Post-Modification Inspection	Sinnott Gering and Schmitt Tower, Inc.	5760315	CCISites
Appurtenance Mapping	Tower Engineering Professionals	1327906	CCISites

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) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
7) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
8) Per photos from CCI Sites, the termination and stitch welds of the reinforcing sleeves to the tower legs at 361-ft to 401-ft were assumed to be 3/16" fillet welds by 3" long. The end gaps between the sleeves and the flange were assumed to be 12".
9) The following material grades were assumed:
   a) Leg grade: A7-33
   b) Original Bracing Grade: A7-33
   c) Original Connection bolts: A307
   d) 2L3-1/2x3-1/2x3/8 pull-off: A36
10) TEP could not analyze the base casting. The base casting thickness was not provided. TEP recommends a base casting thickness be obtained prior to modification. TEP assumes the base casting is sufficient for the purposes of this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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 (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	457 - 436	Leg	3	2	-24829	132219	18.8	Pass
T2	436 - 421	Leg	2 3/4	44	-35526	108536	32.7	Pass
T3	421 - 401	Leg	2 3/4	74	-83883	108536	77.3	Pass
T4	401 - 381	Leg	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	Note 1	Note 1	Note 1	83.4 59.3 (b)	Pass
T8	381 - 376	Leg	3.5" S.R. w/ 3.5 SCH40 Half Pipe	Note 1	Note 1	Note 1	68.8	Pass
T12	361 - 341	Leg	3	191	-107292	164104	65.4	Pass
T13	341 - 321	Leg	3	236	-77670	135863	57.2	Pass
T14	321 - 301	Leg	3	269	-53226	101923	52.2	Pass
T15	301 - 281	Leg	3	303	-86766	135863	63.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T16	281 - 261	Leg	3	336	-120546	135863	88.7	Pass
T17	261 - 241	Leg	3	369	-142318	164448	86.5	Pass
T18	241 - 221	Leg	3	414	-112109	135863	82.5	Pass
T19	221 - 201	Leg	3 1/4	448	-83875	124390	67.4	Pass
T20	201 - 181	Leg	3 1/4	481	-87455	124390	70.3	Pass
T21	181 - 161	Leg	3 1/4	514	-91102	124390	73.2	Pass
T22	161 - 141	Leg	3 1/2	547	-94747	148821	63.7	Pass
T23	141 - 121	Leg	3 1/2	580	-98902	148821	66.5	Pass
T24	121 - 101	Leg	3 1/2	613	-110248	148821	74.1	Pass
T25	101 - 81	Leg	3 1/2	646	-158080	198378	79.7	Pass
T26	81 - 61	Leg	3 1/2	679	-161046	198378	81.2	Pass
T27	61 - 41	Leg	3 1/2	712	-159062	198378	80.2	Pass
T28	41 - 20	Leg	3 1/2	745	-122817	145878	84.2	Pass
T29	20 - 6.70833	Leg	3 1/4	773	-128533	130073	98.8	Pass
T30	6.70833 - 0	Leg	3 1/4	797	-132787	137843	96.3	Pass
T1	457 - 436	Diagonal	L2 1/2x2x1/4	40	-1970	16403	12.0 48.4 (b)	Pass
T2	436 - 421	Diagonal	L2 1/2x2x3/16	53	-2451	12778	19.2	Pass
T3	421 - 401	Diagonal	L2 1/2x2x3/16	86	-6951	12778	54.4 63.2 (b)	Pass
T4	401 - 396	Diagonal	L2 1/2x2x3/16	113	-7463	12778	58.4 67.9 (b)	Pass
T5	396 - 391	Diagonal	L2 1/2x2x3/16	122	-7509	12778	58.8 68.3 (b)	Pass
T6	391 - 386	Diagonal	L2 1/2x2x3/16	134	-9026	12778	70.6	Pass
T7	386 - 381	Diagonal	L2 1/2x2x3/16	146	-8376	12778	65.5 70.5 (b)	Pass
T8	381 - 376	Diagonal	L2 1/2x2x3/16	152	-6549	12778	51.2 71.1 (b)	Pass
T9	376 - 371	Diagonal	L2 1/2x2x3/16	162	-8153	12778	63.8 74.2 (b)	Pass
T10	371 - 366	Diagonal	L2 1/2x2x3/16	176	-6759	12778	52.9 61.5 (b)	Pass
T11	366 - 361	Diagonal	L2 1/2x2x3/16	188	-6996	12778	54.7 63.6 (b)	Pass
T12	361 - 341	Diagonal	L2 1/2x2x3/16	230	-6476	12716	50.9 58.9 (b)	Pass
T13	341 - 321	Diagonal	L2 1/2x2x3/16	266	-4183	12778	32.7 38.1 (b)	Pass
T14	321 - 301	Diagonal	L2 1/2x2x3/16	279	-2516	12778	19.7 48.1 (b)	Pass
T15	301 - 281	Diagonal	L2 1/2x2x3/16	312	-3764	12778	29.5 71.9 (b)	Pass
T16	281 - 261	Diagonal	L2 1/2x2x3/16	345	-4849	12778	37.9 44.1 (b)	Pass
T17	261 - 241	Diagonal	L3x3x1/4	389	-8743	30315	28.8 80.8 (b)	Pass
T18	241 - 221	Diagonal	L3x3x1/4	443	-7190	28608	25.1 65.4 (b)	Pass
T19	221 - 201	Diagonal	L2 1/2x2x3/16	476	-3978	12778	31.1 76.0 (b)	Pass
T20	201 - 181	Diagonal	L2 1/2x2x3/16	509	-2609	12778	20.4 49.9 (b)	Pass
T21	181 - 161	Diagonal	L2 1/2x2x3/16	525	-1273	12778	10.0 24.3 (b)	Pass
T22	161 - 141	Diagonal	L3x3x1/4	554	-3296	28661	11.5 19.2 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T23	141 - 121	Diagonal	L3x3x1/4	605	-4122	28661	14.4 24.0 (b)	Pass
T24	121 - 101	Diagonal	L2 1/2x2x3/16	632	-4302	12778	33.7 39.1 (b)	Pass
T25	101 - 81	Diagonal	L2 1/2x2x3/16	675	-2350	12778	18.4 44.9 (b)	Pass
T26	81 - 61	Diagonal	L2 1/2x2x3/16	689	-1031	12778	8.1 19.7 (b)	Pass
T27	61 - 41	Diagonal	L2 1/2x2x3/16	719	-2256	12778	17.7 43.1 (b)	Pass
T28	41 - 20	Diagonal	L2 1/2x2x3/16	755	-3615	12584	28.7 69.1 (b)	Pass
T29	20 - 6.70833	Diagonal	L2x2x3/16	779	3285	17930	18.3 62.8 (b)	Pass
T30	6.70833 - 0	Diagonal	L2x2x3/16	811	4157	13451	30.9 79.4 (b)	Pass
T1	457 - 436	Horizontal	L2 1/2x2x1/4	36	-973	8147	11.9 18.6 (b)	Pass
T2	436 - 421	Horizontal	L2 1/2x2x1/4	56	1236	27106	4.6 23.6 (b)	Pass
T12	361 - 341	Secondary Horizontal	L2x2x1/4	206	-1858	18022	10.3 23.7 (b)	Pass
T17	261 - 241	Secondary Horizontal	2L3 1/2x3 1/2x3/8x3/8	383	-2472	131047	1.9	Pass
T1	457 - 436	Top Girt	C8x13.75	6	-1	51237	0.2	Pass
T2	436 - 421	Top Girt	L2 1/2x2x1/4	8	784	20334	3.9 15.0 (b)	Pass
T3	421 - 401	Top Girt	L2 1/2x2x1/4	47	571	27106	2.1 10.9 (b)	Pass
T4	401 - 396	Top Girt	L2 1/2x2x1/4	78	-320	10803	3.0 8.8 (b)	Pass
T6	391 - 386	Top Girt	L2 1/2x2x1/4	128	601	27977	2.1	Pass
T10	371 - 366	Top Girt	L2 1/2x2x1/4	170	788	27977	2.8	Pass
T12	361 - 341	Top Girt	L2 1/2x2x1/4	184	-372	9692	3.8 14.6 (b)	Pass
T13	341 - 321	Top Girt	L2 1/2x2x1/4	194	317	27106	1.2 6.1 (b)	Pass
T14	321 - 301	Top Girt	L2 1/2x2x1/4	239	315	27106	1.2 6.0 (b)	Pass
T15	301 - 281	Top Girt	L2 1/2x2x3/16	272	210	15566	1.3 4.0 (b)	Pass
T16	281 - 261	Top Girt	L2 1/2x2x1/4	305	227	20334	1.1 4.3 (b)	Pass
T17	261 - 241	Top Girt	L2 1/2x2x3/16	340	455	15566	2.9 8.7 (b)	Pass
T18	241 - 221	Top Girt	L2 1/2x2x3/16	371	562	15566	3.6 10.7 (b)	Pass
T19	221 - 201	Top Girt	L2 1/2x2x3/16	417	374	15566	2.4 7.1 (b)	Pass
T20	201 - 181	Top Girt	L2 1/2x2x3/16	451	351	15566	2.3 6.7 (b)	Pass
T21	181 - 161	Top Girt	2L3x2x1/4x3/8	483	586	62010	0.9 5.6 (b)	Pass
T22	161 - 141	Top Girt	L2 1/2x2x3/16	516	560	20749	2.7 10.7 (b)	Pass
T23	141 - 121	Top Girt	L2 1/2x2x3/16	550	1144	20749	5.5 21.9 (b)	Pass
T24	121 - 101	Top Girt	L2 1/2x2x3/16	582	-4113	8454	48.6 78.6 (b)	Pass
T25	101 - 81	Top Girt	L2 1/2x2x3/16	615	502	15566	3.2 9.6 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T26	81 - 61	Top Girt	L2 1/2x2x3/16	648	741	20749	3.6 14.2 (b)	Pass
T27	61 - 41	Top Girt	L2 1/2x2x3/16	682	797	20749	3.8 15.2 (b)	Pass
T28	41 - 20	Top Girt	L2 1/2x2x3/16	714	555	15566	3.6 10.6 (b)	Pass
T29	20 - 6.70833	Top Girt	2L2 1/2x2x3/16x1/4	777	9880	31113	31.8 44.9 (b)	Pass
T1	457 - 436	Mid Girt	L2 1/2x2x1/4	13	3212	27106	11.9 61.4 (b)	Pass
T3	421 - 401	Mid Girt	L2 1/2x2x1/4	81	-466	10803	4.3 11.3 (b)	Pass
T12	361 - 341	Mid Girt	L2 1/2x2x1/4	197	279	27106	1.0 5.3 (b)	Pass
T13	341 - 321	Mid Girt	L2 1/2x2x1/4	242	277	27106	1.0 5.3 (b)	Pass
T14	321 - 301	Mid Girt	L2 1/2x2x1/4	277	501	27106	1.9 9.6 (b)	Pass
T15	301 - 281	Mid Girt	L2 1/2x2x3/16	308	210	15566	1.3 4.0 (b)	Pass
T16	281 - 261	Mid Girt	L2 1/2x2x1/4	343	351	27106	1.3 6.7 (b)	Pass
T18	241 - 221	Mid Girt	L2 1/2x2x3/16	420	834	20749	4.0 15.9 (b)	Pass
T19	221 - 201	Mid Girt	L2 1/2x2x3/16	453	346	15566	2.2 6.6 (b)	Pass
T20	201 - 181	Mid Girt	L2 1/2x2x3/16	486	451	20749	2.2 8.6 (b)	Pass
T21	181 - 161	Mid Girt	L2 1/2x2x3/16	519	478	20749	2.3 9.1 (b)	Pass
T22	161 - 141	Mid Girt	L2 1/2x2x3/16	553	492	15566	3.2 9.4 (b)	Pass
T23	141 - 121	Mid Girt	L2 1/2x2x3/16	585	-5222	8454	61.8 68.4 (b)	Pass
T24	121 - 101	Mid Girt	L2 1/2x2x3/16	619	483	15566	3.1 9.2 (b)	Pass
T25	101 - 81	Mid Girt	L2 1/2x2x3/16	651	713	20749	3.4 13.6 (b)	Pass
T26	81 - 61	Mid Girt	L2 1/2x2x3/16	684	750	20749	3.6 14.3 (b)	Pass
T27	61 - 41	Mid Girt	L2 1/2x2x3/16	717	717	20749	3.5 13.7 (b)	Pass
T28	41 - 20	Mid Girt	L2 1/2x2x3/16	747	870	15566	5.6 16.6 (b)	Pass
T1	457 - 436	Guy A@446.5	9/16	838	12865	17500	73.5	Pass
T8	381 - 376	Guy A@381	1 3/8	835	69617	116000	60.0	Pass
T17	261 - 241	Guy A@251	1 1/4	832	49409	96000	51.5	Pass
T23	141 - 121	Guy A@131	11/16	825	15441	25000	61.8	Pass
T1	457 - 436	Guy B@446.5	9/16	837	13027	17500	74.4	Pass
T8	381 - 376	Guy B@381	1 3/8	834	70306	116000	60.6	Pass
T17	261 - 241	Guy B@251	1 1/4	831	50175	96000	52.3	Pass
T23	141 - 121	Guy B@131	11/16	818	15603	25000	62.4	Pass
T1	457 - 436	Guy C@446.5	9/16	836	12522	17500	71.6	Pass
T8	381 - 376	Guy C@381	1 3/8	833	67534	116000	58.2	Pass
T17	261 - 241	Guy C@251	1 1/4	830	49156	96000	51.2	Pass
T23	141 - 121	Guy C@131	11/16	813	15213	25000	60.9	Pass
T8	381 - 376	Top Guy Pull-Off@381	2L3x2x1/4x3/8	142	21857	62816	34.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T17	261 - 241	Top Guy Pull-Off@251	2L3 1/2x3 1/2x3/8x3/8	376	19195	143100	13.4	Pass
T23	141 - 121	Torque Arm Top@131	2L3x3x3/16	820	13577	57538	23.6 57.6 (b)	Pass
T23	141 - 121	Torque Arm Bottom@131	2L3x3x3/16	823	-15273	22404	68.2	Pass
							Summary	
						Leg (T29)	98.8	Pass
						Diagonal (T17)	80.8	Pass
						Horizontal (T2)	23.6	Pass
						Secondary Horizontal (T12)	23.7	Pass
						Top Girt (T24)	78.6	Pass
						Mid Girt (T23)	68.4	Pass
						Guy A (T1)	73.5	Pass
						Guy B (T1)	74.4	Pass
						Guy C (T1)	71.6	Pass
						Top Guy Pull-Off (T8)	34.8	Pass
						Torque Arm Top (T23)	57.6	Pass
						Torque Arm Bottom (T23)	68.2	Pass
						Bolt Checks	80.8	Pass
						RATING =	**98.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Mast Foundation	-	72.8	Pass
1	Guy Anchor Foundation A	-	85.1	Pass
1	Guy Anchor Foundation B	-	85.6	Pass
1	Guy Anchor Foundation C	-	86.4	Pass

Structure Rating (max from all components) =	**98.8%**

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

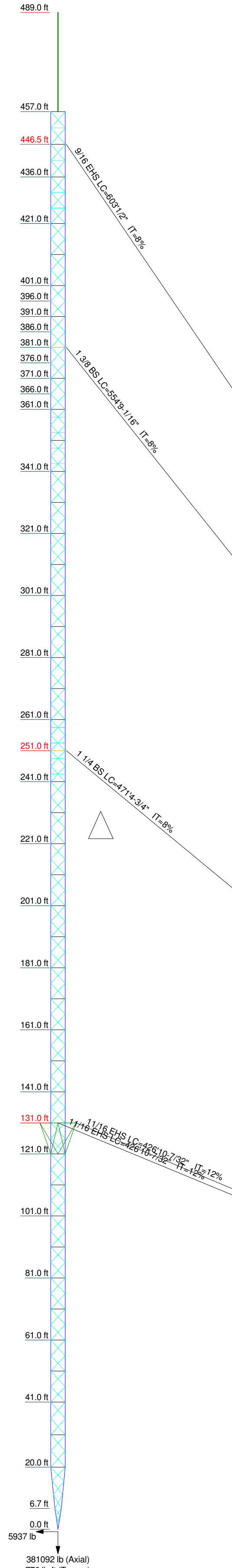
4.1) Recommendations

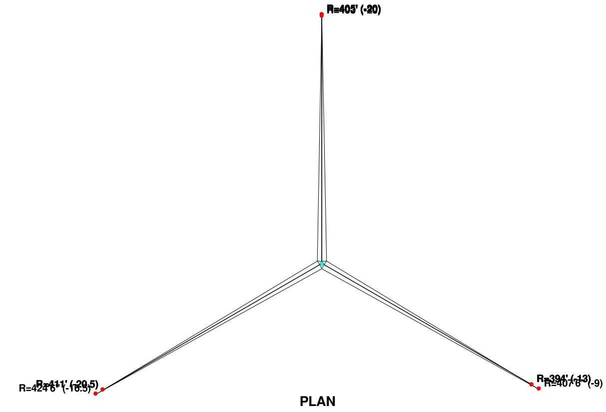
1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its base and anchor foundations have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Mid Girts	Horizontals	Sec. Horizontals	Top Guy Pull-Offs	Face Width (ft)	# Panels @ (ft)	Weight (lb)
T1	SR 3	A7-33	L2 1/2x2x1/4	A7-33	C8x13.75	L2 1/2x2x1/4	L2 1/2x2x1/4	N.A.	N.A.	6	4 @ 5.25	2751.0
T2–T3	SR 2 3/4		L2 1/2x2x3/16		L2 1/2x2x1/4 (T2–T4)	N.A. (T2); L2 1/2x2x1/4 (T3)	L2 1/2x2x1/4 (T2); N.A. (T3–T30)				79 @ 5 (T2–T27)	1549.7 (T2); 1929.9 (T3)
T4–T7	A				C (T5); D (T6); N.A. (T7–T9)	N.A. (T4–T11)			N.A. (T1–T7)			722.9 (T4); 654.8 (T5); 722.9 (T6); 654.8 (T7)
T8–T11	B				D (T10); C (T11)				G (T8); N.A. (T9–T16)			872.7 (T8); 719.6 (T9); 787.8 (T10); 719.6 (T11)
T12–T16	SR 3				L2 1/2x2x1/4 (T12–T14); L2 1/2x2x3/16 (T15); L2 1/2x2x1/4 (T16)	L2 1/2x2x1/4 (T12–T14); L2 1/2x2x3/16 (T15); L2 1/2x2x1/4 (T16)		L2x2x1/4 (T12); N.A. (T13–T16)				2413.3 (T12); 2172.0 (T13); 2172.0 (T14); 2139.7 (T15); 2172.0 (T16)
T17–T18	SR 3		L3x3x1/4	A36	L2 1/2x2x3/16 (T17–T20)	N.A. (T17); L2 1/2x2x3/16 (T18–T28)		F (T17); N.A. (T18–T30)	F (T17); N.A. (T18–T30)			4091.6 (T17); 2545.5 (T18)
T19–T21	SR 3 1/4 (T19–T22)		L2 1/2x2x3/16	A7-33	2L3x2x1/4x3/8 (T21)							2402.8 (T19); 2402.8 (T20); 2503.8 (T21)
T22–T23	SR 3 1/2 (T23–T28)		L3x3x1/4	A36	L2 1/2x2x3/16 (T22–T28)							3092.7 (T22); 4031.1 (T23)
T24–T28	SR 3 1/2		L2 1/2x2x3/16	A7-33							4 @ 5.25 (T28)	2686.9 (T24); 2686.9 (T25); 2686.9 (T26); 2686.9 (T27); 2800.6 (T28)
T29–T30	SR 3 1/4		L2x2x3/16		E (T29); N.A. (T30)	N.A.				2.58333	H 3 @ 4.43056	1568.4 (T29); 698.6 (T30)
												60039.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12" x 3' Beacon	457	ATMAA1412D-1A20	247
BCD-87077	445	2.4" Dia x 6-ft Pipe	247
BCD-87077	445	2.4" Dia x 6-ft Pipe	247
Side Arm Mount [SO 306-1]	445	2.4" Dia x 6-ft Pipe	247
Side Arm Mount [SO 304-1]	445	Sector Mount [SM 301-3]	247
SRL-235-2	444	HBXX-6516DS-VTM w/ Mount Pipe	230
Side Arm Mount [SO 308-1]	444	HBXX-6516DS-VTM w/ Mount Pipe	230
BCD-87077	441	HBXX-6516DS-VTM w/ Mount Pipe	230
Side Arm Mount [SO 308-1]	441	SBNHH-1D65B w/ Mount Pipe	230
ERI 1183-3CP	419	SBNHH-1D65B w/ Mount Pipe	230
6014-2	388	SBNHH-1D65B w/ Mount Pipe	230
SHP-2AE	367	LNX-8513DS-VTM w/ Mount Pipe	230
DB806E-XT	364	LNX-6514DS-VTM w/ Mount Pipe	230
Side Arm Mount [SO 601-1]	364	LNX-8513DS-VTM w/ Mount Pipe	230
455-6	344	RRH2X60-PCS	230
Side Arm Mount [SO 601-1]	344	RRH2X60-PCS	230
AO9009-3	342	RRH2X60-PCS	230
455-6	342	RRH2X60-AWS	230
Side Arm Mount [SO 601-1]	342	RRH2X60-AWS	230
Side Arm Mount [SO 302-1]	342	RRH2X60-AWS	230
455-6	339	RRH2x60-700	230
Side Arm Mount [SO 308-1]	339	RRH2x60-700	230
3" x 6" SideLight	333	RRH2x60-700	230
3" x 6" SideLight	333	(2) DB-T1-6Z-8AB-0Z	230
3" x 6" SideLight	333	Sector Mount [SM 407-3]	230
PG1N0F-0090-310	330	3" x 6" SideLight	215
Side Arm Mount [SO 602-1]	330	3" x 6" SideLight	215
7P-C1-2-CP-L	328	3" x 6" SideLight	215
(3) Side Arm Mount [SO 701-1]	328	P-9A72GN-U	206
DB201-A	326	DFPD1-52 w/ Mount Pipe	200
Side Arm Mount [SO 602-1]	326	BMYD745K	188
PLC-1296	325	ASP-960	186
SRL310C-4HD	322	SPD4-5.2	178
Side Arm Mount [SO 308-1]	322	1.9" x 5.5' Pipe (Horizontal)	150
Pipe Mount [PM 601-1]	322	HPX6-65-P3A	150
SPD3-5.8	322	Pipe Mount [PM 601-1]	146
6014-2	310	PL6-65-PXA	146
DB404-B	284	3-FT Yagi	136
APC-301	284	2.4" Dia x 8-ft Mount Pipe	136
Side Arm Mount [SO 308-1]	284	MGA2-16N	136
BMR10-A-B1	277	MGAR3-23N	136
ANT150F6	264	220-5	133
Side Arm Mount [SO 602-1]	264	SRL-235-2	133
DB809KT3E-Y	255	Side Arm Mount [SO 602-1]	133
Side Arm Mount [SO 203-1]	255	P-9A48GN-U	117
APX16PV-16PVL w/ Mount Pipe	247	3" x 6" SideLight	112
APX16PV-16PVL w/ Mount Pipe	247	3" x 6" SideLight	112
APX16PV-16PVL w/ Mount Pipe	247	3" x 6" SideLight	112
LNX-6515DS-VTM w/ Mount Pipe	247	PD1132-D	109
LNX-6515DS-VTM w/ Mount Pipe	247	Side Arm Mount [SO 303-1]	108
LNX-6515DS-VTM w/ Mount Pipe	247	SSH-9A72GN	108
ATBT-BOTTOM-24V	247	Pipe Mount [PM 601-1]	106
ATBT-BOTTOM-24V	247	PR-950	106
ATBT-BOTTOM-24V	247	PTP 900-13 w/ Mount Pipe	99
KRY 112 489/2	247	SPD2-5.8	99
KRY 112 489/2	247	(2) Side Arm Mount [SO 601-1]	62
KRY 112 489/2	247	CSI-AY/809-960/11	62
ATMAA1412D-1A20	247	P-9A48GN-U	62
ATMAA1412D-1A20	247	SSH-9A72GN	62

SYMBOL LIST

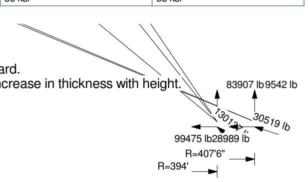
MARK	SIZE	MARK	SIZE
A	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	E	2L2 1/2x2x3/16x1/4
B	3.5" S.R. w/ 3.5 SCH40 Half Pipe	F	2L3 1/2x3 1/2x3/8x3/8
C	N.A.	G	2L3x2x1/4x3/8
D	L2 1/2x2x1/4	H	3 @ 2.23611

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A7-33	33 ksi	60 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield 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. 32' dielectric TFU-33J is included for load transfer only.



Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

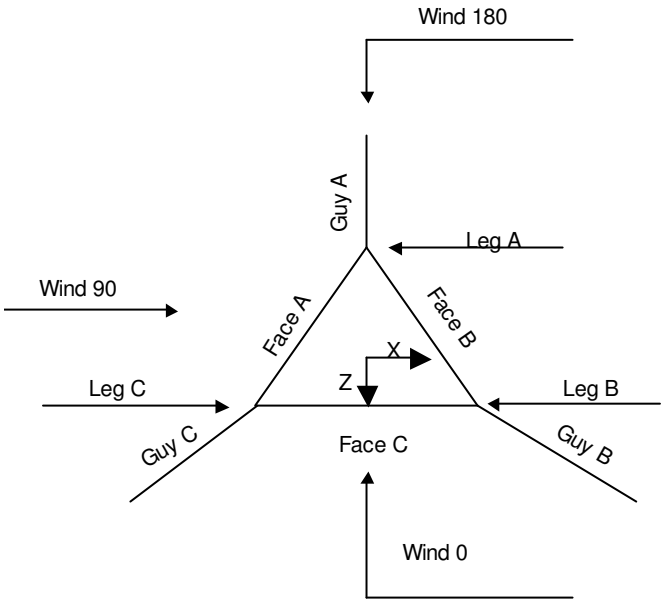
Job: ***Trumbull (BU 873128)***		
Project: ***TEP No. 25575.40946***		
Client: Crown Castle	Drawn by: JSP	App'd:
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS
Path: C:\Users\jspratt\Desktop\tnx Temp\25575 Trumbull\873128_LC7.eri		Dwg No. E-1

Tower Input Data

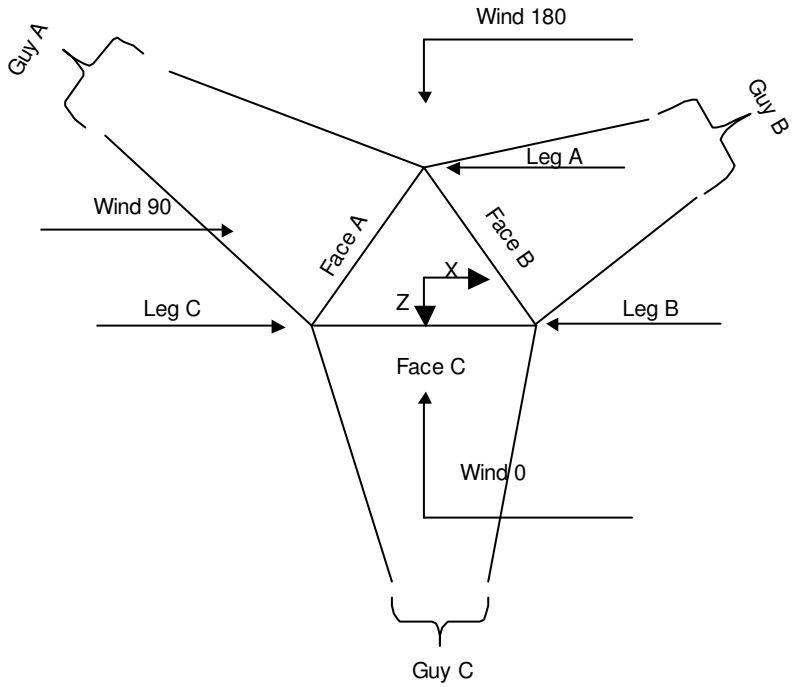
The main tower is a 3x guyed tower with an overall height of 457' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 6' at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:
Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member 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		



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	457'-436'			6'	1	21'
T2	436'-421'			6'	1	15'
T3	421'-401'			6'	1	20'
T4	401'-396'			6'	1	5'
T5	396'-391'			6'	1	5'
T6	391'-386'			6'	1	5'
T7	386'-381'			6'	1	5'
T8	381'-376'			6'	1	5'
T9	376'-371'			6'	1	5'
T10	371'-366'			6'	1	5'
T11	366'-361'			6'	1	5'
T12	361'-341'			6'	1	20'
T13	341'-321'			6'	1	20'
T14	321'-301'			6'	1	20'
T15	301'-281'			6'	1	20'
T16	281'-261'			6'	1	20'

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T17	261'-241'			6'	1	20'
T18	241'-221'			6'	1	20'
T19	221'-201'			6'	1	20'
T20	201'-181'			6'	1	20'
T21	181'-161'			6'	1	20'
T22	161'-141'			6'	1	20'
T23	141'-121'			6'	1	20'
T24	121'-101'			6'	1	20'
T25	101'-81'			6'	1	20'
T26	81'-61'			6'	1	20'
T27	61'-41'			6'	1	20'
T28	41'-20'			6'	1	21'
T29	20'-6'8-17/32"			6'	1	13'3-15/32"
T30	6'8-17/32"-0'			2'6-31/32"	1	6'8-17/32"

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	457'-436'	5'3"	X Brace	No	Yes	0.0000	0.0000
T2	436'-421'	5'	X Brace	No	Yes	0.0000	0.0000
T3	421'-401'	5'	X Brace	No	Yes	0.0000	0.0000
T4	401'-396'	5'	X Brace	No	Yes	0.0000	0.0000
T5	396'-391'	5'	X Brace	No	Yes	0.0000	0.0000
T6	391'-386'	5'	X Brace	No	Yes	0.0000	0.0000
T7	386'-381'	5'	X Brace	No	Yes	0.0000	0.0000
T8	381'-376'	5'	X Brace	No	Yes	0.0000	0.0000
T9	376'-371'	5'	X Brace	No	Yes	0.0000	0.0000
T10	371'-366'	5'	X Brace	No	Yes	0.0000	0.0000
T11	366'-361'	5'	X Brace	No	Yes	0.0000	0.0000
T12	361'-341'	5'	X Brace	No	Yes	0.0000	0.0000
T13	341'-321'	5'	X Brace	No	Yes	0.0000	0.0000
T14	321'-301'	5'	X Brace	No	Yes	0.0000	0.0000
T15	301'-281'	5'	X Brace	No	Yes	0.0000	0.0000
T16	281'-261'	5'	X Brace	No	Yes	0.0000	0.0000
T17	261'-241'	5'	X Brace	No	Yes	0.0000	0.0000
T18	241'-221'	5'	X Brace	No	Yes	0.0000	0.0000
T19	221'-201'	5'	X Brace	No	Yes	0.0000	0.0000
T20	201'-181'	5'	X Brace	No	Yes	0.0000	0.0000
T21	181'-161'	5'	X Brace	No	Yes	0.0000	0.0000
T22	161'-141'	5'	X Brace	No	Yes	0.0000	0.0000
T23	141'-121'	5'	X Brace	No	Yes	0.0000	0.0000
T24	121'-101'	5'	X Brace	No	Yes	0.0000	0.0000
T25	101'-81'	5'	X Brace	No	Yes	0.0000	0.0000
T26	81'-61'	5'	X Brace	No	Yes	0.0000	0.0000
T27	61'-41'	5'	X Brace	No	Yes	0.0000	0.0000
T28	41'-20'	5'3"	X Brace	No	Yes	0.0000	0.0000
T29	20'-6'8-17/32"	4'5-5/32"	X Brace	No	Yes	0.0000	0.0000
T30	6'8-17/32"-0'	2'2-7/8"	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 457'-436'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T2 436'-421'	Solid Round	2 3/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T3 421'-401'	Solid Round	2 3/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T4 401'-396'	Arbitrary Shape	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T5 396'-391'	Arbitrary Shape	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T6 391'-386'	Arbitrary Shape	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T7 386'-381'	Arbitrary Shape	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T8 381'-376'	Arbitrary Shape	3.5" S.R. w/ 3.5 SCH40 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T9 376'-371'	Arbitrary Shape	3.5" S.R. w/ 3.5 SCH40 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T10 371'-366'	Arbitrary Shape	3.5" S.R. w/ 3.5 SCH40 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T11 366'-361'	Arbitrary Shape	3.5" S.R. w/ 3.5 SCH40 Half Pipe	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T12 361'-341'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T13 341'-321'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T14 321'-301'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T15 301'-281'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T16 281'-261'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T17 261'-241'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T18 241'-221'	Solid Round	3	A7-33 (33 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T19 221'-201'	Solid Round	3 1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T20 201'-181'	Solid Round	3 1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T21 181'-161'	Solid Round	3 1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T22 161'-141'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T23 141'-121'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T24 121'-101'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T25 101'-81'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T26 81'-61'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T27 61'-41'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T28 41'-20'	Solid Round	3 1/2	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T29 20'-6'8-17/32"	Solid Round	3 1/4	A7-33 (33 ksi)	Single Angle	L2x2x3/16	A7-33 (33 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T30 6'8-17/32"-0'	Solid Round	3 1/4	A7-33 (33 ksi)	Single Angle	L2x2x3/16	A7-33 (33 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 457'-436'	Channel	C8x13.75	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T2 436'-421'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T3 421'-401'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T4 401'-396'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle		A7-33 (33 ksi)
T6 391'-386'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle		A7-33 (33 ksi)
T7 386'-381'	Single Angle		A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T8 381'-376'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle		A7-33 (33 ksi)
T10 371'-366'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle		A7-33 (33 ksi)
T11 366'-361'	Single Angle		A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T12 361'-341'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T13 341'-321'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T14 321'-301'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T15 301'-281'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T16 281'-261'	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T17 261'-241'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T18 241'-221'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T19 221'-201'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T20 201'-181'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T21 181'-161'	Double Angle	2L3x2x1/4x3/8	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T22 161'-141'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T23 141'-121'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T24 121'-101'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T25 101'-81'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T26 81'-61'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T27 61'-41'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)
T28 41'-20'	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A7-33 (33 ksi)
T29 20'-6'8-17/32"	Double Angle	2L2 1/2x2x3/16x1/4	A7-33 (33 ksi)	Single Angle		A7-33 (33 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 457'-436'	1	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T2 436'-421'	None	Single Angle		A7-33 (33 ksi)	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)
T3 421'-401'	1	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Solid Round		A36 (36 ksi)
T12 361'-341'	1	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T13 341'-321'	1	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Solid Round		A36 (36 ksi)
T14 321'-301'	1	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Solid Round		A36 (36 ksi)
T15 301'-281'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Solid Round		A36 (36 ksi)
T16 281'-261'	1	Single Angle	L2 1/2x2x1/4	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T17 261'-241'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T18 241'-221'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T19 221'-201'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T20 201'-181'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T21 181'-161'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T22 161'-141'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T23 141'-121'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T24 121'-101'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T25 101'-81'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T26 81'-61'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T27 61'-41'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)
T28 41'-20'	1	Single Angle	L2 1/2x2x3/16	A7-33 (33 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T12 361'-341'	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T17 261'-241'	Double Equal Angle	2L3 1/2x3 1/2x3/8x3/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 457'-436'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T2 436'-421'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T3 421'-401'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T4 401'-396'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T5 396'-391'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T6 391'-386'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T7 386'-381'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T8 381'-376'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T9 376'-371'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T10 371'-366'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T11 366'-361'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T12 361'-341'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T13 341'-321'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T14 321'-301'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T15 301'-281'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T16 281'-261'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T17 261'-241'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T18 241'-221'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T19 221'-201'	0.00	0.3750	A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T20 201'-181'	0.00	0.3750	A7-33	1.03	1	1.05	0.0000	0.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
T21 181'-161'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T22 161'-141'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T23 141'-121'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T24 121'-101'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T25 101'-81'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T26 81'-61'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T27 61'-41'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T28 41'-20'	0.00	0.3750	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T29 20'-6'8-17/32"	0.00	0.2500	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000
T30 6'8-17/32"-0'	0.00	0.2500	(33 ksi) A7-33 (33 ksi)	1.03	1	1.05	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 457'-436'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 436'-421'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 421'-401'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 401'-396'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 396'-391'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 391'-386'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 386'-381'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 381'-376'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 376'-371'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 371'-366'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 366'-361'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 361'-341'	No	No	1	1.05	1	1	0.92	1	0.5	1
				1.05	1	1	0.92	1	0.5	1
T13 341'-321'	Yes	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X	K Brace Diags X	Single Diags X	Girts X	Horiz. X	Sec. Horiz. X	Inner Brace X
				Y	Y	Y	Y	Y	Y	Y
				1	1	1	1	1	1	1
T14 321'-301'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 301'-281'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T16 281'-261'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T17 261'-241'	No	No	1	1.17	1	1	0.92	1	0.5	1
				1.17	1	1	0.92	1	0.5	1
T18 241'-221'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T19 221'-201'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T20 201'-181'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T21 181'-161'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T22 161'-141'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T23 141'-121'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T24 121'-101'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T25 101'-81'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T26 81'-61'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T27 61'-41'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T28 41'-20'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T29 20'-6'8-17/32"	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T30 6'8-17/32"-0'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 457'-436'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1
T2 436'-421'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75	0.0000	1
T3 421'-401'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T4 401'-396'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1
T5 396'-391'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1
T6 391'-386'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	0.75
T7 386'-381'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T8 381'-376'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1
T9 376'-371'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1
T10 371'-366'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1
T11 366'-361'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1
T12 361'-341'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T13 341'-321'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T14 321'-301'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T15 301'-281'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T16 281'-261'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T17 261'-241'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T18 241'-221'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T19 221'-201'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T20 201'-181'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T21 181'-161'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T22 161'-141'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T23 141'-121'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T24 121'-101'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T25 101'-81'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T26 81'-61'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T27 61'-41'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T28 41'-20'	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1
T29 20'-6'8-17/32"	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T30 6'8-17/32"-0'	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 457'-436'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T2 436'-421'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T3 421'-401'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T4 401'-396'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T5 396'-391'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T6 391'-386'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T7 386'-381'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T8 381'-376'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T9 376'-371'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T10 371'-366'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T11 366'-361'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T12 361'-341'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T13 341'-321'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T14 321'-301'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T15 301'-281'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T16 281'-261'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T17 261'-241'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T18 241'-221'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T19 221'-201'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T20 201'-181'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T21 181'-161'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T22 161'-141'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T23 141'-121'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T24 121'-101'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T25 101'-81'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T26 81'-61'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T27 61'-41'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T28 41'-20'	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T29 20'-6'8-17/32"	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T30 6'8-17/32"-0'	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
ft		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 457'-436'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A325X	0
T2 436'-421'	Flange	0.8750 A307	8	0.5000 A325X	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	0	0.5000 A307	2	0.0000 A325X	0
T3 421'-401'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T4 401'-396'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.0000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T5 396'-391'	Flange	0.8750 A307	0	0.5000 A325N	2	0.0000 A307	0	0.0000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T6 391'-386'	Flange	0.8750 A307	0	0.5000 A325X	2	0.0000 A307	2	0.0000 A307	0	0.5000 A307	0	0.0000 A307	0	0.5000 A325X	0
T7 386'-381'	Flange	0.8750 A307	0	0.5000 A325X	2	0.0000 A307	0	0.5000 A307	2	0.5000 A307	0	0.0000 A307	0	0.5000 A325X	0
T8 381'-376'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.0000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T9 376'-371'	Flange	0.8750 A307	0	0.5000 A325N	2	0.0000 A307	0	0.0000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T10 371'-366'	Flange	0.8750 A307	0	0.5000 A325N	2	0.0000 A307	2	0.0000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T11 366'-361'	Flange	0.8750 A307	0	0.5000 A325N	2	0.0000 A307	0	0.5000 A307	2	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T12 361'-341'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.5000 A325X	1
T13 341'-321'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T14 321'-301'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T15 301'-281'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T16 281'-261'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T17 261'-241'	Flange	0.6250 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T18 241'-221'	Flange	0.6250 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T19 221'-201'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T20 201'-181'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T21 181'-161'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T22 161'-141'	Flange	0.6250 A307	8	0.6250 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T23 141'-121'	Flange	0.6250 A307	8	0.6250 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A325N	2	0.0000 A307	0	0.0000 A325X	0
T24 121'-101'	Flange	0.8750 A307	8	0.5000 A325N	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T25 101'-81'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T26 81'-61'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T27 61'-41'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T28 41'-20'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.5000 A307	2	0.0000 A307	0	0.0000 A325X	0
T29 20'-6'8-17/32"	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A325N	2	0.5000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0
T30 6'8-17/32"-0'	Flange	0.8750 A307	8	0.5000 A307	2	0.5000 A307	0	0.5000 A307	0	0.5000 A307	0	0.0000 A307	0	0.0000 A325X	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
131	EHS	A	11/16	6000	12%	19000	0.994	425'11-5/8"	403'	0.0000	-20'	100%
		B	11/16	6000	12%	19000	0.994	426'5-13/32"	407'6"	0.0000	-9'	100%
		C	11/16	6000	12%	19000	0.994	444'11-17/32"	424'6"	0.0000	-16'6"	100%
251	BS	A	1 1/4	15360	8%	24000	3.280	484'2-3/4"	405'	0.0000	-20'	100%
		B	1 1/4	15360	8%	24000	3.280	471'2-9/32"	394'	0.0000	-13'	100%
		C	1 1/4	15360	8%	24000	3.280	489'5-7/8"	411'	0.0000	-20'6"	100%
381	BS	A	1 3/8	18560	8%	24000	3.970	567'2-3/4"	405'	0.0000	-20'	100%
		B	1 3/8	18560	8%	24000	3.970	554'6-1/8"	394'	0.0000	-13'	100%
		C	1 3/8	18560	8%	24000	3.970	571'10-3/16"	411'	0.0000	-20'6"	100%
446.5	EHS	A	9/16	2800	8%	21000	0.671	615'3-3/8"	405'	0.0000	-20'	100%
		B	9/16	2800	8%	21000	0.671	602'9-19/32"	394'	0.0000	-13'	100%
		C	9/16	2800	8%	21000	0.671	619'7-3/32"	411'	0.0000	-20'6"	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
131	Torque Arm	15'	53.0000	Bat Ear	A7-33 (33 ksi)	Double Angle	2L3x3x3/16
251	Corner						
381	Corner						
446.5	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
131'	A572-50 (50 ksi)	Solid Round				A7-33 (33 ksi)	Double Angle	
251'	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Double Angle	2L3 1/2x3 1/2x3/8x3/8
381'	A572-50 (50 ksi)	Solid Round			No	A7-33 (33 ksi)	Double Angle	2L3x2x1/4x3/8
446'6"	A572-50 (50 ksi)	Solid Round				A7-33 (33 ksi)	Double Angle	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
131	423	424	442		14'10-7/16" 6.7 sec/pulse	14'10-29/32" 6.7 sec/pulse	16'2-3/4" 7.0 sec/pulse	
251	1588	1546	1606		24'4-5/16" 8.5 sec/pulse	23'1-3/32" 8.3 sec/pulse	24'10-13/16" 8.6 sec/pulse	
381	2252	2201	2270		33'15/32" 9.9 sec/pulse	31'7-3/16" 9.7 sec/pulse	33'6-31/32" 10.0 sec/pulse	
446.5	413	404	416		43'1/4" 11.3 sec/pulse	41'3-31/32" 11.1 sec/pulse	43'7-9/16" 11.4 sec/pulse	

Guy Data *(cont'd)*

	Torque Arm	Pull Off	Diagonal

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K_x	K_y	K_x	K_y	K_x	K_y
131	Yes	Yes	1	1	1	1	1	1
251	No	No			1	1	1	1
381	No	No			1	1	1	1
446.5	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
131	0.7500 A307	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75
251	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
381	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
446.5	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
131	A	55'6"	21	4	0.7983
	B	61'	22	4	0.8074
	C	57'3"	22	4	0.8013
251	A	115'6"	26	5	0.8717
	B	119'	27	5	0.8748
	C	115'3"	26	5	0.8714
381	A	180'6"	30	6	0.9196
	B	184'	30	6	0.9218
	C	180'3"	30	6	0.9195
446.5	A	213'3"	32	6	0.9382
	B	216'9"	32	6	0.9401
	C	213'	32	6	0.9381

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
131	A	20.7413	6150 6000	-107	2363	-5677	-10230.94	43039.50	-17720.51
	A	20.7413	6150 6000	107	2363	-5677	-10230.94	-43039.50	17720.51

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
	B	19.1464	6139 6000	5015	2202	2772	19072.00	43432.08	0.00
	B	19.1464	6139 6000	4909	2202	2957	-9536.00	-43432.08	-16516.84
	C	19.3407	6146 6000	-4908	2232	2951	-9665.19	43387.01	16740.60
	C	19.3407	6146 6000	-5010	2232	2774	19330.38	-43387.01	0.00
			Sum:	**6**	13594	**101**	**-1260.70**	0.00	**223.76**
251	A	34.0157	16248 15360	0	9633	-13085	-33368.66	0.00	0.00
	B	34.0585	16225 15360	11319	9615	6535	16653.31	0.00	-28844.39
	C	33.6715	16250 15360	-11378	9563	6569	16563.39	-0.00	28688.63
			Sum:	**-59**	28810	**19**	**-151.96**	-0.00	**-155.76**
381	A	44.9617	20151 18560	0	14799	-13676	-51266.23	0.00	0.00
	B	45.2530	20123 18560	11776	14834	6799	25692.88	0.00	-44501.38
	C	44.5725	20153 18560	-11924	14716	6884	25488.36	-0.00	44147.13
			Sum:	**-148**	44349	**7**	**-84.99**	-0.00	**-354.25**
446.5	A	49.2801	3113 2800	0	2446	-1925	-8474.31	0.00	0.00
	B	49.6383	3108 2800	1654	2452	955	4247.69	0.00	-7357.21
	C	48.8898	3113 2800	-1680	2435	970	4217.01	-0.00	7304.07
			Sum:	**-27**	7333	0	**-9.62**	-0.00	**-53.13**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
131	A	20.7413	9525 9157	-164	3827	-8721	-16571.32	66119.35	-28702.36
	A	20.7413	9525 9157	164	3827	-8721	-16571.32	-66119.35	28702.36
	B	19.1464	9566 9221	7754	3606	4287	31226.89	67154.43	0.00
	B	19.1464	9566 9221	7590	3606	4572	-15613.44	-67154.43	-27043.28
	C	19.3407	9637 9276	-7634	3676	4591	-15916.17	67491.97	27567.62
	C	19.3407	9637 9276	-7793	3676	4316	31832.34	-67491.97	0.00
			Sum:	**-84**	22217	**324**	**-1613.02**	0.00	**524.34**
251	A	34.0157	25173 23673	0	14999	-20217	-51958.83	0.00	0.00
	B	34.0585	25120	17475	14961	10089	25913.90	0.00	-44884.19

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			23656						
	C	33.6715	25197	-17594	14904	10158	25814.60	-0.00	44712.19
			23694						
			Sum:	**-119**	44865	**31**	**-230.33**	-0.00	**-171.99**
381	A	44.9617	30817	0	22700	-20843	-78634.01	0.00	0.00
			28193						
	B	45.2530	30749	17931	22733	10353	39375.05	0.00	-68199.58
			28168						
	C	44.5725	30843	-18187	22589	10500	39126.06	-0.00	67768.32
			28216						
			Sum:	**-256**	68022	**10**	**-132.90**	-0.00	**-431.27**
446.5	A	49.2801	7114	0	5701	-4256	-19748.09	0.00	0.00
			6000						
	B	49.6383	7053	3629	5673	2095	9826.62	0.00	-17020.20
			5953						
	C	48.8898	7146	-3732	5700	2155	9872.99	-0.00	17100.53
			6031						
			Sum:	**-103**	17074	**-6**	**-48.48**	-0.00	**80.33**

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
131	A	20.7413	6150	-107	2363	-5677	-10230.94	43039.50	-17720.51
			6000						
	A	20.7413	6150	107	2363	-5677	-10230.94	-43039.50	17720.51
			6000						
	B	19.1464	6139	5015	2202	2772	19072.00	43432.08	0.00
			6000						
	B	19.1464	6139	4909	2202	2957	-9536.00	-43432.08	-16516.84
			6000						
	C	19.3407	6146	-4908	2232	2951	-9665.19	43387.01	16740.60
			6000						
	C	19.3407	6146	-5010	2232	2774	19330.38	-43387.01	0.00
			6000						
			Sum:	**6**	13594	**101**	**-1260.70**	0.00	**223.76**
251	A	34.0157	16248	0	9633	-13085	-33368.66	0.00	0.00
			15360						
	B	34.0585	16225	11319	9615	6535	16653.31	0.00	-28844.39
			15360						
	C	33.6715	16250	-11378	9563	6569	16563.39	-0.00	28688.63
			15360						
			Sum:	**-59**	28810	**19**	**-151.96**	-0.00	**-155.76**
381	A	44.9617	20151	0	14799	-13676	-51266.23	0.00	0.00
			18560						
	B	45.2530	20123	11776	14834	6799	25692.88	0.00	-44501.38
			18560						
	C	44.5725	20153	-11924	14716	6884	25488.36	-0.00	44147.13
			18560						
			Sum:	**-148**	44349	**7**	**-84.99**	-0.00	**-354.25**
446.5	A	49.2801	3113	0	2446	-1925	-8474.31	0.00	0.00

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
	B	49.6383	2800 3108	1654	2452	955	4247.69	0.00	-7357.21
	C	48.8898	2800 3113	-1680	2435	970	4217.01	-0.00	7304.07
			2800 Sum:	-27	7333	0	-9.62	-0.00	-53.13

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
131	A	398.74	151.00	7504	11.91	6983	12.79	6480	13.78	6000	14.87	5547	16.07	5123	17.38	4732	18.80
	B	403.24	140.00	7529	11.91	6998	12.80	6487	13.80	6000	14.91	5541	16.14	5113	17.48	4718	18.92
	C	420.24	147.50	7499	13.01	6978	13.97	6477	15.04	6000	16.23	5552	17.52	5134	18.93	4751	20.44
251	A	401.54	271.00	19121	19.67	17766	21.13	16511	22.70	15360	24.36	14313	26.10	13367	27.89	12518	29.73
	B	390.54	264.00	19201	18.56	17819	19.97	16537	21.48	15360	23.09	14289	24.77	13321	26.52	12454	28.32
	C	407.54	271.50	19107	20.11	17756	21.61	16506	23.21	15360	24.90	14319	26.66	13380	28.48	12537	30.33
381	A	401.54	401.00	21808	28.28	20660	29.79	19577	31.38	18560	33.04	17610	34.75	16726	36.52	15906	38.32
	B	390.54	394.00	21845	26.99	20686	28.46	19590	29.99	18560	31.60	17597	33.26	16700	34.97	15868	36.73
	C	407.54	401.50	21815	28.73	20663	30.28	19578	31.89	18560	33.58	17610	35.32	16727	37.11	15909	38.93
446.5	A	401.54	466.50	3176	38.15	3044	39.73	2919	41.36	2800	43.02	2682	44.83	2578	46.55	2480	48.29
	B	390.54	459.50	3179	36.60	3046	38.13	2920	39.71	2800	41.33	2680	43.09	2574	44.77	2475	46.46
	C	407.54	467.00	3177	38.67	3044	40.28	2919	41.93	2800	43.63	2682	45.46	2578	47.20	2480	48.96

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
CA Face HB158-1-08U8-S8J18(1-5/8)	C	Yes	Ar (CfAe)	230' - 10'	-5.0000	0.35	2	2	0.5000	1.9800		1.30
LCF78-50A(7/8")	A	Yes	Ar (CfAe)	230' - 10'	-4.0000	0.35	4	3	0.5000	1.0900		0.34
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	247' - 10'	0.0000	0.4	18	9	0.5000 0.2500	1.0900		0.33
LDF6-50A(1-1/4")	A	Yes	Ar (CfAe)	322' - 10'	-0.5000	0.45	1	1	1.5500	1.5500		0.66
EW63(ELLIPTICAL)	A	Yes	Ar (CfAe)	150' - 10'	0.0000	-0.28	1	1	0.5000	2.0100		0.51
EW63(ELLIPTICAL)	A	Yes	Ar (CfAe)	136' - 10'	0.0000	-0.28	1	1	0.5000	0.0001		0.51
EW63(ELLIPTICAL)	A	Yes	Ar (CfAe)	150' - 136'	0.0000	-0.28	1	1	2.0100	2.0100		0.51
LDF2-50A(3/8")	A	Yes	Ar (CfAe)	106' - 10'	0.0000	-0.21	2	2	0.5000 0.4400	0.4400		0.08
LCF78-50A(7/8")	A	Yes	Ar (CfAe)	230' - 10'	-3.0000	-0.38	7	4	0.5000	1.0900		0.34
1" Rigid	A	Yes	Ar (CfAe)	457' - 10'	0.0000	-0.33	1	1	1.0000	1.0000		1.13

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Conduit 3/8" Cable (Lights)	A	Yes	Ar (CfAe)	457' - 10'	0.0000	-0.43	1	1	0.3750	0.3750		0.22
3/8" Coax	A	Yes	Ar (CfAe)	136' - 10'	3.0000	-0.28	3	3	0.3750	0.3750		0.07
Banjo (6" dia, 36" step)	A	Yes	Af (CfAe)	230' - 10'	-2.0000	0.35	1	1	0.3330	0.3330	1.3320	0.45
Banjo (6" dia, 36" step)	A	Yes	Af (CfAe)	230' - 10'	-2.0000	-0.38	1	1	0.3330	0.3330	1.3320	0.45
AB Face												
LDF5-50A(7/8")	B	Yes	Ar (CfAe)	444' - 10'	0.0000	-0.47	1	1	1.0900	1.0900		0.33
HJ8-50B(3")	B	Yes	Ar (CfAe)	419' - 10'	0.0000	0.4	1	1	3.0100	3.0100		1.78
LDF6-50A(1-1/4")	B	Yes	Ar (CfAe)	146' - 10'	0.0000	0.01	1	1	1.5500	0.0001		0.66
LDF6-50A(1 1/4")	B	Yes	Ar (CfAe)	342' - 146'	0.0000	0.01	1	1	1.5500	1.5500		0.66
LDF5-50A(7/8")	B	Yes	Ar (CfAe)	339' - 10'	0.0000	0.49	1	1	1.0900	1.0900		0.33
3-1/2" Feed Line	B	Yes	Ar (CfAe)	328' - 10'	-1.7500	-0.08	1	1	3.5000	3.5000		3.00
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	264' - 10'	-1.7500	0.12	1	1	1.9800	0.0001		0.82
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	310' - 264'	-0.7500	0.12	1	1	1.9800	1.9800		0.82
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	277' - 10'	0.0000	0.15	1	1	1.9800	1.9800		0.82
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	330' - 10'	0.0000	-0.23	1	1	0.5000	1.9800		0.82
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	364' - 10'	0.0000	-0.07	1	1	0.5000	1.9800		0.82
LDF4P-50A(1/2")	B	Yes	Ar (CfAe)	133' - 10'	2.0000	-0.18	1	1	0.6300	0.6300		0.15
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	264' - 10'	2.0000	-0.2	1	1	1.9800	1.9800		0.82
LDF6-50A(1-1/4")	B	Yes	Ar (CfAe)	330' - 10'	0.0000	-0.18	1	1	0.5000	1.5500		0.66
LDF4-50A(1/2")	B	Yes	Ar (CfAe)	344' - 322'	1.0000	-0.22	1	1	0.5000	0.6300		0.15
LDF4-50A(1/2")	B	Yes	Ar (CfAe)	322' - 10'	1.0000	-0.22	2	2	0.5000	0.6300		0.15
LDF4-50A(1/2")	B	Yes	Ar (CfAe)	178' - 10'	0.0000	-0.225	1	1	0.6300	0.6300		0.15
EW63(ELLIPTICAL)	B	Yes	Ar (CfAe)	146' - 10'	0.0000	-0.13	1	1	2.0100	2.0100		0.51
LDF5-50A(7/8)	B	Yes	Ar (CfAe)	326' - 10'	0.0000	-0.05	1	1	1.0300	1.0300		0.33
LDF1-50A(1/4")	B	Yes	Ar (CfAe)	62' - 10'	0.0000	-0.03	2	2	0.3450	0.3450		0.06
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	75' - 10'	0.0000	-0.01	1	1	1.9800	1.9800		0.82
BC Face												
AVA5-50(7/8")	C	Yes	Ar (CfAe)	230' - 10'	-4.0000	-0.4	7	4	0.5000	1.1020		0.30
Banjo 12" Dia. (40" Step)	C	Yes	Af (CfAe)	230' - 10'	-3.0000	-0.4	1	1	0.2500	0.0000	0.5000	1.91
475-000(4 1/16")	C	Yes	Ar (CfAe)	457' - 10'	-6.0000	0	1	1	4.0620	4.0620		110.00
1.5" dia. M.C.	C	Yes	Ar (CfAe)	457' - 10'	-6.0000	0.1	1	1	1.5000	1.5000		1.85
LDF7-50A(1-5/8")	C	Yes	Ar (CfAe)	388' - 10'	0.0000	-0.1	1	1	1.9800	1.9800		0.82
HJ8-50B(3")	C	Yes	Ar (CfAe)	367' - 10'	0.0000	0.1	1	1	3.0100	3.0100		1.78

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	109' - 10'	0.0000	-0.4	1	1	0.5000	1.0900		0.33
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	99' - 10'	0.0000	0.35	1	1	0.5000	1.0900		0.33
LDF6-50A(1-1/4")	C	Yes	Ar (CfAe)	284' - 255'	0.0000	0.28	1	1	0.5000	1.5500		0.66
LDF6-50A(1-1/4")	C	Yes	Ar (CfAe)	255' - 10'	0.0000	0.28	2	2	0.5000	1.5500		0.66
FSJ1-50A(1/4")	C	Yes	Ar (CfAe)	200' - 99'	0.0000	0.41	1	1	0.2900	0.2900		0.04
FSJ1-50A(1/4")	C	Yes	Ar (CfAe)	99' - 10'	0.0000	0.41	2	2	0.2900	0.2900		0.04
FSJ1-50A(1/4")	C	Yes	Ar (CfAe)	108' - 10'	0.0000	0.25	1	1	0.2900	0.2900		0.04
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	206' - 133'	0.0000	0.475	1	1	0.2500	1.0900		0.33
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	133' - 117'	0.0000	0.475	2	2	0.5000	1.0900		0.33
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	117' - 62'	0.0000	0.475	3	3	0.5000	1.0900		0.33
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	62' - 10'	0.0000	0.475	6	4	0.5000	1.0900		0.33
Equipment												
Thin Flat Climbing Ladder	C	Yes	Af (CfAe)	457' - 10'	-9.0000	0	1	1	2.0000	2.0000	8.0000	4.00
Safety Line 3/8 ***	C	Yes	Ar (CfAe)	457' - 10'	-9.0000	0	1	1	0.3750	0.3750		0.22
cut coax												
15/16"	B	Yes	Ar (CfAe)	90' - 15'	0.0000	-0.1	1	1	0.5000	0.9375		0.33
LDF1-50A(1/4")	C	Yes	Ar (CfAe)	24' - 15'	0.0000	0.45	1	1	0.3450	0.3450		0.06

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 lb
T1	457'-436'	A	2.406	0.000	0.000	0.000	28
		B	0.727	0.000	0.000	0.000	3
		C	10.390	3.500	0.000	0.000	2437
T2	436'-421'	A	1.719	0.000	0.000	0.000	20
		B	1.363	0.000	0.000	0.000	5
		C	7.421	2.500	0.000	0.000	1741
T3	421'-401'	A	2.292	0.000	0.000	0.000	27
		B	6.332	0.000	0.000	0.000	39
		C	9.895	3.333	0.000	0.000	2321
T4	401'-396'	A	0.573	0.000	0.000	0.000	7
		B	1.708	0.000	0.000	0.000	11
		C	2.474	0.833	0.000	0.000	580
T5	396'-391'	A	0.573	0.000	0.000	0.000	7
		B	1.708	0.000	0.000	0.000	11
		C	2.474	0.833	0.000	0.000	580
T6	391'-386'	A	0.573	0.000	0.000	0.000	7

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 lb
		B	1.708	0.000	0.000	0.000	11
		C	2.804	0.833	0.000	0.000	582
T7	386'-381'	A	0.573	0.000	0.000	0.000	7
		B	1.708	0.000	0.000	0.000	11
		C	3.299	0.833	0.000	0.000	584
T8	381'-376'	A	0.573	0.000	0.000	0.000	7
		B	1.708	0.000	0.000	0.000	11
		C	3.299	0.833	0.000	0.000	584
T9	376'-371'	A	0.573	0.000	0.000	0.000	7
		B	1.708	0.000	0.000	0.000	11
		C	3.299	0.833	0.000	0.000	584
T10	371'-366'	A	0.573	0.000	0.000	0.000	7
		B	1.708	0.000	0.000	0.000	11
		C	3.550	0.833	0.000	0.000	586
T11	366'-361'	A	0.573	0.000	0.000	0.000	7
		B	2.203	0.000	0.000	0.000	13
		C	4.553	0.833	0.000	0.000	593
T12	361'-341'	A	2.292	0.000	0.000	0.000	27
		B	10.420	0.000	0.000	0.000	60
		C	18.212	3.333	0.000	0.000	2373
T13	341'-321'	A	2.421	0.000	0.000	0.000	28
		B	20.573	0.000	0.000	0.000	117
		C	18.212	3.333	0.000	0.000	2373
T14	321'-301'	A	4.875	0.000	0.000	0.000	40
		B	31.552	0.000	0.000	0.000	188
		C	18.212	3.333	0.000	0.000	2373
T15	301'-281'	A	4.875	0.000	0.000	0.000	40
		B	33.367	0.000	0.000	0.000	197
		C	18.599	3.333	0.000	0.000	2375
T16	281'-261'	A	4.875	0.000	0.000	0.000	40
		B	36.007	0.000	0.000	0.000	213
		C	20.795	3.333	0.000	0.000	2387
T17	261'-241'	A	9.780	0.000	0.000	0.000	76
		B	36.667	0.000	0.000	0.000	230
		C	22.603	3.333	0.000	0.000	2396
T18	241'-221'	A	26.948	0.500	0.000	0.000	201
		B	36.667	0.000	0.000	0.000	230
		C	29.654	3.333	0.000	0.000	2459
T19	221'-201'	A	33.942	1.110	0.000	0.000	252
		B	36.667	0.000	0.000	0.000	230
		C	37.779	3.333	0.000	0.000	2534
T20	201'-181'	A	33.942	1.110	0.000	0.000	252
		B	36.667	0.000	0.000	0.000	230
		C	39.601	3.333	0.000	0.000	2539
T21	181'-161'	A	33.942	1.110	0.000	0.000	252
		B	37.559	0.000	0.000	0.000	232
		C	39.625	3.333	0.000	0.000	2540
T22	161'-141'	A	36.957	1.110	0.000	0.000	261
		B	37.909	0.000	0.000	0.000	235
		C	39.625	3.333	0.000	0.000	2540
T23	141'-121'	A	39.536	1.110	0.000	0.000	275
		B	39.114	0.000	0.000	0.000	245
		C	40.715	3.333	0.000	0.000	2543
T24	121'-101'	A	39.533	1.110	0.000	0.000	277
		B	39.534	0.000	0.000	0.000	246
		C	43.791	3.333	0.000	0.000	2554
T25	101'-81'	A	40.633	1.110	0.000	0.000	280
		B	40.237	0.000	0.000	0.000	249
		C	47.628	3.333	0.000	0.000	2567
T26	81'-61'	A	40.633	1.110	0.000	0.000	280
		B	43.464	0.000	0.000	0.000	264

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 lb
		C	47.949	3.333	0.000	0.000	2569
T27	61'-41'	A	40.633	1.110	0.000	0.000	280
		B	45.546	0.000	0.000	0.000	271
		C	49.675	3.333	0.000	0.000	2588
T28	41'-20'	A	42.665	1.166	0.000	0.000	294
		B	47.823	0.000	0.000	0.000	285
		C	52.274	3.500	0.000	0.000	2717
T29	20'-6'8-17/32"	A	20.317	0.555	0.000	0.000	140
		B	22.382	0.000	0.000	0.000	134
		C	24.981	1.667	0.000	0.000	1294
T30	6'8-17/32"-0'	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	0.000	0

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 lb
T1	457'-436'	A	1.025	9.583	0.000	0.000	0.000	118
		B		2.094	0.000	0.000	0.000	24
		C		21.155	5.892	0.000	0.000	2774
T2	436'-421'	A	1.020	6.820	0.000	0.000	0.000	84
		B		3.913	0.000	0.000	0.000	44
		C		15.073	4.200	0.000	0.000	1980
T3	421'-401'	A	1.015	9.059	0.000	0.000	0.000	111
		B		12.761	0.000	0.000	0.000	181
		C		20.046	5.589	0.000	0.000	2638
T4	401'-396'	A	1.011	2.258	0.000	0.000	0.000	28
		B		3.394	0.000	0.000	0.000	48
		C		5.002	1.395	0.000	0.000	659
T5	396'-391'	A	1.010	2.256	0.000	0.000	0.000	28
		B		3.391	0.000	0.000	0.000	48
		C		4.998	1.394	0.000	0.000	659
T6	391'-386'	A	1.008	2.253	0.000	0.000	0.000	28
		B		3.389	0.000	0.000	0.000	48
		C		5.660	1.393	0.000	0.000	668
T7	386'-381'	A	1.007	2.251	0.000	0.000	0.000	28
		B		3.386	0.000	0.000	0.000	48
		C		6.654	1.393	0.000	0.000	681
T8	381'-376'	A	1.005	2.248	0.000	0.000	0.000	28
		B		3.383	0.000	0.000	0.000	48
		C		6.649	1.392	0.000	0.000	681
T9	376'-371'	A	1.003	2.245	0.000	0.000	0.000	27
		B		3.381	0.000	0.000	0.000	48
		C		6.644	1.391	0.000	0.000	681
T10	371'-366'	A	1.002	2.243	0.000	0.000	0.000	27
		B		3.378	0.000	0.000	0.000	48
		C		7.056	1.390	0.000	0.000	687
T11	366'-361'	A	1.000	2.240	0.000	0.000	0.000	27
		B		4.370	0.000	0.000	0.000	61
		C		8.721	1.389	0.000	0.000	714
T12	361'-341'	A	0.996	8.932	0.000	0.000	0.000	109
		B		21.044	0.000	0.000	0.000	289
		C		34.812	5.547	0.000	0.000	2852
T13	341'-321'	A	0.989	9.179	0.000	0.000	0.000	112
		B		44.917	0.094	0.000	0.000	592
		C		34.696	5.531	0.000	0.000	2847

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 lb
T14	321'-301'	A	0.982	14.692	0.000	0.000	0.000	181
		B		64.697	1.883	0.000	0.000	893
		C		34.573	5.515	0.000	0.000	2843
T15	301'-281'	A	0.974	14.614	0.000	0.000	0.000	179
		B		68.026	1.883	0.000	0.000	934
		C		35.317	5.498	0.000	0.000	2849
T16	281'-261'	A	0.966	14.531	0.000	0.000	0.000	178
		B		73.420	1.883	0.000	0.000	1000
		C		40.107	5.479	0.000	0.000	2905
T17	261'-241'	A	0.957	15.944	6.360	0.000	0.000	327
		B		77.076	1.883	0.000	0.000	1040
		C		39.930	7.851	0.000	0.000	2937
T18	241'-221'	A	0.947	23.799	29.557	0.000	0.000	893
		B		76.665	1.883	0.000	0.000	1029
		C		44.894	15.267	0.000	0.000	3157
T19	221'-201'	A	0.937	29.066	39.725	0.000	0.000	1150
		B		76.221	1.883	0.000	0.000	1018
		C		52.154	23.058	0.000	0.000	3417
T20	201'-181'	A	0.926	28.843	39.675	0.000	0.000	1139
		B		75.739	1.883	0.000	0.000	1005
		C		58.916	23.008	0.000	0.000	3471
T21	181'-161'	A	0.914	28.599	39.621	0.000	0.000	1128
		B		78.691	1.883	0.000	0.000	1023
		C		58.688	22.954	0.000	0.000	3458
T22	161'-141'	A	0.900	34.044	39.561	0.000	0.000	1182
		B		79.616	1.883	0.000	0.000	1023
		C		58.237	22.894	0.000	0.000	3442
T23	141'-121'	A	0.885	40.792	41.368	0.000	0.000	1256
		B		84.080	1.883	0.000	0.000	1056
		C		57.730	24.416	0.000	0.000	3444
T24	121'-101'	A	0.868	41.232	42.307	0.000	0.000	1251
		B		84.751	1.883	0.000	0.000	1048
		C		60.214	27.519	0.000	0.000	3493
T25	101'-81'	A	0.847	43.270	43.391	0.000	0.000	1261
		B		85.635	1.883	0.000	0.000	1042
		C		68.591	28.828	0.000	0.000	3568
T26	81'-61'	A	0.822	42.441	43.281	0.000	0.000	1232
		B		91.033	1.941	0.000	0.000	1086
		C		67.978	28.947	0.000	0.000	3543
T27	61'-41'	A	0.790	41.374	43.139	0.000	0.000	1195
		B		93.968	3.033	0.000	0.000	1097
		C		66.591	31.322	0.000	0.000	3576
T28	41'-20'	A	0.750	42.035	45.108	0.000	0.000	1207
		B		95.992	3.185	0.000	0.000	1093
		C		68.706	32.700	0.000	0.000	3700
T29	20'-6'8-17/32"	A	0.750	20.017	21.480	0.000	0.000	575
		B		44.695	1.517	0.000	0.000	511
		C		33.193	15.572	0.000	0.000	1765
T30	6'8-17/32"-0'	A	0.750	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	0.000	0

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	457'-436'	A	0.000	1.141	0.402	1.600
		B	0.000	0.249	0.121	0.350
		C	0.000	3.362	2.319	4.716
T2	436'-421'	A	0.000	0.836	0.258	1.024
		B	0.000	0.479	0.205	0.587
		C	0.000	2.466	1.490	3.021
T3	421'-401'	A	0.000	0.951	0.296	1.171
		B	0.000	1.340	0.819	1.650
		C	0.000	2.810	1.711	3.461
T4	401'-396'	A	0.000	0.274	0.086	0.339
		B	0.000	0.412	0.256	0.510
		C	0.000	0.811	0.497	1.003
T5	396'-391'	A	0.000	0.198	0.062	0.245
		B	0.000	0.297	0.185	0.368
		C	0.000	0.585	0.359	0.724
T6	391'-386'	A	0.000	0.273	0.086	0.338
		B	0.000	0.410	0.256	0.509
		C	0.000	0.888	0.546	1.101
T7	386'-381'	A	0.000	0.197	0.062	0.244
		B	0.000	0.296	0.185	0.367
		C	0.000	0.727	0.448	0.903
T8	381'-376'	A	0.000	0.271	0.091	0.356
		B	0.000	0.408	0.271	0.536
		C	0.000	1.004	0.655	1.319
T9	376'-371'	A	0.000	0.196	0.062	0.244
		B	0.000	0.294	0.185	0.367
		C	0.000	0.724	0.448	0.902
T10	371'-366'	A	0.000	0.270	0.086	0.337
		B	0.000	0.407	0.256	0.507
		C	0.000	1.050	0.658	1.310
T11	366'-361'	A	0.000	0.194	0.062	0.243
		B	0.000	0.379	0.239	0.474
		C	0.000	0.902	0.584	1.127
T12	361'-341'	A	0.000	1.217	0.373	1.453
		B	0.000	2.867	1.695	3.423
		C	0.000	5.649	3.504	6.744
T13	341'-321'	A	0.000	0.939	0.313	1.187
		B	0.000	4.605	2.660	5.820
		C	0.000	4.228	2.786	5.344
T14	321'-301'	A	0.000	1.492	0.630	1.900
		B	0.000	6.761	4.080	8.609
		C	0.000	4.182	2.786	5.325
T15	301'-281'	A	0.000	1.472	0.630	1.890
		B	0.000	7.043	4.315	9.040
		C	0.000	4.221	2.836	5.418
T16	281'-261'	A	0.000	1.451	0.630	1.879
		B	0.000	7.522	4.656	9.737
		C	0.000	4.661	3.120	6.033
T17	261'-241'	A	0.000	2.919	2.088	4.762
		B	0.000	10.333	7.829	16.858
		C	0.000	6.392	5.538	10.428
T18	241'-221'	A	0.000	5.321	4.145	8.200
		B	0.000	7.697	5.537	11.861
		C	0.000	6.045	4.981	9.315
T19	221'-201'	A	0.000	6.870	4.532	9.164
		B	0.000	7.571	4.741	10.100
		C	0.000	7.492	5.316	9.995
T20	201'-181'	A	0.000	6.760	4.532	9.126
		B	0.000	7.435	4.741	10.037
		C	0.000	8.044	5.552	10.860
T21	181'-161'	A	0.000	6.640	4.606	9.230

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
		B	0.000	7.616	4.935	10.587
		C	0.000	7.909	5.644	10.994
T22	161'-141'	A	0.000	7.040	5.748	11.417
		B	0.000	7.589	5.724	12.307
		C	0.000	7.741	6.487	12.553
T23	141'-121'	A	0.000	7.701	6.138	12.703
		B	0.000	7.869	5.906	12.981
		C	0.000	7.700	6.651	12.701
T24	121'-101'	A	0.000	7.670	5.256	11.052
		B	0.000	7.775	5.112	11.203
		C	0.000	8.046	6.094	11.594
T25	101'-81'	A	0.000	7.759	5.398	11.449
		B	0.000	7.669	5.203	11.317
		C	0.000	8.702	6.590	12.841
T26	81'-61'	A	0.000	7.447	5.398	11.321
		B	0.000	7.908	5.620	12.022
		C	0.000	8.400	6.631	12.770
T27	61'-41'	A	0.000	7.052	5.398	11.155
		B	0.000	7.930	5.890	12.543
		C	0.000	8.148	6.854	12.888
T28	41'-20'	A	0.000	6.683	5.492	11.138
		B	0.000	7.456	5.992	12.427
		C	0.000	7.755	6.988	12.925
T29	20'-6'8-17/32"	A	0.000	3.936	2.653	5.380
		B	0.000	4.297	2.845	5.874
		C	0.000	4.612	3.387	6.304
T30	6'8-17/32"-0'	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	457'-436'	-0.7163	1.3255	-1.3295	1.4208
T2	436'-421'	-0.7702	1.0547	-1.3635	0.9382
T3	421'-401'	0.6155	1.7028	-0.3106	1.5069
T4	401'-396'	0.6363	1.4526	-0.1498	1.3070
T5	396'-391'	0.7643	1.7448	-0.1874	1.6492
T6	391'-386'	0.7040	1.6610	-0.0736	1.5200
T7	386'-381'	0.9556	2.3401	0.0463	2.2822
T8	381'-376'	0.7581	1.8564	0.0364	1.7604
T9	376'-371'	0.9321	2.2824	0.0471	2.2496
T10	371'-366'	0.7253	2.0698	-0.0066	1.9333
T11	366'-361'	0.8469	2.8257	0.0677	2.6812
T12	361'-341'	0.9209	2.2720	0.2475	1.8729
T13	341'-321'	2.3214	1.5065	1.9151	1.0841
T14	321'-301'	3.1443	-0.4456	2.5879	-0.4336
T15	301'-281'	3.3005	-0.4074	2.7462	-0.3881
T16	281'-261'	3.3014	-0.1828	2.7515	-0.1260
T17	261'-241'	2.1187	-1.1046	2.2497	-1.0506
T18	241'-221'	1.4350	-2.8289	2.2226	-2.4341
T19	221'-201'	0.7711	-2.2607	1.8563	-2.1042
T20	201'-181'	0.4706	-2.0519	1.2461	-1.6957
T21	181'-161'	0.5066	-2.1359	1.3053	-1.8894
T22	161'-141'	0.0835	-1.9475	0.8908	-1.7890

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T23	141'-121'	-0.3882	-1.9226	0.8042	-2.0464
T24	121'-101'	-0.6322	-1.7472	0.8551	-1.9752
T25	101'-81'	-0.8760	-1.3825	0.8593	-1.6530
T26	81'-61'	-0.6562	-1.5122	1.0638	-1.8227
T27	61'-41'	-0.7401	-1.4129	0.8986	-1.7181
T28	41'-20'	-0.7617	-1.4149	0.8005	-1.7129
T29	20'-6'8-17/32"	-0.6025	-1.1590	0.5392	-1.2846
T30	6'8-17/32"-0'	0.0000	0.0000	0.0000	0.0000

Antenna Pole Forces *dielectric TFU-33J*

Length of Pole	Ix	Iy	Modulus E		Antenna Pole C_AA_A	Antenna Pole Weight	Length of Beacon	Beacon C_AA_A	Beacon Weight
ft	in^4	in^4	ksi		ft^2/ft	plf	ft	ft^2	lb
32'	655.5500	655.5500	10000	No Ice	2.33	75.00	0'	0.00	0
				With Ice	2.48	86.50		0.00	0

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 lb
12" x 3' Beacon	A	From Centroid-Leg	0.00 / 0' / 34'	0.0000	457'	No Ice	2.40	2.40	21
						1/2" Ice	2.67	2.67	49
						1" Ice	2.96	2.96	79
						2" Ice	3.56	3.56	150
						4" Ice	4.89	4.89	337
3" x 6" SideLight	A	From Leg	1.00 / 0' / 0'	0.0000	333'	No Ice	0.10	0.10	1
						1/2" Ice	0.16	0.16	2
						1" Ice	0.22	0.22	5
						2" Ice	0.39	0.39	12
						4" Ice	0.86	0.86	43
3" x 6" SideLight	B	From Leg	1.00 / 0' / 0'	0.0000	333'	No Ice	0.10	0.10	1
						1/2" Ice	0.16	0.16	2
						1" Ice	0.22	0.22	5
						2" Ice	0.39	0.39	12
						4" Ice	0.86	0.86	43
3" x 6" SideLight	C	From Leg	1.00 / 0' / 0'	0.0000	333'	No Ice	0.10	0.10	1
						1/2" Ice	0.16	0.16	2
						1" Ice	0.22	0.22	5
						2" Ice	0.39	0.39	12
						4" Ice	0.86	0.86	43
3" x 6" SideLight	A	From Leg	1.00 / 0' / 0'	0.0000	215'	No Ice	0.10	0.10	1
						1/2" Ice	0.16	0.16	2
						1" Ice	0.22	0.22	5
						2" Ice	0.39	0.39	12
						4" Ice	0.86	0.86	43

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
3" x 6" SideLight	B	From Leg	1.00 0' 0'	0.0000	215'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.16 0.22 0.39 0.86	0.10 0.16 0.22 0.39 0.86	1 2 5 12 43
3" x 6" SideLight	C	From Leg	1.00 0' 0'	0.0000	215'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.16 0.22 0.39 0.86	0.10 0.16 0.22 0.39 0.86	1 2 5 12 43
3" x 6" SideLight	A	From Leg	1.00 0' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.16 0.22 0.39 0.86	0.10 0.16 0.22 0.39 0.86	1 2 5 12 43
3" x 6" SideLight	B	From Leg	1.00 0' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.16 0.22 0.39 0.86	0.10 0.16 0.22 0.39 0.86	1 2 5 12 43
3" x 6" SideLight	C	From Leg	1.00 0' 0'	0.0000	112'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.10 0.16 0.22 0.39 0.86	0.10 0.16 0.22 0.39 0.86	1 2 5 12 43
* ***									
BCD-87077	B	From Leg	4.00 0' 5'	-70.0000	445'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.06 4.27 5.49 7.55 10.52	3.06 4.27 5.49 7.55 10.52	27 49 79 163 429
BCD-87077	C	Stand-Off Right	0.50 2' 7'	-70.0000	445'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.06 4.27 5.49 7.55 10.52	3.06 4.27 5.49 7.55 10.52	27 49 79 163 429
Side Arm Mount [SO 306-1]	B	From Leg	2.00 0' 0'	-70.0000	445'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	2.18 3.80 5.42 8.66 15.14	42 62 83 123 205
Side Arm Mount [SO 304-1]	C	Stand-Off Right	0.50 2' 0'	-70.0000	445'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.00 1.37 2.11 3.59	0.94 1.45 1.96 2.98 5.02	23 32 41 59 94
***									
SRL-235-2	A	From Leg	6.00 0' 10'	40.0000	444'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 7.84 10.10 14.65 23.90	5.60 7.84 10.10 14.65 23.90	90 124 174 323 821
Side Arm Mount [SO 308-1]	A	From Leg	3.00 0' 0'	40.0000	444'	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.70 2.42 3.86	3.03 5.22 7.41 11.79	53 79 105 156

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						4" Ice	6.74	20.55	259
***									
BCD-87077	B	From Leg	6.00 0' 6'	-50.0000	441'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.06 4.27 5.49 7.55 10.52	3.06 4.27 5.49 7.55 10.52	27 49 79 163 429
Side Arm Mount [SO 308-1]	B	From Leg	3.00 0' 0'	-50.0000	441'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	3.03 5.22 7.41 11.79 20.55	53 79 105 156 259
***									
ERI 1183-3CP	C	None		0.0000	419'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	182.40 184.84 187.29 192.22 202.22	182.40 184.84 187.29 192.22 202.22	4350 6270 8216 12193 20480
***									
6014-2	C	None		0.0000	388'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	65.00 135.00 205.00 345.00 625.00	65.00 135.00 205.00 345.00 625.00	1086 2388 3690 6294 11502
***									
SHP-2AE	C	From Leg	1.00 0' 0'	-20.0000	367'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	39.75 41.11 42.49 45.26 50.88	122.77 124.60 126.43 130.11 137.59	220 780 1359 2576 5251
***									
DB806E-XT	A	From Leg	4.00 0' 4'	-60.0000	364'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.19 3.67 4.68 6.79	2.40 3.19 3.67 4.68 6.79	16 34 56 119 314
Side Arm Mount [SO 601-1]	A	From Leg	2.00 0' 0'	-60.0000	364'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.22 1.85 2.48 3.74 6.26	6.30 8.61 10.92 15.54 24.78	159 197 234 310 461
***									
455-6	B	From Leg	4.00 0' 10'	-20.0000	344'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.50 7.53 9.58 13.73 21.42	5.50 7.53 9.58 13.73 21.42	25 65 118 262 708
Side Arm Mount [SO 601-1]	B	From Leg	2.00 0' 0'	-20.0000	344'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.22 1.85 2.48 3.74 6.26	6.30 8.61 10.92 15.54 24.78	159 197 234 310 461
***									
AO9009-3	B	From Leg	4.00 0' 5'	-70.0000	342'	No Ice 1/2" Ice 1" Ice 2" Ice	2.55 3.60 4.67 6.14	2.55 3.60 4.67 6.14	11 30 56 127

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						4" Ice	8.75	8.75	357
455-6	A	From Leg	4.00 0' 10'	-60.0000	342'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.50 7.53 9.58 13.73 21.42	5.50 7.53 9.58 13.73 21.42	25 65 118 262 708
Side Arm Mount [SO 601-1]	A	From Leg	2.00 0' 0'	-60.0000	342'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.22 1.85 2.48 3.74 6.26	6.30 8.61 10.92 15.54 24.78	159 197 234 310 461
Side Arm Mount [SO 302-1]	B	From Leg	2.00 0' 0'	-70.0000	342'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.67 2.51 3.35 5.03 8.39	3.27 4.99 6.71 10.15 17.03	55 88 121 187 320
***									
455-6	A	From Leg	6.00 0' 10'	-50.0000	339'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.50 7.53 9.58 13.73 21.42	5.50 7.53 9.58 13.73 21.42	25 65 118 262 708
Side Arm Mount [SO 308-1]	A	From Leg	3.00 0' 0'	-50.0000	339'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.98 1.70 2.42 3.86 6.74	3.03 5.22 7.41 11.79 20.55	53 79 105 156 259
***									
PG1N0F-0090-310	A	From Leg	6.00 0' 5'	60.0000	330'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 4.03 5.03 6.26 8.83	3.00 4.03 5.03 6.26 8.83	28 50 78 155 395
Side Arm Mount [SO 602-1]	A	From Leg	3.00 0' 0'	60.0000	330'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.72 4.11 5.50 8.28 13.84	12.93 17.82 22.71 32.49 52.05	146 223 301 456 766
***									
7P-C1-2-CP-L	C	From Leg	4.00 0' 0'	-60.0000	328'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.00 8.00 9.00 11.00 15.00	7.00 8.00 9.00 11.00 15.00	250 350 450 650 1050
(3) Side Arm Mount [SO 701-1]	C	From Leg	1.50 0' 0'	-60.0000	328'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	65 79 93 121 177
***									
DB201-A	A	From Leg	6.00 0' 3'	0.0000	326'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.10 1.98 2.86 4.62 8.14	1.10 1.98 2.86 4.62 8.14	25 33 40 55 85
Side Arm Mount [SO 602-1]	A	From Leg	3.00 0'	0.0000	326'	No Ice 1/2" Ice	2.72 4.11	12.93 17.82	146 223

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0'			1" Ice	5.50	22.71	301
						2" Ice	8.28	32.49	456
						4" Ice	13.84	52.05	766
***									
PLC-1296	C	From Leg	6.00	-20.0000	325'	No Ice	0.61	1.31	6
			0'			1/2" Ice	1.25	2.86	8
			0'			1" Ice	1.89	4.41	10
						2" Ice	3.18	7.52	14
						4" Ice	5.76	13.73	22
***									
SRL310C-4HD	B	From Leg	6.00	0.0000	322'	No Ice	1.14	1.14	15
			0'			1/2" Ice	2.09	2.09	25
			5'			1" Ice	3.04	3.04	35
						2" Ice	4.94	4.94	55
						4" Ice	8.74	8.74	95
Side Arm Mount [SO 308-1]	B	From Leg	3.00	0.0000	322'	No Ice	0.98	3.03	53
			0'			1/2" Ice	1.70	5.22	79
			0'			1" Ice	2.42	7.41	105
						2" Ice	3.86	11.79	156
						4" Ice	6.74	20.55	259
Pipe Mount [PM 601-1]	A	From Leg	0.50	0.0000	322'	No Ice	3.00	0.90	65
			0'			1/2" Ice	3.74	1.12	79
			0'			1" Ice	4.48	1.34	93
						2" Ice	5.96	1.78	122
						4" Ice	8.92	2.66	178
***									
6014-2	A	None		0.0000	310'	No Ice	65.00	65.00	1086
						1/2" Ice	135.00	135.00	2388
						1" Ice	205.00	205.00	3690
						2" Ice	345.00	345.00	6294
						4" Ice	625.00	625.00	11502
***									
DB404-B	A	From Leg	1.00	0.0000	284'	No Ice	1.14	1.14	14
			0'			1/2" Ice	2.05	2.05	18
			0'			1" Ice	2.96	2.96	22
						2" Ice	4.79	4.79	31
						4" Ice	8.44	8.44	48
APC-301	C	From Leg	6.00	20.0000	284'	No Ice	3.00	3.00	13
			0'			1/2" Ice	4.23	4.23	35
			6'			1" Ice	5.47	5.47	65
						2" Ice	7.69	7.69	149
						4" Ice	10.71	10.71	417
Side Arm Mount [SO 308-1]	C	From Leg	3.00	20.0000	284'	No Ice	0.98	3.03	53
			0'			1/2" Ice	1.70	5.22	79
			0'			1" Ice	2.42	7.41	105
						2" Ice	3.86	11.79	156
						4" Ice	6.74	20.55	259
***									
BMR10-A-B1	B	From Leg	1.00	-30.0000	277'	No Ice	8.38	8.38	55
			0'			1/2" Ice	9.16	9.16	113
			6'			1" Ice	9.95	9.95	180
						2" Ice	11.56	11.56	340
						4" Ice	14.88	14.88	774
***									
***									
***									
***									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
ANT150F6	A	From Leg	6.00 0' 9'	0.0000	264'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.80 6.83 8.87 13.01 21.03	4.80 6.83 8.87 13.01 21.03	30 66 114 249 678
Side Arm Mount [SO 602-1]	A	From Leg	3.00 0' 0'	0.0000	264'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.72 4.11 5.50 8.28 13.84	12.93 17.82 22.71 32.49 52.05	146 223 301 456 766
**** DB809KT3E-Y	B	From Leg	3.00 0' 6'	-60.0000	255'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.39 4.55 5.73 7.38 10.25	3.39 4.55 5.73 7.38 10.25	30 55 86 173 441
Side Arm Mount [SO 203-1]	B	From Leg	1.50 0' 0'	-60.0000	255'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.96 4.10 5.24 7.52 12.08	3.36 4.68 6.00 8.64 13.92	125 154 182 239 353
*** *** APX16PV-16PVL w/ Mount Pipe	A	From Leg	3.00 -5' 0'	90.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.88 7.39 7.89 8.92 11.12	3.27 3.97 4.64 6.02 8.99	59 105 156 281 647
APX16PV-16PVL w/ Mount Pipe	B	From Leg	3.00 -5' 0'	70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.88 7.39 7.89 8.92 11.12	3.27 3.97 4.64 6.02 8.99	59 105 156 281 647
APX16PV-16PVL w/ Mount Pipe	C	From Leg	3.00 -5' 0'	-70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.88 7.39 7.89 8.92 11.12	3.27 3.97 4.64 6.02 8.99	59 105 156 281 647
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	3.00 5' 0'	90.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	83 173 273 506 1151
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	3.00 5' 0'	70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	83 173 273 506 1151
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	3.00 5' 0'	-70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.68 12.40 13.14 14.60 17.87	9.84 11.37 12.91 15.27 20.14	83 173 273 506 1151
ATBT-BOTTOM-24V	A	From Leg	3.00 5' 0'	90.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice	0.12 0.17 0.23 0.38	0.08 0.12 0.17 0.30	3 4 6 13

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 lb
						4" Ice	0.77	0.67	45
ATBT-BOTTOM-24V	B	From Leg	3.00 5' 0'	70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.77	0.08 0.12 0.17 0.30 0.67	3 4 6 13 45
ATBT-BOTTOM-24V	C	From Leg	3.00 5' 0'	-70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.12 0.17 0.23 0.38 0.77	0.08 0.12 0.17 0.30 0.67	3 4 6 13 45
KRY 112 489/2	A	From Leg	3.00 -5' 0'	90.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.65 0.77 0.89 1.16 1.82	0.42 0.52 0.63 0.88 1.47	15 20 27 46 110
KRY 112 489/2	B	From Leg	3.00 -5' 0'	70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.65 0.77 0.89 1.16 1.82	0.42 0.52 0.63 0.88 1.47	15 20 27 46 110
KRY 112 489/2	C	From Leg	3.00 -5' 0'	-70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.65 0.77 0.89 1.16 1.82	0.42 0.52 0.63 0.88 1.47	15 20 27 46 110
ATMAA1412D-1A20	A	From Leg	3.00 -5' 0'	90.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	13 21 30 56 137
ATMAA1412D-1A20	B	From Leg	3.00 -5' 0'	70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	13 21 30 56 137
ATMAA1412D-1A20	C	From Leg	3.00 -5' 0'	-70.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.31 1.47 1.81 2.58	0.47 0.57 0.69 0.95 1.57	13 21 30 56 137
2.4" Dia x 6-ft Pipe	A	From Leg	3.00 0' 0'	0.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.30 3.06 4.70	1.43 1.93 2.30 3.06 4.70	22 33 48 90 231
2.4" Dia x 6-ft Pipe	B	From Leg	3.00 0' 0'	0.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.30 3.06 4.70	1.43 1.93 2.30 3.06 4.70	22 33 48 90 231
2.4" Dia x 6-ft Pipe	C	From Leg	3.00 0' 0'	0.0000	247'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.93 2.30 3.06 4.70	1.43 1.93 2.30 3.06 4.70	22 33 48 90 231
Sector Mount [SM 301-3]	C	None		0.0000	247'	No Ice	29.61	29.61	1302

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 lb
						1/2" Ice	39.80	39.80	1843
						1" Ice	49.99	49.99	2383
						2" Ice	70.37	70.37	3465
						4" Ice	111.13	111.13	5628
***									
HBXX-6516DS-VTM w/ Mount Pipe	A	From Leg	4.00 -6' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.19 6.66 7.15 8.15 10.27	4.53 5.21 5.90 7.38 10.56	50 99 155 287 667
HBXX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.00 -6' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.19 6.66 7.15 8.15 10.27	4.53 5.21 5.90 7.38 10.56	50 99 155 287 667
HBXX-6516DS-VTM w/ Mount Pipe	C	From Leg	4.00 -6' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.19 6.66 7.15 8.15 10.27	4.53 5.21 5.90 7.38 10.56	50 99 155 287 667
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 -2' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.00 9.75 10.43 11.82 14.74	7.73 9.02 9.98 11.93 16.20	97 173 258 453 994
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 -2' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.00 9.75 10.43 11.82 14.74	7.73 9.02 9.98 11.93 16.20	97 173 258 453 994
SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 -2' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.00 9.75 10.43 11.82 14.74	7.73 9.02 9.98 11.93 16.20	97 173 258 453 994
LNX-8513DS-VTM w/ Mount Pipe	A	From Leg	4.00 2' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	65 134 211 393 903
LNX-6514DS-VTM w/ Mount Pipe	C	From Leg	4.00 2' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.68 9.31 9.93 11.20 13.85	7.42 8.45 9.34 11.18 15.22	79 152 233 420 938
LNX-8513DS-VTM w/ Mount Pipe	B	From Leg	4.00 2' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.65 9.31 9.93 11.20 13.87	7.08 8.27 9.18 11.02 15.06	65 134 211 393 903
RRH2X60-PCS	A	From Leg	4.00 -6' 2'	-20.0000	230'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.79 3.02 3.52 4.61	2.01 2.22 2.43 2.89 3.92	55 75 99 155 313
RRH2X60-PCS	B	From Leg	4.00 -6'	-20.0000	230'	No Ice 1/2" Ice	2.57 2.79	2.01 2.22	55 75

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			2'			1" Ice	3.02	2.43	99
						2" Ice	3.52	2.89	155
						4" Ice	4.61	3.92	313
RRH2X60-PCS	C	From Leg	4.00	-20.0000	230'	No Ice	2.57	2.01	55
			-6'			1/2" Ice	2.79	2.22	75
			2'			1" Ice	3.02	2.43	99
						2" Ice	3.52	2.89	155
						4" Ice	4.61	3.92	313
RRH2X60-AWS	A	From Leg	4.00	-20.0000	230'	No Ice	3.96	1.82	60
			2'			1/2" Ice	4.27	2.08	83
			2'			1" Ice	4.60	2.36	109
						2" Ice	5.27	2.96	173
						4" Ice	6.72	4.25	354
RRH2X60-AWS	B	From Leg	4.00	-20.0000	230'	No Ice	3.96	1.82	60
			2'			1/2" Ice	4.27	2.08	83
			2'			1" Ice	4.60	2.36	109
						2" Ice	5.27	2.96	173
						4" Ice	6.72	4.25	354
RRH2X60-AWS	C	From Leg	4.00	-20.0000	230'	No Ice	3.96	1.82	60
			2'			1/2" Ice	4.27	2.08	83
			2'			1" Ice	4.60	2.36	109
						2" Ice	5.27	2.96	173
						4" Ice	6.72	4.25	354
RRH2x60-700	A	From Leg	4.00	-20.0000	230'	No Ice	3.96	1.82	60
			-2'			1/2" Ice	4.27	2.08	83
			2'			1" Ice	4.60	2.36	109
						2" Ice	5.27	2.96	173
						4" Ice	6.72	4.25	354
RRH2x60-700	B	From Leg	4.00	-20.0000	230'	No Ice	3.96	1.82	60
			-2'			1/2" Ice	4.27	2.08	83
			2'			1" Ice	4.60	2.36	109
						2" Ice	5.27	2.96	173
						4" Ice	6.72	4.25	354
RRH2x60-700	C	From Leg	4.00	-20.0000	230'	No Ice	3.96	1.82	60
			-2'			1/2" Ice	4.27	2.08	83
			2'			1" Ice	4.60	2.36	109
						2" Ice	5.27	2.96	173
						4" Ice	6.72	4.25	354
(2) DB-T1-6Z-8AB-0Z	B	From Leg	4.00	-20.0000	230'	No Ice	5.60	2.33	44
			-2'			1/2" Ice	5.92	2.56	80
			2'			1" Ice	6.24	2.79	120
						2" Ice	6.91	3.28	213
						4" Ice	8.37	4.37	455
Sector Mount [SM 407-3]	C	None		0.0000	230'	No Ice	20.49	20.49	956
						1/2" Ice	30.39	30.39	1376
						1" Ice	40.29	40.29	1797
						2" Ice	60.09	60.09	2638
						4" Ice	99.69	99.69	4321
***									
***									
***									
DFPD1-52 w/ Mount Pipe	C	From Leg	1.00	60.0000	200'	No Ice	1.87	1.02	22
			0'			1/2" Ice	2.11	1.28	38
			0'			1" Ice	2.37	1.57	58
						2" Ice	2.94	2.23	109
						4" Ice	4.25	3.79	274
***									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
BMYD745K	A	From Leg	1.00 0' 0'	-80.0000	188'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.70 2.00 2.30 2.90 4.10	1.70 2.00 2.30 2.90 4.10	25 35 45 65 105
***									
ASP-960	A	From Leg	0.50 0' 0'	-80.0000	186'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.92 3.46 4.99 8.06 14.21	1.92 3.46 4.99 8.06 14.21	4 6 7 10 15
***									
1.9" x 5.5' Pipe (Horizontal)	B	From Leg	3.00 0' 0'	0.0000	150'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.22 1.66 2.12 3.05 5.02	0.04 0.06 0.10 0.20 0.51	14 24 39 85 241
***									
Pipe Mount [PM 601-1]	B	From Leg	0.50 0' 0'	0.0000	146'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	65 79 93 122 178
***									
3-FT Yagi	B	From Leg	0.67 0' 0'	20.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.50 0.84 1.52 2.88	0.21 0.69 1.17 2.13 4.05	7 13 19 32 57
2.4" Dia x 8-ft Mount Pipe	B	From Leg	0.67 0' 0'	0.0000	136'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	29 44 63 119 300
***									
***									
220-5	A	From Leg	6.00 0' 10'	-60.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.40 5.42 7.46 11.59 20.05	3.40 5.42 7.46 11.59 20.05	22 49 89 206 598
SRL-235-2	C	From Leg	2.00 0' 12'	60.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 7.84 10.10 14.65 23.90	5.60 7.84 10.10 14.65 23.90	90 124 174 323 821
Side Arm Mount [SO 602-1]	A	From Leg	3.00 0' 0'	-60.0000	133'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.72 4.11 5.50 8.28 13.84	12.93 17.82 22.71 32.49 52.05	146 223 301 456 766
***									
***									
PD1132-D	B	From Leg	0.50 0' 4'	80.0000	109'	No Ice 1/2" Ice 1" Ice 2" Ice	24.89 25.85 26.81 28.75	24.89 25.85 26.81 28.75	105 276 459 862

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 lb
						4" Ice	32.73	32.73	1822
***									
Side Arm Mount [SO 303-1]	B	From Leg	1.50 0' 0'	0.0000	108'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.24 3.19 4.14 6.04 9.84	5.32 7.69 10.06 14.80 24.28	115 159 202 290 465
***									
Pipe Mount [PM 601-1]	C	From Leg	0.50 0' 0'	0.0000	106'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	65 79 93 122 178
***									
PTP 900-13 w/ Mount Pipe	C	From Leg	2.00 0' 0'	50.0000	99'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.48 2.75 3.04 3.66 5.07	0.97 1.24 1.54 2.24 3.87	15 34 56 113 291
***									
CSI-AY/809-960/11	C	From Leg	2.00 0' -8'	-20.0000	62'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.50 0.84 1.52 2.88	0.21 0.69 1.17 2.13 4.05	7 13 19 32 57
(2) Side Arm Mount [SO 601-1]	C	From Leg	1.00 0' 0'	-20.0000	62'	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.22 1.85 2.48 3.74 6.26	6.30 8.61 10.92 15.54 24.78	159 197 234 310 461
******** ******									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
PR-950	C	Grid	From Leg	1.00 0' 0'	0.0000		106'	5.67	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	25.22 25.97 26.72 28.22 31.22	0 0 0 0 0
SPD4-5.2	C	Paraboloid w/Radome	From Leg	1.00 0' 0'	50.0000		178'	4.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	12.57 13.10 13.62 14.68 16.80	0 0 0 0 0
* * *											

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
***											
SPD3-5.8	A	Paraboloid w/Radome	From Leg	1.00 0' 0'	0.0000		322'	3.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.07 7.47 7.86 8.66 10.25	35 73 112 188 342
***											
P-9A72GN-U	C	Grid	From Leg	1.00 0' 0'	60.0000		206'	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.07 29.86 31.44 34.60	112 261 410 709 1306
***											
***											
***											
HPX6-65-P3A	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0' 0'	0.0000		150'	6.46	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.76 33.61 34.46 36.16 39.57	359 532 704 1049 1739
***											
PL6-65-PXA	B	Paraboloid w/Radome	From Leg	1.00 0' 0'	-50.0000		146'	6.36	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.75 32.59 33.43 35.10 38.45	161 167 174 186 211
***											
MGA2-16N	B	Grid	From Leg	0.67 0' 2'	0.0000		136'	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	20 38 55 90 160
MGAR3-23N	B	Grid	From Leg	0.67 0' -2'	20.0000		136'	3.38	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.00 9.45 9.90 10.79 12.59	30 79 127 224 418
***											
P-9A48GN-U	C	Grid	From Leg	1.00 0' 0'	-60.0000		117'	4.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	12.57 13.10 13.62 14.68 16.80	112 179 246 381 650
***											
SSH-9A72GN	B	Grid	From Leg	3.00 0' 0'	80.0000		108'	2.84	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.35 6.73 7.11 7.86 9.37	38 128 219 400 761
***											
SPD2-5.8	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0' 0'	0.0000		99'	2.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.41 3.68 4.21 5.28	22 40 60 90 160
***											
P-9A48GN-U	C	Grid	From Leg	2.00 0' 6'	-20.0000		62'	4.00	No Ice 1/2" Ice 1" Ice	12.57 13.10 13.62	112 179 246

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
SSH-9A72GN	C	Grid	From Leg	2.00 0' -1'	-60.0000		62'	6.00	2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.68 16.80 28.27 29.07 29.86 31.44 34.60	381 650 112 261 410 709 1306

Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	489 - 457	12.100	33	0.4846	0.2367
Antenna					
T1	457 - 436	9.263	32	0.2474	0.2436
T2	436 - 421	8.414	32	0.2386	0.2452
T3	421 - 401	7.926	31	0.2273	0.2498
T4	401 - 396	7.387	31	0.1939	0.2555
T5	396 - 391	7.264	31	0.1855	0.2569
T6	391 - 386	7.149	31	0.1756	0.2583
T7	386 - 381	7.038	31	0.1642	0.2597
T8	381 - 376	6.939	31	0.1511	0.2611
T9	376 - 371	6.868	31	0.1416	0.2630
T10	371 - 366	6.807	31	0.1333	0.2654
T11	366 - 361	6.748	31	0.1264	0.2650
T12	361 - 341	6.688	31	0.1204	0.2544
T13	341 - 321	6.468	31	0.0963	0.2150
T14	321 - 301	6.234	31	0.0887	0.1858
T15	301 - 281	5.953	31	0.0849	0.1615
T16	281 - 261	5.639	31	0.0785	0.1383
T17	261 - 241	5.341	31	0.0624	0.1155
T18	241 - 221	5.166	31	0.0350	0.1075
T19	221 - 201	5.081	35	0.0337	0.1017
T20	201 - 181	4.983	35	0.0462	0.0922
T21	181 - 161	4.808	35	0.0653	0.0788
T22	161 - 141	4.543	35	0.0845	0.0644
T23	141 - 121	4.209	35	0.0954	0.0574
T24	121 - 101	3.850	35	0.0968	0.0552
T25	101 - 81	3.480	35	0.1142	0.0623
T26	81 - 61	3.012	35	0.1398	0.0698
T27	61 - 41	2.433	35	0.1677	0.0767
T28	41 - 20	1.743	35	0.1926	0.0748
T29	20 - 6.70833	0.920	35	0.2110	0.0726
T30	6.70833 - 0	0.360	35	0.2456	0.0760

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
457'	12" x 3' Beacon	32	9.263	0.2474	0.2436	5115
446'6"	Guy	32	8.787	0.2351	0.2438	12568
445'	BCD-87077	32	8.731	0.2354	0.2439	16467
444'	SRL-235-2	32	8.695	0.2357	0.2440	20762
441'	BCD-87077	32	8.589	0.2369	0.2444	95410
419'	ERI 1183-3CP	31	7.869	0.2244	0.2504	48875
388'	6014-2	31	7.082	0.1691	0.2591	35158
381'	Guy	31	6.939	0.1511	0.2611	9548
367'	SHP-2AE	31	6.760	0.1276	0.2659	63961
364'	DB806E-XT	31	6.724	0.1239	0.2617	54554
344'	455-6	31	6.501	0.0993	0.2199	86386
342'	AO9009-3	31	6.479	0.0972	0.2166	96666
339'	455-6	31	6.446	0.0946	0.2118	114889
333'	3" x 6" SideLight	31	6.379	0.0916	0.2026	125855
330'	PG1N0F-0090-310	31	6.344	0.0906	0.1982	111785
328'	7P-C1-2-CP-L	31	6.321	0.0900	0.1953	104031
326'	DB201-A	31	6.297	0.0896	0.1925	97283
325'	PLC-1296	31	6.285	0.0894	0.1912	94259
322'	SPD3-5.8	31	6.247	0.0888	0.1871	87873

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
310'	6014-2	31	6.085	0.0869	0.1720	104021
284'	DB404-B	31	5.687	0.0802	0.1420	168683
277'	BMR10-A-B1	31	5.574	0.0767	0.1332	76018
264'	ANT150F6	31	5.379	0.0661	0.1181	28167
255'	DB809KT3E-Y	31	5.275	0.0537	0.1117	28988
251'	Guy	31	5.238	0.0475	0.1101	33041
247'	APX16PV-16PVL w/ Mount Pipe	31	5.207	0.0417	0.1089	38412
230'	HBXX-6516DS-VTM w/ Mount Pipe	35	5.109	0.0312	0.1047	155407
215'	3" x 6" SideLight	35	5.058	0.0366	0.0993	84936
206'	P-9A72GN-U	35	5.014	0.0423	0.0949	66366
200'	DFPD1-52 w/ Mount Pipe	35	4.977	0.0470	0.0916	58974
188'	BMYD745K	35	4.879	0.0582	0.0839	53040
186'	ASP-960	35	4.860	0.0602	0.0825	52206
178'	SPD4-5.2	35	4.774	0.0684	0.0765	52065
150'	HPX6-65-P3A	35	4.366	0.0921	0.0598	101992
146'	PL6-65-PXA	35	4.297	0.0940	0.0586	127220
138'	MGA2-16N	35	4.156	0.0957	0.0567	234936
136'	3-FT Yagi	35	4.120	0.0958	0.0562	290859
134'	MGAR3-23N	35	4.084	0.0958	0.0558	381184
133'	220-5	35	4.066	0.0958	0.0557	451252
131'	Guy	35	4.030	0.0957	0.0554	576269
117'	P-9A48GN-U	35	3.779	0.0986	0.0561	323998
112'	3" x 6" SideLight	35	3.689	0.1024	0.0577	100842
109'	PD1132-D	35	3.635	0.1053	0.0589	71319
108'	SSH-9A72GN	35	3.616	0.1063	0.0593	64978
106'	PR-950	35	3.578	0.1084	0.0602	54614
99'	SPD2-5.8	35	3.438	0.1166	0.0631	39477
68'	P-9A48GN-U	35	2.648	0.1577	0.0750	44855
62'	CSI-AY/809-960/11	35	2.465	0.1663	0.0765	45136
61'	SSH-9A72GN	35	2.433	0.1677	0.0767	44960

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	489 - 457	54.082	6	1.6346	0.5625
Antenna					
T1	457 - 436	44.285	6	0.9469	0.5851
T2	436 - 421	40.544	6	0.9220	0.5904
T3	421 - 401	37.957	6	0.8898	0.6046
T4	401 - 396	34.643	6	0.7918	0.6228
T5	396 - 391	33.871	6	0.7669	0.6274
T6	391 - 386	33.131	6	0.7377	0.6319
T7	386 - 381	32.407	6	0.7037	0.6364
T8	381 - 376	31.727	6	0.6647	0.6411
T9	376 - 371	31.144	6	0.6367	0.6490
T10	371 - 366	30.597	6	0.6127	0.6586
T11	366 - 361	30.062	6	0.5928	0.6597
T12	361 - 341	29.534	6	0.5761	0.6314
T13	341 - 321	27.585	6	0.5071	0.5266
T14	321 - 301	25.777	6	0.4762	0.4514
T15	301 - 281	24.011	6	0.4560	0.3902
T16	281 - 261	22.316	6	0.4142	0.3323
T17	261 - 241	20.824	6	0.3288	0.2758

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T18	241 - 221	19.834	6	0.2148	0.2588
T19	221 - 201	19.163	6	0.1857	0.2484
T20	201 - 181	18.494	6	0.2084	0.2318
T21	181 - 161	17.650	6	0.2582	0.2040
T22	161 - 141	16.566	6	0.3161	0.1733
T23	141 - 121	15.272	6	0.3566	0.1592
T24	121 - 101	13.890	10	0.3749	0.1561
T25	101 - 81	12.485	10	0.4343	0.1764
T26	81 - 61	10.745	10	0.5152	0.1980
T27	61 - 41	8.635	10	0.6049	0.2176
T28	41 - 20	6.163	10	0.6865	0.2120
T29	20 - 6.70833	3.243	10	0.7467	0.2056
T30	6.70833 - 0	1.266	10	0.8662	0.2149

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
457'	12" x 3' Beacon	6	44.285	0.9469	0.5851	1704
446'6"	Guy	6	42.257	0.9117	0.5860	4196
445'	BCD-87077	6	42.005	0.9124	0.5863	5503
444'	SRL-235-2	6	41.840	0.9133	0.5866	6947
441'	BCD-87077	6	41.353	0.9171	0.5876	32078
419'	ERI 1183-3CP	6	37.611	0.8814	0.6066	15509
388'	6014-2	6	32.694	0.7182	0.6346	11328
381'	Guy	6	31.727	0.6647	0.6411	3109
367'	SHP-2AE	6	30.168	0.5964	0.6617	18382
364'	DB806E-XT	6	29.849	0.5860	0.6510	15718
344'	455-6	6	27.864	0.5158	0.5395	22239
342'	AO9009-3	6	27.677	0.5099	0.5309	23877
339'	455-6	6	27.400	0.5021	0.5183	26754
333'	3" x 6" SideLight	6	26.853	0.4903	0.4945	34958
330'	PG1N0F-0090-310	6	26.582	0.4859	0.4832	37466
328'	7P-C1-2-CP-L	6	26.403	0.4833	0.4758	36612
326'	DB201-A	6	26.223	0.4811	0.4687	35797
325'	PLC-1296	6	26.134	0.4800	0.4651	35407
322'	SPD3-5.8	6	25.866	0.4771	0.4548	34401
310'	6014-2	6	24.800	0.4662	0.4165	37960
284'	DB404-B	6	22.563	0.4227	0.3415	35703
277'	BMR10-A-B1	6	21.991	0.4013	0.3197	20289
264'	ANT150F6	6	21.020	0.3452	0.2821	8597
255'	DB809KT3E-Y	6	20.474	0.2924	0.2671	8819
251'	Guy	6	20.269	0.2675	0.2636	9944
247'	APX16PV-16PVL w/ Mount Pipe	6	20.082	0.2440	0.2612	11398
230'	HBXX-6516DS-VTM w/ Mount Pipe	6	19.447	0.1884	0.2537	33604
215'	3" x 6" SideLight	6	18.973	0.1890	0.2443	47086
206'	P-9A72GN-U	6	18.673	0.1997	0.2369	28150
200'	DFPD1-52 w/ Mount Pipe	6	18.457	0.2104	0.2307	22843
188'	BMYD745K	6	17.971	0.2387	0.2149	19046
186'	ASP-960	6	17.883	0.2441	0.2119	18554
178'	SPD4-5.2	6	17.503	0.2669	0.1991	17723
150'	HPX6-65-P3A	6	15.874	0.3424	0.1639	26373
146'	PL6-65-PXA	6	15.610	0.3497	0.1616	30285
138'	MGA2-16N	6	15.066	0.3595	0.1578	44341
136'	3-FT Yagi	6	14.928	0.3610	0.1569	50826

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
134'	MGAR3-23N	6	14.789	0.3624	0.1562	59575
133'	220-5	6	14.719	0.3630	0.1558	65184
131'	Guy	6	14.580	0.3643	0.1553	80309
117'	P-9A48GN-U	10	13.622	0.3830	0.1587	63851
112'	3" x 6" SideLight	10	13.282	0.3963	0.1635	26566
109'	PD1132-D	10	13.073	0.4057	0.1668	19664
108'	SSH-9A72GN	10	13.002	0.4091	0.1680	18097
106'	PR-950	10	12.859	0.4160	0.1704	15609
99'	SPD2-5.8	10	12.329	0.4419	0.1787	11873
68'	P-9A48GN-U	10	9.413	0.5719	0.2128	13729
62'	CSI-AY/809-960/11	10	8.749	0.6001	0.2172	13927
61'	SSH-9A72GN	10	8.635	0.6049	0.2176	13875

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	457	Leg	A307	0.8750	8	1391	12026	0.116	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1266	1964	0.645	1.333	Bolt Shear
		Horizontal	A307	0.5000	2	486	1964	0.248	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	0	1964	0.000	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	1606	1964	0.818	1.333	Bolt Shear
T2	436	Leg	A307	0.8750	8	1581	12026	0.131	1.333	Bolt Tension
		Diagonal	A325X	0.5000	2	1225	5890	0.208	1.333	Bolt Shear
		Horizontal	A307	0.5000	2	618	1964	0.315	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	392	1964	0.200	1.333	Bolt Shear
T3	421	Leg	A307	0.8750	8	3207	12026	0.267	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3475	4123	0.843	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	285	1964	0.145	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	296	1964	0.151	1.333	Bolt Shear
T4	401	Leg	A307	0.8750	8	9503	12026	0.790	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3732	4123	0.905	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	231	1964	0.118	1.333	Bolt Shear
T5	396	Diagonal	A325N	0.5000	2	3754	4123	0.911	1.333	Bolt Shear
T6	391	Diagonal	A325X	0.5000	2	4513	5890	0.766	1.333	Bolt Shear
T7	386	Diagonal	A325X	0.5000	2	4827	5133	0.940	1.333	Member Block Shear
T8	381	Leg	A307	0.8750	8	9248	12026	0.769	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3909	4123	0.948	1.333	Bolt Shear
T9	376	Diagonal	A325N	0.5000	2	4077	4123	0.989	1.333	Bolt Shear
T10	371	Diagonal	A325N	0.5000	2	3379	4123	0.820	1.333	Bolt Shear
T11	366	Diagonal	A325N	0.5000	2	3498	4123	0.848	1.333	Bolt Shear
T12	361	Leg	A307	0.8750	8	3211	12026	0.267	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3238	4123	0.785	1.333	Bolt Shear
		Secondary Horizontal	A325X	0.5000	1	1858	5890	0.315	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	382	1964	0.194	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	140	1964	0.071	1.333	Bolt Shear
T13	341	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	2092	4123	0.507	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	158	1964	0.081	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	138	1964	0.070	1.333	Bolt Shear
T14	321	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1258	1964	0.641	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A307	0.5000	2	157	1964	0.080	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	251	1964	0.128	1.333	Bolt Shear
T15	301	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1882	1964	0.959	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	105	1964	0.053	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	105	1964	0.053	1.333	Bolt Shear
T16	281	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	2424	4123	0.588	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	114	1964	0.058	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	176	1964	0.089	1.333	Bolt Shear
T17	261	Leg	A307	0.6250	8	3283	6136	0.535	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	4444	4123	1.078	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	227	1964	0.116	1.333	Bolt Shear
T18	241	Leg	A307	0.6250	8	0	6136	0.000	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3595	4123	0.872	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	281	1964	0.143	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	417	1964	0.212	1.333	Bolt Shear
T19	221	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1989	1964	1.013	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	187	1964	0.095	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	173	1964	0.088	1.333	Bolt Shear
T20	201	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1305	1964	0.665	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	175	1964	0.089	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	225	1964	0.115	1.333	Bolt Shear
T21	181	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	637	1964	0.324	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	293	3927	0.075	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	239	1964	0.122	1.333	Bolt Shear
T22	161	Leg	A307	0.6250	8	0	6136	0.000	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	1648	6443	0.256	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	280	1964	0.143	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	246	1964	0.125	1.333	Bolt Shear
T23	141	Leg	A307	0.6250	8	0	6136	0.000	1.333	Bolt Tension
		Diagonal	A325N	0.6250	2	2061	6443	0.320	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	572	1964	0.291	1.333	Bolt Shear
		Mid Girt	A325N	0.5000	2	3761	4123	0.912	1.333	Bolt Shear
		Torque Arm Top@131	A307	0.7500	2	6788	8836	0.768	1.333	Bolt Shear
		Torque Arm Bottom@131	A307	0.7500	2	7637	8836	0.864	1.333	Bolt Shear
T24	121	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	2151	4123	0.522	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	2056	1964	1.047	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	241	1964	0.123	1.333	Bolt Shear
T25	101	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1175	1964	0.599	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	251	1964	0.128	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	357	1964	0.182	1.333	Bolt Shear
T26	81	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	516	1964	0.263	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	370	1964	0.189	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	375	1964	0.191	1.333	Bolt Shear
T27	61	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1128	1964	0.575	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	398	1964	0.203	1.333	Bolt Shear
		Mid Girt	A307	0.5000	2	359	1964	0.183	1.333	Bolt Shear
T28	41	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1808	1964	0.921	1.333	Bolt Shear
		Top Girt	A307	0.5000	2	278	1964	0.141	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Mid Girt	A307	0.5000	2	435	1964	0.222	1.333	Bolt Shear
T29	20	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	1643	1964	0.837	1.333	Bolt Shear
		Top Girt	A325N	0.5000	2	4940	8247	0.599	1.333	Bolt Shear
T30	6.70833	Leg	A307	0.8750	8	0	12026	0.000	1.333	Bolt Tension
		Diagonal	A307	0.5000	2	2078	1964	1.058	1.333	Bolt Shear

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T1	446'6" (A) (838)	9/16 EHS	2800	35000	12865	17500	2.000	2.721
	446'6" (B) (837)	9/16 EHS	2800	35000	13027	17500	2.000	2.687
	446'6" (C) (836)	9/16 EHS	2800	35000	12522	17500	2.000	2.795
T8	381' (A) (835)	1 3/8 BS	18560	232000	69617	116000	2.000	3.333
	381' (B) (834)	1 3/8 BS	18560	232000	70306	116000	2.000	3.300
	381' (C) (833)	1 3/8 BS	18560	232000	67534	116000	2.000	3.435
T17	251' (A) (832)	1 1/4 BS	15360	192000	49409	96000	2.000	3.886
	251' (B) (831)	1 1/4 BS	15360	192000	50175	96000	2.000	3.827
	251' (C) (830)	1 1/4 BS	15360	192000	49156	96000	2.000	3.906
T23	131' (A) (824)	11/16 EHS	6000	50000	15272	25000	2.000	3.274
	131' (A) (825)	11/16 EHS	6000	50000	15441	25000	2.000	3.238
	131' (B) (818)	11/16 EHS	6000	50000	15603	25000	2.000	3.205
	131' (B) (819)	11/16 EHS	6000	50000	15198	25000	2.000	3.290
	131' (C) (812)	11/16 EHS	6000	50000	14996	25000	2.000	3.334
	131' (C) (813)	11/16 EHS	6000	50000	15213	25000	2.000	3.287

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	3	21'	5'3"	84.0 K=1.00	1.00	14.032	7.0686	-24829	99189	0.250
T2	436 - 421	2 3/4	15'	5'	87.3 K=1.00	1.00	13.708	5.9396	-35526	81422	0.436
T3	421 - 401	2 3/4	20'	5'	87.3 K=1.00	1.00	13.708	5.9396	-83883	81422	1.030
T4	401 - 396	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2 K=1.00	1.00	15.503	9.7900	-98990	151769	0.652

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T5	396 - 391	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2 K=1.00	1.00	15.503	9.7900	-114495	151769	0.754
T6	391 - 386	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2 K=1.00	1.00	15.503	9.7900	-131057	151769	0.864
T7	386 - 381	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2 K=1.00	1.00	15.503	9.7900	-150370	151769	0.991
T8	381 - 376	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5 K=1.00	1.00	15.820	11.0000	-155345	174023	0.893
T9	376 - 371	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5 K=1.00	1.00	15.820	11.0000	-140860	174023	0.809
T10	371 - 366	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5 K=1.00	1.00	15.820	11.0000	-128388	174023	0.738
T11	366 - 361	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5 K=1.00	1.00	15.820	11.0000	-117120	174023	0.673
T12	361 - 341	3	20'	2'6"	40.0 K=1.00	0.98	17.416	7.0686	-107292	123109	0.872
T13	341 - 321	3	20'	5'	80.0 K=1.00	1.00	14.419	7.0686	-77670	101923	0.762
T14	321 - 301	3	20'	5'	80.0 K=1.00	1.00	14.419	7.0686	-53226	101923	0.522*
T15	301 - 281	3	20'	5'	80.0 K=1.00	1.00	14.419	7.0686	-86766	101923	0.851
T16	281 - 261	3	20'	5'	80.0 K=1.00	1.00	14.419	7.0686	-120546	101923	1.183
T17	261 - 241	3	20'	2'6"	40.0 K=1.00	0.99	17.453	7.0686	-142318	123367	1.154
T18	241 - 221	3	20'	5'	80.0 K=1.00	1.00	14.419	7.0686	-112109	101923	1.100
T19	221 - 201	3 1/4	20'	5'	73.8 K=1.00	1.00	14.994	8.2958	-83875	124390	0.674*
T20	201 - 181	3 1/4	20'	5'	73.8 K=1.00	1.00	14.994	8.2958	-87455	124390	0.703*
T21	181 - 161	3 1/4	20'	5'	73.8 K=1.00	1.00	14.994	8.2958	-91102	124390	0.732*
T22	161 - 141	3 1/2	20'	5'	68.6 K=1.00	1.00	15.468	9.6211	-94747	148821	0.637*
T23	141 - 121	3 1/2	20'	5'	68.6 K=1.00	1.00	15.468	9.6211	-98902	148821	0.665*
T24	121 - 101	3 1/2	20'	5'	68.6 K=1.00	1.00	15.468	9.6211	-110248	148821	0.741*
T25	101 - 81	3 1/2	20'	5'	68.6 K=1.00	1.00	15.468	9.6211	-158080	148821	1.062
T26	81 - 61	3 1/2	20'	5'	68.6 K=1.00	1.00	15.468	9.6211	-161046	148821	1.082
T27	61 - 41	3 1/2	20'	5'	68.6 K=1.00	1.00	15.468	9.6211	-159062	148821	1.069
T28	41 - 20	3 1/2	21'	5'3"	72.0 K=1.00	1.00	15.162	9.6211	-122817	145878	0.842*
T29	20 - 6.70833	3 1/4	13'5-9/32"	4'5-3/4"	66.2 K=1.00	1.00	15.680	8.2958	-128533	130073	0.988*
T30	6.70833 - 0	3 1/4	6'10-7/16"	2'3-15/32"	33.8 K=1.00	0.92	16.616	8.2958	-132787	137843	0.963*

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	L2 1/2x2x1/4	7'7-13/16"	3'7-9/16"	107.0 K=1.04	11.608	1.0600	-1970	12305	0.160
T2	436 - 421	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-2451	9586	0.256
T3	421 - 401	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-6951	9586	0.725
T4	401 - 396	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-7463	9586	0.779
T5	396 - 391	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-7509	9586	0.783
T6	391 - 386	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-9026	9586	0.942
T7	386 - 381	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-8376	9586	0.874
T8	381 - 376	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-6549	9586	0.683
T9	376 - 371	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-8153	9586	0.851
T10	371 - 366	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-6759	9586	0.705
T11	366 - 361	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-6996	9586	0.730
T12	361 - 341	L2 1/2x2x3/16	7'6"	3'9"	105.4 K=1.00	11.792	0.8090	-6476	9539	0.679
T13	341 - 321	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-4183	9586	0.436
T14	321 - 301	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-2516	9586	0.262
T15	301 - 281	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-3764	9586	0.393
T16	281 - 261	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-4849	9586	0.506
T17	261 - 241	L3x3x1/4	7'6"	3'9"	76.0 K=1.00	15.793	1.4400	-8743	22742	0.384
T18	241 - 221	L3x3x1/4	7'6"	3'6-19/32"	84.0 K=1.17	14.904	1.4400	-7190	21462	0.335
T19	221 - 201	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-3978	9586	0.415
T20	201 - 181	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-2609	9586	0.272
T21	181 - 161	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-1273	9586	0.133
T22	161 - 141	L3x3x1/4	7'6"	3'6-15/32"	83.8 K=1.17	14.931	1.4400	-3296	21501	0.153
T23	141 - 121	L3x3x1/4	7'6"	3'6-15/32"	83.8 K=1.17	14.931	1.4400	-4122	21501	0.192
T24	121 - 101	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-4302	9586	0.449
T25	101 - 81	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-2350	9586	0.245
T26	81 - 61	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-1031	9586	0.108
T27	61 - 41	L2 1/2x2x3/16	7'6"	3'6-19/32"	104.9 K=1.05	11.849	0.8090	-2256	9586	0.235

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T28	41 - 20	L2 1/2x2x3/16	7'7-13/16"	3'7-9/16"	106.5 K=1.04	11.669	0.8090	-3615	9441	0.383
T29	20 - 6.70833	L2x2x3/16	5'9-31/32"	3'1-3/16"	100.9 K=1.07	12.289	0.7150	-1198	8787	0.136
T30	6.70833 - 0	L2x2x3/16	2'7-3/32"	1'3-1/8"	58.9 K=1.53	16.291	0.7150	-3425	11648	0.294*

* DL controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	L2 1/2x2x1/4	6'	5'4-3/16"	139.4 K=0.92	7.685	1.0600	-973	8147	0.119*
T2	436 - 421	L2 1/2x2x1/4	6'	5'4-9/16"	139.8 K=0.92	7.646	1.0600	-388	8104	0.048

* DL controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T12	361 - 341	L2x2x1/4	6'	5'9"	88.2 K=0.50	14.413	0.9380	-1858	13520	0.137
T17	261 - 241	2L3 1/2x3 1/2x3/8x3/8	6'	5'9"	32.2 K=0.50	19.781	4.9700	-2472	98310	0.025

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	C8x13.75	6'	5'9"	124.6 K=1.00	9.514	4.0400	-1	38437	0.000
T3	421 - 401	L2 1/2x2x1/4	6'	5'4-9/16"	139.8 K=0.92	7.646	1.0600	-76	8104	0.009
T4	401 - 396	L2 1/2x2x1/4	6'	5'4-9/16"	139.8 K=0.92	7.646	1.0600	-320	8104	0.040
T12	361 - 341	L2 1/2x2x1/4	6'	5'8-1/32"	147.5 K=0.92	6.859	1.0600	-372	7271	0.051
T23	141 - 121	L2 1/2x2x3/16	6'	5'3-23/32"	138.0 K=0.92	7.839	0.8090	-167	6342	0.026
T24	121 - 101	L2 1/2x2x3/16	6'	5'3-23/32"	138.0	7.839	0.8090	-4113	6342	0.648

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T27	61 - 41	L2 1/2x2x3/16	6'	5'3-23/32"	K=0.92 138.0 K=0.92	7.839	0.8090	-9	6342	0.001

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T3	421 - 401	L2 1/2x2x1/4	6'	5'4-9/16"	139.8 K=0.92	7.646	1.0600	-466	8104	0.058
T14	321 - 301	L2 1/2x2x1/4	6'	5'4-3/16"	139.4 K=0.92	7.685	1.0600	-143	8147	0.018
T18	241 - 221	L2 1/2x2x3/16	6'	5'4-3/16"	138.7 K=0.92	7.758	0.8090	-197	6276	0.031
T23	141 - 121	L2 1/2x2x3/16	6'	5'3-23/32"	138.0 K=0.92	7.839	0.8090	-5222	6342	0.823

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T23	141 - 121 (814)	2L3x3x3/16	7'6-19/32"	6'11-13/32"	104.4 K=1.18	11.882	2.1800	-3	25902	0.000
T23	141 - 121 (821)	2L3x3x3/16	7'6-19/32"	6'11-13/32"	104.4 K=1.18	11.882	2.1800	-63	25902	0.002
T23	141 - 121 (826)	2L3x3x3/16	7'6-19/32"	6'11-13/32"	104.4 K=1.18	11.882	2.1800	-195	25902	0.008

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T23	141 - 121 (816)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	139.2 K=0.92	7.710	2.1800	-14714	16807	0.875
T23	141 - 121 (817)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	139.2 K=0.92	7.710	2.1800	-15233	16807	0.906
T23	141 - 121 (822)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	139.2 K=0.92	7.710	2.1800	-15266	16807	0.908
T23	141 - 121 (823)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	139.2 K=0.92	7.710	2.1800	-15273	16807	0.909
T23	141 - 121 (828)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	139.2 K=0.92	7.710	2.1800	-14449	16807	0.860
T23	141 - 121 (829)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	139.2 K=0.92	7.710	2.1800	-14878	16807	0.885

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	3	21'	5'3"	84.0	19.800	7.0686	14029	139958	0.100
T2	436 - 421	2 3/4	15'	5'	87.3	19.800	5.9396	19538	117604	0.166
T3	421 - 401	2 3/4	20'	5'	87.3	19.800	5.9396	61843	117604	0.526
T4	401 - 396	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2	19.800	9.7900	76024	193842	0.392
T5	396 - 391	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2	19.800	9.7900	90299	193842	0.466
T6	391 - 386	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2	19.800	9.7900	106694	193842	0.550
T7	386 - 381	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	5'	5'	68.2	19.800	9.7900	121519	193842	0.627
T8	381 - 376	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5	19.800	11.0000	73985	217800	0.340
T9	376 - 371	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5	19.800	11.0000	62104	217800	0.285
T10	371 - 366	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5	19.800	11.0000	47531	217800	0.218
T11	366 - 361	3.5" S.R. w/ 3.5 SCH40 Half Pipe	5'	5'	64.5	19.800	11.0000	35732	217800	0.164
T12	361 - 341	3	20'	2'6"	40.0	19.800	7.0686	25685	139958	0.184
T16	281 - 261	3	20'	5'	80.0	19.800	7.0686	16166	139958	0.116
T17	261 - 241	3	20'	2'6"	40.0	19.800	7.0686	34355	139958	0.245

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	L2 1/2x2x1/4	7'7-13/16'	3'7-9/16"	77.5	30.000	0.6778	2531	20334	0.124
T2	436 - 421	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	1989	15566	0.128
T3	421 - 401	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	6865	15566	0.441
T4	401 - 396	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	7294	15566	0.469
T5	396 - 391	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	7496	15566	0.482
T6	391 - 386	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	7786	15566	0.500
T7	386 - 381	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	9654	15566	0.620
T8	381 - 376	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	7817	15566	0.502

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T9	376 - 371	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	6922	15566	0.445
T10	371 - 366	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	6646	15566	0.427
T11	366 - 361	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	6680	15566	0.429
T12	361 - 341	L2 1/2x2x3/16	7'6"	3'9"	75.0	30.000	0.5189	6197	15566	0.398
T13	341 - 321	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	4140	15566	0.266
T14	321 - 301	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	2237	15566	0.144
T15	301 - 281	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	3394	15566	0.218
T16	281 - 261	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	4586	15566	0.295
T17	261 - 241	L3x3x1/4	7'6"	3'9"	48.4	29.000	0.9628	8887	27922	0.318
T18	241 - 221	L3x3x1/4	7'6"	3'6-19/32'	48.4	29.000	0.9628	7159	27922	0.256
T19	221 - 201	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	3818	15566	0.245
T20	201 - 181	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	2429	15566	0.156
T21	181 - 161	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	999	15566	0.064
T22	161 - 141	L3x3x1/4	7'6"	3'6-15/32'	48.4	29.000	0.9394	3018	27242	0.111
T23	141 - 121	L3x3x1/4	7'6"	3'6-15/32'	48.4	29.000	0.9394	4036	27242	0.148
T24	121 - 101	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	4079	15566	0.262
T25	101 - 81	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	2078	15566	0.134
T26	81 - 61	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	726	15566	0.047
T27	61 - 41	L2 1/2x2x3/16	7'6"	3'6-19/32'	75.0	30.000	0.5189	1961	15566	0.126
T28	41 - 20	L2 1/2x2x3/16	7'7-13/16'	3'7-9/16"	76.6	30.000	0.5189	3589	15566	0.231
T29	20 - 6.70833	L2x2x3/16	5'19/32"	2'9-3/8"	58.0	30.000	0.4484	3285	13451	0.244
T30	6.70833 - 0	L2x2x3/16	3'1-5/16"	1'4-13/16'	31.1	30.000	0.4484	4157	13451	0.309*

* DL controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	467	20334	0.023*
T2	436 - 421	L2 1/2x2x1/4	6'	5'4-9/16"	116.9	30.000	0.6778	1236	20334	0.061

* DL controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T12	361 - 341	L2x2x1/4	6'	5'9"	113.3	29.000	0.5863	1858	17003	0.109
T17	261 - 241	2L3 1/2x3 1/2x3/8x3/8	6'	5'9"	64.5	21.600	4.9700	2472	107352	0.023

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	C8x13.75	6'	5'9"	112.2	19.800	4.0400	1	79992	0.000
T2	436 - 421	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	784	20334	0.039*
T3	421 - 401	L2 1/2x2x1/4	6'	5'4-9/16"	116.9	30.000	0.6778	571	20334	0.028
T4	401 - 396	L2 1/2x2x1/4	6'	5'4-9/16"	116.9	30.000	0.6778	461	20334	0.023
T6	391 - 386	L2 1/2x2x1/4	6'	5'8-9/32"	115.2	19.800	1.0600	601	20988	0.029
T10	371 - 366	L2 1/2x2x1/4	6'	5'8-1/32"	114.8	19.800	1.0600	788	20988	0.038
T12	361 - 341	L2 1/2x2x1/4	6'	5'8-1/32"	114.8	30.000	0.6778	764	20334	0.038
T13	341 - 321	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	317	20334	0.016
T14	321 - 301	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	315	20334	0.015
T15	301 - 281	L2 1/2x2x3/16	6'	5'4-3/16"	115.0	30.000	0.5189	210	15566	0.013*
T16	281 - 261	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	227	20334	0.011*
T17	261 - 241	L2 1/2x2x3/16	6'	5'9"	115.0	30.000	0.5189	455	15566	0.029*
T18	241 - 221	L2 1/2x2x3/16	6'	5'4-3/16"	115.0	30.000	0.5189	562	15566	0.036*
T19	221 - 201	L2 1/2x2x3/16	6'	5'4-3/16"	115.0	30.000	0.5189	374	15566	0.024*
T20	201 - 181	L2 1/2x2x3/16	6'	5'3-31/32'	114.6	30.000	0.5189	351	15566	0.023*
T21	181 - 161	2L3x2x1/4x3/8	6'	5'3-31/32'	77.2	30.000	1.5506	586	46519	0.013
T22	161 - 141	L2 1/2x2x3/16	6'	5'3-31/32'	114.6	30.000	0.5189	560	15566	0.036
T23	141 - 121	L2 1/2x2x3/16	6'	5'3-23/32'	114.2	30.000	0.5189	1144	15566	0.074
T24	121 - 101	L2 1/2x2x3/16	6'	5'3-23/32'	114.2	30.000	0.5189	3822	15566	0.246
T25	101 - 81	L2 1/2x2x3/16	6'	5'3-23/32'	114.2	30.000	0.5189	502	15566	0.032*
T26	81 - 61	L2 1/2x2x3/16	6'	5'3-23/32'	114.2	30.000	0.5189	741	15566	0.048
T27	61 - 41	L2 1/2x2x3/16	6'	5'3-23/32'	114.2	30.000	0.5189	797	15566	0.051
T28	41 - 20	L2 1/2x2x3/16	6'	5'3-23/32'	114.2	30.000	0.5189	555	15566	0.036*
T29	20 - 6.70833	2L2 1/2x2x3/16x1/4	6'	5'3-23/32'	86.4	30.000	1.0371	9880	31113	0.318*

* DL controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	457 - 436	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	3212	20334	0.158
T3	421 - 401	L2 1/2x2x1/4	6'	5'4-9/16"	116.9	30.000	0.6778	592	20334	0.029
T12	361 - 341	L2 1/2x2x1/4	6'	5'9"	116.5	30.000	0.6778	279	20334	0.014
T13	341 - 321	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	277	20334	0.014
T14	321 - 301	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	501	20334	0.025
T15	301 - 281	L2 1/2x2x3/16	6'	5'4-3/16"	115.0	30.000	0.5189	210	15566	0.013*
T16	281 - 261	L2 1/2x2x1/4	6'	5'4-3/16"	116.5	30.000	0.6778	351	20334	0.017
T18	241 - 221	L2 1/2x2x3/16	6'	5'4-3/16"	115.0	30.000	0.5189	834	15566	0.054
T19	221 - 201	L2 1/2x2x3/16	6'	5'3-31/32' '	114.6	30.000	0.5189	346	15566	0.022*
T20	201 - 181	L2 1/2x2x3/16	6'	5'3-31/32' '	114.6	30.000	0.5189	451	15566	0.029
T21	181 - 161	L2 1/2x2x3/16	6'	5'3-31/32' '	114.6	30.000	0.5189	478	15566	0.031
T22	161 - 141	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	492	15566	0.032*
T23	141 - 121	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	7521	15566	0.483
T24	121 - 101	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	483	15566	0.031*
T25	101 - 81	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	713	15566	0.046
T26	81 - 61	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	750	15566	0.048
T27	61 - 41	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	717	15566	0.046
T28	41 - 20	L2 1/2x2x3/16	6'	5'3-23/32' '	114.2	30.000	0.5189	870	15566	0.056*

* DL controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	381 - 376	2L3x2x1/4x3/8	6'	5'8-9/32"	76.6	19.800	2.3800	21857	47124	0.464
T17	261 - 241	2L3 1/2x3 1/2x3/8x3/8	6'	5'9"	64.5	21.600	4.9700	19195	107352	0.179

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T23	141 - 121 (814)	2L3x3x3/16	7'6-19/32' '	6'11-13/32"	94.6	19.800	2.1800	13330	43164	0.309
T23	141 - 121 (815)	2L3x3x3/16	7'6-19/32' '	6'11-13/32"	94.6	19.800	2.1800	13093	43164	0.303
T23	141 - 121 (820)	2L3x3x3/16	7'6-19/32' '	6'11-13/32"	94.6	19.800	2.1800	13577	43164	0.315
T23	141 - 121 (821)	2L3x3x3/16	7'6-19/32' '	6'11-13/32"	94.6	19.800	2.1800	13139	43164	0.304

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T23	141 - 121 (826)	2L3x3x3/16	7'6-19/32"	6'11-13/32"	94.6	19.800	2.1800	13279	43164	0.308
T23	141 - 121 (827)	2L3x3x3/16	7'6-19/32"	6'11-13/32"	94.6	19.800	2.1800	13395	43164	0.310

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T23	141 - 121 (816)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	157.0	19.800	2.1800	7130	43164	0.165
T23	141 - 121 (817)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	157.0	19.800	2.1800	7294	43164	0.169
T23	141 - 121 (822)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	157.0	19.800	2.1800	7601	43164	0.176
T23	141 - 121 (823)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	157.0	19.800	2.1800	7696	43164	0.178
T23	141 - 121 (828)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	157.0	19.800	2.1800	7073	43164	0.164
T23	141 - 121 (829)	2L3x3x3/16	12'6-3/8"	11'9-31/32"	157.0	19.800	2.1800	7132	43164	0.165

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	457 - 436	Leg	3	2	-24829	132219	18.8	Pass
T2	436 - 421	Leg	2 3/4	44	-35526	108536	32.7	Pass
T3	421 - 401	Leg	2 3/4	74	-83883	108536	77.3	Pass
T4	401 - 381	Leg	3" S.R. w/ 3 SCH 40 Half Pipe and 3.75 x 5/16 Half Pipe	Note 1	Note 1	Note 1	83.4 59.3 (b)	Pass
T8	381 - 376	Leg	3.5" S.R. w/ 3.5 SCH40 Half Pipe	Note 1	Note 1	Note 1	68.8	Pass
T12	361 - 341	Leg	3	191	-107292	164104	65.4	Pass
T13	341 - 321	Leg	3	236	-77670	135863	57.2	Pass
T14	321 - 301	Leg	3	269	-53226	101923	52.2	Pass
T15	301 - 281	Leg	3	303	-86766	135863	63.9	Pass
T16	281 - 261	Leg	3	336	-120546	135863	88.7	Pass
T17	261 - 241	Leg	3	369	-142318	164448	86.5	Pass
T18	241 - 221	Leg	3	414	-112109	135863	82.5	Pass
T19	221 - 201	Leg	3 1/4	448	-83875	124390	67.4	Pass
T20	201 - 181	Leg	3 1/4	481	-87455	124390	70.3	Pass
T21	181 - 161	Leg	3 1/4	514	-91102	124390	73.2	Pass
T22	161 - 141	Leg	3 1/2	547	-94747	148821	63.7	Pass
T23	141 - 121	Leg	3 1/2	580	-98902	148821	66.5	Pass
T24	121 - 101	Leg	3 1/2	613	-110248	148821	74.1	Pass
T25	101 - 81	Leg	3 1/2	646	-158080	198378	79.7	Pass
T26	81 - 61	Leg	3 1/2	679	-161046	198378	81.2	Pass
T27	61 - 41	Leg	3 1/2	712	-159062	198378	80.2	Pass
T28	41 - 20	Leg	3 1/2	745	-122817	145878	84.2	Pass
T29	20 - 6.70833	Leg	3 1/4	773	-128533	130073	98.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T30	6.70833 - 0	Leg	3 1/4	797	-132787	137843	96.3	Pass
T1	457 - 436	Diagonal	L2 1/2x2x1/4	40	-1970	16403	12.0	Pass
							48.4 (b)	
T2	436 - 421	Diagonal	L2 1/2x2x3/16	53	-2451	12778	19.2	Pass
T3	421 - 401	Diagonal	L2 1/2x2x3/16	86	-6951	12778	54.4	Pass
							63.2 (b)	
T4	401 - 396	Diagonal	L2 1/2x2x3/16	113	-7463	12778	58.4	Pass
							67.9 (b)	
T5	396 - 391	Diagonal	L2 1/2x2x3/16	122	-7509	12778	58.8	Pass
							68.3 (b)	
T6	391 - 386	Diagonal	L2 1/2x2x3/16	134	-9026	12778	70.6	Pass
T7	386 - 381	Diagonal	L2 1/2x2x3/16	146	-8376	12778	65.5	Pass
							70.5 (b)	
T8	381 - 376	Diagonal	L2 1/2x2x3/16	152	-6549	12778	51.2	Pass
							71.1 (b)	
T9	376 - 371	Diagonal	L2 1/2x2x3/16	162	-8153	12778	63.8	Pass
							74.2 (b)	
T10	371 - 366	Diagonal	L2 1/2x2x3/16	176	-6759	12778	52.9	Pass
							61.5 (b)	
T11	366 - 361	Diagonal	L2 1/2x2x3/16	188	-6996	12778	54.7	Pass
							63.6 (b)	
T12	361 - 341	Diagonal	L2 1/2x2x3/16	230	-6476	12716	50.9	Pass
							58.9 (b)	
T13	341 - 321	Diagonal	L2 1/2x2x3/16	266	-4183	12778	32.7	Pass
							38.1 (b)	
T14	321 - 301	Diagonal	L2 1/2x2x3/16	279	-2516	12778	19.7	Pass
							48.1 (b)	
T15	301 - 281	Diagonal	L2 1/2x2x3/16	312	-3764	12778	29.5	Pass
							71.9 (b)	
T16	281 - 261	Diagonal	L2 1/2x2x3/16	345	-4849	12778	37.9	Pass
							44.1 (b)	
T17	261 - 241	Diagonal	L3x3x1/4	389	-8743	30315	28.8	Pass
							80.8 (b)	
T18	241 - 221	Diagonal	L3x3x1/4	443	-7190	28608	25.1	Pass
							65.4 (b)	
T19	221 - 201	Diagonal	L2 1/2x2x3/16	476	-3978	12778	31.1	Pass
							76.0 (b)	
T20	201 - 181	Diagonal	L2 1/2x2x3/16	509	-2609	12778	20.4	Pass
							49.9 (b)	
T21	181 - 161	Diagonal	L2 1/2x2x3/16	525	-1273	12778	10.0	Pass
							24.3 (b)	
T22	161 - 141	Diagonal	L3x3x1/4	554	-3296	28661	11.5	Pass
							19.2 (b)	
T23	141 - 121	Diagonal	L3x3x1/4	605	-4122	28661	14.4	Pass
							24.0 (b)	
T24	121 - 101	Diagonal	L2 1/2x2x3/16	632	-4302	12778	33.7	Pass
							39.1 (b)	
T25	101 - 81	Diagonal	L2 1/2x2x3/16	675	-2350	12778	18.4	Pass
							44.9 (b)	
T26	81 - 61	Diagonal	L2 1/2x2x3/16	689	-1031	12778	8.1	Pass
							19.7 (b)	
T27	61 - 41	Diagonal	L2 1/2x2x3/16	719	-2256	12778	17.7	Pass
							43.1 (b)	
T28	41 - 20	Diagonal	L2 1/2x2x3/16	755	-3615	12584	28.7	Pass
							69.1 (b)	
T29	20 - 6.70833	Diagonal	L2x2x3/16	779	3285	17930	18.3	Pass
							62.8 (b)	
T30	6.70833 - 0	Diagonal	L2x2x3/16	811	4157	13451	30.9	Pass
							79.4 (b)	
T1	457 - 436	Horizontal	L2 1/2x2x1/4	36	-973	8147	11.9	Pass
							18.6 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T2	436 - 421	Horizontal	L2 1/2x2x1/4	56	1236	27106	4.6	Pass
							23.6 (b)	
T12	361 - 341	Secondary Horizontal	L2x2x1/4	206	-1858	18022	10.3	Pass
							23.7 (b)	
T17	261 - 241	Secondary Horizontal	2L3 1/2x3 1/2x3/8x3/8	383	-2472	131047	1.9	Pass
T1	457 - 436	Top Girt	C8x13.75	6	-1	51237	0.2	Pass
T2	436 - 421	Top Girt	L2 1/2x2x1/4	8	784	20334	3.9	Pass
							15.0 (b)	
T3	421 - 401	Top Girt	L2 1/2x2x1/4	47	571	27106	2.1	Pass
							10.9 (b)	
T4	401 - 396	Top Girt	L2 1/2x2x1/4	78	-320	10803	3.0	Pass
							8.8 (b)	
T6	391 - 386	Top Girt	L2 1/2x2x1/4	128	601	27977	2.1	Pass
T10	371 - 366	Top Girt	L2 1/2x2x1/4	170	788	27977	2.8	Pass
T12	361 - 341	Top Girt	L2 1/2x2x1/4	184	-372	9692	3.8	Pass
							14.6 (b)	
T13	341 - 321	Top Girt	L2 1/2x2x1/4	194	317	27106	1.2	Pass
							6.1 (b)	
T14	321 - 301	Top Girt	L2 1/2x2x1/4	239	315	27106	1.2	Pass
							6.0 (b)	
T15	301 - 281	Top Girt	L2 1/2x2x3/16	272	210	15566	1.3	Pass
							4.0 (b)	
T16	281 - 261	Top Girt	L2 1/2x2x1/4	305	227	20334	1.1	Pass
							4.3 (b)	
T17	261 - 241	Top Girt	L2 1/2x2x3/16	340	455	15566	2.9	Pass
							8.7 (b)	
T18	241 - 221	Top Girt	L2 1/2x2x3/16	371	562	15566	3.6	Pass
							10.7 (b)	
T19	221 - 201	Top Girt	L2 1/2x2x3/16	417	374	15566	2.4	Pass
							7.1 (b)	
T20	201 - 181	Top Girt	L2 1/2x2x3/16	451	351	15566	2.3	Pass
							6.7 (b)	
T21	181 - 161	Top Girt	2L3x2x1/4x3/8	483	586	62010	0.9	Pass
							5.6 (b)	
T22	161 - 141	Top Girt	L2 1/2x2x3/16	516	560	20749	2.7	Pass
							10.7 (b)	
T23	141 - 121	Top Girt	L2 1/2x2x3/16	550	1144	20749	5.5	Pass
							21.9 (b)	
T24	121 - 101	Top Girt	L2 1/2x2x3/16	582	-4113	8454	48.6	Pass
							78.6 (b)	
T25	101 - 81	Top Girt	L2 1/2x2x3/16	615	502	15566	3.2	Pass
							9.6 (b)	
T26	81 - 61	Top Girt	L2 1/2x2x3/16	648	741	20749	3.6	Pass
							14.2 (b)	
T27	61 - 41	Top Girt	L2 1/2x2x3/16	682	797	20749	3.8	Pass
							15.2 (b)	
T28	41 - 20	Top Girt	L2 1/2x2x3/16	714	555	15566	3.6	Pass
							10.6 (b)	
T29	20 - 6.70833	Top Girt	2L2 1/2x2x3/16x1/4	777	9880	31113	31.8	Pass
							44.9 (b)	
T1	457 - 436	Mid Girt	L2 1/2x2x1/4	13	3212	27106	11.9	Pass
							61.4 (b)	
T3	421 - 401	Mid Girt	L2 1/2x2x1/4	81	-466	10803	4.3	Pass
							11.3 (b)	
T12	361 - 341	Mid Girt	L2 1/2x2x1/4	197	279	27106	1.0	Pass
							5.3 (b)	
T13	341 - 321	Mid Girt	L2 1/2x2x1/4	242	277	27106	1.0	Pass
							5.3 (b)	
T14	321 - 301	Mid Girt	L2 1/2x2x1/4	277	501	27106	1.9	Pass
							9.6 (b)	
T15	301 - 281	Mid Girt	L2 1/2x2x3/16	308	210	15566	1.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
							4.0 (b)	
T16	281 - 261	Mid Girt	L2 1/2x2x1/4	343	351	27106	1.3	Pass
							6.7 (b)	
T18	241 - 221	Mid Girt	L2 1/2x2x3/16	420	834	20749	4.0	Pass
							15.9 (b)	
T19	221 - 201	Mid Girt	L2 1/2x2x3/16	453	346	15566	2.2	Pass
							6.6 (b)	
T20	201 - 181	Mid Girt	L2 1/2x2x3/16	486	451	20749	2.2	Pass
							8.6 (b)	
T21	181 - 161	Mid Girt	L2 1/2x2x3/16	519	478	20749	2.3	Pass
							9.1 (b)	
T22	161 - 141	Mid Girt	L2 1/2x2x3/16	553	492	15566	3.2	Pass
							9.4 (b)	
T23	141 - 121	Mid Girt	L2 1/2x2x3/16	585	-5222	8454	61.8	Pass
							68.4 (b)	
T24	121 - 101	Mid Girt	L2 1/2x2x3/16	619	483	15566	3.1	Pass
							9.2 (b)	
T25	101 - 81	Mid Girt	L2 1/2x2x3/16	651	713	20749	3.4	Pass
							13.6 (b)	
T26	81 - 61	Mid Girt	L2 1/2x2x3/16	684	750	20749	3.6	Pass
							14.3 (b)	
T27	61 - 41	Mid Girt	L2 1/2x2x3/16	717	717	20749	3.5	Pass
							13.7 (b)	
T28	41 - 20	Mid Girt	L2 1/2x2x3/16	747	870	15566	5.6	Pass
							16.6 (b)	
T1	457 - 436	Guy A@446.5	9/16	838	12865	17500	73.5	Pass
T8	381 - 376	Guy A@381	1 3/8	835	69617	116000	60.0	Pass
T17	261 - 241	Guy A@251	1 1/4	832	49409	96000	51.5	Pass
T23	141 - 121	Guy A@131	11/16	825	15441	25000	61.8	Pass
T1	457 - 436	Guy B@446.5	9/16	837	13027	17500	74.4	Pass
T8	381 - 376	Guy B@381	1 3/8	834	70306	116000	60.6	Pass
T17	261 - 241	Guy B@251	1 1/4	831	50175	96000	52.3	Pass
T23	141 - 121	Guy B@131	11/16	818	15603	25000	62.4	Pass
T1	457 - 436	Guy C@446.5	9/16	836	12522	17500	71.6	Pass
T8	381 - 376	Guy C@381	1 3/8	833	67534	116000	58.2	Pass
T17	261 - 241	Guy C@251	1 1/4	830	49156	96000	51.2	Pass
T23	141 - 121	Guy C@131	11/16	813	15213	25000	60.9	Pass
T8	381 - 376	Top Guy Pull-Off@381	2L3x2x1/4x3/8	142	21857	62816	34.8	Pass
T17	261 - 241	Top Guy Pull-Off@251	2L3 1/2x3 1/2x3/8x3/8	376	19195	143100	13.4	Pass
T23	141 - 121	Torque Arm Top@131	2L3x3x3/16	820	13577	57538	23.6	Pass
							57.6 (b)	
T23	141 - 121	Torque Arm Bottom@131	2L3x3x3/16	823	-15273	22404	68.2	Pass

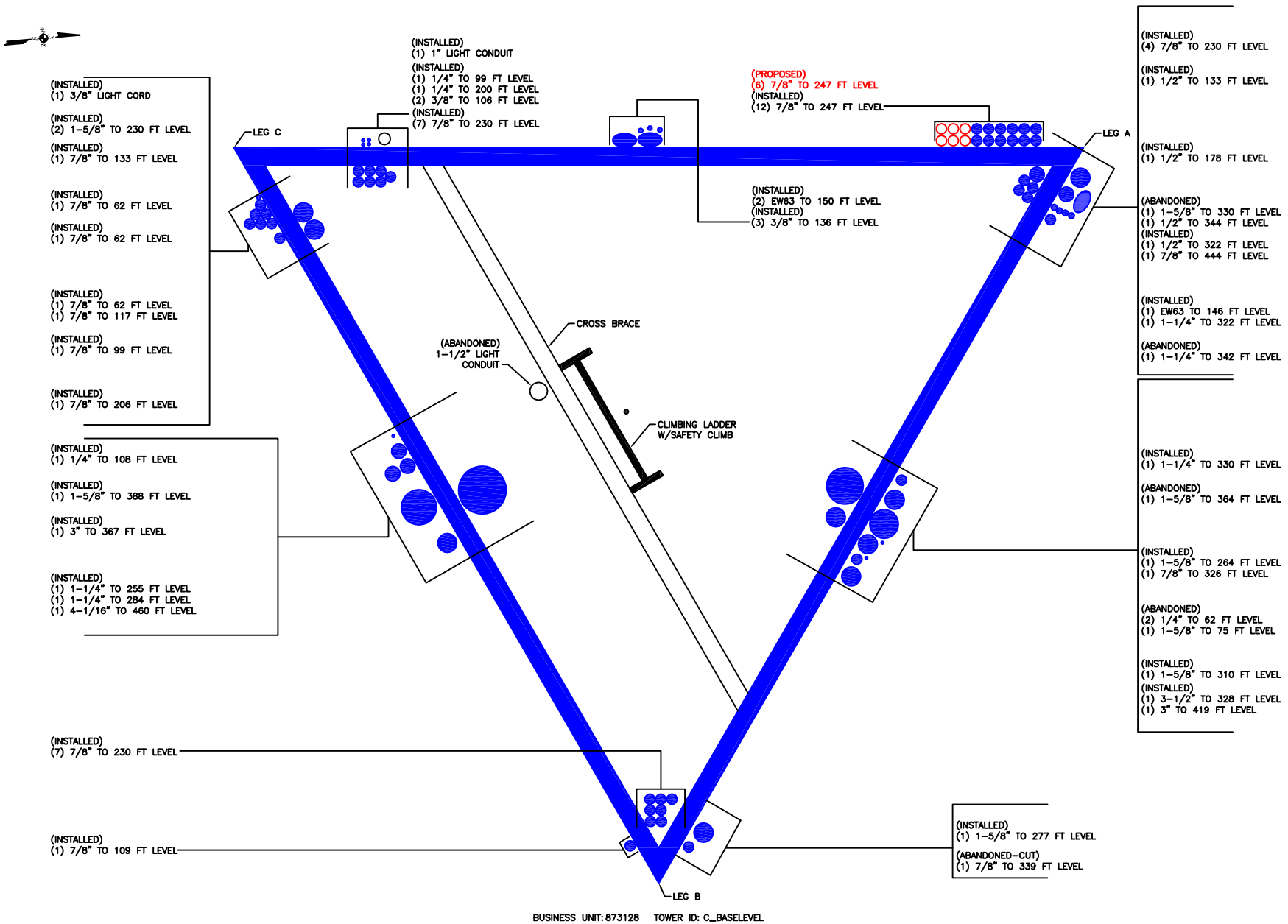
Summary		
Leg (T29)	98.8	Pass
Diagonal (T17)	80.8	Pass
Horizontal (T2)	23.6	Pass
Secondary Horizontal (T12)	23.7	Pass
Top Girt (T24)	78.6	Pass
Mid Girt (T23)	68.4	Pass
Guy A (T1)	73.5	Pass
Guy B (T1)	74.4	Pass
Guy C (T1)	71.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Top Guy Pull-Off (T8)	34.8	Pass
						Torque Arm Top (T23)	57.6	Pass
						Torque Arm Bottom (T23)	68.2	Pass
						Bolt Checks	80.8	Pass
						RATING =	**98.8**	**Pass**

1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 873128 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Project Name:	Trumbull	**Engineer:**	MGY
Project Number:	25575.40946	**Check:**	ZRH
Client Site Number:	BU 873128	**Date:**	12/11/15

Grouted/Un-Grouted Pipe Leg + Full Sleeve R/F, Elevations: 381' - 401'

ASIF: 1.33 - allowable stress increase factor (typically 1.33)
DL Control: NO - does dead load control (?)

Input - Loads

$P_{initial}$: 30.0 kips - force from initial load (no wind)
P_{wind}: 150.4 kips - force due to final loading including reinforcement
T_u: 121.5 kips - maximum load on leg

Quick Check

Weld Size:	OK
Weld Connection:	64.8%
Crushing Check:	83.4%
Leg Comp. Check:	66.1%
Sleeve Check:	47.4%
Built-up Check:	77.0%
Slenderness Check:	OK
Leg Tension Check:	65.1%

Input - Tower Leg

3" Diam. SR

K: 1.00 - effective length factor for leg
L_u: 5.00 ft - unbraced length of tower leg
F_{y_leg}: 33.00 ksi - minimum specified yield strength of tower leg
F_{u_leg}: 60.00 ksi - minimum specified ultimate strength of tower leg
r: 0.75 in - minimum radius of gyration of tower leg
A_{leg}: 7.07 in^2 - area of tower leg
Di: 0.00 in - inside diameter of tower leg
t_{leg}: 1.50 in - thickness of tower leg
$f`_c$: 0.00 ksi - minimum specified compressive strength of grout (If ungrouted enter 0)

Input - Sleeve R/F 1

3.75" OD Inner Sleeve & 3STD Outer Sleeve

F_{y_sleeve}: 35.00 ksi - minimum specified yield strength of sleeve r/f
F_{u_sleeve}: 60.00 ksi - minimum specified ultimate strength of sleeve r/f
r_{x_sleeve}: 0.51 in - minimum radius of gyration of sleeve r/f about the x-axis
r_{y_sleeve}: 1.16 in - minimum radius of gyration of sleeve r/f about the y-axis
A_{sleeve}: 1.11 in^2 - area of sleeve r/f
t_{sleeve}: 0.22 in - thickness of tower leg
Termination: Connected to Leg ONLY

Input - Sleeve Connection to Leg

a: 6.00 in - spacing of connectors connecting the sleeve to the leg
D: 3.00 - weld size for the weld connecting the sleeve to the leg (unit = # of 16ths)
Length //: 3.00 in - length of weld on each side of the leg at the termination
Length ⊥: 0.00 in - length of weld at the bottom/top of the leg sleeve at termination (≥D/2)
No: 2.00 - number of longitudinal welds per end of the leg (typically near side & far side, so 2)
F_{EXX}: 70.00 ksi - weld electrode classification
Width: 3.50 in - maximum width of the built-up leg
Gap: 12.00 in - length of leg considered for crushing

Input - Built-up Leg Section

r_{x_bu}: 0.90 in - minimum radius of gyration of the built-up section about the x-axis
r_{y_bu}: 0.91 in - minimum radius of gyration of the built-up section about the y-axis

Input - Leg w/ Single Sleeve

A: 8.18 in^2 - area of (1)
r_{x_bu}: 0.80 in - minimum rad
r_{y_bu}: 0.82 in - minimum rad
Inner Sleeve Gap: 18.00 in - length of leg

Project Name:	Trumbull	**Engineer:**	MGY
Project Number:	25575.40946	**Check:**	ZRH
Client Site Number:	BU 873128	**Date:**	12/11/2015
Elevation:	361 - 381	**CODE:**	TIA-F

Grouted/Un-Grouted Pipe Leg + Half Sleeve R/F

ASIF: 1.33 - allowable stress increase factor (typically 1.33)
Mast St.: 1.00 - from tnxTower

Input - Loads

$P_{initial}$: 30 kips - force from initial load (no wind)
P_{wind}: 155.345 kips - force due to final loading including reinforcement
T_u: 73.985 kips - maximum load on leg

Quick Check

Weld Size:	OK
Weld Connection:	68.8%
Crushing Check:	62.9%
Leg Comp. Check:	55.8%
Sleeve Check:	41.7%
Built-up Check:	67.1%
Slenderness Check:	OK
Leg Tension Check:	29.1%

Input - Tower Leg

3.5" SR

K: 1.00 - effective length factor for leg
L_u: 5.00 ft - unbraced length of tower leg
F_{y_leg}: 33.00 ksi - minimum specified yield strength of tower leg
F_{u_leg}: 60.00 ksi - minimum specified ultimate strength of tower leg
r: 0.88 in - minimum radius of gyration of tower leg
A_{leg}: 9.62 in^2 - area of tower leg
Di: 0.00 in - inside diameter of tower leg
t_{leg}: 1.75 in - thickness of tower leg
$f`_c$: 0.00 ksi - minimum specified compressive strength of grout (If ungrouted enter 0)

Input - Sleeve R/F

3.5 STD Gap Check: OK

F_{y_sleeve}: 35.00 ksi - minimum specified yield strength of sleeve r/f
F_{u_sleeve}: 60.00 ksi - minimum specified ultimate strength of sleeve r/f
r_{x_sleeve}: 0.58 in - minimum radius of gyration of sleeve r/f about the x-axis
r_{y_sleeve}: 1.34 in - minimum radius of gyration of sleeve r/f about the y-axis
A_{sleeve}: 1.34 in^2 - area of sleeve r/f
t_{sleeve}: 0.23 in - thickness of sleeve r/f
Termination: Connected to Leg ONLY

Input - Sleeve Connection to Leg

a: 6.00 in - spacing of connectors connecting the sleeve to the leg
D: 3.00 - weld size for the weld connecting the sleeve to the leg (unit = # of 16ths)
Length //: 3.00 in - length of weld on each side of the leg at the termination
Length ⊥: 0.00 in - length of weld at the bottom/top of the leg sleeve at termination ftD/2)
No: 2.00 - number of longitudinal welds per end of the leg (typically near side & far side, so 2)
F_{EXX}: 70.00 ksi - weld electrode classification
Width: 4.00 in - maximum width of the built-up leg
Gap: 12.00 in - length of leg considered for crushing

Input - Built-up Leg Section

3.5" SR w/3.5 STD Half Sleeve

r_{x_bu}: 0.93 in - minimum radius of gyration of the built-up section about the x-axis
r_{y_bu}: 0.94 in - minimum radius of gyration of the built-up section about the y-axis

Bearing: 72.8%

Pad		
Width at the top of the pad (ft)	**Width at the bottom of the pad (ft)**	**Thickness of the pad (ft)**
10.50	10.50	2.00

Pier			
Width at the top of the pier (ft)	**Width at the bottom of the pier (ft)**	**Length of the pier (ft)**	**Pier Extension above grade (ft)**
4.50	10.00	3.00	0.50

Soil Density (kcf)	**Depth to base of foundation (ft)**	**Vertical Load (kip)**	**Horizontal Load (kip)**
0.115	5.00	381.09	5.94

Weight of Concrete	57.86	**kip**
W_c (Replaced)	13.65	**kip**
Weight of Soil	18.54	**kip**
Total Vertical Load	457.49	**kip**
Moment	29.69	**kip-ft**
Section Modulus - S	136.43	**ft^3**
Area - A	110.25	**ft^2**
Min. Pressure - q_{min}	3.93	**ksf**
Max Pressure - q_{max}	4.37	**ksf**

All. Pressure - q_{all} 6.00 **ksf** **Net Bearing Pressure?** No

Lateral: 5.5%

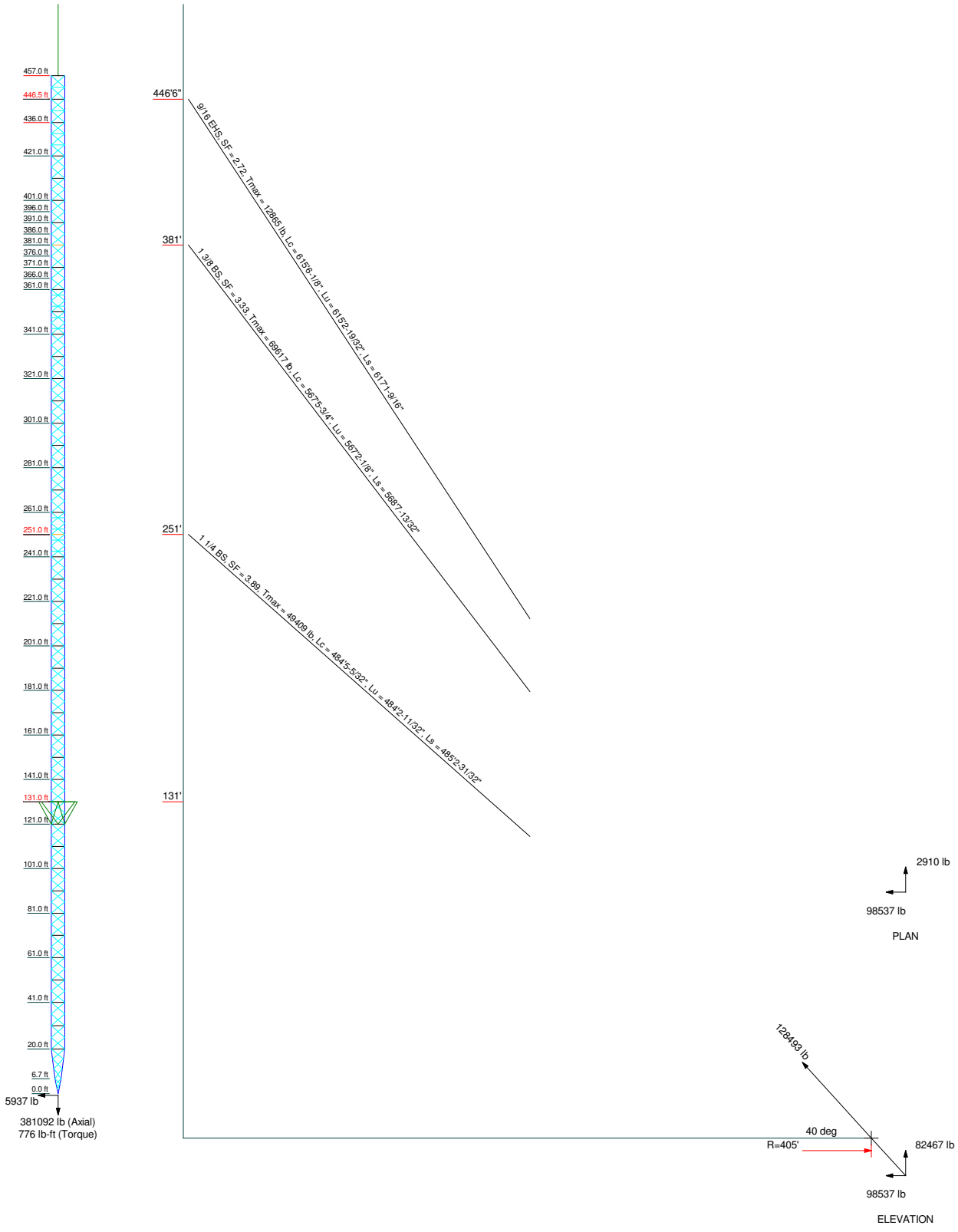
Coefficient of Friction (μ)	**Friction Angle (ϕ) (Degrees)**	**Cohesion (ksf)**
0.4	34	0

K_P	3.54	
$Pressure_{Top}$	1.22	**ksf**
$Pressure_{Bottom}$	2.03	**ksf**
Force from pressure	34.17	**kip**
Force from friction	183.00	**kip**
Total Resistance	108.58	**kip (SF = 2.0)**

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'A'@405 ft Azimuth 0 deg Elev -20 ft
Plane through centroid of tower



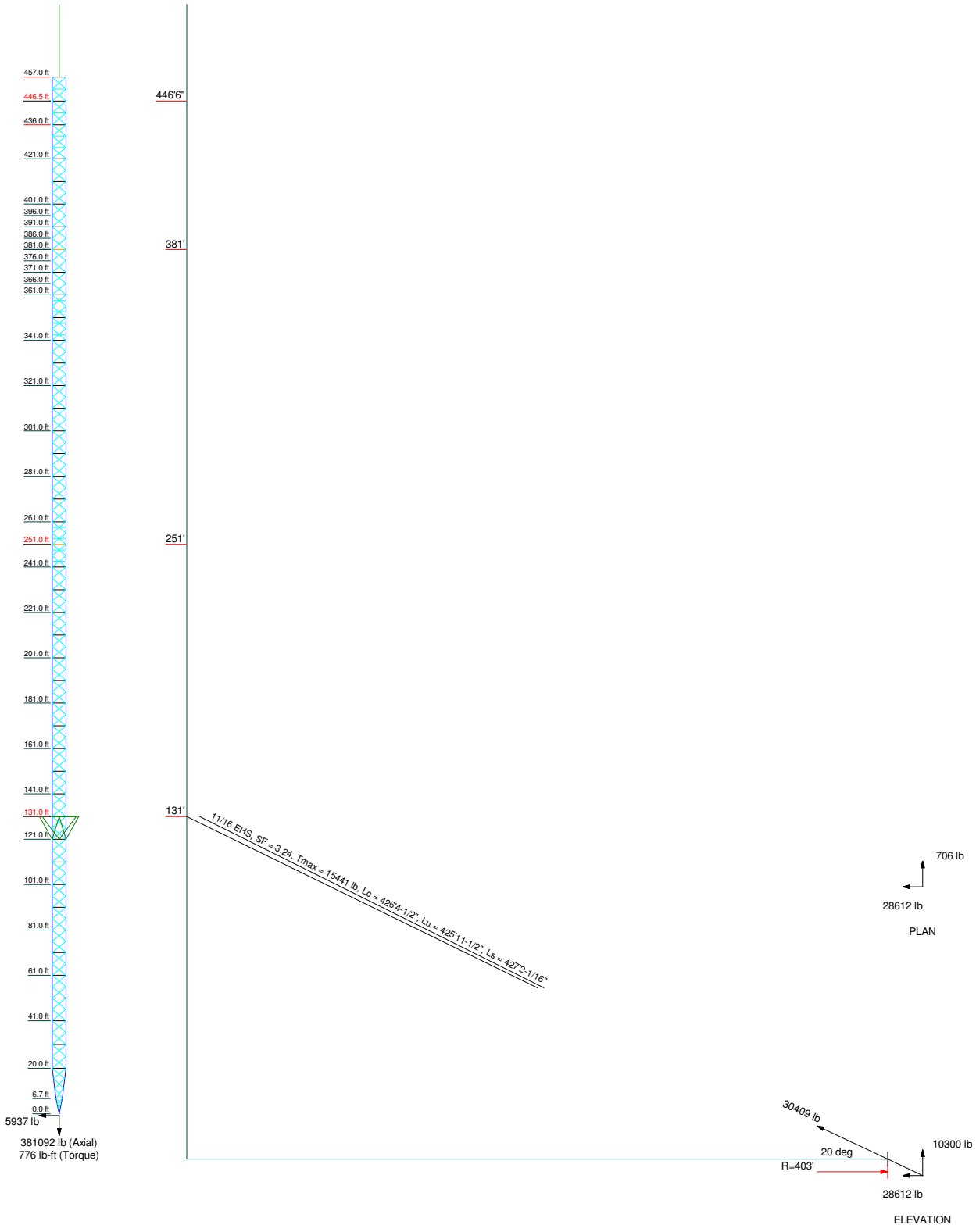
Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: ***Trumbull (BU 873128)***			
Project: ***TEP No. 25575.40946***			
Client: Crown Castle	Drawn by: JSP	App'd:	
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS	
Path: C:\Users\jspratt\Desktop\tnx Temp\25575 Trumbull\873128_LC7.eri		Dwg No. E-6	

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'A'@403 ft Azimuth 0 deg Elev -20 ft
Plane through centroid of tower



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Client: Crown Castle	Drawn by: JSP	App'd:	
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS	
Path: C:\Users\jspratt\Desktop\nx Temp\25575 Trumbull\873128_LC7.er		Dwg No. E-6	

Deadman Anchor Analysis: A - Anchor Path

Project Name: Trumbull
Job #: TEP No. 25575.40946
Client: BU 873128
Analysis by: MGY
Checked by: ZRH
Code: TIA - F

Anchor Block is Adequate for Uplift	**28.0%**
Anchor Block is Adequate for Lateral	**85.1%**

Loads

U_{max}: 92.77 kips - maximum uplift reaction
H_{max}: 127.15 kips - maximum horizontal reaction

Capacity

U_{all}: 331.26 kips - allowable uplift
H_{all}: 149.33 kips - allowable horizontal

Foundation Input

Guy Path: A
Anchor Ring: Anchor Path

W_b: 18.50 ft - width of anchor block
L_b: 23.00 ft - length of anchor block
T_b: 3.30 ft - thickness of anchor block
d: 2.00 ft - depth from t/ grade to t/ anchor block
b: 5.30 ft - depth from t/ grade to b/ anchor block

Ultimate Soil Properties

D_w: 8.50 ft - depth from t/ grade to water table

Geotechnical Firm: FDH Engineering
Report: 04-1229E
Date: 2/3/2005
Notes: Boring B-4
42" Frost Depth (per CT building code)

USE? Yes
Soil Berm:
depth: 4.00 ft
width: 18.50 ft
length: 23.50 ft
density: 110.00 pcf

Weight: 191.29 kips

Layer	Begin (ft)	End (ft)	ϕ Friction Angle (deg)	c Ult. Cohesion (psf)	γ Eff. Unit Weight (pcf)	f_s Ult. Skin Friction (ksf)	μ Friction Factor
1	0.00	2.00	33.00	0.00	115.00	0.00	0.00
2	2.00	3.50	0.00	0.00	115.00	0.00	0.40
3	3.50	4.00	33.00	0.00	115.00	0.19	0.40
4	4.00	5.30	41.00	0.00	125.00	0.33	0.40
5							
6							

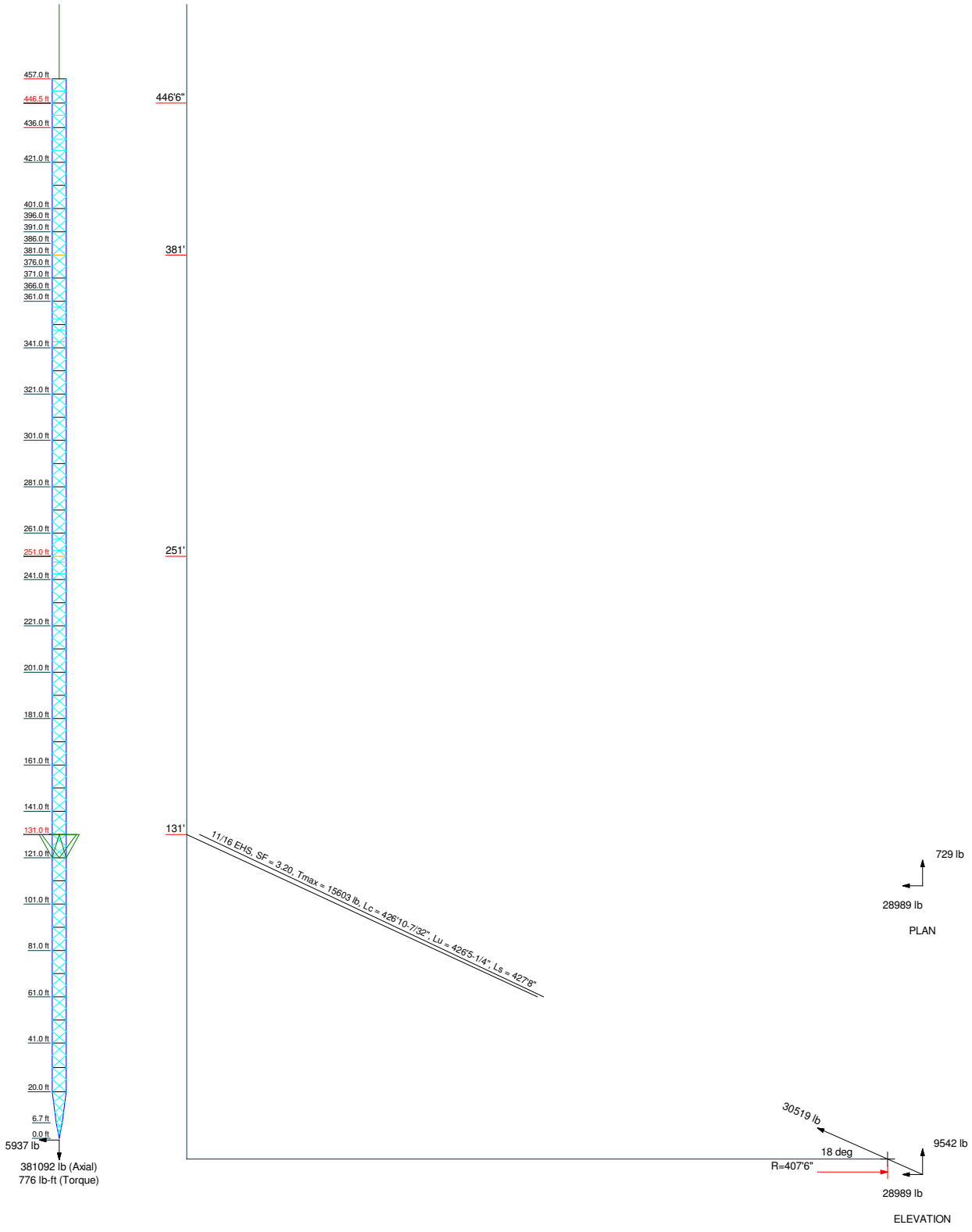
Analysis Criteria

Uplift:	F_{s_sides}=	11.42	Yes	Horizontal:	F_{s_sides} =	15.65	Yes
	F_{s_front}=	12.04	Yes		F_{s_top} =	0.00	No
	F_{s_back}=	0.00	No		F_{s_bottom} =	0.00	No
					$F_{\perp} \cdot \mu$ =	177.35	Yes

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'B'@407.5 ft Azimuth 120 deg Elev -9 ft
Plane through centroid of tower



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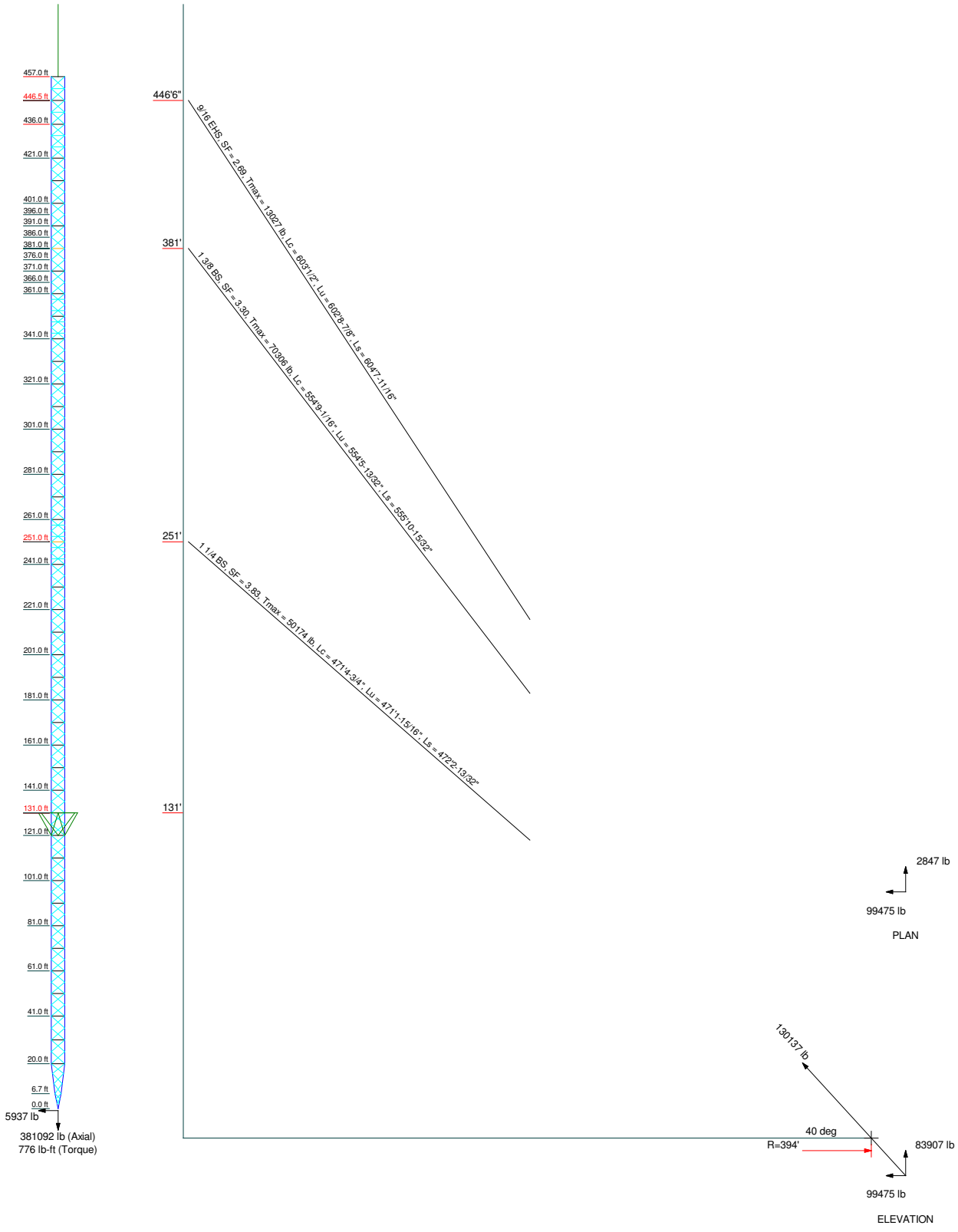
Job: *Trumbull (BU 873128)*			
Project: *TEP No. 25575.40946*			
Client: Crown Castle	Drawn by: JSP	App'd:	
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS	
Path: C:\Users\jspratt\Desktop\tnx Temp\25575 Trumbull\873128_LC7.eri		Dwg No. E-6	

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'B'@394 ft Azimuth 120 deg Elev -13 ft
Plane through centroid of tower



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Job: ***Trumbull (BU 873128)***			
Project: ***TEP No. 25575.40946***			
Client: Crown Castle	Drawn by: JSP	App'd:	
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS	
Path: C:\Users\jspratt\Desktop\tnx Temp\25575 Trumbull\873128_LC7.eri		Dwg No. E-6	

Deadman Anchor Analysis: B - Anchor Path

Project Name: Trumbull
Job #: TEP No. 25575.40946
Client: BU 873128
Analysis by: MGY
Checked by: ZRH
Code: TIA - F

Anchor Block is Adequate for Uplift	**35.1%**
Anchor Block is Adequate for Lateral	**35.6%**
Concrete Block is Adequate for Lateral	**85.6%**
Concrete Block is Adequate for Overturning	**31.5%**

Loads

U_1: 83.91 kips - uplift reaction (block front)
H_1: 99.48 kips - maximum horizontal reaction (block
U_2: 9.54 kips - uplift reaction (block back)
H_2: 28.99 kips - maximum horizontal reaction (block back)

Capacity

U_{all}: 239.30 kips - allowable uplift
H_{all}: 279.42 kips - allowable horizontal

Foundation Input

Guy Path: B
Anchor Ring: Anchor Path

W_b: 7.00 ft - width of anchor block
L_b: 6.00 ft - length of anchor block
T_b: 5.50 ft - thickness of anchor block
d: 4.30 ft - depth from t/ grade to t/ anchor block
b: 9.80 ft - depth from t/ grade to b/ anchor block

Ultimate Soil Properties

D_w: 8.50 ft - depth from t/ grade to water table

Geotechnical Firm: FDH Engineering
Report: 04-1229E
Date: 2/3/2005
Notes: Boring B-2
42" Frost Depth (per CT building code)

USE? Yes
Concrete Berm:
depth (above gr): 3.00 ft
depth (below gr): 2.30 ft
width: 15.00 ft
length: 15.00 ft
density: 150.00 pcf

Layer	Begin (ft)	End (ft)	ϕ Friction Angle (deg)	c Ult. Cohesion (psf)	γ Eff. Unit Weight (pcf)	f_s Ult. Skin Friction (ksf)	μ Friction Factor
1	0.00	2.30	0.00	0.00	115.00	0.00	0.00
2	2.30	3.50	34.00	0.00	115.00	0.00	0.40
3	3.50	4.30	0.00	5000.00	135.00	1.89	0.40
4	4.30	8.50	0.00	5000.00	135.00	1.89	0.40
5	8.50	9.80	0.00	5000.00	72.60	1.89	0.40
6							

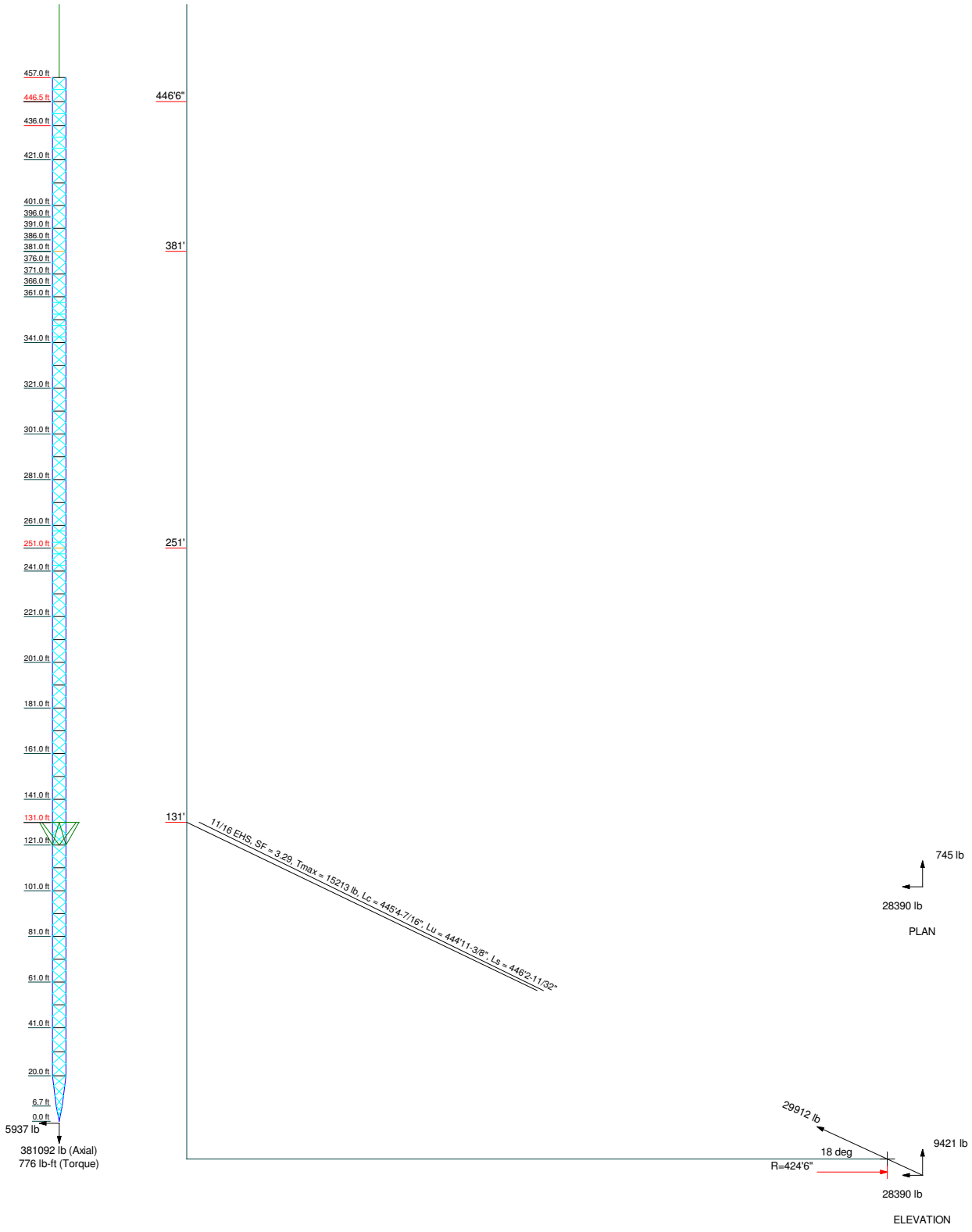
Analysis Criteria

Uplift:	F_{s_sides}=	93.83	Yes	Horizontal:	F_{s_sides} =	111.24	Yes
	F_{s_front}=	62.37	Yes		F_{s_top} =	0.00	No
	F_{s_back}=	0.00	No		F_{s_bottom} =	0.00	No
					$F_{\perp} \cdot \mu$ =	88.81	Yes

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'C'@424.5 ft Azimuth 240 deg Elev -16.5 ft
Plane through centroid of tower



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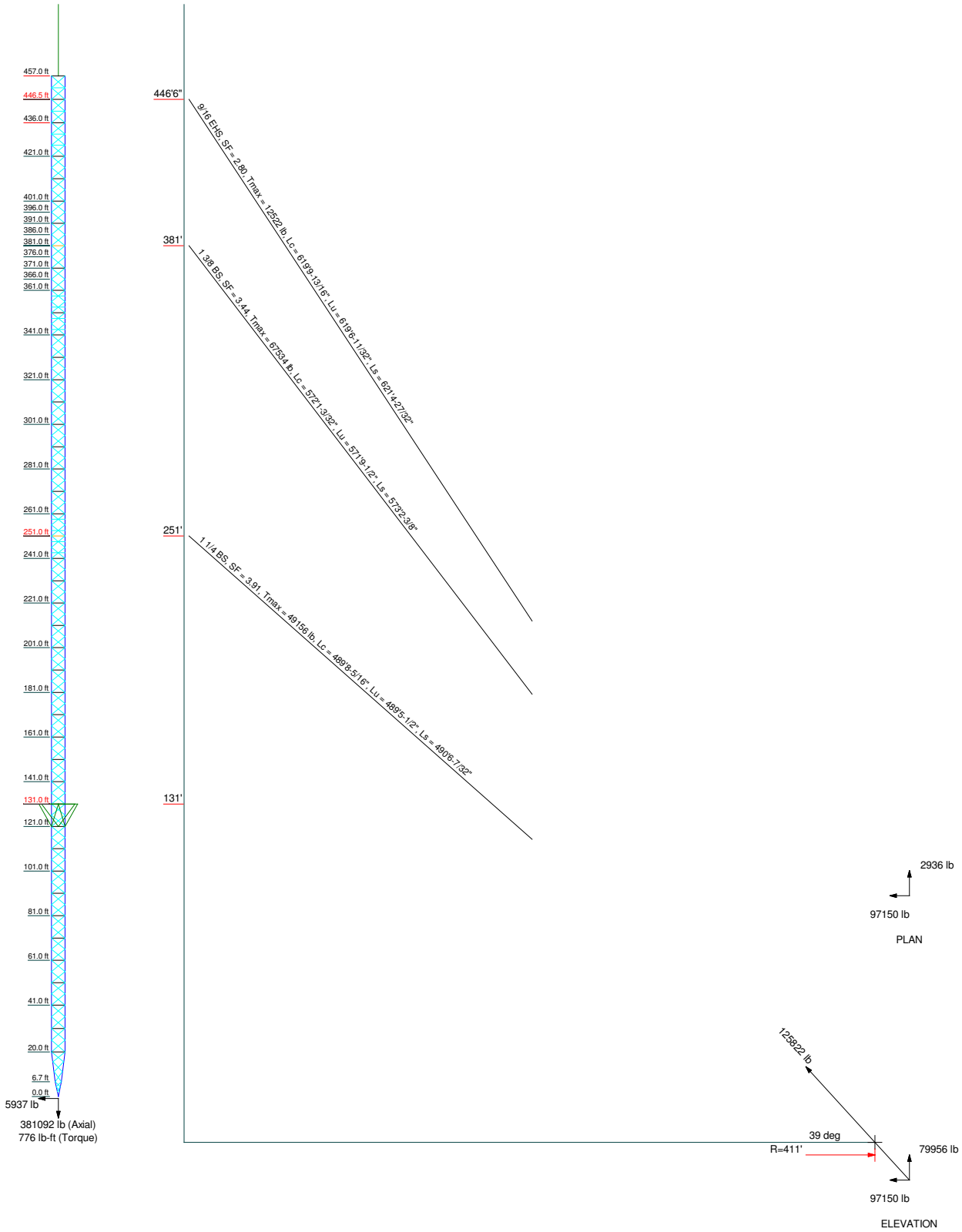
Job: *Trumbull (BU 873128)*			
Project: *TEP No. 25575.40946*			
Client: Crown Castle	Drawn by: JSP	App'd:	
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS	
Path: C:\Users\jspratt\Desktop\nx Temp\25575 Trumbull\873128_LC7.er		Dwg No. E-6	

Guy Tensions and Tower Reactions

TIA/EIA-222-F - 85 mph/38 mph 0.7500 in Ice

Maximum Values
Anchor 'C'@411 ft Azimuth 240 deg Elev -20.5 ft
Plane through centroid of tower



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Job: ***Trumbull (BU 873128)***			
Project: ***TEP No. 25575.40946***			
Client: Crown Castle	Drawn by: JSP	App'd:	
Code: TIA/EIA-222-F	Date: 12/11/15	Scale: NTS	
Path: C:\Users\jspratt\Desktop\tnx Temp\25575 Trumbull\873128_LC7.eri		Dwg No. E-6	

Deadman Anchor Analysis: C - Anchor Path

Project Name: Trumbull
Job #: TEP No. 25575.40946
Client: BU No. 873128
Analysis by: MGY
Checked by: ZRH
Code: TIA - F

Anchor Block is Adequate for Uplift	**47.2%**
Anchor Block is Adequate for Lateral	**86.4%**
Concrete Block is Adequate for Lateral	**83.8%**
Concrete Block is Adequate for Overturning	**31.0%**

Loads

U_1: 79.96 kips - uplift reaction (block front)
H_1: 97.15 kips - maximum horizontal reaction (block
U_2: 9.42 kips - uplift reaction (block back)
H_2: 28.39 kips - maximum horizontal reaction (block back)

Capacity

U_{all}: 169.53 kips - allowable uplift
H_{all}: 112.39 kips - allowable horizontal

Foundation Input

Guy Path: C
Anchor Ring: Anchor Path

W_b: 7.00 ft - width of anchor block
L_b: 6.00 ft - length of anchor block
T_b: 5.50 ft - thickness of anchor block
d: 4.30 ft - depth from t/ grade to t/ anchor block
b: 9.80 ft - depth from t/ grade to b/ anchor block

Ultimate Soil Properties

D_w: 8.50 ft - depth from t/ grade to water table

Geotechnical Firm: FDH Engineering
Report: 04-1229E
Date: 2/3/2005
Notes: Boring B-3
42" Frost Depth (per CT building code)

USE? Yes
Concrete Berm:
depth (above gr): 3.00 ft
depth (below gr): 2.30 ft
width: 15.00 ft
length: 15.00 ft
density: 150.00 pcf

Layer	Begin (ft)	End (ft)	ϕ Friction Angle (deg)	c Ult. Cohesion (psf)	γ Eff. Unit Weight (pcf)	f_s Ult. Skin Friction (ksf)	μ Friction Factor
1	0.00	2.30	0.00	0.00	115.00	0.00	0.00
2	2.30	4.00	34.00	0.00	115.00	0.00	0.40
3	4.00	8.50	39.00	0.00	120.00	0.42	0.40
4	8.50	9.00	39.00	0.00	57.60	0.58	0.40
5	9.00	15.50	43.00	0.00	62.60	0.69	0.40
6							

Analysis Criteria

Uplift:	F_{s_sides}=	23.30	Yes	Horizontal:	F_{s_sides} =	28.31	Yes
	F_{s_front}=	15.71	Yes		F_{s_top} =	0.00	No
	F_{s_back}=	0.00	No		F_{s_bottom} =	0.00	No
					$F_{\perp} \cdot \mu$ =	73.50	Yes

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

T-Mobile Existing Facility

Site ID: CT11203B

CT11203B_Shelton_VideoLn
637 Video Lane
Shelton, CT 06484

November 11, 2015

EBI Project Number: 6215004068

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	27.24 %

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

EBI Consulting
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November 11, 2015

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

Emissions Analysis for Site: **CT11203B – CT11203B_Shelton_VideoLn**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **637 Video Lane, Shelton, 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 approximately 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 **637 Video Lane, Shelton, 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 / UMTS 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) Since the radios are ground mounted there are additional cabling losses accounted for. For each RF path the following losses were calculated. 1.57 dB of additional cable loss for all 700 MHz Channels, 2.88 dB of additional cable loss for all 1900 MHz channels and 2.97 dB of additional cable loss at 2100 MHz. This is based on manufacturers Specifications for 280 feet of 1-5/8” coax cable on each path.

6) 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.

7) 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.

8) The antennas used in this modeling are the **RFS APX16PV-16PVL** 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 **RFS APX16PV-16PVL** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. 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.

9) The antenna mounting height centerline of the proposed antennas is **247 feet** above ground level (AGL).

10) 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:	RFS APX16PV-16PVL	Make / Model:	RFS APX16PV-16PVL	Make / Model:	RFS APX16PV-16PVL
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	247	Height (AGL):	247	Height (AGL):	247
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	6	Channel Count	6	# PCS Channels:	6
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	5,193.72	ERP (W):	5,193.72	ERP (W):	5,193.72
Antenna A1 MPE%	0.32	Antenna B1 MPE%	0.32	Antenna C1 MPE%	0.32
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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):	247	Height (AGL):	247	Height (AGL):	247
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):	602.73	ERP (W):	602.73	ERP (W):	602.73
Antenna A2 MPE%	0.08	Antenna B2 MPE%	0.08	Antenna C2 MPE%	0.08

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**0.40 %**
Verizon Wireless	0.95 %
Marcus - Andrew DB408-B Transmit Ant.	0.11 %
Marcus - Radiowaves SPD3-5.8 Microwave Dish	0.00 %
Marcus - Radiowaves SPD4-5.8 Microwave dish	0.01 %
Marcus - Radiowaves SD2-5.8 Microwave Dish	0.02 %
Light Squared	0.35 %
Field Measurements	25.40 %
Site Total MPE %:	**27.24 %**

T-Mobile Sector 1 Total:	0.40 %
T-Mobile Sector 2 Total:	0.40 %
T-Mobile Sector 3 Total:	0.40 %
Site Total:	27.24 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**1291.67**	**247**	**1.60**	**2100**	**1000**	**0.16 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**659.36**	**247**	**0.82**	**1900**	**1000**	**0.08 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**645.83**	**247**	**0.80**	**2100**	**1000**	**0.08 %**
T-Mobile 700 MHz LTE	**1**	**602.73**	**247**	**0.37**	**700**	**467**	**0.08 %**
						Total:	**0.40%**

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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:	0.40 %
Sector 2:	0.40 %
Sector 3 :	0.40 %
T-Mobile Per Sector Maximum:	0.40 %
Site Total:	27.24 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **27.24%** 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.

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