COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

January 20, 2015

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification
Northeast Utilties/T-Mobile equipment upgrade
Site ID CT11111A
20 Barnabas Road, Newtown, Connecticut

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, Northeast Utilities owns the existing lattice tower and related facility located at 20 Barnabas Road, Newtown, Connecticut (Latitude: 41.42762905 Longitude: -73.3436). T-Mobile intends to remove three (3) antennas and three (3) TMAs (tower mounted amplifiers) and add six (6) panel antennas and related equipment at this existing telecommunications facility in Newtown ("Newtown Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, copies of this letter are being sent to the First Selectman, E. Patricia Llodra, and the property owner, Barnabas Realty Group General Partnership.

The existing Newtown Facility consists of a 180 foot tall lattice tower, approved by the Council in Docket No. 144.[1] T-Mobile plans to remove three (3) antennas and three (3) TMAs (tower mounted amplifiers) and add six (6) panel antennas on three (3) proposed mounts at a centerline of 149 feet. T-Mobile will also add fiber and coax cables and relocate existing coax cables on a proposed cable ladder. (See the plans revised to January 12, 2015 attached hereto as Exhibit A). The existing Newtown Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated November 10, 2014 and attached hereto as Exhibit B.[2]

[1] The Decision and Order in this docket (dated November 20, 1991) contains no relevant requirements or limitations on the configuration of the Newtown Facility.
[2] The structural analysis provides that the tower is adequate to support the proposed equipment with the reinforcements detailed in Section 4 in the report. Those reinforcements will be completed prior to the installation of the proposed modifications.

1. The proposed modification will not increase the height of the tower. T-Mobile's proposed modifications will be installed at a centerline of 149 feet, merely modifying existing antennas located at the same 149 foot elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries. T-Mobile proposes no changes to the existing compound and equipment pad.

3. The proposed modification to the Newtown Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement/additional antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated December 4, 2014, T-Mobile's operations would add 4.92% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 73.35% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

CL&P has authorized the filing of this exempt modification as evidenced by the letter of authorization signed January 19, 2015 attached hereto as Exhibit D.

For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement/additional antennas and equipment at the Newtown Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,

Julie D. Kohler, Esq.

cc: Town of Newtown, First Selectman E. Patricia Llodra
Northeast Utilities
Barnabas Realty Group General Partnership
Elizabeth Jamieson, Transcend Wireless

T-MOBILE USA, INC.
12920 SE 38TH STREET
BELLEVUE, WA 98006
(425) 378-4000

2917430
8/8/2014
2000011160

Invoice Number	Inv. Date	Description	Deductions	Voucher	Amount Paid
CT11111A-1	8/5/2014	Exempt Mod Filing Fees	0.00	1101580003	625.00

DO NOT ACCEPT THIS CHECK UNLESS THE FACE FADES FROM BLACK TO RED WITH LOGO IN BACKGROUND. THE BACK OF THIS DOCUMENT HAS HEAT-SENSITIVE INK THAT CHANGES FROM ORANGE TO YELLOW.
COPYBAN CAPTURE ANTI-FRAUD PROTECTION

T-MOBILE USA, INC.
12920 SE 38th Street
Bellevue, WA 98006
(425) 378-4000

The Bank of New York Mellon
Pittsburgh, PA
60-180/433

2917430
8/8/2014
VID 2000011160

PAY $625 00 CTS
SIX TWO FIVE CTS

*$625.00

Six Hundred Twenty Five Dollars Only*******

To The Order Of
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQ
NEW BRITAIN, CT 06051

VOID AFTER 180 DAYS
THIS CHECK CLEARS THROUGH POSITIVE PAY

⑈000291[illegible]30⑈ ⑆043301601⑆ 013⑈8430⑈

THE ORIGINAL DOCUMENT HAS A REFLECTIVE WATERMARK ON THE BACK. HOLD AT AN ANGLE TO VIEW, DO NOT CASH IF MISSING.

EXHIBIT A

SITE NAME: NEWTOWN/ I-84 X9

NEWTOWN SERVICE CENTER
20 BARNABUS RD.
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SITE NUMBER: CT11111A

L700 - 702CC CONFIGURATION

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES

1. STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY HUDSON DESIGN ON BEHALF OF T-MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING TOWER PLATFORM, EXISTING ANTENNA MOUNTS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T-MOBILE MODERNIZATION EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.

2. HUDSON DESIGN ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

CALL
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455
OR CALL 811
UNDERGROUND SERVICE ALERT

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).
SITE ADDRESS:	20 BARNABUS RD NEWTOWN, CT 06470
LATITUDE:	41° 25' 39.468" N
LONGITUDE:	73° 20' 36.9594" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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T-MOBILE NORTHEAST LLC

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BLOOMFIELD, CT 06002
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SITE NUMBER: CT11111A
SITE NAME:
NEWTOWN/ 1-84 X9
20 BARNABUS RD
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR 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 SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. 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 BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR – TRANSCEND WIRELESS
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T-MOBILE

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

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

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

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

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR 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 SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

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

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR 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.

19. 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.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE: IBC 2003 W/ 2005 CT SUPPLEMENT + 2009 AMENDMENT
ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

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APPROVALS

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20 BARNABUS RD
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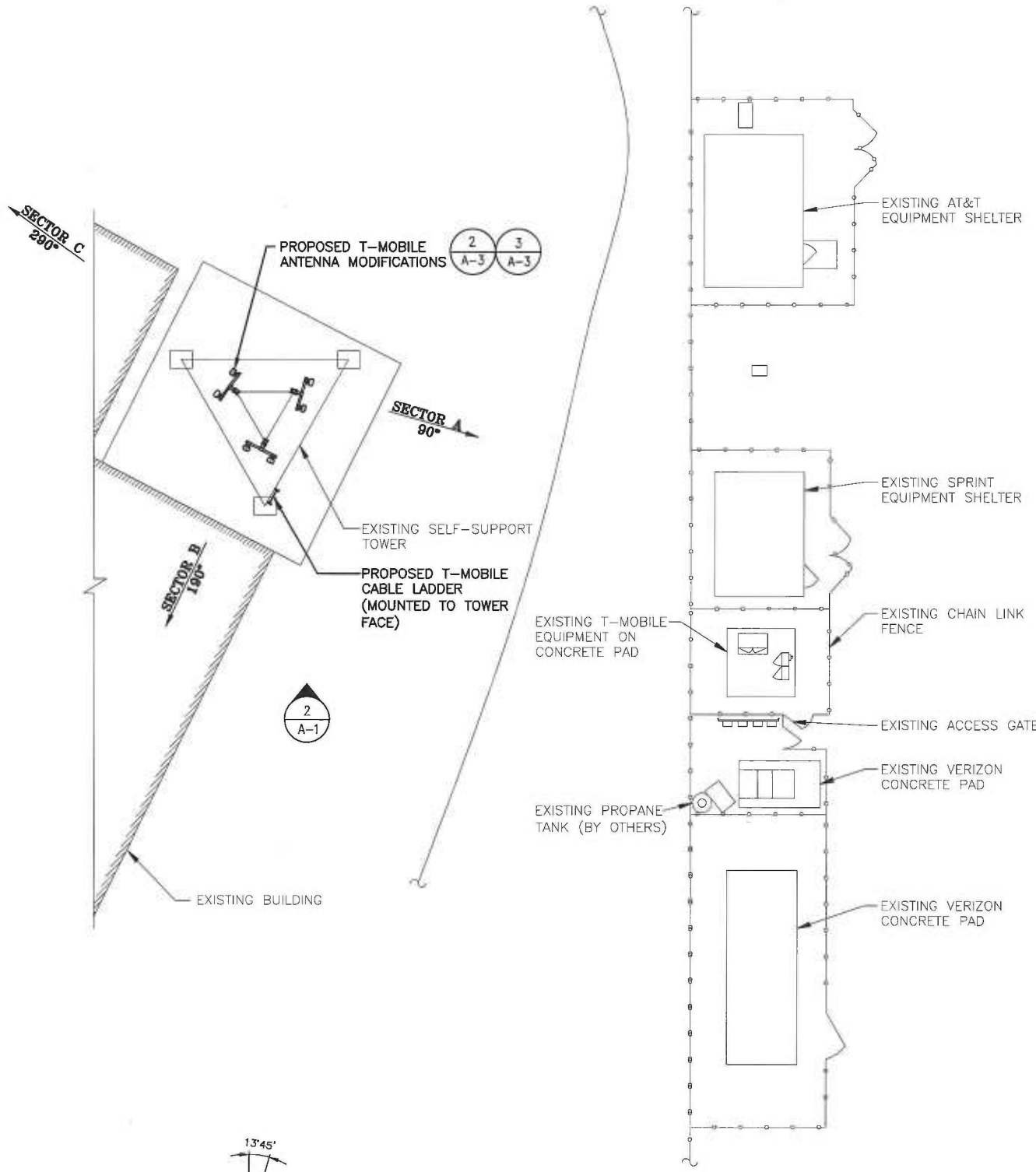
FAIRFIELD COUNTY

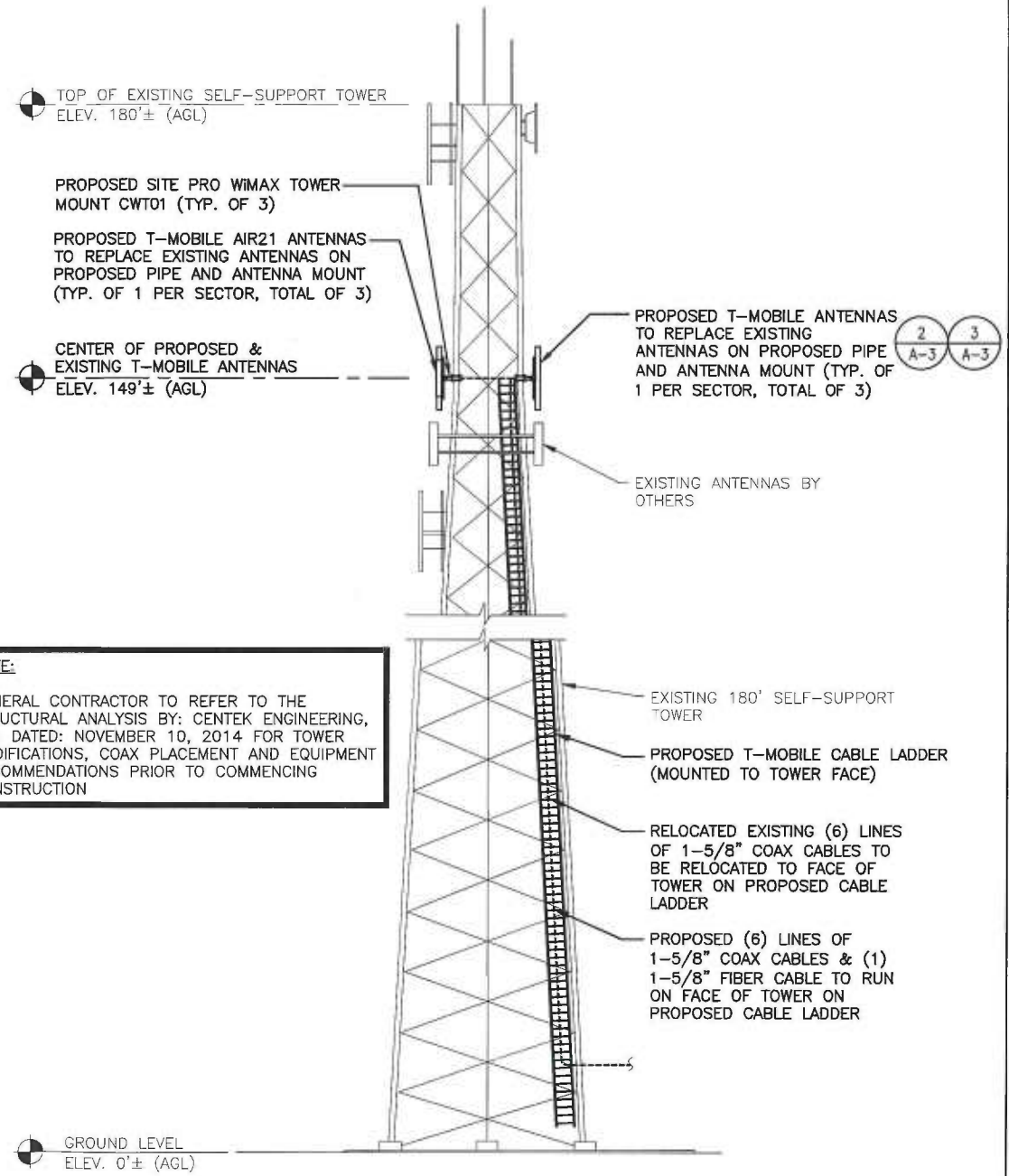
SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-1





NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY: CENTEK ENGINEERING, INC. DATED: NOVEMBER 10, 2014 FOR TOWER MODIFICATIONS, COAX PLACEMENT AND EQUIPMENT RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION

1 A-1 **COMPOUND PLAN**
SCALE: 3/32"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

2 A-1 **ELEVATION**
SCALE: 3/32"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

L700 - 702CU CONFIGURATION

T-MOBILE NORTHEAST LLC

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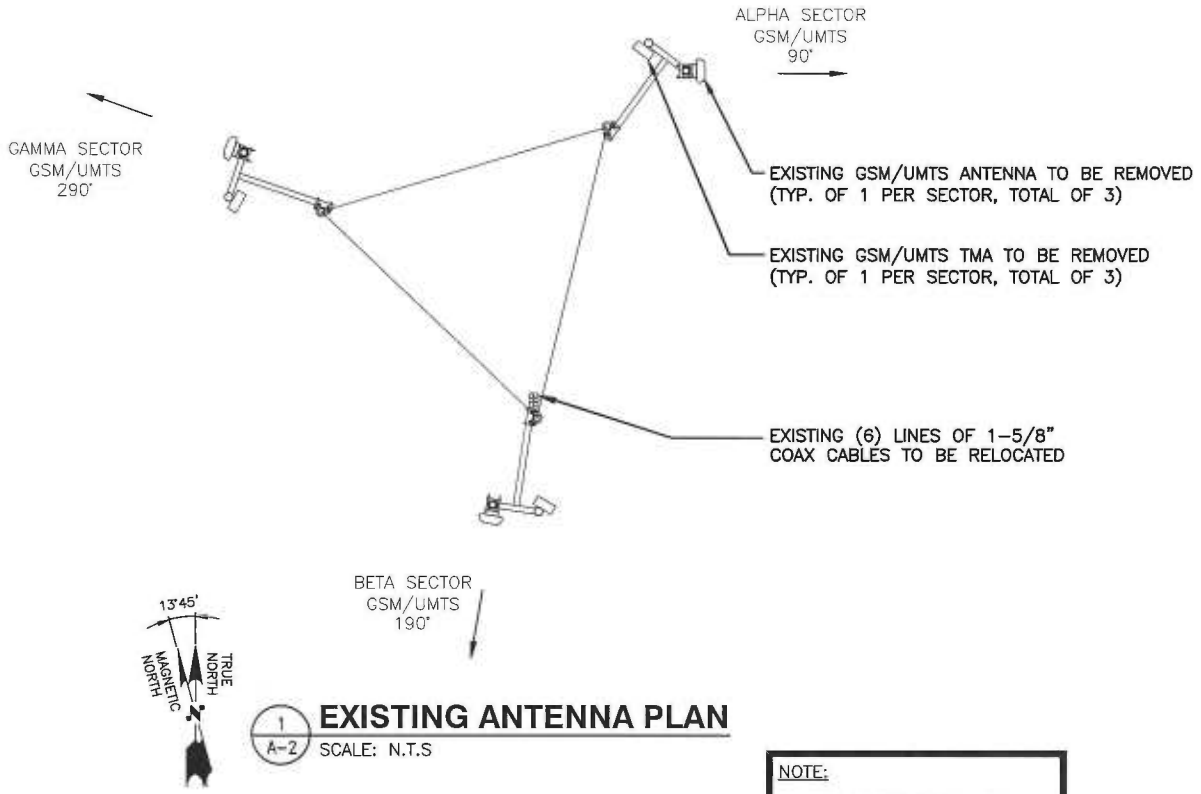
FAIRFIELD COUNTY

SHEET TITLE

COMPOUND PLAN &
ELEVATION

SHEET NUMBER

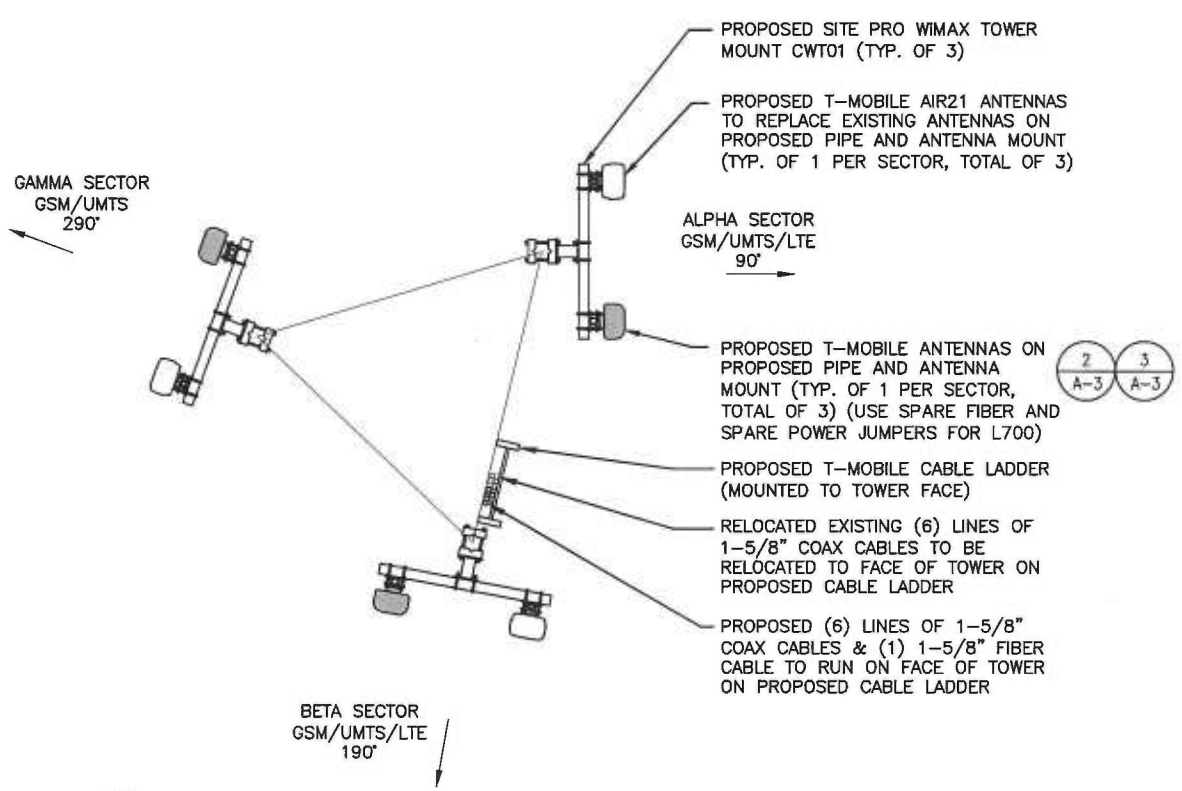
A-1



1 / A-2 **EXISTING ANTENNA PLAN**
SCALE: N.T.S

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



2 / A-2 **PROPOSED ANTENNA PLAN**
SCALE: N.T.S

NOTE:

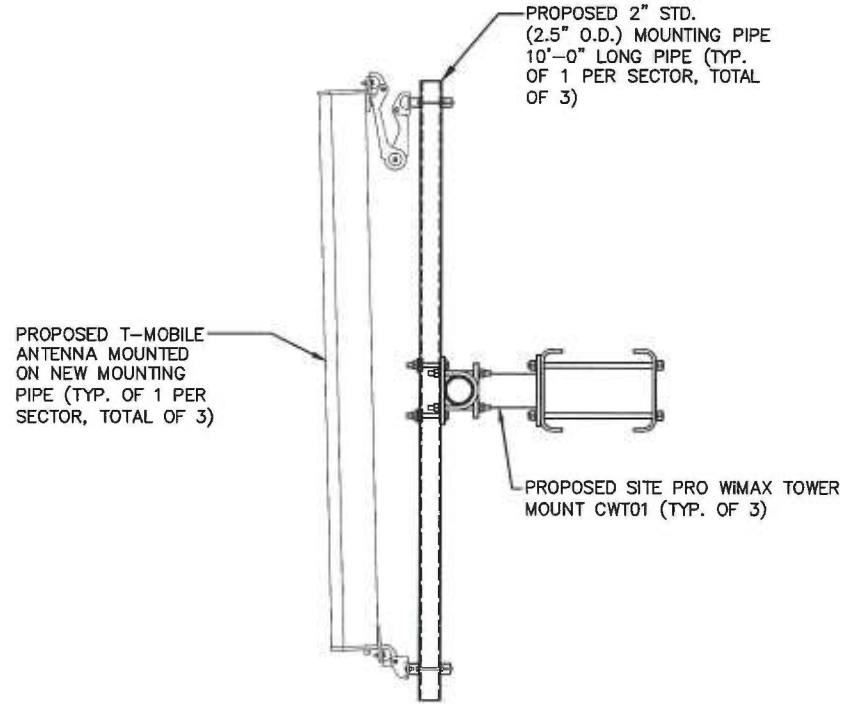
GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY: CENTEK ENGINEERING, INC. DATED: NOVEMBER 10, 2014 FOR TOWER MODIFICATIONS, COAX PLACEMENT AND EQUIPMENT RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION

EXISTING ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	EMS	RR-90-17-00DP	56x8x2.8
BETA:	EMS	RR-90-17-00DP	56x8x2.8
GAMMA:	EMS	RR-90-17-00DP	56x8x2.8

PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA:	COMMSCOPE AIR21	LNX-6515DS-VTM B2A/B4P	96.4x11.9x7.1 55x12x7.9
BETA:	COMMSCOPE AIR21	LNX-6515DS-VTM B2A/B4P	96.4X11.9X7.1 55x12x7.9
GAMMA:	COMMSCOPE AIR21	LNX-6515DS-VTM B2A/B4P	96.4X11.9X7.1 55x12x7.9



3 / A-2 **ANTENNA MOUNT (TYP.)**
SCALE: N.T.S.

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

APPROVALS

CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING/SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE
PROJECT NO:	CT11111A
DRAWN BY:	AS
CHECKED BY:	DR

6	01/12/15	ISSUED FOR REVIEW
5	01/08/15	ISSUED FOR REVIEW
4	12/22/14	ISSUED FOR REVIEW
3	11/26/14	ISSUED FOR REVIEW
2	08/25/14	ISSUED FOR REVIEW
1	08/22/14	ISSUED FOR REVIEW
0	08/11/14	ISSUED FOR REVIEW

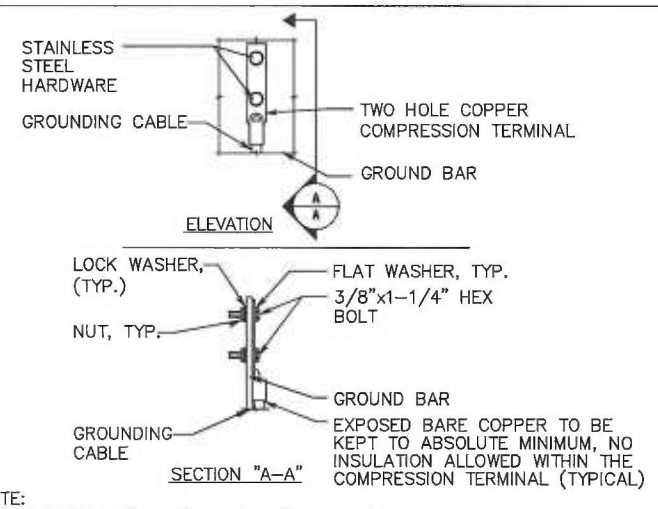
SITE NUMBER: CT11111A
SITE NAME:
NEWTOWN/ 1-84 X9
20 BARNABUS RD
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SHEET TITLE

ANTENNA PLAN
& DETAILS

SHEET NUMBER

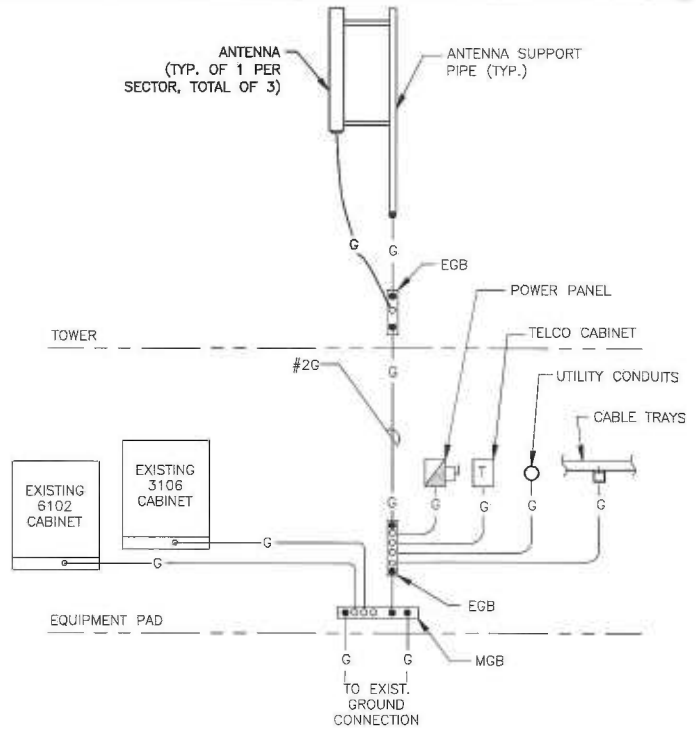
A-2



NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

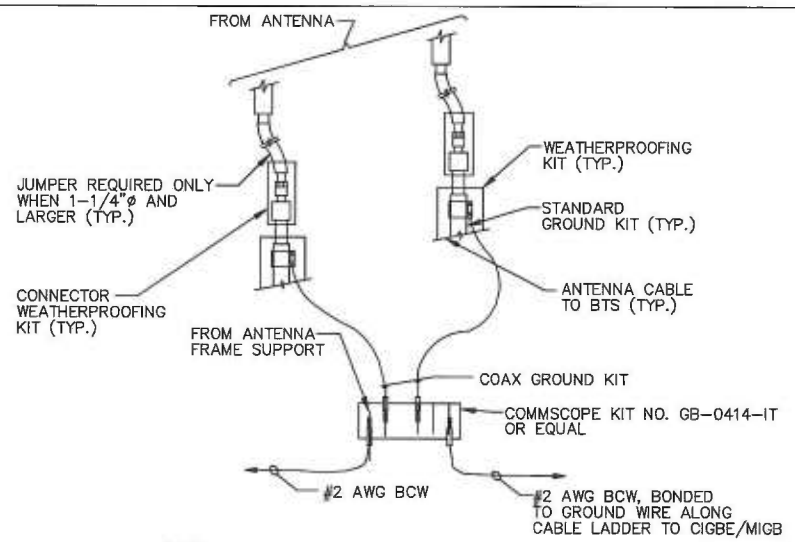
TYPICAL GROUND BAR CONNECTION DETAIL

1 / G-1 N.T.S.



GROUNDING RISER DIAGRAM

2 / G-1 N.T.S.



NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

3 / G-1 N.T.S.

NOTE:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

ANTENNA CABLE GROUNDING

5 / G-1 N.T.S.

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

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APPROVALS

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2	08/25/14	ISSUED FOR REVIEW
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0	08/11/14	ISSUED FOR REVIEW

SITE NUMBER: CT11111A
SITE NAME:
NEWTOWN/ 1-84 X9

20 BARNABUS RD
NEWTOWN, CT 06470
FAIRFIELD COUNTY

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-1

EXHIBIT B

CENTEK engineering

Centered on Solutions℠

Structural Analysis and Tower Reinforcement Report

180-ft Existing ROHN SSV Lattice Tower

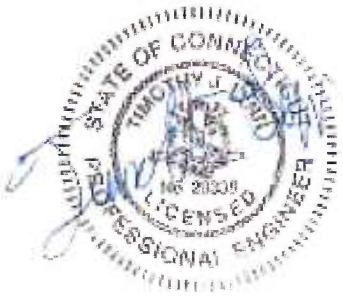
Proposed T-Mobile
Antenna Upgrade

T-Mobile Site Ref: CT11111A

20 Barnabas Road
Newtown, CT 06470

CENTEK Project No. 14025.011

Date: November 10, 2014



Prepared for:
T-Mobile Towers
4 Sylvan Way
Parsippany, NJ 07054

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

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Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing Northeast Utilities self supporting lattice tower located in Newtown, Connecticut.

The host tower is a 180-ft three legged, tapered steel lattice tower originally designed and manufactured by UNR-ROHN. The tower geometry and structure member sizes were obtained from a tower mapping report prepared by CSB Communications LLC, dated August 22, 2006 and a previous structural analysis and reinforcement design report prepared by Centek Engineering, Inc., project no. 14025.002 (Rev. 2), dated April 9, 2014.

Antenna and appurtenance inventory were obtained from a combination of the aforementioned Centek Engineering, Inc. structural analysis and reinforcement design report and information from T-Mobile.

The existing tower consists of nine (9) tapered steel pipe leg sections conforming to ASTM A572-50. Diagonal lateral support bracing consists of single angle steel sections conforming to ASTM A36. All tower connections are bolted. The width of the tower face is 8.56-ft at the top and 24.86-ft at the base.

T-Mobile proposes the removal of three (3) panel antennas and three (3) TMA's and the installation of six (6) panel antennas mounted on three (3) proposed mounts. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing tower supports several communication antennas. The existing and proposed loads considered in the analysis consist of the following:

- NEU (Existing):
  Antenna: One (1) RFS PD220 Omni-directional whip antenna pipe mounted to the top of the existing tower with a RAD center elevation of ±191-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on the face of the existing tower as specified in Section 3 of this report.
- NEU (Existing):
  Antenna: One (1) 8-ft Omni-directional whip antenna mounted to the top of the existing tower with a RAD center elevation of ±189-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on the face of the existing tower as specified in Section 3 of this report.
- MUNICIPAL (EXISTING):
  Antenna: One (1) 10-ft 2 Bay dipole antenna mounted to the top of the existing tower with a RAD center elevation of ±188-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on the face of the existing tower as specified in Section 3 of this report.

- NEU (Existing):
  Antenna: One (1) 6-ft Microwave dish antenna mounted to the leg of the existing tower with a RAD center elevation of ±180-ft above grade level.
  Coax Cable: One (1) EW63 elliptical coax cable running on the face of the existing tower as specified in Section 3 of this report.
- NEU (Existing):
  Antenna: One (1) 12-ft 2 Bay Dipole antenna mounted to the leg of the existing tower with a RAD center elevation of ±176-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on the face of the existing tower as specified in Section 3 of this report.
- NEU (Existing):
  Antenna: Two (2) Andrew DB586 Omni-directional whip antennas (one upright, one inverted) and one (1) TTA mounted to the leg of the existing tower on a 3-ft stand-off with a RAD center elevation of ±160-ft above grade level.
  Coax Cable: Two (2) 7/8" ∅ coax cables running on the face of the existing tower as specified in Section 3 of this report.
- MUNICIPAL (Existing):
  Antenna: One (1) 10-ft 2 Bay Dipole antenna mounted on one (1) 3-ft side arm with a RAD center elevation of ±144-ft above grade level.
  Coax Cable: One (1) 7/8" ∅ coax cable running on the face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing):
  Antennas: Three (3) P65-16-XLH-RR panel antennas, three (3) Kathrein 800-10121 panel antennas and six (6) Powerwave LGP21401 TMA's mounted on three (3) SitePro1 10-ft Lightweight T-Arms with a RAD center elevation of 135-ft above grade level.
  Radios: Six (6) Ericsson Remote Radio Units, Part No. RRUS-11 mounted to three (3) faces of the existing tower at a RAD center elevation of 135-ft above grade level.
  Surge Arrestor: One (1) Raycap DC6-48-60-18-8F Surge Arrestor mounted to the leg of the existing tower with a RAD center elevation of 135-ft above grade level.
  Coax Cables: Nine (9) 1-5/8" ∅ coax cables and one (1) 5/8" ∅ fiber optic cable and two (2) #8 DC control cables running within one (1) 3" ∅ flex conduit running on the leg of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing):
  Antennas: Six (6) Antel BXA-70063-6CF panel antennas, six (6) Antel BXA-171063-12CF panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads and three (3) Alcatel-Lucent RRH2x40-07-U Remote Radio Heads mounted to three (3) 12ft-6in. Heavy Duty V-Frames (Site PRO1 P/NVFA12 with a RAD center elevation of 126-ft above grade level.
  Misc Equipment: One (1) RFS DB-T1-6Z-8AB-0Z main distribution box flush mounted to the leg of the existing tower with a RAD center elevation of 126-ft above grade level.
  Coax Cables: Two (2) 1-5/8" ∅ Hybriflex fiber lines running on the East face of the existing tower adjacent to the existing municipal cables, as specified in Section 3 of this report.

- *SPRINT (Reserved – Interim configuration):*
  Antennas: *Four (4) Andrew/Decibel DB980F90E-M, two (2) Andrew/Decibel DB950G65E-M panel antennaS, two (2) RFS APXVSPP18-C-A20 panel antennas, one (1) Powerwave P40-16-XLPP-RR-A panel antenna, three (3) 1900MHz 4X45W RRH's and three (3) 800MHz 2X50W RRH's mounted on three (3) existing 10-ft boom gates with a RAD center elevation of ±91-ft above the tower base.*
  Coax Cables: *Six (6) 1-5/8" ∅ coaxial cables and three (3) 1-1/4"∅ Hybriflex cables running on the leg of the existing tower as specified in Section 3 of this report.*
- *SPRINT (Reserved – Final configuration):*
  Antennas: *Two (2) RFS APXVSPP18-C-A20 panel antennas, one (1) Powerwave P40-16-XLPP-RR-A panel antenna, three (3) 1900MHz 4X45W RRH's and three (3) 800MHz 2X50W RRH's mounted on three (3) existing 10-ft boom gates with a RAD center elevation of ±91-ft above the tower base.*
  Coax Cables: *Three (3) 1-1/4"∅ Hybriflex cables running on the face of the existing tower as specified in Section 3 of this report.*

  Note 1: All existing SPRINT equipment shall be removed upon the successful completion of the testing of the proposed equipment. The removal the existing SPRINT equipment shall be completed within a time frame acceptable to NEU.
- SPRINT (Existing):
  Antennas: One (1) GPS antenna mounted on one (1) 1-ft side arm with RAD center elevation of ±62-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the leg of the existing tower as specified in Section 3 of this report.
- T-MOBILE (Existing to Relocate):
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on a leg of the existing tower to be relocated to the face of the tower on a proposed cable ladder as specified in Section 3 of this report.
- T-MOBILE (Existing to Remove):
  Antennas: Three (3) EMS RR-90-17-00DP panel antennas and three (3) TMA's mounted on three (3) 3-ft side arms with a RAD center elevation of ±149-ft above grade level.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) Ericsson AIR 21 B2A/B4P and three (3) Andrew LNX-6512DS panel antennas mounted on three (3) proposed Site-Pro WiMax Tower Mounts p/n CWT01 with a RAD center elevation of ±149-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on the face of the tower on a proposed cable ladder as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- **All coax cables routed as specified in Section 3 of this report.**
- **All calculations were performed using the interim configuration for Sprint's antenna loading.**

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower legs, and the model assumes that the leg members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for 85mph basic wind speed (fastest mile) with no ice and 85mph with ½ inch accumulative ice to determine stresses in members as per guidelines of Northeast Utilities Substation Standard (NU SUB-090), TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice tower structure and its components.

Basic Wind Speed:	Fairfield; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	NU SUB-090; v = 85 mph (fastest mile)	*[Northeast Utilities Substation Standard 090]*
	Newtown; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	NU–SUB-090 wind speed controls	
Load Cases:	Load Case 1; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation. This load case typically controls the design.	*[Northeast Utilities Substation Standard 090]*
	Load Case 2; 85 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. This load case typically controls the design of lattice towers.	*[Northeast Utilities Substation Standard 090]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

The tower deflection was evaluated with a wind velocity of 85 mph concurrent with 0.5" ice to determine twist (rotation) and sway (deflection) in accordance with NU SUB-90 requirements.

- Calculated stresses were found to be within allowable limits. In Load Case 2, per tnxTower "Section Capacity Table", this tower was found to be at **84.9%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T10)	3'-0"-23'-0"	78.7%	**PASS**
Diagonal Bolts (T10)	3'-0"-23'-0"	84.9%	**PASS**
Secondary Horizontal (T10)	3'-0"-23'-0"	83.5%	**PASS**

- The tower combined deflection is **0.5462 degrees**.

Deflection Criteria	Proposed (degrees)	Allowable (degrees)	Result
Sway (Tilt)	0.5449	0.5	**n/a**
Twist	0.0370	0.5	**n/a**
Combined	0.5462	0.5	**PASS** (2)

Note 2: *Tower deflection is less than the previously approved deflection of 0.5564 degrees per the structural report prepared by Centek job no. 14025.002 dated April 9, 2014.*

Foundation and Anchors

The existing foundation system consists of three (3) 2-ft 6in square reinforced concrete piers on three (3) 10-ft square x 2-ft deep reinforced concrete pads concentrically bearing on the existing sub grade, with subsequent mass concrete reinforcement located at grade. The existing foundation geometry was obtained from the aforementioned Centek structural report. The sub-grade conditions used in the analysis of the existing foundation were obtained from a geo-technical soil study prepared by Clarence Welti and Assoc., dated October 19, 2011. The tower legs are connected to the foundation with (6) 1.00"∅, ASTM A-449 (Fu = 120ksi) anchor bolts per leg.

- The tower reactions developed from the governing Load Case 2 were used in the verification of the foundation and anchor bolts:

Load Effect	Proposed Tower Reactions
Leg Shear	31 kips
Leg Compression	249 kips
Leg Tension	192 kips
Base Moment	4908 ft-kips
Base Shear	55 kips

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Tension and Shear	80.6%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2 (FS)[4]	Proposed Loading (FS)[3]	Result
Reinforced Concrete Pad and Pier	Overturning	2.00	2.66	**PASS**

Note 3: FS denotes Factor of Safety

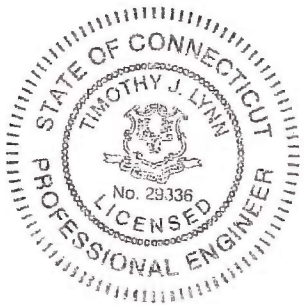
Conclusion

This analysis shows that the subject tower **with the proposed reinforcement detailed in section 4 of this report is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

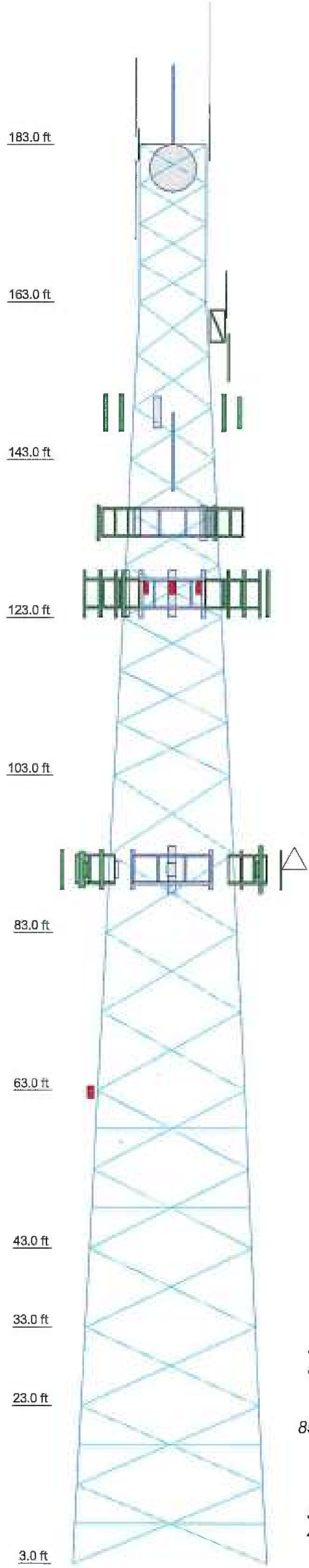
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	P2.5x.203	A572-50	L1 3/4x1 3/4x3/16	A36	L2 1/2x2 1/2x3/16	N.A.	8.56	4 @ 5	0.9
T2	P2.5x.276	A572-50	L2x2x1/4	A36	N.A.	N.A.	10.6	9 @ 6.66667	1.1
T3	P3x.216	A572-50	L2 1/2x2 1/2x3/16	A36	N.A.	N.A.	12.68	9 @ 6.66667	1.8
T4	P4x.337	A572-50	L2 1/2x2 1/2x5/16	A36	N.A.	N.A.	14.77	9 @ 6.66667	2.3
T5	P5x.258	A572-50	A	A36	N.A.	N.A.	16.77	10 @ 10	3.3
T6	P5x.375	A572-50	L3 1/2x3 1/2x5/16	A36	N.A.	N.A.	18.77	10 @ 10	3.0
T7	P5x.375	A572-50	L3 1/2x3 1/2x3/8	A36	N.A.	L3 1/2x3 1/2x1/4	20.86	10 @ 10	4.3
T8	P6x.432	A572-50	L4x4x3/8	A36	N.A.	N.A.	21.86	10 @ 10	2.2
T9	P6x.432	A572-50	L4x4x3/8	A36	N.A.	N.A.	22.86	10 @ 10	2.3
T10	P6x.432	A572-50	L4x4x3/8	A36	N.A.	L4x4x1/4	24.86	10 @ 10	5.7
									26.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PD220 (NU)	191	BXA-70063/6CF (Verizon)	126
2" Dia 8' Omni (NU)	189	BXA-70063/6CF (Verizon)	126
10' 2-Bay Dipole (Municipal)	188	BXA-70063/6CF (Verizon)	126
3'x2.5" Pipe Mount (NU)	183	BXA-70063/6CF (Verizon)	126
4'x4" Pipe Mount (NU)	183	BXA-70063/6CF (Verizon)	126
6'x4" Pipe Mount (NU Dish)	180	BXA-70063/6CF (Verizon)	126
6 FT DISH (NU)	180	BXA-171063-12CF (Verizon)	126
12' Dipole (NU)	176	BXA-171063-12CF (Verizon)	126
DB586-Y (NEU)	164	BXA-171063-12CF (Verizon)	126
3' Standoff (NEU)	160	BXA-171063-12CF (Verizon)	126
TMA (NEU)	160	BXA-171063-12CF (Verizon)	126
DB586-Y (NEU)	156	BXA-171063-12CF (Verizon)	126
LNX-6512DS (T-Mobile - Proposed)	149	RRH2x40-07-U (Verizon)	126
LNX-6512DS (T-Mobile - Proposed)	149	RRH2x40-07-U (Verizon)	126
LNX-6512DS (T-Mobile - Proposed)	149	RRH2x40-07-U (Verizon)	126
AIR21 (T-Mobile - Proposed)	149	RRH2x40-AWS (Verizon)	126
AIR21 (T-Mobile - Proposed)	149	RRH2x40-AWS (Verizon)	126
AIR21 (T-Mobile - Proposed)	149	RRH2x40-AWS (Verizon)	126
Site Pro Compact Tower Mount CWT01 (T-Mobile - Proposed)	149	DB-T1-6Z-8AB-0Z (Verizon)	126
		Site Pro Heavy Duty V-Frame (Verizon)	126
Site Pro Compact Tower Mount CWT01 (T-Mobile - Proposed)	149	Site Pro Heavy Duty V-Frame (Verizon)	126
		Site Pro Heavy Duty V-Frame (Verizon)	126
Site Pro Compact Tower Mount CWT01 (T-Mobile - Proposed)	149	FD-RRH 4x40 1900 (Sprint)	91
		FD-RRH 4x40 1900 (Sprint)	91
10' 2-Bay Dipole (Municipal)	144	FD-RRH 4x40 1900 (Sprint)	91
3' Standoff (Municipal)	139	FD-RRH 2x50 800 (Sprint)	91
10'6" Site Pro T-Arm (ATT)	135	FD-RRH 2x50 800 (Sprint)	91
10'6" Site Pro T-Arm (ATT)	135	FD-RRH 2x50 800 (Sprint)	91
800 10121 (ATT)	135	P40-16-XLPP-RR-A w/ Mount (Sprint)	91
DC6-48-60-18-8F Surge Arrestor (ATT)	135	10' Frame (Sprint)	91
800 10121 (ATT)	135	(2) DB950G65E-M w/Mount Pipe (Sprint)	91
(2) LPG21401 TMA (ATT)	135		
(2) LPG21401 TMA (ATT)	135	10' Frame (Sprint)	91
800 10121 (ATT)	135	(2) DB980F90E-M w/Mount Pipe (Sprint)	91
(2) LPG21401 TMA (ATT)	135		
P65-16-XL w/ mount pipe (ATT)	135	10' Frame (Sprint)	91
P65-16-XL w/ mount pipe (ATT)	135	(2) DB980F90E-M w/Mount Pipe (Sprint)	91
P65-16-XL w/ mount pipe (ATT)	135		
(2) RRH (ATT)	135	APXVSPP18-C-A20 w/ Mount (Sprint)	91
(2) RRH (ATT)	135	APXVSPP18-C-A20 w/ Mount (Sprint)	91
(2) RRH (ATT)	135	GPS (Sprint)	62
10'6" Site Pro T-Arm (ATT)	135	1' Standoff (Sprint)	62

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L3X3X3/16 Reinf w/L2.5X2.5X3/16		

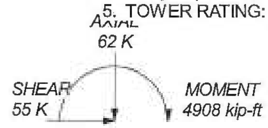
MATERIAL STRENGTH

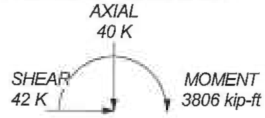
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 85 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 85 mph wind.
4. Analysis per NU-SUB-090 Standard
5. TOWER RATING: 84.9%

MAX. CORNER REACTIONS AT BASE:
DOWN
UPLIFT
SHEAR



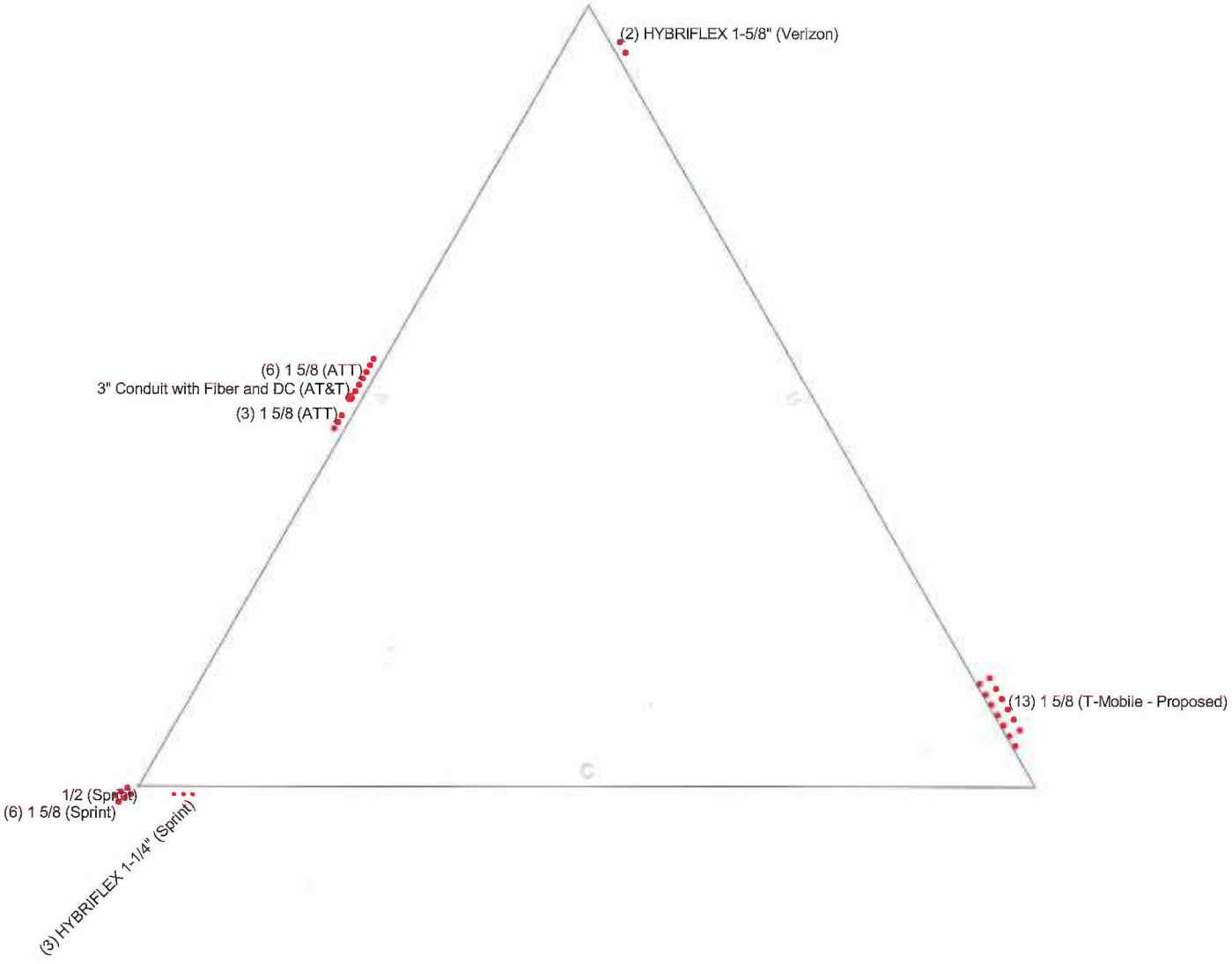


Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 14025.011 - CT11111A		
Project: 180-ft Lattice Tower - 20 Barnabas Rd, Newtown, CT		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 11/10/14	Scale: NTS
Path: J:\Jobs\1402500.WI\011 - CT11111A\04_Structural\Backup Documentation\Rev (1)\ERI Files\180 RCHN SSV Lattice Newton CT.eri		Dwg No. E-1

Feedline Plan

Round Flat App In Face App Out Face



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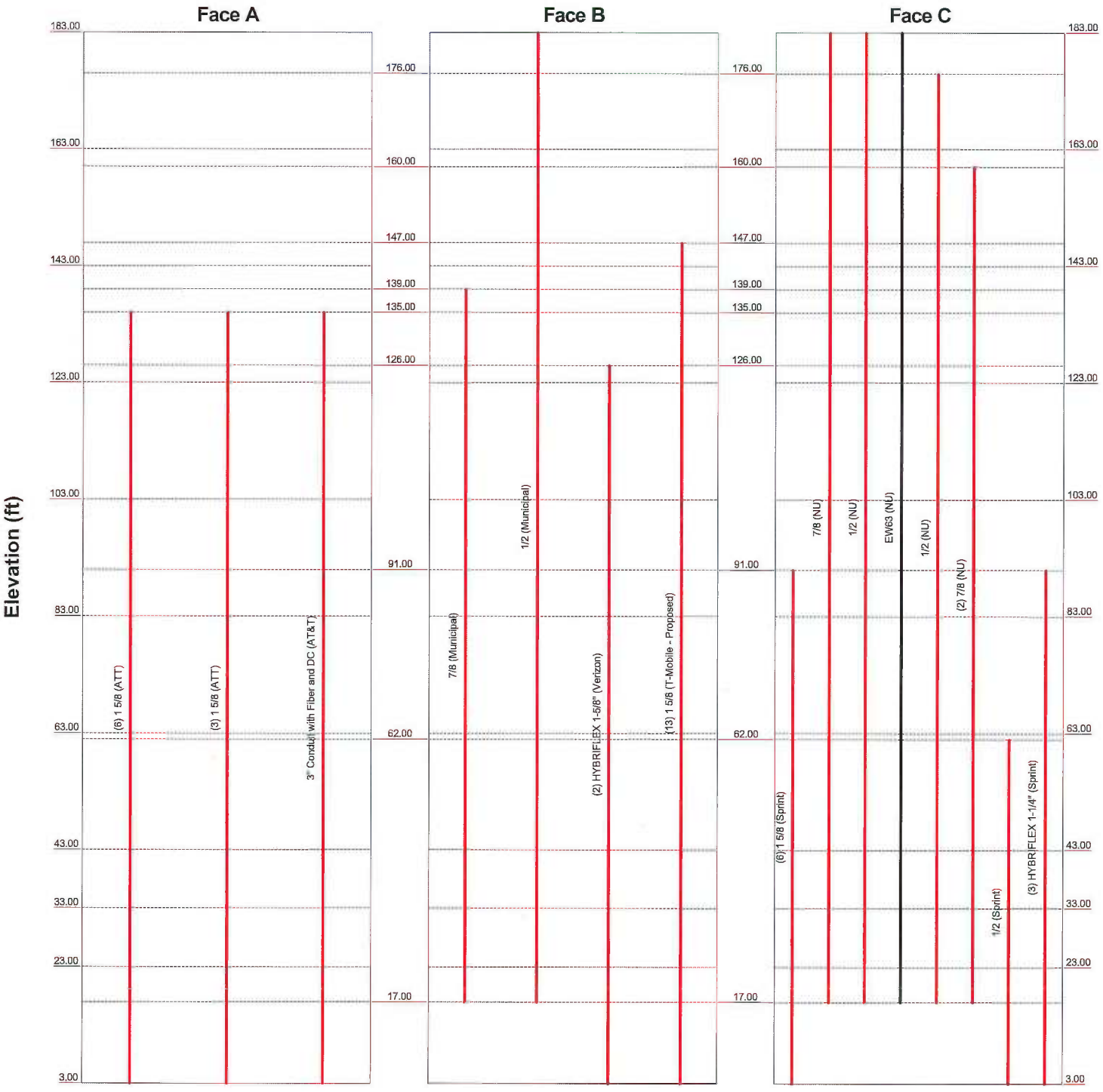
Job: ***14025.011 - CT11111A***		
Project: ***180-ft Lattice Tower - 20 Barnabas Rd, Newtown, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 11/10/14	Scale: NTS
Path:		Dwg No. E-7

Feedline Distribution Chart
3' - 183'

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



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FAX: (203) 488-8587

Job: ***14025.011 - CT11111A***		
Project: ***180-ft Lattice Tower - 20 Barnabas Rd, Newtown, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 11/10/14	Scale: NTS
Path:		Dwg No. E-7

tnxTower	Job	Page
	14025.011 - CT11111A	1 of 35
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 180-ft Lattice Tower - 20 Barnabas Rd, Newtown, CT	Date 12:12:26 11/10/14
	Client T-Mobile	Designed by TJL

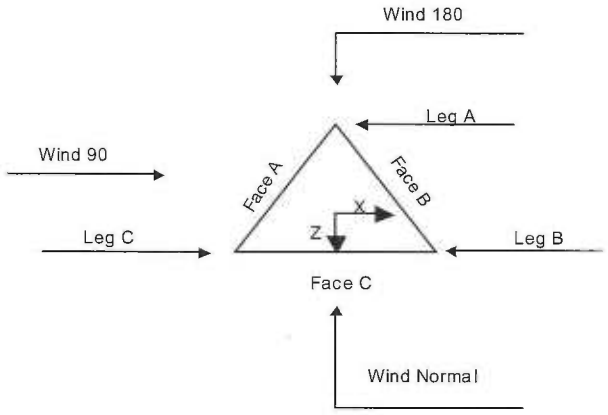
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 183.00 ft above the ground line.
The base of the tower is set at an elevation of 3.00 ft above the ground line.
The face width of the tower is 8.56 ft at the top and 24.86 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 85 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 85 mph.
Analysis per NU-SUB-090 Standard.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	183.00-163.00			8.56	1	20.00
T2	163.00-143.00			8.56	1	20.00
T3	143.00-123.00			10.60	1	20.00
T4	123.00-103.00			12.68	1	20.00
T5	103.00-83.00			14.77	1	20.00
T6	83.00-63.00			16.77	1	20.00
T7	63.00-43.00			18.77	1	20.00
T8	43.00-33.00			20.86	1	10.00
T9	33.00-23.00			21.86	1	10.00
T10	23.00-3.00			22.86	1	20.00

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	183.00-163.00	5.00	X Brace	No	No	0.0000	0.0000
T2	163.00-143.00	6.67	X Brace	No	No	0.0000	0.0000
T3	143.00-123.00	6.67	X Brace	No	No	0.0000	0.0000
T4	123.00-103.00	6.67	X Brace	No	No	0.0000	0.0000
T5	103.00-83.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	83.00-63.00	10.00	X Brace	No	No	0.0000	0.0000
T7	63.00-43.00	10.00	X Brace	No	Yes	0.0000	0.0000
T8	43.00-33.00	10.00	X Brace	No	No	0.0000	0.0000
T9	33.00-23.00	10.00	X Brace	No	No	0.0000	0.0000
T10	23.00-3.00	10.00	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 183.00-163.00	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 163.00-143.00	Pipe	P2.5x.276	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 143.00-123.00	Pipe	P3x.216	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 123.00-103.00	Pipe	P4x.337	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T5 103.00-83.00	Pipe	P5x.258	A572-50 (50 ksi)	Arbitrary Shape	L3X3X3/16 Reinf w/L2.5X2.5X3/16	A36 (36 ksi)
T6 83.00-63.00	Pipe	P5x.375	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 63.00-43.00	Pipe	P5x.375	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)
T8 43.00-33.00	Pipe	P6x.432	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T9 33.00-23.00	Pipe	P6x.432	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 ksi)
T10 23.00-3.00	Pipe	P6x.432	A572-50 (50 ksi)	Equal Angle	L4x4x3/8	A36 (36 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 183.00-163.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Equal 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
T7 63.00-43.00	Equal Angle	L3 1/2x3 1/2x1/4	A36	Equal Angle		A36

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
ft						
T10 23.00-3.00	Equal Angle	L4x4x1/4	(36 ksi) A36 (36 ksi)	Equal Angle		(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
T1 183.00-163.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 163.00-143.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 143.00-123.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 123.00-103.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 103.00-83.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 83.00-63.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 63.00-43.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 43.00-33.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 33.00-23.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 23.00-3.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	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
ft										
T1	Yes	Yes	1	1	1	1	1	1	1	1
183.00-163.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
163.00-143.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
143.00-123.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
123.00-103.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
103.00-83.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
83.00-63.00				1	1	1	1	1	1	1

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
T7	Yes	Yes	1	1	1	1	1	1	1	1
63.00-43.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
43.00-33.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
33.00-23.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
23.00-3.00				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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	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	0.75
183.00-163.00														
T2	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	0.75
163.00-143.00														
T3	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	0.75
143.00-123.00														
T4	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	0.75
123.00-103.00														
T5	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	0.75
103.00-83.00														
T6 83.00-63.00	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	0.75
T7 63.00-43.00	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	0.75
T8 43.00-33.00	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	0.75
T9 33.00-23.00	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	0.75
T10 23.00-3.00	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	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1	Flange	0.6250	4	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
183.00-163.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	0.7500	4	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
163.00-143.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	0.8750	4	0.5000	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
143.00-123.00		A325N		A325X		A325N		A325N		A325N		A325N		A325N	

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.
T4 123.00-103.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 103.00-83.00	Flange	1.0000 A325N	4	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 83.00-63.00	Flange	1.0000 A325N	4	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 63.00-43.00	Flange	1.0000 A325N	6	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 43.00-33.00	Flange	0.0000 A325N	0	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 33.00-23.00	Flange	1.0000 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 23.00-3.00	Flange	1.0000 A449	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

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
1 5/8 (Sprint)	C	No	Ar (Leg)	91.00 - 3.00	0.0000	-0.02	6	3	0.5000	1.9800		1.04
1 5/8 (ATT)	A	Yes	Ar (CfAe)	135.00 - 3.00	2.0000	0.02	6	6	0.5000	1.9800		1.04
1 5/8 (ATT)	A	Yes	Ar (CfAe)	135.00 - 3.00	2.0000	-0.04	3	3	0.5000	1.9800		1.04
7/8 (Municipal)	B	Yes	Ar (CfAe)	139.00 - 17.00	2.0000	-0.47	1	1	1.1100	1.1100		0.54
1/2 (Municipal)	B	Yes	Ar (CfAe)	183.00 - 17.00	2.0000	-0.46	1	1	0.5800	0.5800		0.25
7/8 (NU)	C	Yes	Ar (CfAe)	183.00 - 17.00	2.0000	-0.45	1	1	1.1100	1.1100		0.54
1/2 (NU)	C	Yes	Ar (CfAe)	183.00 - 17.00	2.0000	-0.44	1	1	0.5800	0.5800		0.25
EW63 (NU)	C	Yes	Af (CfAe)	183.00 - 17.00	2.0000	-0.43	1	1	1.5742	1.5742	5.0668	0.51
1/2 (NU)	C	Yes	Ar (CfAe)	176.00 - 17.00	2.0000	-0.42	1	1	0.5800	0.5800		0.25
7/8 (NU)	C	Yes	Ar (CfAe)	160.00 - 17.00	2.0000	-0.4	2	2	1.1100	1.1100		0.54
1/2 (Sprint)	C	No	Ar (Leg)	62.00 - 3.00	0.0000	0	1	1	0.5800	0.5800		0.25
3" Conduit with Fiber and DC (AT&T)	A	Yes	Ar (CfAe)	135.00 - 3.00	2.0000	-0.01	1	1	0.0000	3.0000		1.16
HYBRIFLEX 1-1/4" (Sprint)	C	Yes	Ar (CfAe)	91.00 - 3.00	2.0000	0.45	3	3	1.5400	1.5400		1.30
HYBRIFLEX 1-5/8" (Verizon)	B	Yes	Ar (CfAe)	126.00 - 3.00	2.0000	-0.44	2	2	1.9800	1.9800		1.90
1 5/8 (T-Mobile -	B	Yes	Ar (CfAe)	147.00 - 3.00	0.0000	0.41	13	7	1.9800	1.9800		1.04

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
Proposed)												

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	183.00-163.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.967	0.000	0.000	0.000	0.01
		C	3.445	2.624	0.000	0.000	0.03
T2	163.00-143.00	A	0.000	0.000	0.000	0.000	0.00
		B	5.587	0.000	0.000	0.000	0.06
		C	6.928	2.624	0.000	0.000	0.05
T3	143.00-123.00	A	20.820	0.000	0.000	0.000	0.13
		B	26.537	0.000	0.000	0.000	0.30
		C	7.483	2.624	0.000	0.000	0.05
T4	123.00-103.00	A	34.700	0.000	0.000	0.000	0.21
		B	32.517	0.000	0.000	0.000	0.36
		C	7.483	2.624	0.000	0.000	0.05
T5	103.00-83.00	A	38.660	0.000	0.000	0.000	0.21
		B	32.517	0.000	0.000	0.000	0.36
		C	14.523	2.624	0.000	0.000	0.13
T6	83.00-63.00	A	44.600	0.000	0.000	0.000	0.21
		B	32.517	0.000	0.000	0.000	0.36
		C	25.083	2.624	0.000	0.000	0.26
T7	63.00-43.00	A	45.518	0.000	0.000	0.000	0.21
		B	32.517	0.000	0.000	0.000	0.36
		C	26.002	2.624	0.000	0.000	0.26
T8	43.00-33.00	A	22.783	0.000	0.000	0.000	0.11
		B	16.258	0.000	0.000	0.000	0.18
		C	13.025	1.312	0.000	0.000	0.13
T9	33.00-23.00	A	22.783	0.000	0.000	0.000	0.11
		B	16.258	0.000	0.000	0.000	0.18
		C	13.025	1.312	0.000	0.000	0.13
T10	23.00-3.00	A	45.567	0.000	0.000	0.000	0.21
		B	30.545	0.000	0.000	0.000	0.35
		C	20.812	0.787	0.000	0.000	0.22

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	183.00-163.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		2.633	0.000	0.000	0.000	0.02
		C		7.862	3.735	0.000	0.000	0.10
T2	163.00-143.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		9.587	0.000	0.000	0.000	0.15
		C		14.762	3.735	0.000	0.000	0.16
T3	143.00-123.00	A	0.500	9.960	17.360	0.000	0.000	0.33
		B		41.703	0.000	0.000	0.000	0.73
		C		15.817	3.735	0.000	0.000	0.17
T4	123.00-103.00	A	0.500	16.600	28.933	0.000	0.000	0.55
		B		50.850	0.000	0.000	0.000	0.85

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		15.817	3.735	0.000	0.000	0.17
T5	103.00-83.00	A	0.500	18.587	32.240	0.000	0.000	0.55
		B		50.850	0.000	0.000	0.000	0.85
		C		22.883	7.041	0.000	0.000	0.35
T6	83.00-63.00	A	0.500	21.567	37.200	0.000	0.000	0.55
		B		50.850	0.000	0.000	0.000	0.85
		C		33.483	12.001	0.000	0.000	0.62
T7	63.00-43.00	A	0.500	24.068	37.200	0.000	0.000	0.55
		B		50.850	0.000	0.000	0.000	0.85
		C		35.985	12.001	0.000	0.000	0.64
T8	43.00-33.00	A	0.500	12.100	18.600	0.000	0.000	0.27
		B		25.425	0.000	0.000	0.000	0.42
		C		18.058	6.001	0.000	0.000	0.32
T9	33.00-23.00	A	0.500	12.100	18.600	0.000	0.000	0.27
		B		25.425	0.000	0.000	0.000	0.42
		C		18.058	6.001	0.000	0.000	0.32
T10	23.00-3.00	A	0.500	24.200	37.200	0.000	0.000	0.55
		B		46.545	0.000	0.000	0.000	0.82
		C		25.045	9.387	0.000	0.000	0.52

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
T1	183.00-163.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.113	0.075	0.205
		C	0.000	0.520	0.473	0.948
T2	163.00-143.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.292	0.341	0.585
		C	0.000	0.581	0.583	1.162
T3	143.00-123.00	A	0.000	0.788	1.501	1.969
		B	0.000	1.202	1.913	3.006
		C	0.000	0.580	0.729	1.449
T4	123.00-103.00	A	0.000	1.266	2.412	3.165
		B	0.000	1.414	2.260	3.535
		C	0.000	0.559	0.703	1.398
T5	103.00-83.00	A	0.000	0.000	2.270	3.577
		B	0.000	0.000	2.127	3.995
		C	0.000	0.000	0.862	1.979
T6	83.00-63.00	A	0.000	0.871	2.323	3.049
		B	0.000	0.973	2.177	3.404
		C	0.000	0.628	1.192	2.196
T7	63.00-43.00	A	0.000	1.230	3.280	4.304
		B	0.000	1.373	3.073	4.806
		C	0.000	0.886	1.683	3.101
T8	43.00-33.00	A	0.000	0.419	1.277	1.676
		B	0.000	0.468	1.197	1.872
		C	0.000	0.302	0.655	1.207
T9	33.00-23.00	A	0.000	0.416	1.267	1.663
		B	0.000	0.464	1.187	1.857
		C	0.000	0.299	0.650	1.198
T10	23.00-3.00	A	0.000	1.202	3.665	4.809
		B	0.000	1.229	3.226	4.916
		C	0.000	0.495	1.134	1.979

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	183.00-163.00	3.4327	1.7386	4.1619	1.7337
T2	163.00-143.00	9.0792	4.8128	10.4389	5.2360
T3	143.00-123.00	8.9895	2.3182	12.4721	3.6866
T4	123.00-103.00	5.5618	-2.3520	10.0451	-0.7014
T5	103.00-83.00	2.2787	-0.2757	7.8310	1.0875
T6	83.00-63.00	-2.3687	2.6116	3.6388	3.5860
T7	63.00-43.00	-2.7249	2.7407	2.4129	3.8736
T8	43.00-33.00	-2.9569	3.0369	2.8020	4.3826
T9	33.00-23.00	-3.0507	3.1454	2.8954	4.5352
T10	23.00-3.00	-5.4915	2.0513	-1.2941	3.1657

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
2" Dia 8' Omni	C	From Leg	0.50	0.0000	189.00	No Ice	2.00	2.00	0.01
(NU)			0.00			1/2" Ice	3.03	3.03	0.02
			0.00						
4'x4" Pipe Mount	C	From Leg	0.25	0.0000	183.00	No Ice	1.32	1.32	0.04
(NU)			0.00			1/2" Ice	1.58	1.58	0.06
			0.00						
12' Dipole	C	From Leg	0.50	0.0000	176.00	No Ice	3.60	3.60	0.04
(NU)			0.00			1/2" Ice	4.83	4.83	0.06
			0.00						
10' 2-Bay Dipole	A	From Leg	0.50	0.0000	188.00	No Ice	1.07	1.07	0.01
(Municipal)			0.00			1/2" Ice	1.71	1.71	0.02
			0.00						
3'x2.5" Pipe Mount	A	From Leg	0.25	0.0000	183.00	No Ice	0.60	0.60	0.02
(NU)			0.00			1/2" Ice	0.79	0.79	0.03
			0.00						
6'x4" Pipe Mount	A	From Leg	0.25	0.0000	180.00	No Ice	2.09	2.09	0.05
(NU Dish)			0.00			1/2" Ice	2.46	2.46	0.07
			0.00						
PD220	B	From Leg	0.50	0.0000	191.00	No Ice	3.56	3.56	0.02
(NU)			0.00			1/2" Ice	7.13	7.13	0.05
			0.00						
3' Standoff	A	From Leg	1.50	0.0000	139.00	No Ice	2.20	2.20	0.06
(Municipal)			0.00			1/2" Ice	3.30	3.30	0.07
			0.00						
10' 2-Bay Dipole	A	From Leg	3.00	0.0000	144.00	No Ice	1.07	1.07	0.01
(Municipal)			0.00			1/2" Ice	1.71	1.71	0.02
			0.00						
800 10121	A	From Leg	2.00	0.0000	135.00	No Ice	5.46	3.29	0.05
(ATT)			4.00			1/2" Ice	5.88	3.64	0.08
			0.00						
(2) LPG21401 TMA	A	From Leg	2.00	0.0000	135.00	No Ice	0.95	0.37	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(ATT)			4.00 0.00			1/2" Ice	1.09	0.48	0.02
800 10121	B	From Leg	2.00	0.0000	135.00	No Ice	5.46	3.29	0.05
(ATT)			4.00 0.00			1/2" Ice	5.88	3.64	0.08
(2) LPG21401 TMA	B	From Leg	2.00	0.0000	135.00	No Ice	0.95	0.37	0.02
(ATT)			4.00 0.00			1/2" Ice	1.09	0.48	0.02
800 10121	C	From Leg	2.00	0.0000	135.00	No Ice	5.46	3.29	0.05
(ATT)			4.00 0.00			1/2" Ice	5.88	3.64	0.08
(2) LPG21401 TMA	C	From Leg	2.00	0.0000	135.00	No Ice	0.95	0.37	0.02
(ATT)			4.00 0.00			1/2" Ice	1.09	0.48	0.02
P65-16-XL w/ mount pipe	A	From Leg	2.00	0.0000	135.00	No Ice	8.40	5.54	0.07
(ATT)			-4.00 0.00			1/2" Ice	8.95	6.48	0.12
P65-16-XL w/ mount pipe	B	From Leg	2.00	0.0000	135.00	No Ice	8.40	5.54	0.07
(ATT)			-4.00 0.00			1/2" Ice	8.95	6.48	0.12
P65-16-XL w/ mount pipe	C	From Leg	2.00	0.0000	135.00	No Ice	8.40	5.54	0.07
(ATT)			-4.00 0.00			1/2" Ice	8.95	6.48	0.12
(2) RRH	A	From Leg	0.00	0.0000	135.00	No Ice	2.94	1.25	0.06
(ATT)			0.00 0.00			1/2" Ice	3.17	1.41	0.07
(2) RRH	B	From Leg	0.00	0.0000	135.00	No Ice	2.94	1.25	0.06
(ATT)			0.00 0.00			1/2" Ice	3.17	1.41	0.07
(2) RRH	C	From Leg	0.00	0.0000	135.00	No Ice	2.94	1.25	0.06
(ATT)			0.00 0.00			1/2" Ice	3.17	1.41	0.07
DC6-48-60-18-8F Surge	C	From Leg	0.00	0.0000	135.00	No Ice	2.23	2.23	0.02
Arrestor			0.00			1/2" Ice	2.45	2.45	0.04
(ATT)			0.00						
10'6" Site Pro T-Arm	A	From Leg	1.00	0.0000	135.00	No Ice	4.50	4.50	0.25
(ATT)			0.00 0.00			1/2" Ice	5.65	5.65	0.35
10'6" Site Pro T-Arm	B	From Leg	1.00	0.0000	135.00	No Ice	4.50	4.50	0.25
(ATT)			0.00 0.00			1/2" Ice	5.65	5.65	0.35
10'6" Site Pro T-Arm	C	From Leg	1.00	0.0000	135.00	No Ice	4.50	4.50	0.25
(ATT)			0.00 0.00			1/2" Ice	5.65	5.65	0.35
10' Frame	A	From Leg	2.00	0.0000	91.00	No Ice	17.20	12.50	1.00
(Sprint)			0.00 0.00			1/2" Ice	25.00	19.00	1.50
(2) DB980F90E-M w/Mount	A	From Leg	4.00	0.0000	91.00	No Ice	4.37	3.95	0.03
Pipe			0.00			1/2" Ice	4.96	5.04	0.07
(Sprint)			0.00						
10' Frame	B	From Leg	2.00	0.0000	91.00	No Ice	17.20	12.50	1.00
(Sprint)			0.00 0.00			1/2" Ice	25.00	19.00	1.50
(2) DB980F90E-M w/Mount	B	From Leg	4.00	0.0000	91.00	No Ice	4.37	3.95	0.03
Pipe			0.00			1/2" Ice	4.96	5.04	0.07
(Sprint)			0.00						
10' Frame	C	From Leg	2.00	0.0000	91.00	No Ice	17.20	12.50	1.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Sprint)			0.00 0.00			1/2" Ice	25.00	19.00	1.50
(2) DB950G65E-M w/Mount Pipe	C	From Leg	4.00 0.00	0.0000	91.00	No Ice 1/2" Ice	6.89 7.56	5.90 7.01	0.04 0.10
(Sprint)			0.00						
GPS	C	From Leg	1.00	0.0000	62.00	No Ice	1.00	1.00	0.01
(Sprint)			0.00 0.00			1/2" Ice	1.50	1.50	0.01
1' Standoff	C	From Leg	0.50	0.0000	62.00	No Ice	0.25	0.25	0.01
(Sprint)			0.00 0.00			1/2" Ice	0.38	0.38	0.01
3' Standoff	B	From Leg	1.50	0.0000	160.00	No Ice	2.75	2.75	0.06
(NEU)			0.00 0.00			1/2" Ice	3.65	3.65	0.07
DB586-Y	B	From Leg	3.00	0.0000	164.00	No Ice	1.01	1.01	0.01
(NEU)			0.00 0.00			1/2" Ice	1.28	1.28	0.02
DB586-Y	B	From Leg	3.00	0.0000	156.00	No Ice	1.01	1.01	0.01
(NEU)			0.00 0.00			1/2" Ice	1.28	1.28	0.02
TMA	B	From Leg	0.00	0.0000	160.00	No Ice	0.78	0.29	0.02
(NEU)			0.00 0.00			1/2" Ice	0.90	0.38	0.02
APXVSPP18-C-A20 w/ Mount	A	From Leg	4.00 0.00	0.0000	91.00	No Ice 1/2" Ice	8.96 9.66	8.08 9.14	0.12 0.20
(Sprint)			0.00						
APXVSPP18-C-A20 w/ Mount	B	From Leg	4.00 0.00	0.0000	91.00	No Ice 1/2" Ice	8.96 9.66	8.08 9.14	0.12 0.20
(Sprint)			0.00						
P40-16-XLPP-RR-A w/ Mount	C	From Leg	4.00 0.00	0.0000	91.00	No Ice 1/2" Ice	11.73 12.47	6.32 7.27	0.11 0.20
(Sprint)			0.00						
FD-RRH 4x40 1900	A	From Face	3.50	0.0000	91.00	No Ice	2.61	2.71	0.06
(Sprint)			0.00 0.00			1/2" Ice	2.84	2.95	0.08
FD-RRH 4x40 1900	B	From Leg	3.50	0.0000	91.00	No Ice	2.61	2.71	0.06
(Sprint)			0.00 0.00			1/2" Ice	2.84	2.95	0.08
FD-RRH 4x40 1900	C	From Leg	3.50	0.0000	91.00	No Ice	2.61	2.71	0.06
(Sprint)			0.00 0.00			1/2" Ice	2.84	2.95	0.08
FD-RRH 2x50 800	A	From Leg	3.50	0.0000	91.00	No Ice	2.40	2.25	0.06
(Sprint)			0.00 0.00			1/2" Ice	2.61	2.46	0.09
FD-RRH 2x50 800	B	From Leg	3.50	0.0000	91.00	No Ice	2.40	2.25	0.06
(Sprint)			0.00 0.00			1/2" Ice	2.61	2.46	0.09
FD-RRH 2x50 800	C	From Leg	3.50	0.0000	91.00	No Ice	2.40	2.25	0.06
(Sprint)			0.00 0.00			1/2" Ice	2.61	2.46	0.09
BXA-70063/6CF	A	From Leg	3.50	0.0000	126.00	No Ice	7.73	4.16	0.02
(Verizon)			-6.00 0.00			1/2" Ice	8.27	4.60	0.06
BXA-70063/6CF	B	From Leg	3.50	0.0000	126.00	No Ice	7.73	4.16	0.02
(Verizon)			-6.00 0.00			1/2" Ice	8.27	4.60	0.06
BXA-70063/6CF	C	From Leg	3.50	0.0000	126.00	No Ice	7.73	4.16	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Verizon)			-6.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-70063/6CF	A	From Leg	3.50	0.0000	126.00	No Ice	7.73	4.16	0.02
(Verizon)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-70063/6CF	B	From Leg	3.50	0.0000	126.00	No Ice	7.73	4.16	0.02
(Verizon)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-70063/6CF	C	From Leg	3.50	0.0000	126.00	No Ice	7.73	4.16	0.02
(Verizon)			0.00			1/2" Ice	8.27	4.60	0.06
			0.00						
BXA-171063-12CF	A	From Leg	3.50	0.0000	126.00	No Ice	4.79	3.62	0.02
(Verizon)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-171063-12CF	B	From Leg	3.50	0.0000	126.00	No Ice	4.79	3.62	0.02
(Verizon)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-171063-12CF	C	From Leg	3.50	0.0000	126.00	No Ice	4.79	3.62	0.02
(Verizon)			-4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-171063-12CF	A	From Leg	3.50	0.0000	126.00	No Ice	4.79	3.62	0.02
(Verizon)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-171063-12CF	B	From Leg	3.50	0.0000	126.00	No Ice	4.79	3.62	0.02
(Verizon)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
BXA-171063-12CF	C	From Leg	3.50	0.0000	126.00	No Ice	4.79	3.62	0.02
(Verizon)			4.00			1/2" Ice	5.24	4.06	0.04
			0.00						
RRH2x40-07-U	A	From Face	0.50	0.0000	126.00	No Ice	2.25	1.23	0.05
(Verizon)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-07-U	B	From Face	0.50	0.0000	126.00	No Ice	2.25	1.23	0.05
(Verizon)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-07-U	C	From Face	0.50	0.0000	126.00	No Ice	2.25	1.23	0.05
(Verizon)			0.00			1/2" Ice	2.45	1.39	0.07
			0.00						
RRH2x40-AWS	A	From Face	0.50	0.0000	126.00	No Ice	2.52	1.59	0.04
(Verizon)			0.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-AWS	B	From Face	0.50	0.0000	126.00	No Ice	2.52	1.59	0.04
(Verizon)			0.00			1/2" Ice	2.75	1.80	0.06
			0.00						
RRH2x40-AWS	C	From Face	0.50	0.0000	126.00	No Ice	2.52	1.59	0.04
(Verizon)			0.00			1/2" Ice	2.75	1.80	0.06
			0.00						
DB-T1-6Z-8AB-0Z	C	From Face	0.50	0.0000	126.00	No Ice	5.60	2.33	0.04
(Verizon)			0.00			1/2" Ice	5.92	2.56	0.08
			0.00						
Site Pro Heavy Duty	A	From Leg	1.75	0.0000	126.00	No Ice	15.00	15.00	0.50
V-Frame			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon)			0.00						
Site Pro Heavy Duty	B	From Leg	1.75	0.0000	126.00	No Ice	15.00	15.00	0.50
V-Frame			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon)			0.00						
Site Pro Heavy Duty	C	From Leg	1.75	0.0000	126.00	No Ice	15.00	15.00	0.50

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
V-Frame			0.00			1/2" Ice	20.60	20.60	0.65
(Verizon)			0.00						
LNX-6512DS	A	From Leg	3.00	0.0000	149.00	No Ice	5.61	3.35	0.03
(T-Mobile - Proposed)			-2.00			1/2" Ice	6.01	3.71	0.06
			0.00						
LNX-6512DS	B	From Leg	3.00	0.0000	149.00	No Ice	5.61	3.35	0.03
(T-Mobile - Proposed)			-2.00			1/2" Ice	6.01	3.71	0.06
			0.00						
LNX-6512DS	C	From Leg	3.00	0.0000	149.00	No Ice	5.61	3.35	0.03
(T-Mobile - Proposed)			-2.00			1/2" Ice	6.01	3.71	0.06
			0.00						
AIR21	B	From Leg	3.00	0.0000	149.00	No Ice	6.53	4.36	0.08
(T-Mobile - Proposed)			2.00			1/2" Ice	6.98	4.77	0.12
			0.00						
AIR21	C	From Leg	3.00	0.0000	149.00	No Ice	6.53	4.36	0.08
(T-Mobile - Proposed)			-2.00			1/2" Ice	6.98	4.77	0.12
			0.00						
AIR21	C	From Leg	3.00	0.0000	149.00	No Ice	6.53	4.36	0.08
(T-Mobile - Proposed)			2.00			1/2" Ice	6.98	4.77	0.12
			0.00						
Site Pro Compact Tower	A	From Leg	3.00	0.0000	149.00	No Ice	2.85	2.85	0.15
Mount CWT01			0.00			1/2" Ice	4.05	4.05	0.20
(T-Mobile - Proposed)			0.00						
Site Pro Compact Tower	B	From Leg	3.00	0.0000	149.00	No Ice	2.85	2.85	0.15
Mount CWT01			0.00			1/2" Ice	4.05	4.05	0.20
(T-Mobile - Proposed)			0.00						
Site Pro Compact Tower	C	From Leg	3.00	0.0000	149.00	No Ice	2.85	2.85	0.15
Mount CWT01			0.00			1/2" Ice	4.05	4.05	0.20
(T-Mobile - Proposed)			0.00						

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 K
6 FT DISH	A	Paraboloid	From	0.50	0.0000		180.00	6.00	No Ice	28.27	0.14
(NU)		w/Radome	Leg	0.00					1/2" Ice	29.05	0.29
				0.00							

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	173.00	1.605	30	175.992	A	12.975	9.583	9.583	42.48	0.000	0.000
183.00-163.00					B	12.900	10.550		40.87	0.000	0.000
					C	15.126	13.028		34.04	0.000	0.000
T2	153.00	1.55	29	196.398	A	11.385	9.600	9.600	45.75	0.000	0.000
163.00-143.00					B	11.044	15.187		36.60	0.000	0.000
					C	13.426	16.528		32.05	0.000	0.000
T3	133.00	1.489	28	238.641	A	14.865	32.508	11.688	24.67	0.000	0.000
143.00-123.00					B	14.452	38.224		22.19	0.000	0.000
					C	18.260	19.171		31.22	0.000	0.000
T4	113.00	1.421	26	282.010	A	16.163	49.727	15.027	22.81	0.000	0.000
123.00-103.00					B	16.315	47.544		23.53	0.000	0.000
					C	20.497	22.511		34.94	0.000	0.000
T5	93.00	1.345	25	324.683	A	17.779	57.234	18.574	24.76	0.000	0.000
103.00-83.00					B	17.922	51.091		26.91	0.000	0.000
					C	21.810	33.098		33.83	0.000	0.000
T6 83.00-63.00	73.00	1.255	23	364.683	A	20.849	63.174	18.574	22.11	0.000	0.000
					B	20.995	51.091		25.77	0.000	0.000
					C	24.604	43.658		27.21	0.000	0.000
T7 63.00-43.00	53.00	1.145	21	405.584	A	33.293	64.095	18.577	19.08	0.000	0.000
					B	33.499	51.094		21.96	0.000	0.000
					C	37.513	44.579		22.63	0.000	0.000
T8 43.00-33.00	38.00	1.041	19	219.128	A	14.074	33.843	11.060	23.08	0.000	0.000
					B	14.154	27.318		26.67	0.000	0.000
					C	16.007	24.085		27.59	0.000	0.000
T9 33.00-23.00	28.00	1	18	229.128	A	14.660	33.843	11.060	22.80	0.000	0.000
					B	14.740	27.318		26.30	0.000	0.000
					C	16.589	24.085		27.19	0.000	0.000
T10 23.00-3.00	13.00	1	18	488.255	A	45.566	67.687	22.120	19.53	0.000	0.000
					B	46.005	52.665		22.42	0.000	0.000
					C	48.884	42.932		24.09	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	173.00	1.605	30	0.5000	177.658	A	12.975	20.034	12.917	39.13	0.000	0.000
183.00-163.00						B	12.770	22.555		36.57	0.000	0.000
						C	15.763	27.376		29.94	0.000	0.000
T2	153.00	1.55	29	0.5000	198.067	A	11.385	18.632	12.939	43.11	0.000	0.000
163.00-143.00						B	10.800	27.926		33.41	0.000	0.000
						C	13.958	32.812		27.67	0.000	0.000
T3	133.00	1.489	28	0.5000	240.310	A	31.756	30.745	15.027	24.04	0.000	0.000
143.00-123.00						B	13.359	62.074		19.92	0.000	0.000
						C	18.651	36.810		27.09	0.000	0.000
T4	113.00	1.421	26	0.5000	283.679	A	44.344	41.131	18.367	21.49	0.000	0.000
123.00-103.00						B	15.041	75.233		20.35	0.000	0.000
						C	20.912	41.054		29.64	0.000	0.000
T5 103.00-83.00	93.00	1.345	25	0.5000	326.352	A	52.746	40.500	21.913	23.50	0.000	0.000
						B	20.088	72.763		23.60	0.000	0.000
						C	29.146	44.796		29.64	0.000	0.000
T6 83.00-63.00	73.00	1.255	23	0.5000	366.352	A	57.324	49.229	21.913	20.57	0.000	0.000
						B	19.768	78.411		22.32	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	32.977	61.390		23.22	0.000	0.000
T7 63.00-43.00	53.00	1.145	21	0.5000	407.253	A	69.469	55.205	21.916	17.58	0.000	0.000
						B	31.767	81.843		19.29	0.000	0.000
						C	45.473	67.465		19.41	0.000	0.000
T8 43.00-33.00	38.00	1.041	19	0.5000	219.962	A	32.275	28.248	12.729	21.03	0.000	0.000
						B	13.479	41.524		23.14	0.000	0.000
						C	20.144	34.324		23.37	0.000	0.000
T9 33.00-23.00	28.00	1	18	0.5000	229.962	A	32.865	28.396	12.729	20.78	0.000	0.000
						B	14.071	41.672		22.84	0.000	0.000
						C	20.730	34.470		23.06	0.000	0.000
T10 23.00-3.00	13.00	1	18	0.5000	489.924	A	81.622	60.764	25.459	17.88	0.000	0.000
						B	44.315	83.083		19.98	0.000	0.000
						C	56.639	62.317		21.40	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	173.00	1.605	30	175.992	A	12.975	9.583	9.583	42.48	0.000	0.000
183.00-163.00					B	12.900	10.550		40.87	0.000	0.000
					C	15.126	13.028		34.04	0.000	0.000
T2	153.00	1.55	29	196.398	A	11.385	9.600	9.600	45.75	0.000	0.000
163.00-143.00					B	11.044	15.187		36.60	0.000	0.000
					C	13.426	16.528		32.05	0.000	0.000
T3	133.00	1.489	28	238.641	A	14.865	32.508	11.688	24.67	0.000	0.000
143.00-123.00					B	14.452	38.224		22.19	0.000	0.000
					C	18.260	19.171		31.22	0.000	0.000
T4	113.00	1.421	26	282.010	A	16.163	49.727	15.027	22.81	0.000	0.000
123.00-103.00					B	16.315	47.544		23.53	0.000	0.000
					C	20.497	22.511		34.94	0.000	0.000
T5	93.00	1.345	25	324.683	A	17.779	57.234	18.574	24.76	0.000	0.000
103.00-83.00					B	17.922	51.091		26.91	0.000	0.000
					C	21.810	33.098		33.83	0.000	0.000
T6 83.00-63.00	73.00	1.255	23	364.683	A	20.849	63.174	18.574	22.11	0.000	0.000
					B	20.995	51.091		25.77	0.000	0.000
					C	24.604	43.658		27.21	0.000	0.000
T7 63.00-43.00	53.00	1.145	21	405.584	A	33.293	64.095	18.577	19.08	0.000	0.000
					B	33.499	51.094		21.96	0.000	0.000
					C	37.513	44.579		22.63	0.000	0.000
T8 43.00-33.00	38.00	1.041	19	219.128	A	14.074	33.843	11.060	23.08	0.000	0.000
					B	14.154	27.318		26.67	0.000	0.000
					C	16.007	24.085		27.59	0.000	0.000
T9 33.00-23.00	28.00	1	18	229.128	A	14.660	33.843	11.060	22.80	0.000	0.000
					B	14.740	27.318		26.30	0.000	0.000
					C	16.589	24.085		27.19	0.000	0.000
T10 23.00-3.00	13.00	1	18	488.255	A	45.566	67.687	22.120	19.53	0.000	0.000
					B	46.005	52.665		22.42	0.000	0.000
					C	48.884	42.932		24.09	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.03	0.93	A	0.128	2.853	0.578	1	1	18.518	2.07	103.42	C
183.00-163.00			B	0.133	2.834	0.579	1	1	19.009			
			C	0.16	2.735	0.583	1	1	22.722			
T2	0.11	1.13	A	0.107	2.937	0.576	1	1	16.913	2.05	102.27	C
163.00-143.00			B	0.134	2.833	0.579	1	1	19.839			
			C	0.153	2.762	0.582	1	1	23.043			
T3	0.47	1.20	A	0.199	2.601	0.59	1	1	34.047	2.90	145.14	B
143.00-123.00			B	0.221	2.528	0.595	1	1	37.190			
			C	0.157	2.746	0.583	1	1	29.428			
T4	0.63	2.27	A	0.234	2.487	0.598	1	1	45.892	3.36	168.20	A
123.00-103.00			B	0.226	2.51	0.596	1	1	44.658			
			C	0.153	2.762	0.582	1	1	33.595			
T5	0.71	3.33	A	0.231	2.496	0.597	1	1	51.961	3.61	180.73	A
103.00-83.00			B	0.213	2.555	0.593	1	1	48.221			
			C	0.169	2.702	0.585	1	1	41.159			
T6	0.83	2.99	A	0.23	2.498	0.597	1	1	58.569	3.80	190.24	A
83.00-63.00			B	0.198	2.604	0.59	1	1	51.135			
			C	0.187	2.639	0.588	1	1	50.269			
T7	0.83	4.18	A	0.24	2.467	0.599	1	1	71.712	4.20	210.01	A
63.00-43.00			B	0.209	2.568	0.592	1	1	63.756			
			C	0.202	2.588	0.591	1	1	63.855			
T8	0.42	2.24	A	0.219	2.535	0.594	1	1	34.190	1.87	187.06	A
43.00-33.00			B	0.189	2.632	0.588	1	1	30.224			
			C	0.183	2.654	0.587	1	1	30.147			
T9	0.42	2.29	A	0.212	2.557	0.593	1	1	34.725	1.84	184.11	A
33.00-23.00			B	0.184	2.652	0.587	1	1	30.781			
			C	0.178	2.673	0.586	1	1	30.705			
T10	0.79	5.69	A	0.232	2.493	0.597	1	1	86.005	4.44	222.23	A
23.00-3.00			B	0.202	2.589	0.591	1	1	77.121			
			C	0.188	2.636	0.588	1	1	74.130			
Sum Weight:	5.23	26.24						OTM	2363.46 kip-ft	30.16		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.03	0.93	A	0.128	2.853	0.578	0.8	1	15.923	1.79	89.65	C
183.00-163.00			B	0.133	2.834	0.579	0.8	1	16.429			
			C	0.16	2.735	0.583	0.8	1	19.697			
T2	0.11	1.13	A	0.107	2.937	0.576	0.8	1	14.636	1.81	90.35	C
163.00-143.00			B	0.134	2.833	0.579	0.8	1	17.630			
			C	0.153	2.762	0.582	0.8	1	20.358			
T3	0.47	1.20	A	0.199	2.601	0.59	0.8	1	31.074	2.68	133.86	B
143.00-123.00			B	0.221	2.528	0.595	0.8	1	34.300			
			C	0.157	2.746	0.583	0.8	1	25.776			
T4	0.63	2.27	A	0.234	2.487	0.598	0.8	1	42.660	3.13	156.35	A
123.00-103.00			B	0.226	2.51	0.596	0.8	1	41.395			
			C	0.153	2.762	0.582	0.8	1	29.495			
T5	0.71	3.33	A	0.231	2.496	0.597	0.8	1	48.405	3.37	168.36	A
103.00-83.00			B	0.213	2.555	0.593	0.8	1	44.637			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.169	2.702	0.585	0.8	1	36.796			
T6	0.83	2.99	A	0.23	2.498	0.597	0.8	1	54.399	3.53	176.70	A
83.00-63.00			B	0.198	2.604	0.59	0.8	1	46.936			
			C	0.187	2.639	0.588	0.8	1	45.348			
T7	0.83	4.18	A	0.24	2.467	0.599	0.8	1	65.053	3.81	190.51	A
63.00-43.00			B	0.209	2.568	0.592	0.8	1	57.056			
			C	0.202	2.588	0.591	0.8	1	56.352			
T8	0.42	2.24	A	0.219	2.535	0.594	0.8	1	31.375	1.72	171.66	A
43.00-33.00			B	0.189	2.632	0.588	0.8	1	27.394			
			C	0.183	2.654	0.587	0.8	1	26.945			
T9	0.42	2.29	A	0.212	2.557	0.593	0.8	1	31.793	1.69	168.56	A
33.00-23.00			B	0.184	2.652	0.587	0.8	1	27.833			
			C	0.178	2.673	0.586	0.8	1	27.387			
T10	0.79	5.69	A	0.232	2.493	0.597	0.8	1	76.891	3.97	198.68	A
23.00-3.00			B	0.202	2.589	0.591	0.8	1	67.920			
			C	0.188	2.636	0.588	0.8	1	64.353			
Sum Weight:	5.23	26.24						OTM	2150.78 kip-ft	27.49		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.93	A	0.128	2.853	0.578	0.85	1	16.572	1.86	93.09	C
183.00-163.00			B	0.133	2.834	0.579	0.85	1	17.074			
			C	0.16	2.735	0.583	0.85	1	20.453			
T2	0.11	1.13	A	0.107	2.937	0.576	0.85	1	15.205	1.87	93.33	C
163.00-143.00			B	0.134	2.833	0.579	0.85	1	18.182			
			C	0.153	2.762	0.582	0.85	1	21.029			
T3	0.47	1.20	A	0.199	2.601	0.59	0.85	1	31.818	2.73	136.68	B
143.00-123.00			B	0.221	2.528	0.595	0.85	1	35.022			
			C	0.157	2.746	0.583	0.85	1	26.689			
T4	0.63	2.27	A	0.234	2.487	0.598	0.85	1	43.468	3.19	159.32	A
123.00-103.00			B	0.226	2.51	0.596	0.85	1	42.211			
			C	0.153	2.762	0.582	0.85	1	30.520			
T5	0.71	3.33	A	0.231	2.496	0.597	0.85	1	49.294	3.43	171.45	A
103.00-83.00			B	0.213	2.555	0.593	0.85	1	45.533			
			C	0.169	2.702	0.585	0.85	1	37.887			
T6	0.83	2.99	A	0.23	2.498	0.597	0.85	1	55.441	3.60	180.08	A
83.00-63.00			B	0.198	2.604	0.59	0.85	1	47.986			
			C	0.187	2.639	0.588	0.85	1	46.578			
T7	0.83	4.18	A	0.24	2.467	0.599	0.85	1	66.718	3.91	195.38	A
63.00-43.00			B	0.209	2.568	0.592	0.85	1	58.731			
			C	0.202	2.588	0.591	0.85	1	58.228			
T8	0.42	2.24	A	0.219	2.535	0.594	0.85	1	32.079	1.76	175.51	A
43.00-33.00			B	0.189	2.632	0.588	0.85	1	28.101			
			C	0.183	2.654	0.587	0.85	1	27.746			
T9	0.42	2.29	A	0.212	2.557	0.593	0.85	1	32.526	1.72	172.45	A
33.00-23.00			B	0.184	2.652	0.587	0.85	1	28.570			
			C	0.178	2.673	0.586	0.85	1	28.216			
T10	0.79	5.69	A	0.232	2.493	0.597	0.85	1	79.170	4.09	204.57	A
23.00-3.00			B	0.202	2.589	0.591	0.85	1	70.220			
			C	0.188	2.636	0.588	0.85	1	66.797			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	5.23	26.24						OTM	2203.95 kip-ft	28.16		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.12	1.53	A	0.186	2.644	0.588	1	1	24.747	2.63	131.74	C
183.00-163.00			B	0.199	2.6	0.59	1	1	26.081			
			C	0.243	2.459	0.6	1	1	32.190			
T2	0.31	1.66	A	0.152	2.766	0.582	1	1	22.223	2.68	133.85	C
163.00-143.00			B	0.196	2.611	0.589	1	1	27.262			
			C	0.236	2.48	0.598	1	1	33.594			
T3	1.22	1.91	A	0.26	2.408	0.604	1	1	50.342	3.74	187.10	A
143.00-123.00			B	0.314	2.26	0.62	1	1	51.861			
			C	0.231	2.496	0.597	1	1	40.632			
T4	1.56	3.09	A	0.301	2.293	0.616	1	1	69.692	4.71	235.42	A
123.00-103.00			B	0.318	2.249	0.622	1	1	61.809			
			C	0.218	2.536	0.594	1	1	45.313			
T5	1.75	4.33	A	0.286	2.335	0.612	1	1	77.517	5.04	252.23	A
103.00-83.00			B	0.285	2.338	0.611	1	1	64.567			
			C	0.227	2.51	0.596	1	1	55.853			
T6	2.02	3.97	A	0.291	2.321	0.613	1	1	87.508	5.28	264.10	A
83.00-63.00			B	0.268	2.385	0.607	1	1	67.334			
			C	0.258	2.415	0.604	1	1	70.047			
T7	2.04	5.60	A	0.306	2.28	0.618	1	1	103.574	5.60	280.25	A
63.00-43.00			B	0.279	2.353	0.61	1	1	81.665			
			C	0.277	2.358	0.609	1	1	86.574			
T8	1.02	2.86	A	0.275	2.364	0.609	1	1	49.467	2.52	252.43	A
43.00-33.00			B	0.25	2.437	0.602	1	1	38.472			
			C	0.248	2.445	0.601	1	1	40.782			
T9	1.02	2.93	A	0.266	2.389	0.606	1	1	50.078	2.48	248.05	A
33.00-23.00			B	0.242	2.46	0.6	1	1	39.073			
			C	0.24	2.468	0.599	1	1	41.391			
T10	1.89	7.53	A	0.291	2.321	0.613	1	1	118.875	5.72	286.03	A
23.00-3.00			B	0.26	2.408	0.604	1	1	94.537			
			C	0.243	2.459	0.6	1	1	94.034			
Sum Weight:	12.93	35.41						OTM	3165.37 kip-ft	40.42		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.12	1.53	A	0.186	2.644	0.588	0.8	1	22.152	2.38	118.83	C
183.00-163.00			B	0.199	2.6	0.59	0.8	1	23.527			
			C	0.243	2.459	0.6	0.8	1	29.037			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T2	0.31	1.66	A	0.152	2.766	0.582	0.8	1	19.946	2.45	122.72	C
163.00-143.00			B	0.196	2.611	0.589	0.8	1	25.102			
			C	0.236	2.48	0.598	0.8	1	30.802			
T3	1.22	1.91	A	0.26	2.408	0.604	0.8	1	43.990	3.43	171.58	B
143.00-123.00			B	0.314	2.26	0.62	0.8	1	49.189			
			C	0.231	2.496	0.597	0.8	1	36.902			
T4	1.56	3.09	A	0.301	2.293	0.616	0.8	1	60.824	4.11	205.46	A
123.00-103.00			B	0.318	2.249	0.622	0.8	1	58.801			
			C	0.218	2.536	0.594	0.8	1	41.130			
T5	1.75	4.33	A	0.286	2.335	0.612	0.8	1	66.968	4.36	217.90	A
103.00-83.00			B	0.285	2.338	0.611	0.8	1	60.550			
			C	0.227	2.51	0.596	0.8	1	50.024			
T6	2.02	3.97	A	0.291	2.321	0.613	0.8	1	76.044	4.59	229.50	A
83.00-63.00			B	0.268	2.385	0.607	0.8	1	63.381			
			C	0.258	2.415	0.604	0.8	1	63.451			
T7	2.04	5.60	A	0.306	2.28	0.618	0.8	1	89.680	4.85	242.65	A
63.00-43.00			B	0.279	2.353	0.61	0.8	1	75.312			
			C	0.277	2.358	0.609	0.8	1	77.480			
T8	1.02	2.86	A	0.275	2.364	0.609	0.8	1	43.012	2.19	219.49	A
43.00-33.00			B	0.25	2.437	0.602	0.8	1	35.776			
			C	0.248	2.445	0.601	0.8	1	36.753			
T9	1.02	2.93	A	0.266	2.389	0.606	0.8	1	43.505	2.15	215.49	A
33.00-23.00			B	0.242	2.46	0.6	0.8	1	36.258			
			C	0.24	2.468	0.599	0.8	1	37.245			
T10	1.89	7.53	A	0.291	2.321	0.613	0.8	1	102.550	4.94	246.75	A
23.00-3.00			B	0.26	2.408	0.604	0.8	1	85.674			
			C	0.243	2.459	0.6	0.8	1	82.706			
Sum Weight:	12.93	35.41						OTM	2806.55 kip-ft	35.46		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.12	1.53	A	0.186	2.644	0.588	0.85	1	22.801	2.44	122.06	C
183.00-163.00			B	0.199	2.6	0.59	0.85	1	24.165			
			C	0.243	2.459	0.6	0.85	1	29.826			
T2	0.31	1.66	A	0.152	2.766	0.582	0.85	1	20.516	2.51	125.50	C
163.00-143.00			B	0.196	2.611	0.589	0.85	1	25.642			
			C	0.236	2.48	0.598	0.85	1	31.500			
T3	1.22	1.91	A	0.26	2.408	0.604	0.85	1	45.578	3.48	173.91	B
143.00-123.00			B	0.314	2.26	0.62	0.85	1	49.857			
			C	0.231	2.496	0.597	0.85	1	37.835			
T4	1.56	3.09	A	0.301	2.293	0.616	0.85	1	63.041	4.26	212.95	A
123.00-103.00			B	0.318	2.249	0.622	0.85	1	59.553			
			C	0.218	2.536	0.594	0.85	1	42.176			
T5	1.75	4.33	A	0.286	2.335	0.612	0.85	1	69.605	4.53	226.48	A
103.00-83.00			B	0.285	2.338	0.611	0.85	1	61.554			
			C	0.227	2.51	0.596	0.85	1	51.481			
T6	2.02	3.97	A	0.291	2.321	0.613	0.85	1	78.910	4.76	238.15	A
83.00-63.00			B	0.268	2.385	0.607	0.85	1	64.369			
			C	0.258	2.415	0.604	0.85	1	65.100			
T7	2.04	5.60	A	0.306	2.28	0.618	0.85	1	93.154	5.04	252.05	A
63.00-43.00			B	0.279	2.353	0.61	0.85	1	76.900			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.277	2.358	0.609	0.85	1	79.753			
T8	1.02	2.86	A	0.275	2.364	0.609	0.85	1	44.626	2.28	227.72	A
43.00-33.00			B	0.25	2.437	0.602	0.85	1	36.450			
			C	0.248	2.445	0.601	0.85	1	37.760			
T9	1.02	2.93	A	0.266	2.389	0.606	0.85	1	45.148	2.24	223.63	A
33.00-23.00			B	0.242	2.46	0.6	0.85	1	36.962			
			C	0.24	2.468	0.599	0.85	1	38.282			
T10	1.89	7.53	A	0.291	2.321	0.613	0.85	1	106.632	5.13	256.57	A
23.00-3.00			B	0.26	2.408	0.604	0.85	1	87.890			
			C	0.243	2.459	0.6	0.85	1	85.538			
Sum Weight:	12.93	35.41						OTM	2892.23 kip-ft	36.67		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.93	A	0.128	2.853	0.578	1	1	18.518	2.07	103.42	C
183.00-163.00			B	0.133	2.834	0.579	1	1	19.009			
			C	0.16	2.735	0.583	1	1	22.722			
T2	0.11	1.13	A	0.107	2.937	0.576	1	1	16.913	2.05	102.27	C
163.00-143.00			B	0.134	2.833	0.579	1	1	19.839			
			C	0.153	2.762	0.582	1	1	23.043			
T3	0.47	1.20	A	0.199	2.601	0.59	1	1	34.047	2.90	145.14	B
143.00-123.00			B	0.221	2.528	0.595	1	1	37.190			
			C	0.157	2.746	0.583	1	1	29.428			
T4	0.63	2.27	A	0.234	2.487	0.598	1	1	45.892	3.36	168.20	A
123.00-103.00			B	0.226	2.51	0.596	1	1	44.658			
			C	0.153	2.762	0.582	1	1	33.595			
T5	0.71	3.33	A	0.231	2.496	0.597	1	1	51.961	3.61	180.73	A
103.00-83.00			B	0.213	2.555	0.593	1	1	48.221			
			C	0.169	2.702	0.585	1	1	41.159			
T6	0.83	2.99	A	0.23	2.498	0.597	1	1	58.569	3.80	190.24	A
83.00-63.00			B	0.198	2.604	0.59	1	1	51.135			
			C	0.187	2.639	0.588	1	1	50.269			
T7	0.83	4.18	A	0.24	2.467	0.599	1	1	71.712	4.20	210.01	A
63.00-43.00			B	0.209	2.568	0.592	1	1	63.756			
			C	0.202	2.588	0.591	1	1	63.855			
T8	0.42	2.24	A	0.219	2.535	0.594	1	1	34.190	1.87	187.06	A
43.00-33.00			B	0.189	2.632	0.588	1	1	30.224			
			C	0.183	2.654	0.587	1	1	30.147			
T9	0.42	2.29	A	0.212	2.557	0.593	1	1	34.725	1.84	184.11	A
33.00-23.00			B	0.184	2.652	0.587	1	1	30.781			
			C	0.178	2.673	0.586	1	1	30.705			
T10	0.79	5.69	A	0.232	2.493	0.597	1	1	86.005	4.44	222.23	A
23.00-3.00			B	0.202	2.589	0.591	1	1	77.121			
			C	0.188	2.636	0.588	1	1	74.130			
Sum Weight:	5.23	26.24						OTM	2363.46 kip-ft	30.16		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.93	A	0.128	2.853	0.578	0.8	1	15.923	1.79	89.65	C
183.00-163.00			B	0.133	2.834	0.579	0.8	1	16.429			
			C	0.16	2.735	0.583	0.8	1	19.697			
T2	0.11	1.13	A	0.107	2.937	0.576	0.8	1	14.636	1.81	90.35	C
163.00-143.00			B	0.134	2.833	0.579	0.8	1	17.630			
			C	0.153	2.762	0.582	0.8	1	20.358			
T3	0.47	1.20	A	0.199	2.601	0.59	0.8	1	31.074	2.68	133.86	B
143.00-123.00			B	0.221	2.528	0.595	0.8	1	34.300			
			C	0.157	2.746	0.583	0.8	1	25.776			
T4	0.63	2.27	A	0.234	2.487	0.598	0.8	1	42.660	3.13	156.35	A
123.00-103.00			B	0.226	2.51	0.596	0.8	1	41.395			
			C	0.153	2.762	0.582	0.8	1	29.495			
T5	0.71	3.33	A	0.231	2.496	0.597	0.8	1	48.405	3.37	168.36	A
103.00-83.00			B	0.213	2.555	0.593	0.8	1	44.637			
			C	0.169	2.702	0.585	0.8	1	36.796			
T6	0.83	2.99	A	0.23	2.498	0.597	0.8	1	54.399	3.53	176.70	A
83.00-63.00			B	0.198	2.604	0.59	0.8	1	46.936			
			C	0.187	2.639	0.588	0.8	1	45.348			
T7	0.83	4.18	A	0.24	2.467	0.599	0.8	1	65.053	3.81	190.51	A
63.00-43.00			B	0.209	2.568	0.592	0.8	1	57.056			
			C	0.202	2.588	0.591	0.8	1	56.352			
T8	0.42	2.24	A	0.219	2.535	0.594	0.8	1	31.375	1.72	171.66	A
43.00-33.00			B	0.189	2.632	0.588	0.8	1	27.394			
			C	0.183	2.654	0.587	0.8	1	26.945			
T9	0.42	2.29	A	0.212	2.557	0.593	0.8	1	31.793	1.69	168.56	A
33.00-23.00			B	0.184	2.652	0.587	0.8	1	27.833			
			C	0.178	2.673	0.586	0.8	1	27.387			
T10	0.79	5.69	A	0.232	2.493	0.597	0.8	1	76.891	3.97	198.68	A
23.00-3.00			B	0.202	2.589	0.591	0.8	1	67.920			
			C	0.188	2.636	0.588	0.8	1	64.353			
Sum Weight:	5.23	26.24						OTM	2150.78 kip-ft	27.49		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.03	0.93	A	0.128	2.853	0.578	0.85	1	16.572	1.86	93.09	C
183.00-163.00			B	0.133	2.834	0.579	0.85	1	17.074			
			C	0.16	2.735	0.583	0.85	1	20.453			
T2	0.11	1.13	A	0.107	2.937	0.576	0.85	1	15.205	1.87	93.33	C
163.00-143.00			B	0.134	2.833	0.579	0.85	1	18.182			
			C	0.153	2.762	0.582	0.85	1	21.029			
T3	0.47	1.20	A	0.199	2.601	0.59	0.85	1	31.818	2.73	136.68	B
143.00-123.00			B	0.221	2.528	0.595	0.85	1	35.022			
			C	0.157	2.746	0.583	0.85	1	26.689			
T4	0.63	2.27	A	0.234	2.487	0.598	0.85	1	43.468	3.19	159.32	A
123.00-103.00			B	0.226	2.51	0.596	0.85	1	42.211			
			C	0.153	2.762	0.582	0.85	1	30.520			
T5	0.71	3.33	A	0.231	2.496	0.597	0.85	1	49.294	3.43	171.45	A
103.00-83.00			B	0.213	2.555	0.593	0.85	1	45.533			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.169	2.702	0.585	0.85	1	37.887			
T6	0.83	2.99	A	0.23	2.498	0.597	0.85	1	55.441	3.60	180.08	A
83.00-63.00			B	0.198	2.604	0.59	0.85	1	47.986			
			C	0.187	2.639	0.588	0.85	1	46.578			
T7	0.83	4.18	A	0.24	2.467	0.599	0.85	1	66.718	3.91	195.38	A
63.00-43.00			B	0.209	2.568	0.592	0.85	1	58.731			
			C	0.202	2.588	0.591	0.85	1	58.228			
T8	0.42	2.24	A	0.219	2.535	0.594	0.85	1	32.079	1.76	175.51	A
43.00-33.00			B	0.189	2.632	0.588	0.85	1	28.101			
			C	0.183	2.654	0.587	0.85	1	27.746			
T9	0.42	2.29	A	0.212	2.557	0.593	0.85	1	32.526	1.72	172.45	A
33.00-23.00			B	0.184	2.652	0.587	0.85	1	28.570			
			C	0.178	2.673	0.586	0.85	1	28.216			
T10	0.79	5.69	A	0.232	2.493	0.597	0.85	1	79.170	4.09	204.57	A
23.00-3.00			B	0.202	2.589	0.591	0.85	1	70.220			
			C	0.188	2.636	0.588	0.85	1	66.797			
Sum Weight:	5.23	26.24						OTM	2203.95 kip-ft	28.16		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	8.98					
Bracing Weight	17.26					
Total Member Self-Weight	26.24			5.96	-2.06	
Total Weight	40.28			5.96	-2.06	
Wind 0 deg - No Ice		0.09	-41.71	-3782.49	-11.48	-0.78
Wind 30 deg - No Ice		19.91	-34.36	-3128.16	-1817.92	1.56
Wind 60 deg - No Ice		33.70	-19.43	-1759.49	-3070.54	3.73
Wind 90 deg - No Ice		39.53	0.03	18.91	-3593.78	5.10
Wind 120 deg - No Ice		36.06	20.84	1904.20	-3270.96	5.08
Wind 150 deg - No Ice		19.88	34.50	3171.46	-1824.63	3.30
Wind 180 deg - No Ice		-0.09	39.21	3610.69	7.36	0.93
Wind 210 deg - No Ice		-20.04	34.59	3180.88	1836.82	-1.76
Wind 240 deg - No Ice		-36.15	21.00	1920.52	3276.26	-4.30
Wind 270 deg - No Ice		-39.53	0.22	37.75	3589.65	-5.10
Wind 300 deg - No Ice		-33.60	-19.27	-1743.18	3057.00	-4.66
Wind 330 deg - No Ice		-19.75	-34.27	-3118.74	1797.48	-3.10
Member Ice	9.17					
Total Weight Ice	61.74			15.97	-7.99	
Wind 0 deg - Ice		0.10	-54.40	-4867.94	-17.69	15.13
Wind 30 deg - Ice		25.38	-43.83	-3968.21	-2314.79	16.62
Wind 60 deg - Ice		42.70	-24.62	-2223.54	-3897.79	14.97
Wind 90 deg - Ice		50.46	0.03	29.26	-4580.46	10.12
Wind 120 deg - Ice		47.04	27.19	2462.04	-4225.21	1.95
Wind 150 deg - Ice		25.35	43.97	4032.37	-2321.66	-6.75
Wind 180 deg - Ice		-0.10	49.61	4570.81	1.71	-13.15
Wind 210 deg - Ice		-25.51	44.07	4042.07	2322.48	-16.83
Wind 240 deg - Ice		-47.14	27.35	2478.83	4218.93	-17.08
Wind 270 deg - Ice		-50.46	0.23	48.66	4564.48	-10.12
Wind 300 deg - Ice		-42.60	-24.46	-2206.74	3872.12	-1.82
Wind 330 deg - Ice		-25.22	-43.74	-3958.51	2282.02	6.96
Total Weight	40.28			5.96	-2.06	

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 0 deg - Service		0.09	-41.71	-3787.52	-8.14	-0.78
Wind 30 deg - Service		19.91	-34.36	-3133.19	-1814.58	1.56
Wind 60 deg - Service		33.70	-19.43	-1764.52	-3067.20	3.73
Wind 90 deg - Service		39.53	0.03	13.89	-3590.43	5.10
Wind 120 deg - Service		36.06	20.84	1899.18	-3267.62	5.08
Wind 150 deg - Service		19.88	34.50	3166.43	-1821.29	3.30
Wind 180 deg - Service		-0.09	39.21	3605.66	10.70	0.93
Wind 210 deg - Service		-20.04	34.59	3175.85	1840.16	-1.76
Wind 240 deg - Service		-36.15	21.00	1915.49	3279.60	-4.30
Wind 270 deg - Service		-39.53	0.22	32.72	3592.99	-5.10
Wind 300 deg - Service		-33.60	-19.27	-1748.20	3060.34	-4.66
Wind 330 deg - Service		-19.75	-34.27	-3123.77	1800.82	-3.10

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	183 - 163	Leg	Max Tension	21	5.12	-0.00	-0.02
			Max. Compression	15	-6.75	0.05	0.13
			Max. Mx	19	-0.24	0.37	-0.11
			Max. My	20	-0.78	-0.07	0.36
			Max. Vy	18	0.32	-0.24	-0.03
			Max. Vx	21	-0.31	0.00	0.00
		Diagonal	Max Tension	20	1.54	0.00	0.00
			Max. Compression	19	-1.62	0.00	0.00
			Max. Mx	16	0.33	0.01	0.00
			Max. My	19	-1.20	0.01	0.00
			Max. Vy	16	-0.01	0.01	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	23	0.06	0.00	0.00
			Max. Compression	17	-0.17	0.00	0.00
			Max. Mx	14	-0.04	-0.05	0.00
			Max. My	15	-0.09	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
T2	163 - 143	Leg	Max Tension	21	14.79	-0.20	-0.01
			Max. Compression	19	-18.25	0.04	0.01
			Max. Mx	23	-13.03	0.23	0.04
			Max. My	26	-1.65	-0.03	-0.26
			Max. Vy	17	-0.54	-0.21	-0.04
			Max. Vx	26	0.55	0.01	0.11
		Diagonal	Max Tension	20	2.56	0.00	0.00
			Max. Compression	20	-2.56	0.00	0.00
			Max. Mx	22	1.57	0.03	-0.00
			Max. My	24	-2.52	0.02	0.01
			Max. Vy	22	0.02	0.03	-0.00
			Max. Vx	24	-0.00	0.00	0.00
T3	143 - 123	Leg	Max Tension	21	29.70	-0.88	0.02
			Max. Compression	19	-38.84	1.38	0.02
			Max. Mx	21	28.80	1.48	0.04
			Max. My	16	-4.90	0.00	1.50
			Max. Vy	21	0.96	-1.36	0.04
			Max. Vx	16	0.90	0.00	-1.11
		Diagonal	Max Tension	20	4.87	0.00	0.00
			Max. Compression	20	-5.01	0.00	0.00
			Max. Mx	20	1.66	0.05	0.00
			Max. My	20	-3.66	0.01	0.01
			Max. Vy	20	-0.02	0.05	0.00
			Max. Vx	20	-0.00	0.00	0.00
T4	123 - 103	Leg	Max Tension	21	54.03	-0.22	0.02
			Max. Compression	19	-68.55	-0.10	0.03
			Max. Mx	15	-47.68	1.41	-0.04
			Max. My	22	-5.28	0.03	1.11
			Max. Vy	15	0.33	1.41	-0.04
			Max. Vx	16	-0.21	0.00	-1.11
		Diagonal	Max Tension	20	6.59	0.00	0.00
			Max. Compression	20	-6.38	0.00	0.00
			Max. Mx	20	2.64	0.07	0.01
			Max. My	20	-6.36	0.04	0.02
			Max. Vy	22	0.04	0.07	-0.01
			Max. Vx	21	-0.00	0.00	0.00
T5	103 - 83	Leg	Max Tension	21	76.94	-1.17	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	19	-98.80	0.48	-0.03
			Max. Mx	23	-79.46	1.41	0.03
			Max. My	26	-7.22	0.09	-1.24
			Max. Vy	17	-1.31	-1.20	-0.04
			Max. Vx	22	1.23	0.08	1.22
		Diagonal	Max Tension	20	9.29	0.00	0.00
			Max. Compression	20	-9.02	0.00	0.00
			Max. Mx	21	5.31	-0.19	-0.02
			Max. My	16	-3.92	-0.13	0.03
			Max. Vy	21	-0.08	-0.19	0.02
			Max. Vx	16	-0.00	0.00	0.00
T6	83 - 63	Leg	Max Tension	21	104.57	0.04	0.03
			Max. Compression	19	-134.62	-0.32	-0.01
			Max. Mx	17	87.97	-1.07	-0.03
			Max. My	22	-11.04	-0.31	0.91
			Max. Vy	17	-0.20	-1.07	-0.03
			Max. Vx	16	-0.17	-0.30	-0.90
		Diagonal	Max Tension	26	10.06	0.00	0.00
			Max. Compression	20	-9.94	0.00	0.00
			Max. Mx	19	8.43	0.18	-0.01
			Max. My	21	-7.97	0.08	0.02
			Max. Vy	21	0.06	0.17	0.02
			Max. Vx	21	-0.00	0.00	0.00
T7	63 - 43	Leg	Max Tension	21	132.16	0.81	0.01
			Max. Compression	19	-169.71	-1.30	-0.01
			Max. Mx	19	-169.55	1.46	0.00
			Max. My	22	-14.90	0.39	1.25
			Max. Vy	19	0.58	1.46	0.00
			Max. Vx	22	0.40	0.39	1.25
		Diagonal	Max Tension	26	10.70	0.00	0.00
			Max. Compression	26	-10.53	0.00	0.00
			Max. Mx	21	7.32	0.24	0.02
			Max. My	21	-8.92	0.15	0.03
			Max. Vy	21	0.08	0.24	0.02
			Max. Vx	21	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	19	2.94	0.00	0.00
			Max. Compression	19	-2.94	0.00	0.00
			Max. Mx	14	0.27	-0.46	0.00
			Max. My	22	2.49	0.00	0.01
			Max. Vy	14	0.09	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T8	43 - 33	Leg	Max Tension	21	147.30	-1.45	0.02
			Max. Compression	19	-186.56	2.62	-0.01
			Max. Mx	15	-185.57	2.63	-0.01
			Max. My	22	-15.11	-1.34	0.83
			Max. Vy	15	-0.47	2.63	-0.01
			Max. Vx	22	0.12	-1.34	0.83
		Diagonal	Max Tension	26	9.94	0.00	0.00
			Max. Compression	26	-11.84	0.00	0.00
			Max. Mx	21	7.18	0.34	0.03
			Max. My	21	-10.40	0.24	0.04
			Max. Vy	21	0.10	0.34	0.03
			Max. Vx	21	-0.01	0.00	0.00
T9	33 - 23	Leg	Max Tension	21	158.77	1.09	0.01
			Max. Compression	19	-205.54	-2.08	-0.01
			Max. Mx	15	-204.24	2.63	-0.01
			Max. My	22	-18.52	-2.17	0.70
			Max. Vy	15	0.55	2.63	-0.01
			Max. Vx	22	-0.10	-2.17	0.70
		Diagonal	Max Tension	24	12.33	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	24	-9.91	0.00	0.00
			Max. Mx	10	7.52	0.23	-0.02
			Max. My	15	1.32	0.17	-0.03
			Max. Vy	21	0.09	0.21	0.03
			Max. Vx	15	-0.00	0.00	0.00
T10	23 - 3	Leg	Max Tension	21	184.02	3.74	-0.01
			Max. Compression	23	-241.48	-0.00	-0.00
			Max. Mx	21	174.15	3.74	-0.01
			Max. My	20	-21.56	3.10	-2.47
			Max. Vy	21	-1.15	-1.92	0.00
			Max. Vx	20	0.67	3.10	-2.47
		Diagonal	Max Tension	24	14.27	0.00	0.00
			Max. Compression	24	-13.30	0.00	0.00
			Max. Mx	21	6.98	0.43	0.03
			Max. My	18	-13.21	0.29	-0.05
			Max. Vy	21	0.11	0.43	0.03
			Max. Vx	18	0.01	0.00	0.00
		Secondary Horizontal	Max Tension	23	4.19	0.00	0.00
			Max. Compression	23	-4.19	0.00	0.00
			Max. Mx	14	0.39	-0.75	0.00
			Max. My	22	3.52	0.00	0.02
			Max. Vy	14	-0.12	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	23	248.55	25.65	-14.34
	Max. H_x	23	248.55	25.65	-14.34
	Max. H_z	16	-165.26	-23.29	15.47
	Min. Vert	17	-188.49	-27.07	15.24
	Min. H_x	17	-188.49	-27.07	15.24
	Min. H_z	23	248.55	25.65	-14.34
Leg B	Max. Vert	19	248.41	-25.40	-14.60
	Max. H_x	25	-187.06	26.82	15.44
	Max. H_z	26	-163.71	22.91	15.88
	Min. Vert	25	-187.06	26.82	15.44
	Min. H_x	19	248.41	-25.40	-14.60
	Min. H_z	19	248.41	-25.40	-14.60
Leg A	Max. Vert	15	247.37	0.35	29.31
	Max. H_x	24	18.31	4.01	-2.45
	Max. H_z	15	247.37	0.35	29.31
	Min. Vert	21	-192.38	-0.30	-31.30
	Min. H_x	18	19.22	-3.99	-2.33
	Min. H_z	21	-192.38	-0.30	-31.30

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	40.28	0.00	0.00	5.96	-2.06	0.00
Dead+Wind 0 deg - No Ice	40.28	0.09	-41.71	-3790.59	-11.52	-0.76
Dead+Wind 30 deg - No Ice	40.28	19.91	-34.36	-3134.84	-1821.81	1.58
Dead+Wind 60 deg - No Ice	40.28	33.70	-19.43	-1763.23	-3077.09	3.75
Dead+Wind 90 deg - No Ice	40.28	39.53	0.03	18.98	-3601.44	5.11
Dead+Wind 120 deg - No Ice	40.28	36.06	20.84	1908.29	-3277.96	5.09
Dead+Wind 150 deg - No Ice	40.28	19.88	34.50	3178.26	-1828.56	3.30
Dead+Wind 180 deg - No Ice	40.28	-0.09	39.21	3618.44	7.36	0.91
Dead+Wind 210 deg - No Ice	40.28	-20.04	34.59	3187.71	1840.75	-1.79
Dead+Wind 240 deg - No Ice	40.28	-36.15	21.00	1924.64	3283.25	-4.32
Dead+Wind 270 deg - No Ice	40.28	-39.53	0.22	37.85	3597.30	-5.12
Dead+Wind 300 deg - No Ice	40.28	-33.60	-19.27	-1746.88	3063.51	-4.67
Dead+Wind 330 deg - No Ice	40.28	-19.75	-34.27	-3125.41	1801.32	-3.09
Dead+Ice+Temp	61.74	-0.00	-0.00	16.01	-8.04	-0.00
Dead+Wind 0 deg+Ice+Temp	61.74	0.10	-54.40	-4882.73	-17.82	15.19
Dead+Wind 30 deg+Ice+Temp	61.74	25.38	-43.83	-3980.30	-2321.92	16.69
Dead+Wind 60 deg+Ice+Temp	61.74	42.70	-24.62	-2230.29	-3909.73	15.04
Dead+Wind 90 deg+Ice+Temp	61.74	50.46	0.03	29.39	-4594.43	10.15
Dead+Wind 120 deg+Ice+Temp	61.74	47.04	27.19	2469.52	-4238.05	1.96
Dead+Wind 150 deg+Ice+Temp	61.74	25.35	43.97	4044.71	-2328.83	-6.75
Dead+Wind 180 deg+Ice+Temp	61.74	-0.10	49.61	4584.85	1.65	-13.21
Dead+Wind 210 deg+Ice+Temp	61.74	-25.51	44.07	4054.48	2329.53	-16.90
Dead+Wind 240 deg+Ice+Temp	61.74	-47.14	27.35	2486.41	4231.68	-17.16
Dead+Wind 270 deg+Ice+Temp	61.74	-50.46	0.23	48.85	4578.36	-10.15
Dead+Wind 300 deg+Ice+Temp	61.74	-42.60	-24.46	-2213.48	3883.91	-1.83
Dead+Wind 330 deg+Ice+Temp	61.74	-25.22	-43.74	-3970.62	2288.93	6.96
Dead+Wind 0 deg - Service	40.28	0.09	-41.71	-3790.59	-11.52	-0.76
Dead+Wind 30 deg - Service	40.28	19.91	-34.36	-3134.84	-1821.81	1.58
Dead+Wind 60 deg - Service	40.28	33.70	-19.43	-1763.23	-3077.09	3.75
Dead+Wind 90 deg - Service	40.28	39.53	0.03	18.98	-3601.44	5.11
Dead+Wind 120 deg - Service	40.28	36.06	20.84	1908.29	-3277.96	5.09
Dead+Wind 150 deg - Service	40.28	19.88	34.50	3178.26	-1828.56	3.30
Dead+Wind 180 deg - Service	40.28	-0.09	39.21	3618.44	7.36	0.91
Dead+Wind 210 deg - Service	40.28	-20.04	34.59	3187.71	1840.75	-1.79
Dead+Wind 240 deg - Service	40.28	-36.15	21.00	1924.64	3283.25	-4.32
Dead+Wind 270 deg - Service	40.28	-39.53	0.22	37.85	3597.30	-5.12
Dead+Wind 300 deg - Service	40.28	-33.60	-19.27	-1746.88	3063.51	-4.67
Dead+Wind 330 deg - Service	40.28	-19.75	-34.27	-3125.41	1801.32	-3.09

Solution Summary

Load Comb.	Sum of Applied Forces PX	PY	PZ	Sum of Reactions PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-40.28	0.00	0.00	40.28	0.00	0.000%
2	0.09	-40.28	-41.71	-0.09	40.28	41.71	0.000%
3	19.91	-40.28	-34.36	-19.91	40.28	34.36	0.000%
4	33.70	-40.28	-19.43	-33.70	40.28	19.43	0.000%
5	39.53	-40.28	0.03	-39.53	40.28	-0.03	0.000%
6	36.06	-40.28	20.84	-36.06	40.28	-20.84	0.000%
7	19.88	-40.28	34.50	-19.88	40.28	-34.50	0.000%
8	-0.09	-40.28	39.21	0.09	40.28	-39.21	0.000%
9	-20.04	-40.28	34.59	20.04	40.28	-34.59	0.000%
10	-36.15	-40.28	21.00	36.15	40.28	-21.00	0.000%
11	-39.53	-40.28	0.22	39.53	40.28	-0.22	0.000%
12	-33.60	-40.28	-19.27	33.60	40.28	19.27	0.000%
13	-19.75	-40.28	-34.27	19.75	40.28	34.27	0.000%
14	0.00	-61.74	0.00	0.00	61.74	0.00	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
15	0.10	-61.74	-54.40	-0.10	61.74	54.40	0.000%
16	25.38	-61.74	-43.83	-25.38	61.74	43.83	0.000%
17	42.70	-61.74	-24.62	-42.70	61.74	24.62	0.000%
18	50.46	-61.74	0.03	-50.46	61.74	-0.03	0.000%
19	47.04	-61.74	27.19	-47.04	61.74	-27.19	0.000%
20	25.35	-61.74	43.97	-25.35	61.74	-43.97	0.000%
21	-0.10	-61.74	49.61	0.10	61.74	-49.61	0.000%
22	-25.51	-61.74	44.07	25.51	61.74	-44.07	0.000%
23	-47.14	-61.74	27.35	47.14	61.74	-27.35	0.000%
24	-50.46	-61.74	0.23	50.46	61.74	-0.23	0.000%
25	-42.60	-61.74	-24.46	42.60	61.74	24.46	0.000%
26	-25.22	-61.74	-43.74	25.22	61.74	43.74	0.000%
27	0.09	-40.28	-41.71	-0.09	40.28	41.71	0.000%
28	19.91	-40.28	-34.36	-19.91	40.28	34.36	0.000%
29	33.70	-40.28	-19.43	-33.70	40.28	19.43	0.000%
30	39.53	-40.28	0.03	-39.53	40.28	-0.03	0.000%
31	36.06	-40.28	20.84	-36.06	40.28	-20.84	0.000%
32	19.88	-40.28	34.50	-19.88	40.28	-34.50	0.000%
33	-0.09	-40.28	39.21	0.09	40.28	-39.21	0.000%
34	-20.04	-40.28	34.59	20.04	40.28	-34.59	0.000%
35	-36.15	-40.28	21.00	36.15	40.28	-21.00	0.000%
36	-39.53	-40.28	0.22	39.53	40.28	-0.22	0.000%
37	-33.60	-40.28	-19.27	33.60	40.28	19.27	0.000%
38	-19.75	-40.28	-34.27	19.75	40.28	34.27	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000201
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000208
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000145
16	Yes	4	0.00000001	0.00000369
17	Yes	4	0.00000001	0.00000192
18	Yes	4	0.00000001	0.00000175
19	Yes	4	0.00000001	0.00000146
20	Yes	4	0.00000001	0.00000182
21	Yes	4	0.00000001	0.00000199
22	Yes	4	0.00000001	0.00000378
23	Yes	4	0.00000001	0.00000145
24	Yes	4	0.00000001	0.00000172
25	Yes	4	0.00000001	0.00000188
26	Yes	4	0.00000001	0.00000175
27	Yes	4	0.00000001	0.00000001

28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000201
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000208
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	183 - 163	9.695	35	0.4268	0.0161
T2	163 - 143	7.904	35	0.4157	0.0134
T3	143 - 123	6.184	35	0.3863	0.0105
T4	123 - 103	4.613	35	0.3323	0.0070
T5	103 - 83	3.231	35	0.2874	0.0044
T6	83 - 63	2.121	35	0.2237	0.0036
T7	63 - 43	1.227	35	0.1690	0.0024
T8	43 - 33	0.587	35	0.1055	0.0014
T9	33 - 23	0.359	35	0.0806	0.0010
T10	23 - 3	0.186	35	0.0547	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.00	PD220	35	9.695	0.4268	0.0161	263604
189.00	2" Dia 8' Omni	35	9.695	0.4268	0.0161	263604
188.00	10' 2-Bay Dipole	35	9.695	0.4268	0.0161	263604
183.00	4'x4" Pipe Mount	35	9.695	0.4268	0.0161	263604
180.00	6 FT DISH	35	9.425	0.4255	0.0152	263604
176.00	12' Dipole	35	9.065	0.4238	0.0140	188289
164.00	DB586-Y	35	7.992	0.4165	0.0135	68922
160.00	3' Standoff	35	7.639	0.4130	0.0132	55186
156.00	DB586-Y	35	7.289	0.4087	0.0127	45410
149.00	LNX-6512DS	35	6.687	0.3984	0.0115	34356
144.00	10' 2-Bay Dipole	35	6.267	0.3886	0.0107	29676
139.00	3' Standoff	35	5.856	0.3763	0.0098	28811
135.00	800 10121	35	5.536	0.3654	0.0091	28973
126.00	BXA-70063/6CF	35	4.838	0.3400	0.0075	29238
91.00	10' Frame	35	2.536	0.2497	0.0039	20392
62.00	GPS	35	1.189	0.1660	0.0023	17791

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	183 - 163	12.404	19	0.5449	0.0370
T2	163 - 143	10.113	19	0.5313	0.0353
T3	143 - 123	7.915	19	0.4935	0.0296
T4	123 - 103	5.910	19	0.4245	0.0220
T5	103 - 83	4.148	19	0.3675	0.0153
T6	83 - 63	2.728	19	0.2866	0.0124
T7	63 - 43	1.582	23	0.2169	0.0084
T8	43 - 33	0.758	23	0.1357	0.0052
T9	33 - 23	0.465	23	0.1037	0.0038
T10	23 - 3	0.241	23	0.0705	0.0025

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.00	PD220	19	12.404	0.5449	0.0370	197946
189.00	2" Dia 8' Omni	19	12.404	0.5449	0.0370	197946
188.00	10' 2-Bay Dipole	19	12.404	0.5449	0.0370	197946
183.00	4'x4" Pipe Mount	19	12.404	0.5449	0.0370	197946
180.00	6 FT DISH	19	12.059	0.5434	0.0369	197946
176.00	12' Dipole	19	11.598	0.5413	0.0367	141390
164.00	DB586-Y	19	10.226	0.5324	0.0355	51873
160.00	3' Standoff	19	9.774	0.5278	0.0347	41989
156.00	DB586-Y	19	9.327	0.5222	0.0338	34961
149.00	LNX-6512DS	19	8.557	0.5090	0.0317	26575
144.00	10' 2-Bay Dipole	19	8.021	0.4964	0.0300	22933
139.00	3' Standoff	19	7.497	0.4807	0.0282	22260
135.00	800 10121	19	7.087	0.4667	0.0267	22568
126.00	BXA-70063/6CF	19	6.197	0.4343	0.0231	22866
91.00	10' Frame	19	3.259	0.3196	0.0134	16225
62.00	GPS	23	1.533	0.2130	0.0082	14001

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	183	Leg	A325N	0.6250	4	1.28	13.50	0.095 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1.62	4.12	0.392 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	0.17	4.12	0.040 ✔	1.333	Bolt Shear
T2	163	Leg	A325N	0.7500	4	3.70	19.44	0.190 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2.56	4.12	0.622 ✔	1.333	Bolt Shear
T3	143	Leg	A325N	0.8750	4	7.43	26.45	0.281 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.5000	1	4.87	4.76	1.023 ✔	1.333	Member Bearing
T4	123	Leg	A325N	1.0000	4	13.51	34.56	0.391 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6.59	6.44	1.024 ✔	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T5	103	Leg	A325N	1.0000	4	19.23	34.55	0.557 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	9.29	9.28	1.001 ✔	1.333	Bolt Shear
T6	83	Leg	A325N	1.0000	4	26.14	34.56	0.756 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	10.06	9.28	1.084 ✔	1.333	Bolt Shear
T7	63	Leg	A325N	1.0000	6	21.98	34.56	0.636 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	10.70	13.25	0.808 ✔	1.333	Bolt Shear
T8	43	Diagonal	A325X	0.7500	1	11.84	13.25	0.893 ✔	1.333	Bolt Shear
T9	33	Leg	A325N	1.0000	6	26.46	34.56	0.766 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	12.33	12.63	0.976 ✔	1.333	Bolt Shear
T10	23	Leg	A449	1.0000	6	30.60	31.10	0.984 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.8750	1	14.27	12.63	1.130 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	183 - 163	P2.5x.203	20.00	5.00	63.3 K=1.00	22.141	1.7040	-6.75	37.73	0.179 ✔
T2	163 - 143	P2.5x.276	20.03	6.68	86.7 K=1.00	17.634	2.2535	-18.25	39.74	0.459 ✔
T3	143 - 123	P3x.216	20.04	6.68	68.9 K=1.00	21.145	2.2285	-38.84	47.12	0.824 ✔
T4	123 - 103	P4x.337	20.04	6.68	54.3 K=1.00	23.671	4.4074	-68.55	104.33	0.657 ✔
T5	103 - 83	P5x.258	20.03	10.02	64.0 K=1.00	22.021	4.2999	-98.80	94.69	1.043 ✔
T6	83 - 63	P5x.375	20.03	10.02	65.4 K=1.00	21.782	6.1120	-134.62	133.13	1.011 ✔
T7	63 - 43	P5x.375	20.04	5.14	33.6 K=1.00	26.700	6.1120	-169.71	163.19	1.040 ✔
T8	43 - 33	P6x.432	10.02	10.02	54.8 K=1.00	23.591	8.4049	-186.56	198.28	0.941 ✔
T9	33 - 23	P6x.432	10.02	10.02	54.8 K=1.00	23.591	8.4049	-205.54	198.28	1.037 ✔
T10	23 - 3	P6x.432	20.03	5.12	28.0 K=1.00	27.400	8.4049	-241.48	230.30	1.049 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	183 - 163	L1 3/4x1 3/4x3/16	9.91	4.70	164.3 K=1.00	5.530	0.6211	-1.62	3.43	0.471 ✔
T2	163 - 143	L2x2x1/4	12.24	6.06	186.1 K=1.00	4.312	0.9380	-2.56	4.04	0.634 ✔
T3	143 - 123	L2 1/2x2 1/2x3/16	14.02	6.93	167.9 K=1.00	5.295	0.9020	-5.01	4.78	1.049 ✔
T4	123 - 103	L2 1/2x2 1/2x5/16	15.89	7.79	191.3 K=1.00	4.082	1.4600	-6.38	5.96	1.071 ✔
T5	103 - 83	L3X3X3/16 Reinf w/L2.5X2.5X3/16	19.10	9.57	143.2 K=1.00	7.281	3.2137	-9.02	23.40	0.386 ✔
T6	83 - 63	L3 1/2x3 1/2x5/16	20.83	10.29	179.0 K=1.00	4.663	2.0900	-9.59	9.75	0.984 ✔
T7	63 - 43	L3 1/2x3 1/2x3/8	22.67	11.22	196.0 K=1.00	3.888	2.4800	-9.87	9.64	1.024 ✔
T8	43 - 33	L4x4x3/8	23.59	11.62	176.9 K=1.00	4.770	2.8600	-11.84	13.64	0.868 ✔
T9	33 - 23	L4x4x3/8	24.50	12.05	183.5 K=1.00	4.433	2.8600	-9.91	12.68	0.782 ✔
T10	23 - 3	L4x4x3/8	25.41	12.51	190.6 K=1.00	4.113	2.8600	-13.31	11.76	1.131 ✔

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	63 - 43	L3 1/2x3 1/2x1/4	20.32	19.86	267.1 K=0.78	2.093	1.6900	-2.94	3.54	0.832 ✔
T10	23 - 3	KL/R > 250 (C) - 133 L4x4x1/4 KL/R > 250 (C) - 172	24.35	23.80	277.4 K=0.77	1.940	1.9400	-4.19	3.76	1.113 ✔

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	183 - 163	L2 1/2x2 1/2x3/16	8.56	8.09	196.2 K=1.00	3.881	0.9020	-0.17	3.50	0.047 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	183 - 163	P2.5x.203	20.00	5.00	63.3	30.000	1.7040	5.12	51.12	0.100 ✔
T2	163 - 143	P2.5x.276	20.03	6.68	86.7	30.000	2.2535	14.79	67.61	0.219 ✔
T3	143 - 123	P3x.216	20.04	6.68	68.9	30.000	2.2285	29.70	66.85	0.444 ✔
T4	123 - 103	P4x.337	20.04	6.68	54.3	30.000	4.4074	54.03	132.22	0.409 ✔
T5	103 - 83	P5x.258	20.03	10.02	64.0	30.000	4.2999	76.94	129.00	0.596 ✔
T6	83 - 63	P5x.375	20.03	10.02	65.4	30.000	6.1120	104.57	183.36	0.570 ✔
T7	63 - 43	P5x.375	20.04	5.14	33.6	30.000	6.1120	132.16	183.36	0.721 ✔
T8	43 - 33	P6x.432	10.02	10.02	54.8	30.000	8.4049	147.30	252.15	0.584 ✔
T9	33 - 23	P6x.432	10.02	10.02	54.8	30.000	8.4049	158.77	252.15	0.630 ✔
T10	23 - 3	P6x.432	20.03	5.12	28.0	30.000	8.4049	184.02	252.15	0.730 ✔

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	183 - 163	L1 3/4x1 3/4x3/16	9.91	4.70	107.7	29.000	0.3779	1.54	10.96	0.141 ✔
T2	163 - 143	L2x2x1/4	12.24	6.06	121.7	29.000	0.5863	2.56	17.00	0.150 ✔
T3	143 - 123	L2 1/2x2 1/2x3/16	14.02	6.93	108.6	29.000	0.5886	4.87	17.07	0.285 ✔
T4	123 - 103	L2 1/2x2 1/2x5/16	15.89	7.79	125.0	29.000	0.9192	6.59	26.66	0.247 ✔
T5	103 - 83	L3X3X3/16 Reinf w/L2.5X2.5X3/16	19.10	9.57	143.2	21.600	3.2137	9.29	69.42	0.134 ✔
T6	83 - 63	L3 1/2x3 1/2x5/16	20.83	10.29	116.0	29.000	1.3624	10.06	39.51	0.255 ✔
T7	63 - 43	L3 1/2x3 1/2x3/8	22.67	11.22	127.5	29.000	1.6139	10.70	46.80	0.229 ✔
T8	43 - 33	L4x4x3/8	23.59	11.62	114.8	29.000	1.8989	9.94	55.07	0.181 ✔
T9	33 - 23	L4x4x3/8	24.50	12.05	119.2	29.000	1.8637	12.33	54.05	0.228 ✔
T10	23 - 3	L4x4x3/8	26.33	12.97	128.2	29.000	1.8637	14.27	54.05	0.264

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
										✔

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T7	63 - 43	L3 1/2x3 1/2x1/4	20.32	19.86	218.6	21.600	1.6900	2.94	36.50	0.081 ✔
T10	23 - 3	L4x4x1/4	24.35	23.80	228.5	21.600	1.9400	4.19	41.90	0.100 ✔

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	183 - 163	L2 1/2x2 1/2x3/16	8.56	8.09	128.3	29.000	0.5886	0.06	17.07	0.004 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	183 - 163	Leg	P2.5x.203	3	-6.75	50.29	13.4	Pass
T2	163 - 143	Leg	P2.5x.276	32	-18.25	52.97	34.5	Pass
T3	143 - 123	Leg	P3x.216	53	-38.84	62.81	61.8	Pass
T4	123 - 103	Leg	P4x.337	74	-68.55	139.07	49.3	Pass
T5	103 - 83	Leg	P5x.258	95	-98.80	126.22	78.3	Pass
T6	83 - 63	Leg	P5x.375	110	-134.62	177.46	75.9	Pass
T7	63 - 43	Leg	P5x.375	125	-169.71	217.53	78.0	Pass
T8	43 - 33	Leg	P6x.432	146	-186.56	264.31	70.6	Pass
T9	33 - 23	Leg	P6x.432	155	-205.54	264.31	77.8	Pass
T10	23 - 3	Leg	P6x.432	163	-241.48	306.99	78.7	Pass
T1	183 - 163	Diagonal	L1 3/4x1 3/4x3/16	9	-1.62	4.58	35.3	Pass
T2	163 - 143	Diagonal	L2x2x1/4	36	-2.56	5.39	47.6	Pass
T3	143 - 123	Diagonal	L2 1/2x2 1/2x3/16	57	-5.01	6.37	78.7	Pass
T4	123 - 103	Diagonal	L2 1/2x2 1/2x5/16	78	-6.38	7.94	80.3	Pass
T5	103 - 83	Diagonal	L3X3X3/16 Reinf w/L2.5X2.5X3/16	99	-9.02	31.19	28.9 75.1 (b)	Pass
T6	83 - 63	Diagonal	L3 1/2x3 1/2x5/16	115	-9.59	12.99	73.8 81.3 (b)	Pass
T7	63 - 43	Diagonal	L3 1/2x3 1/2x3/8	130	-9.87	12.85	76.8	Pass
T8	43 - 33	Diagonal	L4x4x3/8	151	-11.84	18.19	65.1 67.0 (b)	Pass
T9	33 - 23	Diagonal	L4x4x3/8	157	-9.91	16.90	58.7 73.2 (b)	Pass

tnxTower	Job: 14025.011 - CT11111A	Page: 35 of 35
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project: 180-ft Lattice Tower - 20 Barnabas Rd, Newtown, CT	Date: 12:12:26 11/10/14
	Client: T-Mobile	Designed by: TJL

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T10	23 - 3	Diagonal	L4x4x3/8	175	-13.31	15.68	84.9	Pass
T7	63 - 43	Secondary Horizontal	L3 1/2x3 1/2x1/4	133	-2.94	4.72	62.4	Pass
T10	23 - 3	Secondary Horizontal	L4x4x1/4	172	-4.19	5.02	83.5	Pass
T1	183 - 163	Top Girt	L2 1/2x2 1/2x3/16	5	-0.17	4.67	3.6	Pass
							Summary	
						Leg (T10)	78.7	Pass
						Diagonal (T10)	84.9	Pass
						Secondary Horizontal (T10)	83.5	Pass
						Top Girt (T1)	3.6	Pass
						Bolt Checks	84.8	Pass
						RATING =	**84.9**	**Pass**

Program Version 6.0.0.8 - 9/7/2011 File:J:/Jobs/1402500.WI/011 - CT11111A/04_Structural/Backup Documentation/Rev (1)/ERI Files/180 ROHN SSV Lattice Newton CT.eri

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Subject:	Anchor Bolt Analysis
Location:	Newtown, CT
Rev. 1: 11/10/14	Prepared by: T.J.L. Checked by: C.F.C. Job No. 14025.011

Tower Anchor Bolt Analysis

Max Leg Reactions:

Uplift = $Uplift := 192 \cdot kips$ (User Input)

Shear = $Shear := 31 \cdot kips$ (User Input)

Compression = $Compression := 249 \cdot kips$ (User Input)

Anchor Bolt Data:

Use ASTM A449 (Per ROHN Drawing A850562)

Number of Anchor Bolts = $N := 6$ (User Input)

Bolt Ultimate Strength = $F_u := 120ksi$ (User Input)

Bolt Yield Strength = $F_y := 90ksi$ (User Input)

Diameter of Bolts = $D := 1.0in$ (User Input)

Threads per Inch = $n := 8$ (User Input)

Coefficient of Friction = $\mu := 0.55$ (User Input) (ASCE 10-97 pg. 23)

Anchor Bolt Area:

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.974 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$ (ASCE 10-97 Eq. 7.4-3)

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area = $A_{s1} := \frac{Uplift}{F_y} + \frac{Shear}{\mu \cdot .85 \cdot F_y} = 2.9 \cdot in^2$ (ASCE 10-97 Eq. 7.4-2)

$A_{s2} := \left[\frac{Shear - (0.3 \cdot Compression)}{\mu \cdot .85 \cdot F_y}\right] = -1.039 \cdot in^2$ (ASCE 10-97 Eq. 7.4-4)

Provided Area = $A_{sprovided} := A_n \cdot N = 3.6 \cdot in^2$

$Condition1 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

$Condition2 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed"\right)$

Condition2 = "OK"

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Subject:	Lattice Tower Foundation Anaylsis
Location:	Newtown, CT
Rev. 1: 11/10/14	Prepared by: T.J.L. Checked by: C.F.C. Job No. 14025.011

Pad and Pier Foundation:

Input Data:

Tower Data

Max Uplift Force =	$Uplift := 192 \cdot kips$	(User Input from RISATower)	(Leg)
Max Shear Force =	$Shear := 31 \cdot kips$	(User Input from RISATower)	(Leg)
Max Compressive Force =	$Compression := 249 \cdot kips$	(User Input from RISATower)	(Leg)
Base Shear =	$Shear_{tot} := 55 \cdot kips$	(User Input from RISATower)	(Tower)
Base Compression =	$Comp_{tot} := 62 \cdot kips$	(User Input from RISATower)	(Tower)
Base Moment =	$Moment := 4908 \cdot ft \cdot kips$	(User Input from RISATower)	(Tower)
Tower Height =	$H_t := 180 \cdot ft$	(User Input)	

Original Foundation Data (Foundation #1): (North East Leg):

Overall Depth of Footing =	$D_{f1} := 7.1 \cdot ft$	(User Input)	Foundation #1. Refer to Sketch SKRAD101498 Sheet 1 of 3 prepared for Connecticut Light and Power Company, dated 10/14/98
Length of Pier =	$L_{p1} := 10.0 \cdot ft$	(User Input)	
Pier Projection Above Grade =	$P_{P1} := 4.9 \cdot ft$	(User Input)	
Width of Pier =	$d_{p1} := 2.5 \cdot ft$	(User Input)	
Pad Width =	$PD_{w1} := 10.0 \cdot ft$	(User Input)	
Pad Thickness =	$PD_{t1} := 2.0 \cdot ft$	(User Input)	

Original Foundation Data (Foundation #2): (South West Leg):

Overall Depth of Footing =	$D_{f2} := 8.5 \cdot ft$	(User Input)	Foundation #2. Refer to Sketch SKRAD101498 Sheet 1 of 3 prepared for Connecticut Light and Power Company, dated 10/14/98
Length of Pier =	$L_{p2} := 10.0 \cdot ft$	(User Input)	
Pier Projection Above Grade =	$P_{P2} := 3.5 \cdot ft$	(User Input)	
Width of Pier =	$d_{p2} := 2.5 \cdot ft$	(User Input)	
Pad Width =	$PD_{w2} := 10.0 \cdot ft$	(User Input)	
Pad Thickness =	$PD_{t2} := 2.0 \cdot ft$	(User Input)	

Original Foundation Data (Foundation #3): (South East Leg):

Overall Depth of Footing =	$D_{f3} := 10.75 \cdot ft$	(User Input)	Foundation #3. Refer to Sketch SKRAD101498 Sheet 1 of 3 prepared for Connecticut Light and Power Company, dated 10/14/98
Length of Pier =	$L_{p3} := 10.0 \cdot ft$	(User Input)	
Pier Projection Above Grade =	$P_{P3} := 1.25 \cdot ft$	(User Input)	
Width of Pier =	$d_{p3} := 2.5 \cdot ft$	(User Input)	
Pad Width =	$PD_{w3} := 10.0 \cdot ft$	(User Input)	
Pad Thickness =	$PD_{t3} := 2.0 \cdot ft$	(User Input)	

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Material Properties:

Internal Friction Angle of Soil =	$\Phi_s := 34 \cdot deg$	(User Input)	Based on Geotech Report prepared by Clarence Welti & Assoc., INC., dated October 19, 2011
Allowable Soil Bearing Capacity =	$q_s := 6000 \cdot psf$	(User Input)	
Allowable Soil Bearing Capacity =	$q_{suse} := 3000 \cdot psf$	(User Input)	Note: 3000psf used for evaluation of existing concrete at grade and proposed concrete infill for soil bearing condition.
Unit Weight of Soil =	$\gamma_s := 125 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_c := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	Z := 2	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Calculated Factors:

Load Factor =

$$LF := \begin{cases} 1.333 & \text{if } H_t \le 700 \cdot ft \\ 1.7 & \text{if } H_t \ge 1200 \cdot ft \\ 1.333 + \left(\frac{H_t - 700ft}{1200ft - 700ft}\right) \cdot 0.4 & \text{otherwise} \end{cases} = 1.333$$

Calculated Data:

Active Pressure =

$$K_a := \frac{\left(1 - \sin\left(\Phi_s\right)\right)}{\left(1 + \sin\left(\Phi_s\right)\right)} = 0.283$$

$$P_a := \frac{1}{2} \cdot \left(PD_{t1}\right)^2 \cdot PD_{w1} \cdot \gamma_s \cdot K_a = 0.71 \cdot kips$$

Coefficient of Lateral Soil Pressure =

$$K_p := \frac{1 + \sin\left(\Phi_s\right)}{1 - \sin\left(\Phi_s\right)} = 3.537$$

$$P_p := \frac{1}{2} \cdot \left(PD_{t1}\right)^2 \cdot PD_{w1} \cdot \gamma_s \cdot K_p = 8.84 \cdot kips$$

Stability of Footing:

Adjusted Concrete Unit Weight =

$$\gamma_c := if\left(Bouyancy = 1, \gamma_c - 62.4pcf, \gamma_c\right) = 150 \cdot pcf$$

Adjusted Soil Unit Weight =

$$\gamma_s := if\left(Bouyancy = 1, \gamma_s - 62.4pcf, \gamma_s\right) = 125 \cdot pcf$$

Cross Sectional Area 1 of Resisting Pyramid =

$$B_1 := PD_{w1}{}^2 = 100ft^2$$

Cross Sectional Area 2 of Resisting Pyramid =

$$B_2 := \left[2\left(L_{p1} - P_{P1} - n\right) \cdot \tan\left(\Phi_s\right) + PD_{w1}\right]^2 = 284.9ft^2$$

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Volume and Weight of Original Tower Foundation

Foundation #1:

Volume of Concrete = $V_{origconc1} := \left[\left(PD_{w1}^{2} \cdot PD_{t1}\right) + d_{p1}^{2} L_{p1}\right] = 262.5 \cdot ft^3$

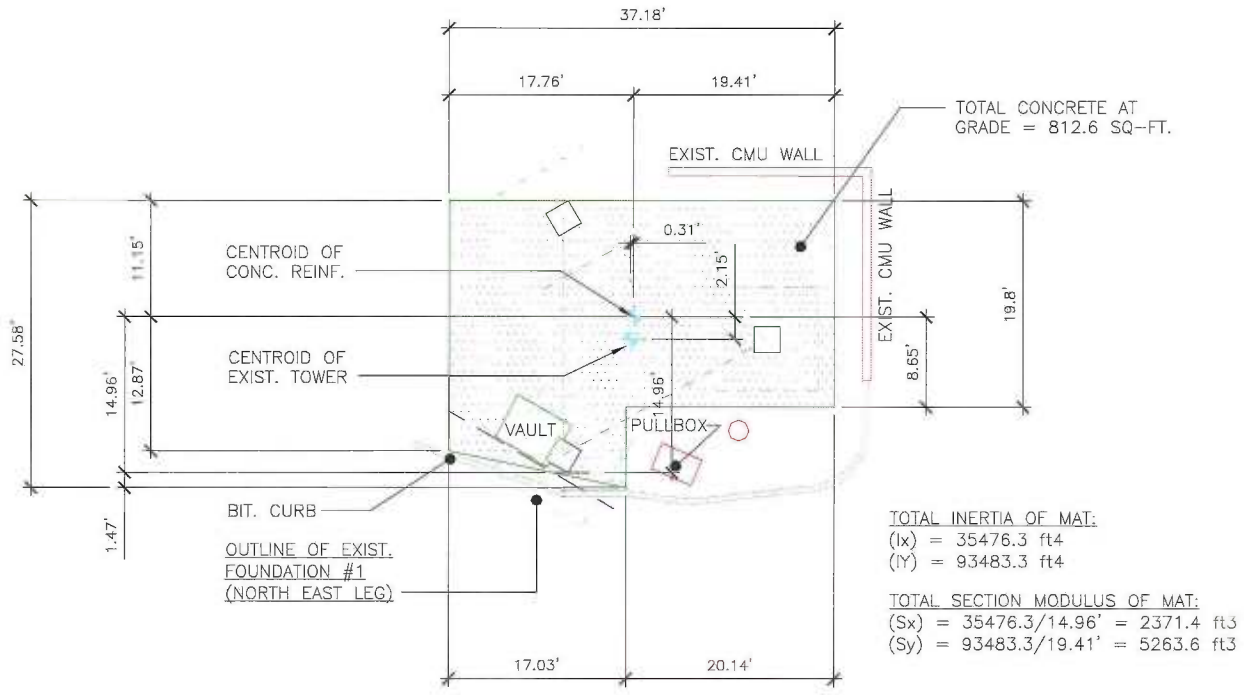
Foundation #2:

Volume of Concrete = $V_{origconc2} := \left[\left(PD_{w2}^{2} \cdot PD_{t2}\right) + d_{p2}^{2} L_{p2}\right] = 262.5 \cdot ft^3$

Foundation #3:

Volume of Concrete = $V_{origconc3} := \left[\left(PD_{w3}^{2} \cdot PD_{t3}\right) + d_{p3}^{2} L_{p3}\right] = 262.5 \cdot ft^3$

Total Weight of Original Concrete = $WT_{origconc} := \left(V_{origconc1} + V_{origconc2} + V_{origconc3}\right) \cdot \gamma_c = 118.1 \cdot kip$



TOTAL INERTIA OF MAT:
(Ix) = 35476.3 ft4
(IY) = 93483.3 ft4

TOTAL SECTION MODULUS OF MAT:
(Sx) = 35476.3/14.96' = 2371.4 ft3
(Sy) = 93483.3/19.41' = 5263.6 ft3

Volume and Weight of Soil Above Original Footing to Underside of Previous Reinforcement

Foundation #1:

Volume of Soil Above Footing = $V_{soilfnd1} := \left(PD_{w1}^{2} - d_{p1}^{2}\right)\left(L_{p1} - P_{P1}\right) = 478.12 \cdot ft^{3}$

Foundation #2:

Volume of Soil Above Footing = $V_{soilfnd2} := \left(PD_{w2}^{2} - d_{p2}^{2}\right)\left(L_{p2} - P_{P2}\right) = 609.38 \cdot ft^{3}$

Foundation #3:

Volume of Soil Above Footing = $V_{soilfnd3} := \left(PD_{w3}^{2} - d_{p3}^{2}\right)\left(L_{p3} - P_{P3}\right) = 820.31 \cdot ft^{3}$

Total Weight of Soil = $WT_{s} := \left(V_{soilfnd1} + V_{soilfnd2} + V_{soilfnd3}\right) \cdot \gamma_{s} = 238.5 \cdot kip$

Volume and Weight of Previous Concrete Reinforcement and Proposed Infill

Foundation #1:

Contact Area of Concrete At Grade = $A_{concfnd1} := \left(102.87ft^{2} - 6.25ft^{2}\right) = 96.62ft^{2}$

Volume of Concrete At Grade = $V_{concfnd1} := \left(A_{concfnd1} \cdot 6.0ft\right) = 579.72 \cdot ft^{3}$

Foundation #2:

Contact Area of Concrete At Grade = $A_{concfnd2} := \left(260ft^{2} - 6.25ft^{2}\right) = 253.75ft^{2}$

Volume of Concrete At Grade = $V_{concfnd2} := \left[\left(A_{concfnd2}\right)4.0ft\right] = 1015 \cdot ft^{3}$ (Minus pier area)

Foundation #3:

Contact Area of Concrete At Grade = $A_{concfnd3} := \left(169ft^{2} - 6.25ft^{2}\right) = 162.75ft^{2}$

Volume of Concrete At Grade = $V_{concfnd3} := \left[\left(A_{concfnd3}\right)4.5ft\right] = 732.38 \cdot ft^{3}$

Area of Existing Reinforced Concrete At Grade = $A_{origreinf} := \left(A_{concfnd1} + A_{concfnd2} + A_{concfnd3}\right) = 513.1 \cdot ft^{2}$

Area of Proposed Reinforced Concrete Infill = $A_{reinfprop} := 255ft^{2}$

Average Depth of Mat (Existing and Proposed Infill) = $Mat_{t} := 4.0ft$

Area of Proposed Reinforced Concrete Infill = $A_{mattot} := A_{origreinf} + A_{reinfprop} = 768.1ft^{2}$

Weight of Concrete At Grade (Proposed Infill) = $WT_{concgrade} := \left(V_{concfnd1} + V_{concfnd2} + V_{concfnd3}\right) \cdot \gamma_{c} = 349.1 \cdot kip$

Weight of Concrete At Grade (Proposed Infill) = $WT_{concgradeinfill} := \left[\left(A_{reinfprop}\right)Mat_{t}\right] \cdot \gamma_{c} = 153 \cdot kip$

Total Weight of Concrete At Grade = $WT_{concgradetot} := \left(WT_{concgrade} + WT_{concgradeinfill}\right) = 502.1 \cdot kip$

Total Weight of Original Concrete Foundation System (x3), Soil, Previous Concrete Reinforcement and Proposed R.C. Infill

Total Weight = $WT_{tot} := WT_{origconc} + WT_s + WT_{concgradetot} = 858.7 \cdot kip$

Soil Bearing Pressure:

Section Modulus of Mat = $S := 2274.5ft^3$ (Calculated external of program)

Minimum Distance From Tower Centroid to Edge of Mat at Foundation #1 (North East leg) = $y1 := 14.62ft$ (Calculated external of program)

Minimum Distance From Reinforced Mat Centroid to Edge of Mat at Foundation #1 (North East leg) = $y2 := 16.83ft$ (Shortest Lever Arm Calculated external of program)

Maximum Pressure Under Mat =

$$P_{max} := \frac{WT_{tot} - WT_{origconc} - WT_s + Comp_{tot}}{A_{mattot}} + \frac{Shear_{tot} \cdot (Mat_t)}{S} = 0.83 \cdot ksf$$

$Max\_Pressure\_Check := if(P_{max} < q_{suse}, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

Minimum Pressure Under Mat =

$$P_{min} := \frac{WT_{tot} - WT_{origconc} - WT_s + Comp_{tot}}{A_{mattot}} - \frac{Shear_{tot} \cdot (Mat_t)}{S} = 0.64 \cdot ksf$$

$Min\_Pressure\_Check := if[(P_{min} \geq 0) \cdot (P_{min} < q_{suse}), "Okay", "No Good"]$

Min_Pressure_Check = "Okay"

Overturning Moment Check:

Overturning Moment = $M_{ot} := Moment + Shear_{tot} \cdot (Mat_t) = 5128 \cdot kip \cdot ft$

Resisting Moment = $M_r := (WT_{origconc} + WT_s) \cdot y1 + (WT_{concgradetot} \cdot y2) = 13663.3\,ft \cdot kips$

Factor of Safety = $\frac{M_r}{M_{ot}} = 2.66$

$$Overturning\_Moment := if\left(\frac{M_r}{M_{ot}} > 2, "OK", "NG"\right)$$

Overturning_Moment = "OK"

Concrete Infill Reinforcement:

Note:
Reinforcement calculation for concrete infill based on temperature and shrinkage steel requirements only. Moment strength okay by inspection due to thickness of slab.
Top and bottom reinforcement combined to account for required amount

Concrete Cover = $c := 3in$

Assumed Min Rebar Diameter = $d_{bar} := 0.5in$

Concrete Infill Thickness = $h := Mat_t$

Effective Depth = $d := h - c - \left(.5 \cdot d_{bar}\right) = 44.75 \cdot in$

Reinforcement = $Reinf_{reqd} := (.0018 \cdot d \cdot 1 \cdot ft) \cdot \frac{1}{2} = 0.48 \cdot in^2$

(Temperature and Shrinkage Reinforcement Distributed Between Top and Bottom of Concrete Slab)

Use #6 bars @ 10" o.c. or #7 bars @ 12" o.c.

NORTHEAST UTILITIES SYSTEM

TOWER REINFORCEMENT DESIGN

T-MOBILE - CT11111A
20 BARNABAS ROAD
NEWTOWN, CT 06470

VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	20 BARNABAS ROAD NEWTOWN, CT 06470
PROJECT COORDINATES:	LAT: 41°–25'–39.50"N LON: 73°–20'–37.42"W ELEV: ±452' AMSL
NU CONTACT:	STEVE FLORIO 860.665.5611
T–MOBILE SITE REF.:	CT11111A
T–MOBILE CONTACT:	MARK RICHARD 860.692.7143
ANTENNA CL HEIGHT:	149'–0"
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

SHEET INDEX

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PROFESSIONAL ENGINEER SEAL

CENTEK engineering

T-MOBILE

CT11111A

20 BARNABAS ROAD
NEWTOWN, CT 06470

DATE: 11/10/14
SCALE: AS SHOWN
JOB NO. 14023.011

TITLE SHEET

SHEET NO.
T-1

DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.

1. DESIGN CRITERIA:

   WIND SPEED OF 85 MPH (FASTEST MILE) AND 85 MPH (FASTEST MILE) CONCURRENT WITH 0.5" OF RADIAL ICE NEU SUB-090.

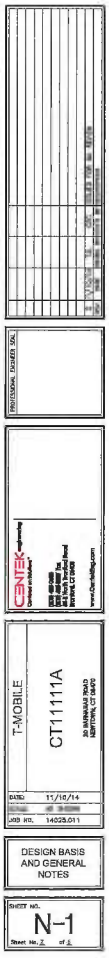
   - SEISMIC LOAD: PER ASCE 7-95 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (DOES NOT GOVERN).

PROJECT SCOPE

1. REMOVAL OF THREE EMS RR-90-17-00DP PANEL ANTENNAS, THREE (3) TMA's AND THREE (3) SIDEARMS WITH A RAD CENTER ELEVATION OF 149'-0" AGL.
2. INSTALLATION OF SIX (6) ERICSSON AIR21 PANEL ANTENNAS AND THREE (3) ERICSSON KRY 112 TMA's MOUNTED ON THREE (3) SITE PRO COMPACT TOWER MOUNTS (P/N CWT8) WITH A RAD CENTER ELEVATION OF 149'-0" AGL.
3. INSTALLATION OF SIX (6) 1-5/8" ø COAX CABLES AND ONE (1) 1-5/8" ø FIBER CABLE MOUNTED TO A LEG OF THE EXISTING TOWER.

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR T-MOBILE, DATED 11/10/14.
2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM A PREVIOUS STRUCTURAL REPORT PREPARED BY CENTEK ENGINEERING PROJECT #13118.000, DATED NOVEMBER 13, 2013.
3. THE TEMPORARY DETACHMENT AND/OR REPLACEMENT OF TOWER MEMBERS SHALL BE DONE ONE AT A TIME AND SHALL BE CONDUCTED ON DAYS WITH LESS THAN 15 MPH WIND PRESENT. NO MEMBER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY.
4. ALL REINFORCEMENT SHOWN HEREIN APPLIES TO ALL SIDES OF THE TOWER.
5. PROVIDE TEMPORARY ANCHORS, GUYING AND/OR BRACING AS REQUIRED TO SAFELY CONDUCT THE WORK.
6. ALL WORK SHALL BE IN ACCORDANCE WITH TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES".
7. THE TOWER STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER REINFORCEMENTS ARE COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE TOWER STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIE-DOWNS, WHICH MIGHT BE NECESSARY.
8. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
9. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
10. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
12. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.
13. TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.
14. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE TEMPORARILY RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT.
15. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.



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T-MOBILE

CT11111A

34 MERIDIAN ROAD
NEWTOWN, CT 06470

DATE: 11/10/14
SCALE: AS SHOWN
JOB NO. 14025.011

DESIGN BASIS AND GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 4

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD).

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL STEEL (TOWER REINF. SOLID ROUND BAR)--- ASTM A572_GR50 (50 KSI)
   D. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   E. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   F. PIPE---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEELS, ASTM-E80XX FOR A572_GR65 STEEL.
   E. BLIND BOLTS---AS1252 PROPERTY CLASS 8.8 (FU=120 KSI).

4. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

16. ALL BOLTS SHALL BE INSTALLED PER THE REQUIREMENTS OF AISC 14TH EDITION & RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS".

17. ALL BOLTS SHALL BE INSTALLED AS SNUG-TIGHT CONNECTIONS UNLESS OTHERWISE INDICATED. CONNECTIONS SPECIFIED AS PRETENSIONED OR SLIP-CRITICAL SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT GIVEN IN TABLE J3.1 OF AISC 14TH EDITION.

18. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

19. LOAD INDICATOR WASHERS SHALL BE UTILIZED ON ALL PRETENSIONED OR SLIP-CRITICAL CONNECTIONS.

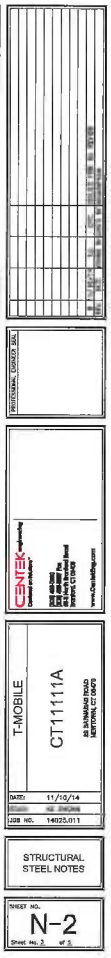
20. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

21. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

22. FABRICATE BEAMS WITH MILL CAMBER UP.

23. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.

24. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.



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T-MOBILE

CT11111A

65 MANSFIELD ROAD
WILLINGTON, CT 06279

DATE: 11/10/14
SCALE: AS SHOWN
JOB NO.: 14025.011

STRUCTURAL STEEL NOTES

SHEET NO.
N-2
Sheet No. 2 of 3

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST-INSTALLED ANCHOR ROD PULL-OUT TEST
[illegible]	EOR APPROVED POST-INSTALLED ANCHOR MPII	–	REBAR & FORMWORK GEOMETRY VERIFICATION	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	–	CONCRETE TESTING		
–	FABRICATOR CERTIFIED WELDER INSPECTION	X	STEEL INSPECTION		
X	MATERIAL CERTIFICATIONS	–	POST INSTALLED ANCHOR ROD VERIFICATION		
		–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON-SITE COLD GALVANIZING VERIFICATION		
		X	CONTRACTOR AS-BUILT REDLINE DRAWINGS		

NOTES:

1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.
3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.
4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.
5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON-SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS-BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE-CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST-CONSTRUCTION: FINAL CONDITION OF THE SITE

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CT11111A

20 BARNABAS ROAD
NEWTOWN, CT 06470

DATE:	11/10/14
SCALE:	AS SHOWN
JOB NO.	14025.011

MODIFICATION INSPECTION REQUIREMENTS

SHEET NO.

MI-1

Sheet No. 4 of 5

I. REINFORCEMENT SCHEDULE KEY:
(MEMBERS INDICATED WITHIN SCHEDULE ARE EXISTING UNLESS NOTED OTHERWISE)

A. REPLACE EXIST. L3.5X3.5X1/4 DIAGONAL MEMBERS WITH L3.5X3.5X5/16 MEMBERS. REPLACE EXIST. 1/2" ø A325-N BOLTS W/ NEW 1/2" ø A325-N BOLTS.

B. REPLACE EXIST. L2X2X1/8 DIAGONAL MEMBERS WITH L2X2X1/4 MEMBERS. REPLACE EXIST. 1/2" ø A325-N BOLTS W/ NEW 1/2" ø A325-N BOLTS.

REPLACE EXIST. 3/4" ø A325-N DIAGONAL BOLTS WITH W/ NEW 3/4" ø A325-X BOLTS (SECTION T7 40'-0"-60'-0" ATB)

MAX. TOWER STEEL USAGE w/ ABOVE REINFORCEMENTS = 84.9% (DIAGONALS SECTION T10 3'-0"-23'-0" ATB) UNDER LOAD CASE #2

LEGEND:

1. A.T.B. DENOTES ABOVE TOWER BASE.
2. A.G.L. DENOTES ABOVE GRADE LEVEL.
3. TXX DENOTES TNXTOWER OUTPUT SECTION NUMBER.

SECTION	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
LEGS	P6X0.432			P5X0.375		P5X0.258	P4X0.337	P3X0.216	P2.5X0.276	P2.5X0.203
LEG GRADE	A572-50									
DIAGONALS	L4X4X$\frac{1}{4}$			L3.5X3.5X$\frac{1}{4}$	A	L3X3X$\frac{1}{8}$ REIN.	L2.5X2.5X$\frac{1}{8}$	L2.5X2.5X$\frac{1}{8}$	B	L1.75X1.75X$\frac{1}{8}$
DIAG.GRADE	A36									
TOP GIRTS	N.A.									L2.5X2.5X$\frac{1}{8}$
SEC. HORZ.	L4X4X1/4		N.A.	L3.5X3.5X$\frac{1}{4}$			N.A.			

180.0'
160.0'
140.0'
120.0'
100.0'
80.0'
60.0'
40.0'
20.0'
0.0'

NOTE: ALL NON T-MOBILE APPURTENANCES NOT SHOWN FOR CLARITY

PROPOSED THREE (3) ERICSSON AIR21 B2A/B4P AND THREE (3) ANDREW LNX-6512DS PANEL ANTENNAS MOUNTED ON THREE (3) SITE PRO COMPACT TOWER MOUNTS (P/N CWT01).

℄ T-MOBILE ANTENNAS
EL. ±149'-0" A.G.L.

EXISTING MUNICIPAL ONE (1) 7/8" ø AND ONE (1) 1/2" ø CABLES

EXISTING VERIZON TWO (2) 1-5/8" ø HYBRIFLEX FIBER LINES.

APPROX TRUE NORTH

EXISTING AT&T NINE (9) 1-5/8" ø COAX CABLES AND ONE (1) 3" CONDUIT

PROPOSED T-MOBLIE SIX (6) 1-5/8" ø COAX CABLES AND ONE (1) 1-5/8" ø FIBER CABLE

EXISTING/RESERVED SPRINT SIX (6) 1-5/8" ø COAX CABLES, THREE (3) 1-1/4" ø HYBRIFLEX FIBER LINES AND ONE (1) 1/2" ø CABLE

RELOCATED T-MOBLIE SIX (6) 1-5/8" ø COAX CABLES FROM LEG TO FACE

EXISTING NEU THREE (3) 7/8" ø, TWO (2) 1/2" ø AND ONE (1) EW63 CABLES

REPLACE EXISTING 3/4"ø A325 DIAGONAL BOLTS w/ 3/4"ø A325-X BOLTS OF SAME LENGTH, TYP. OF 24.

2 / S-1 FEEDLINE PLAN
SCALE: 1/4" = 1'-0"

1 / S-1 TOWER ELEVATION - PROPOSED
SCALE: 1" = 20'-0"

T-MOBILE
CT11111A
DATE: 11/10/14
SCALE: AS SHOWN
JOB NO. 14025.011

TOWER REINFORCEMENT DETAILS

SHEET NO.
S-1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

LNX-6512DS-VTM

Andrew® DualPol® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Excellent choice to maximize both coverage and capacity in suburban and rural applications
- Ideal choice for site collocations and tough zoning restrictions
- Extended elevation tilt for maximum flexibility in urban core areas
- Remote beam tilt management is an optional feature using Andrew's Teletilt® system
- The RF connectors are designed for IP67 rating and the radome for IP56 rating

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain, dBi	14.1	15.0
Beamwidth, Horizontal, degrees	65	65
Beamwidth, Horizontal Tolerance, degrees	±3	±3
Beamwidth, Vertical, degrees	19.0	17.0
Beam Tilt, degrees	0–15	0–15
USLS, typical, dB	17	18
Front-to-Back Ratio at 180°, dB	28	28
CPR at Boresight, dB	12	12
CPR at Sector, dB	10	10
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-150	-150
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

Mechanical Specifications

Color	Light gray
Connector Interface	7-16 DIN Female
Connector Location	Bottom
Connector Quantity	2
Lightning Protection	dc Ground
Radome Material	Fiberglass, UV resistant
Wind Area, maximum	0.2 m^2 | 1.9 ft^2
Wind Loading, maximum	379.8 N @ 150 km/h 85.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1232.0 mm | 48.5 in
Width	301.0 mm | 11.9 in
Net Weight	13.0 kg | 28.7 lb

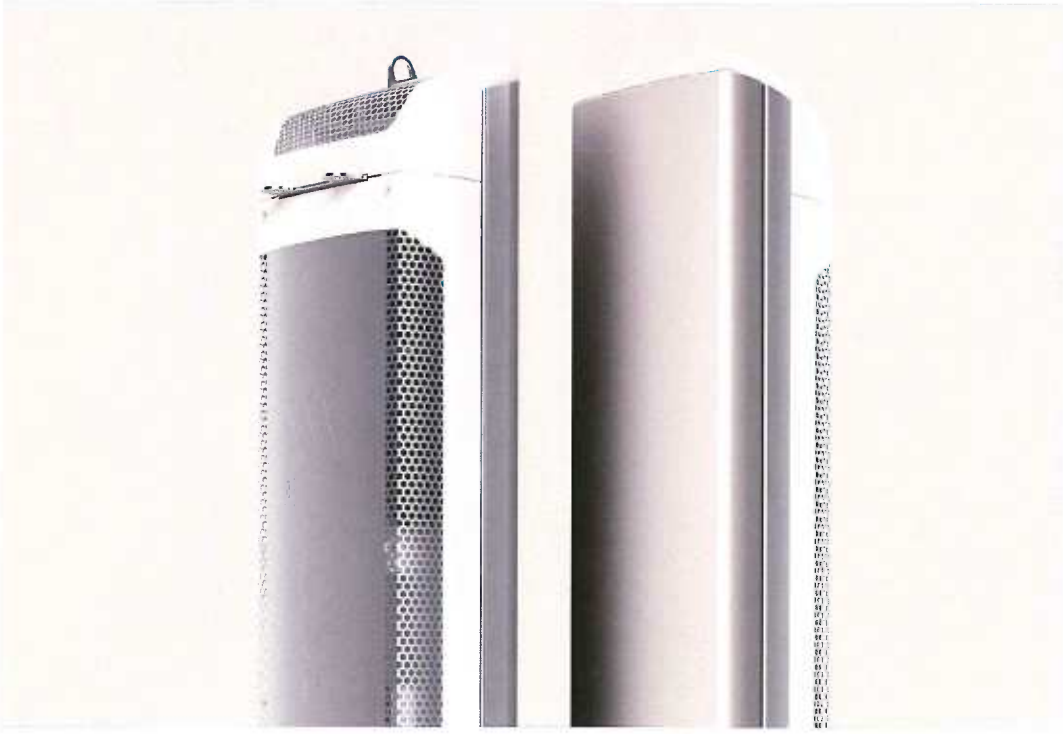
Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator LNX-6512DS-R2M

ERICSSON

DATA-SHEET FOR

AIR 21, 1.3 M, B2A B4P



The Antenna-Integrated Radio (AIR) is a single tower-mounted unit that can replace the antenna/s and radio for one sector. Additional electronics such as ASC? and a RET Actuator and control are also included. A passive antenna function for an extra band is optional.

ericsson.com

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CT11111A

Newtown / I-84 / X9
Newtown Service Center - 20 Barnabus Road
Newtown, CT 06470

December 4, 2014

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	73.35 %

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

EBI Consulting
environmental | engineering | due diligence

December 4, 2014

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

Emissions Analysis for Site: **CT11111A – Newtown / I-84 / X9**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **Newtown Service Center - 20 Barnabus Road, Newtown, 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 both 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 **Newtown Service Center - 20 Barnabus Road, Newtown, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

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

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

4) 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.

5) 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.

6) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The 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.

7) The antenna mounting height centerline of the proposed antennas is **149 feet** above ground level (AGL).

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

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	149	Height (AGL):	149	Height (AGL):	149
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A1 MPE%	0.82	Antenna B1 MPE%	0.82	Antenna C1 MPE%	0.82
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	149	Height (AGL):	149	Height (AGL):	149
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A2 MPE%	0.82	Antenna B2 MPE%	0.82	Antenna C2 MPE%	0.82

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile	**4.92**
Nextel	4.71 %
6755 MHz Syetem	0.00 %
37.48, 37.74, 48.34, 154.9637 MHz Systems	4.80 %
Sprint	9.01 %
AT&T	13.17 %
Verizon Wireless	36.74 %
Site Total MPE %:	**73.35 %**

T-Mobile Sector 1 Total:	1.64 %
T-Mobile Sector 2 Total:	1.64 %
T-Mobile Sector 3 Total:	1.64 %
Site Total:	73.35 %

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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:	1.64 %
Sector 2:	1.64 %
Sector 3 :	1.64 %
T-Mobile Total:	4.92 %
Site Total:	73.35 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **73.35%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803`

EXHIBIT D

Northeast Utilities System

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

January 8, 2015

T-Mobile
4 Sylvan Way
Parsippany, NJ 07054

Re: Site Permitting Authorization
Barnabas Road, Newtown, CT
L700 upgrade

Dear T-Mobile,

Authorization is hereby given to T-Mobile employees and its duly authorized agents and independent contractors (hereinafter collectively referred to as " T-Mobile"), to apply for any and all local municipal, state and federal licenses, permits and approvals, including but not limited to Connecticut Siting Council, building permits, zoning variances, zoning special exceptions, site plan and subdivision approvals, driveway, wetlands and terrain alteration permits, which are or may be necessary or required for T-Mobile to construct, operate and maintain a wireless communications system (PCS System), and/or antenna site on the following property over which The Connecticut Light & Power Company (CL&P) has property rights:

CT 11111A (site location)
Newtown, Connecticut

The foregoing authorization is given subject to the following conditions:

1. This authorization shall be nonexclusive. Nothing herein shall prevent or restrict CL&P from authorizing any other person or entity to apply for any similar licenses, permits or approvals to construct, operate and maintain any other communication system or facility of any type on the property at any time.

2. This authorization shall not obligate CL&P to pay for or reimburse any costs or expenses or to provide any assistance of any kind in connection with any applications, or bind or obligate CL&P to agree or be responsible for any on-site or off-site improvements, development restrictions, impact fees or assessments, capital improvement charges, bonds or other security, or any other fee, assessment, charge or expense imposed or required as a condition of any license, permit or approval. T-Mobile shall be solely and fully responsible for all fees, charges costs and expenses of any kind in connection with any applications. CL&P agrees to reasonably cooperate with T-Mobile in signing such applications or other similar documents as may be required in order for T-Mobile to apply for any license, permit or approval.

3. This authorization shall not be deemed or construed to grant or transfer to T-Mobile any interest in the property, whatsoever, and shall not in any respect obligate or require CL&P to sell, lease or license the Property to T-Mobile or otherwise allow T-Mobile to use or occupy the property for any purpose, regardless of whether any licenses, permits and approvals applied for by T-Mobile for the property are granted. T-Mobile understands and acknowledges T-Mobile's sole risk and without any enforceable expectation that the property will be made available for T-Mobile's use.

4. T-Mobile shall be required to supply to CL&P, free of charge and contemporaneous with T-Mobile 's filing of same, a complete copy of any and all applications, plans, reports and other public filings made by T-Mobile with any local, municipal, state or federal governmental or regulatory officer, agency board, bureau, commission or other person or body for any licenses, permits or approvals for the property, and to keep CL&P fully informed on a regular basis of the status of T-Mobile 's applications.

5. This authorization shall automatically expire six (6) months after the date of this letter, unless extended in writing by mutual agreement of CL&P and T-Mobile.

Very truly yours,

Salvatore Giuliano, Manager

R E & Property Management

AGREED TO on behalf of
T-Mobile

By: _____
Duly Authorized

Date: 1-19-2015

Site Location: Barnabas Road, Newtown, CT