July 14, 2022

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

Re: Notice of Exempt Modification New Cingular Wireless PCS LLC ("AT&T") Site CT1118
1925 East Main Street, Torrington, CT 06790 (the "Property")
Latitude: 41.8232731 N Longitude: 73.0766739 W

Dear Ms. Bachman:

AT&T currently maintains (12) antennas at the 95' level on the existing 155' monopole tower ("Tower") at 1925 East Main Street, Torrington, CT. The Tower is owned by SBA Towers and the property is owned by TEP Incorporated. AT&T intends to modify its facility by removing all (12) antennas and adding (3) AIR6449 B77D at the 93'2" level, (3) TPA-65R-BU6DA-K & (3) OPA65R-BU6DA antennas at the 95' level and (3) AIR6419 B77G antennas at the 96'8" level of the tower. The AIR6649 B77D & AIR6419 B77G antennas are stacked one on top of the other. AT&T also intends to remove (6) RRUs at the 95' level and add (3) 4449 B5/B12, (3) 4415 B25 & (3) 4478 B14 RRUs at the 95' level. The height of AT&Ts existing antennas is 95'and proposed antennas is 93'2", 95' & 96'8" on the Tower. The height of the existing & proposed RRUs is 95'.

This modification may include B2, B5, B17, B14, B29, B30, B66 & n77 hardware that is 4G(LTE) and/or 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

The Tower received City of Torrington Special Exception & Site Plan approval on August 9, 2000. AT&T received CT Siting Council approval under EM-CING-143-040213 on February 18, 2004. There were no conditions that could be feasibility be violated by this modification, including total facility height and mounting restrictions. The AT&T modification complies with the above-mentioned approvals.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ("R.C.S.A") §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A §16-50j-72(b)(2). In accordance with to R.C.S.A §16-50j-73, a copy of this letter is being sent the Hon. Elinor Carbone, Mayor, City of Torrington, Mr. Jeremy Leifert, City Planner, City of Torrington, TEP Incorporated, the property owner and SBA Towers, the tower owner.

The planned modification of the facility falls squarely within those activities explicitly provided for in R.C.S.A §16-50j-72(b)(2). Specifically:

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

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

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

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

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

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

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

Sincerely,

Hollis M. Redding

Hollis M. Redding
SAI Communications, LLC
12 Industrial Way
Salem, NH 03079
Mobile: 860-834-6964
hredding@saigrp.com

Enclosures

Cc:
Hon Elinor Carbone, Mayor, chief elected official
Mr. Jeremy Leifert, City Planner, City of Torrington
TEP Incorporated, the property owner
SBA Towers, the tower owner

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Exposure

CT1118

1925 East Main Street, Torrington, CT

July 7, 2022

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of AT&T antenna arrays on the existing monopole located at 1925 East Main Street in Torrington, CT. The coordinates of the existing monopole are 41-49-23.78 N, 73-4-36.03 W

AT&T is proposing the following:

1) Install twelve (12) multi-band antennas (four (4) per sector) to support its commercial LTE network and the FirstNet National Public Safety Broadband Network ("NPSBN").

This report considers the planned antenna configuration for AT&T[1] to derive the resulting % Maximum Permissible Exposure of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to AT&T's Radio Frequency Design Sheet dated 06/23/22.

3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

ERP = Effective Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Calculation Results

Table 1 below outlines the cumulative power density information for the AT&T modification to the existing monopole facility at the site. The proposed antennas are directional in nature; therefore, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
Nextel	143	851	9	100	0.0172	0.5673	0.30%
VoiceStream	133	1930	4	294	0.0262	1.0000	0.26%
Sprint	131	1900	4	1005	0.0925	1.0000	0.93%
Sprint	131	2100	2	1751	0.0806	1.0000	0.81%
Sprint	131	1900	1	377	0.0087	1.0000	0.09%
Sprint	131	600	2	789	0.0363	0.4000	0.91%
Sprint	131	700	2	433	0.0199	0.4667	0.43%
Sprint	153	1900	4	12.8	0.0009	1.0000	0.01%
Sprint	153	850	1	12.1	0.0002	0.5667	0.00%
Sprint	153	2500	2	12.8	0.0004	1.0000	0.00%
MetroPCS	85	2130	3	631	0.1091	1.0000	1.09%
Verizon	123	751	4	697	0.0732	0.5007	1.46%
Verizon	123	877	2	473	0.0249	0.5847	0.43%
Verizon	123	874	4	825	0.0867	0.5827	1.49%
Verizon	123	1975	4	1052	0.1105	1.0000	1.11%
Verizon	123	2120	4	2080	0.2186	1.0000	2.19%
Verizon	123	3730	4	6531	0.6863	1.0000	6.86%
Town	no RF information available %MPE estimated						5.00%
AT&T	95	739	1	2749	0.0125	0.4927	2.53%
AT&T	95	763	1	2625	0.0119	0.5087	2.34%
AT&T	95	885	1	3229	0.0147	0.5900	2.49%
AT&T	95	1900	3	6297	0.0858	1.0000	8.58%
AT&T	95	2100	2	10121	0.0919	1.0000	9.19%
AT&T	95	2300	1	9665	0.0439	1.0000	4.39%
AT&T	96.6	3500	1	24286	0.1064	1.0000	10.64%
AT&T	93.16	3500	1	24286	0.1150	1.0000	11.50%
						Total	**70.03%**

Table 1: Carrier Information[2]

[2] The existing record in the CSC Power Density Table for AT&T should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for Nextel, VoiceStream, Sprint, MetroPCS, Verizon, Town and AT&T was taken directly from the CSC database dated 01/21/2022. Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

5. Conclusion

The above analysis concludes that RF exposure at ground level from the proposed facility will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the highest expected percent of Maximum Permissible Exposure at ground level for AT&T's equipment is **70.03% of the FCC General Population/Uncontrolled limit**.

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, ANSI/IEEE Std. C95.1 and ANSI/IEEE Std. C95.3.

July 7, 2022
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

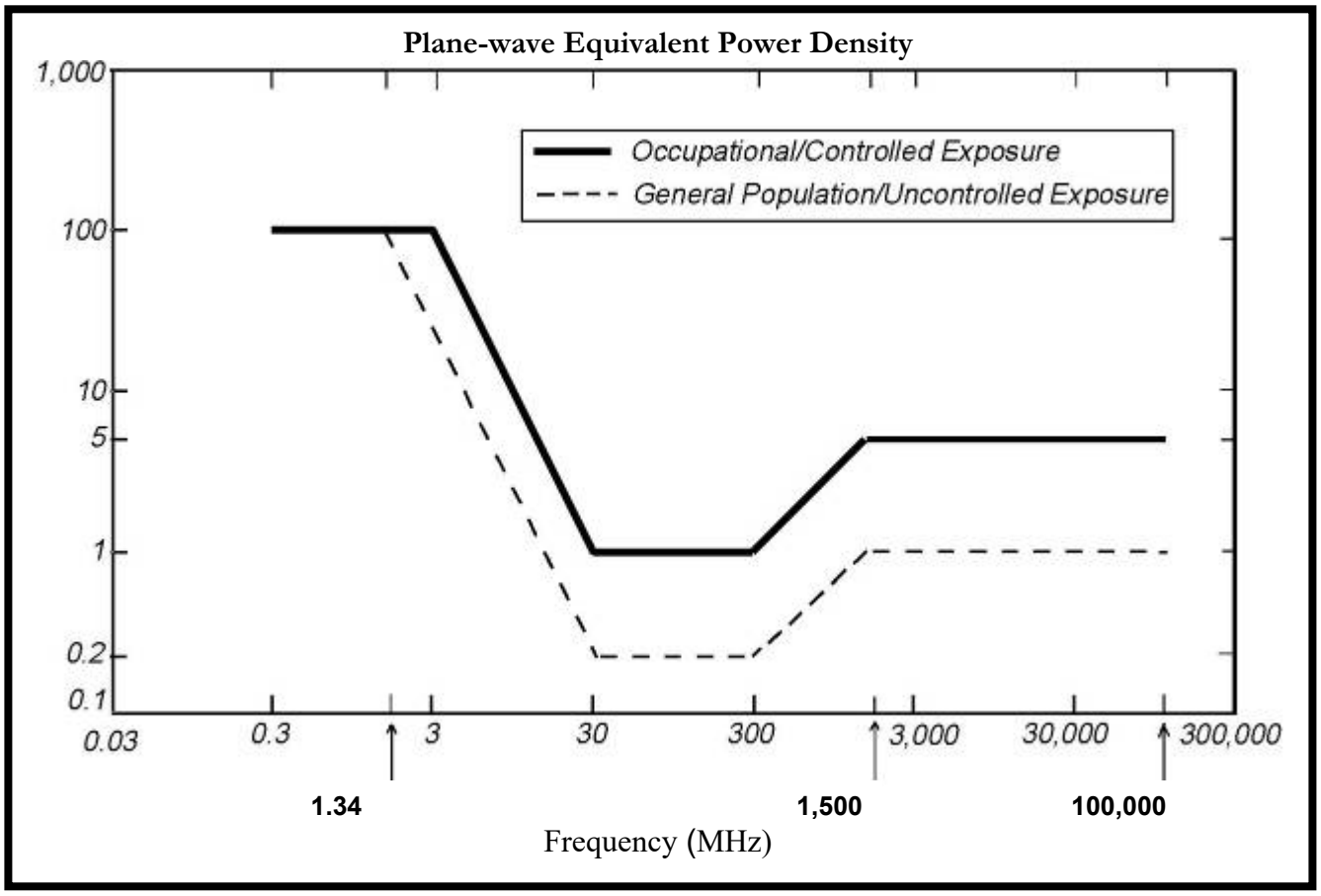
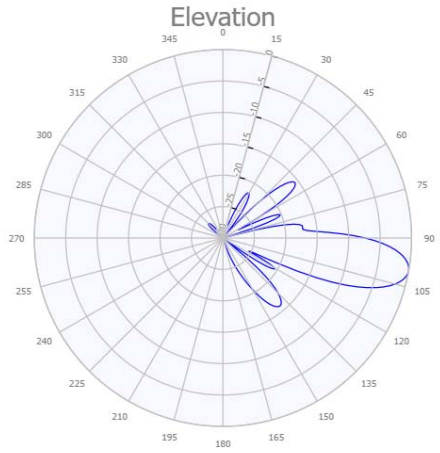
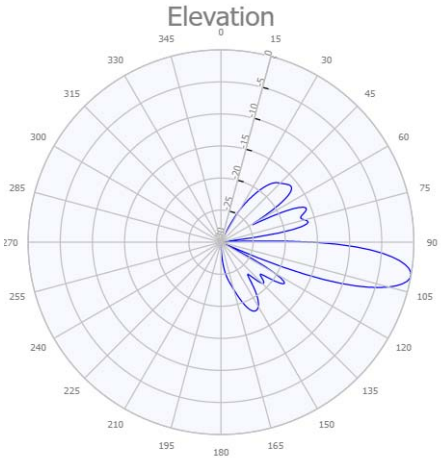
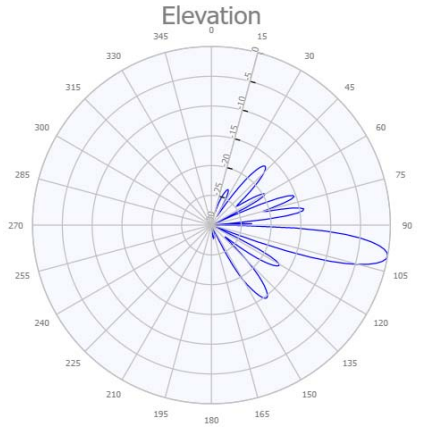
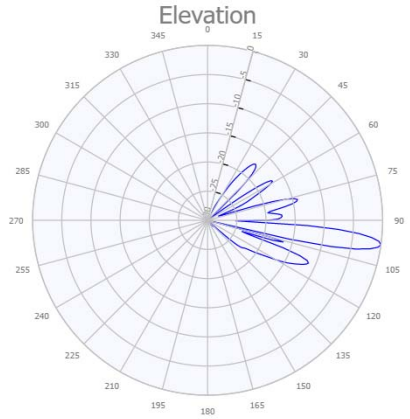
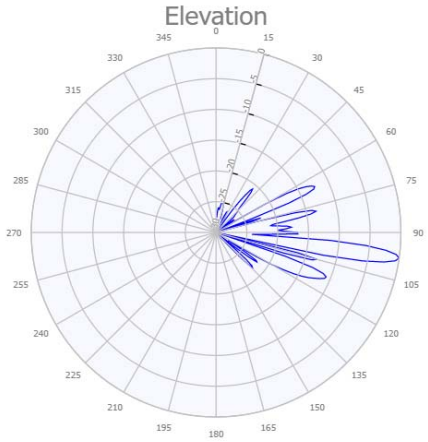
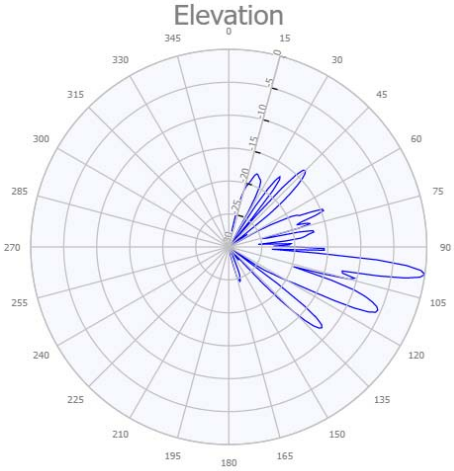


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

700 MHz Manufacturer: CCI Model #: TPA-65R-BU6DA-K Frequency Band: 698-806 MHz Gain: 14.5 dBi Vertical Beamwidth: 12.8° Horizontal Beamwidth: 73° Polarization: Dual Linear45° Size L x W x D: 71.2” x 20.7” x 7.7”	
700 MHz Manufacturer: CCI Products Model #: OPA65R-BU6DA Frequency Band: 698-806 MHz Gain: 14.3 dBi Vertical Beamwidth: 12.9° Horizontal Beamwidth: 73° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 7.7”	
885 MHz Manufacturer: CCI Products Model #: OPA65R-BU6DA Frequency Band: 824 - 896 MHz Gain: 15.2 dBi Vertical Beamwidth: 11.1° Horizontal Beamwidth: 64° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 7.7”	

1900 MHz Manufacturer: CCI Model #: TPA-65R-BU6DA-K Frequency Band: 1850-1990 MHz Gain: 18.1 dBi Vertical Beamwidth: 5.2° Horizontal Beamwidth: 66° Polarization: Dual Linear45° Size L x W x D: 71.2” x 20.7” x 7.7”	
2100 MHz Manufacturer: CCI Model #: TPA-65R-BU6DA-K Frequency Band: 2110-2180 MHz Gain: 18.4 dBi Vertical Beamwidth: 4.8° Horizontal Beamwidth: 66° Polarization: Dual Linear45° Size L x W x D: 71.2” x 20.7” x 7.7”	
2300 MHz Manufacturer: CCI Products Model #: OPA65R-BU6DA Frequency Band: 2300-2400 MHz Gain: 18.2 dBi Vertical Beamwidth: 4.1° Horizontal Beamwidth: 55° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 7.7”	

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:
- NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: AIR6449 B77D (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: TPA-65R-BU6DA-K (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: OPA65R-BU6DA (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4449 B5/B12 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4415 B25 (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4478 B14 (700) (TOTAL OF 1 PER BETA SECTOR).
- EXISTING AT&T RRUS: 4478 B14 (700)(TYP. 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2) (TO BE RELOCATED TO TOWER TOP @ POS. 2)
- EXISTING AT&T RRUS: 4426 B66 (AWS)(TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- NEW AT&T DC & FIBER SURGE ARRESTOR DC9-48-60-24-8C-EV (TOTAL OF 1).
- ADD (3) AWG 6 DC POWER & (1) 24 PAIR FIBER.
- ADD (3) Y-CABLES.
- PROPOSED MOUNT MODS (SEE S-1 SHEET).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD 6648 + XCEDE CABLE.
- ADD IDLE.
- ADD (3) RECTIFIERS.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNAS: 7770 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: AM-X-CD-16-65-00T-RET (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- EXISTING AT&T ANTENNAS: HPA-65R-BUU-H6 (TYP. OF 2 PER ALPHA & GAMMA SECTOR, TOTAL OF 4).
- EXISTING AT&T ANTENNAS: 800-10764 (TOTAL OF 1 PER BETA SECTOR).
- EXISTING AT&T ANTENNAS: SBNHH-1D65A (TOTAL OF 2 PER BETA SECTOR).
- EXISTING AT&T RRUS: RRUS-12 B2 (PCS) (TYP. 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS-11 B12 (700) (TYP. 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T TMA'S LGP17201 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T DIPLEXER LGP21901 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T DIPLEXER DBCT108F1V92-1 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING (6) COAX CABLES.

ITEMS TO REMAIN:
- (8) RRU'S, (2) SURGE ARRESTOR, (6) COAX CABLES, (4) DC POWER & (2) FIBER.

SITE ADDRESS:	1925 EAST MAIN STREET TORRINGTON, CT 06790
LATITUDE:	41.8232731° N, 41° 49' 23.78" N
LONGITUDE:	73.0766739° W, 73° 4' 36.03" W
TYPE OF SITE:	MONOPOLE / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	155'-0"±
RAD CENTER:	95'-0"± (LTE), 96'-8"± (DoD), 93'-2"± (C-Band)
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

SITE NUMBER: CTL01118

SITE NAME: TORRINGTON EAST MAIN ST

FA CODE: 10042345

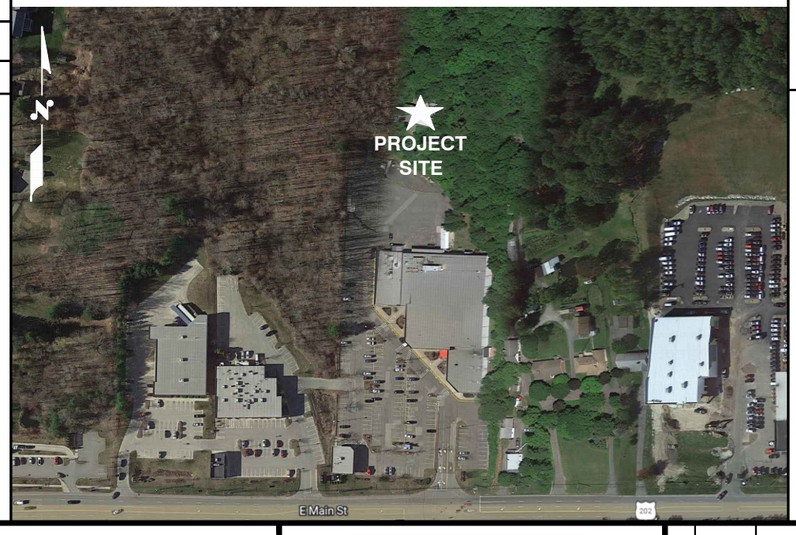
PACE ID: MRCTB060828, MRCTB060662, MRCTB060536, MRCTB060655

PROJECT: 5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING EAST ON ENTERPRISE DR TOWARD CAPITAL BLVD.TURN LEFT ONTO CAPITAL BLVD.TURN LEFT ONTO WEST ST.MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN.MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN.MERGE ONTO CT-571 VIA EXIT 24 ON THE LEFT TOWARD KENSINGTON/CT-71/CT-372.STAY STRAIGHT TO GO ONTO CT-372/CT-571. CONTINUE TO FOLLOW CT-372.MERGE ONTO CT-72 W VIA THE RAMP ON THE LEFT TOWARD BRISTOL/I-84 W.TAKE THE N WASHINGTON STREET/CT-177 EXIT, EXIT 1.TURN RIGHT ONTO N WASHINGTON ST/CT-177. CONTINUE TO FOLLOW CT-177.TURN SLIGHT LEFT ONTO MAIN ST/CT-4. CONTINUE TO FOLLOW CT-4.TURN LEFT ONTO SPIELMAN HWY/CT-4. CONTINUE TO FOLLOW CT-4.TURN RIGHT ONTO BIRGE PARK RD/CT-4. CONTINUE TO FOLLOW CT-4.TURN RIGHT ONTO TORRINGFORD ST/CT-183.TURN RIGHT ONTO E MAIN ST/US-202 E.1925 E MAIN ST, TORRINGTON, CT 06790-3102, 1925 E MAIN ST IS ON THE LEFT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. 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 AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

TITLE SHEET

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	T-1	3

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 STANDARDS) 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 AND #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 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 AWG 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 – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

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. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T 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 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

    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, FOURTEENTH EDITION;

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

    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	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

GENERAL NOTES

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

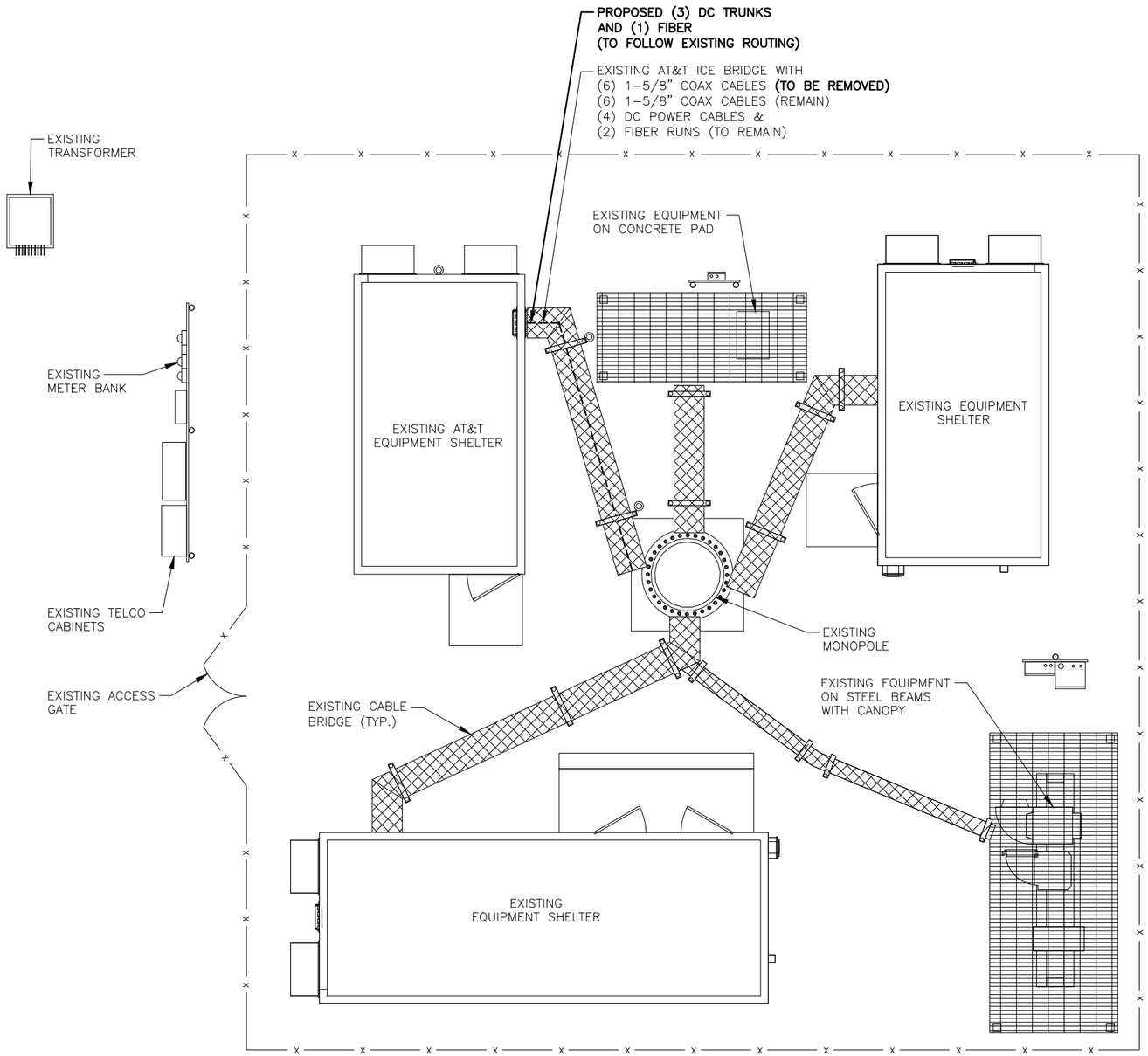
SITE NUMBER	DRAWING NUMBER	REV
CTL01118	GN-1	3

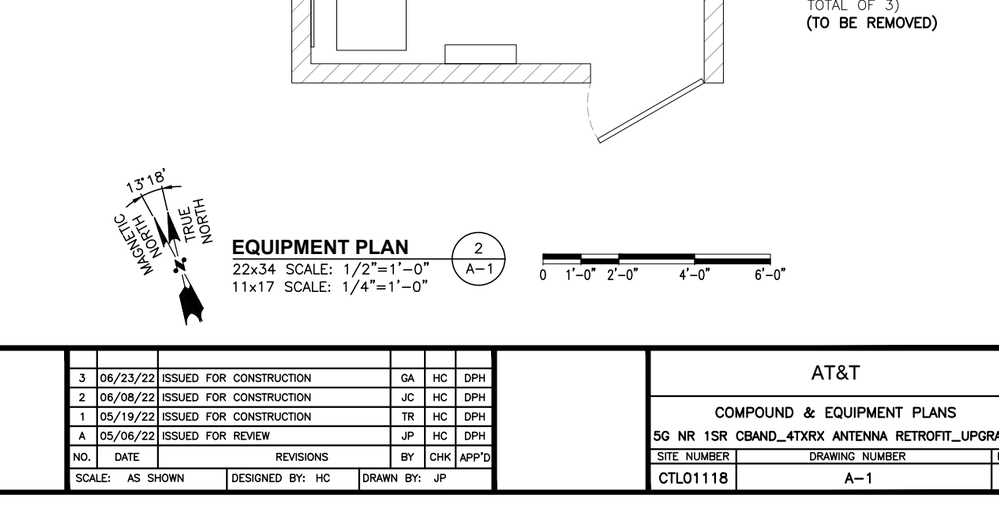
NOTE:

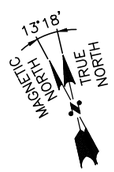
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: SBA COMMUNICATIONS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.







COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"

EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

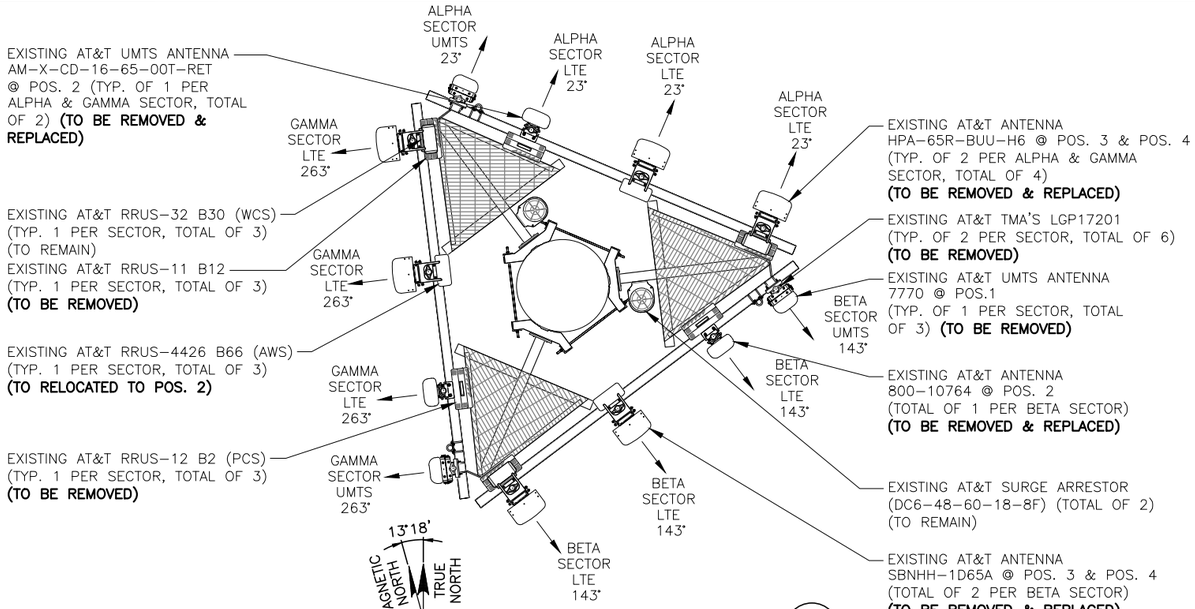
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

COMPOUND & EQUIPMENT PLANS

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

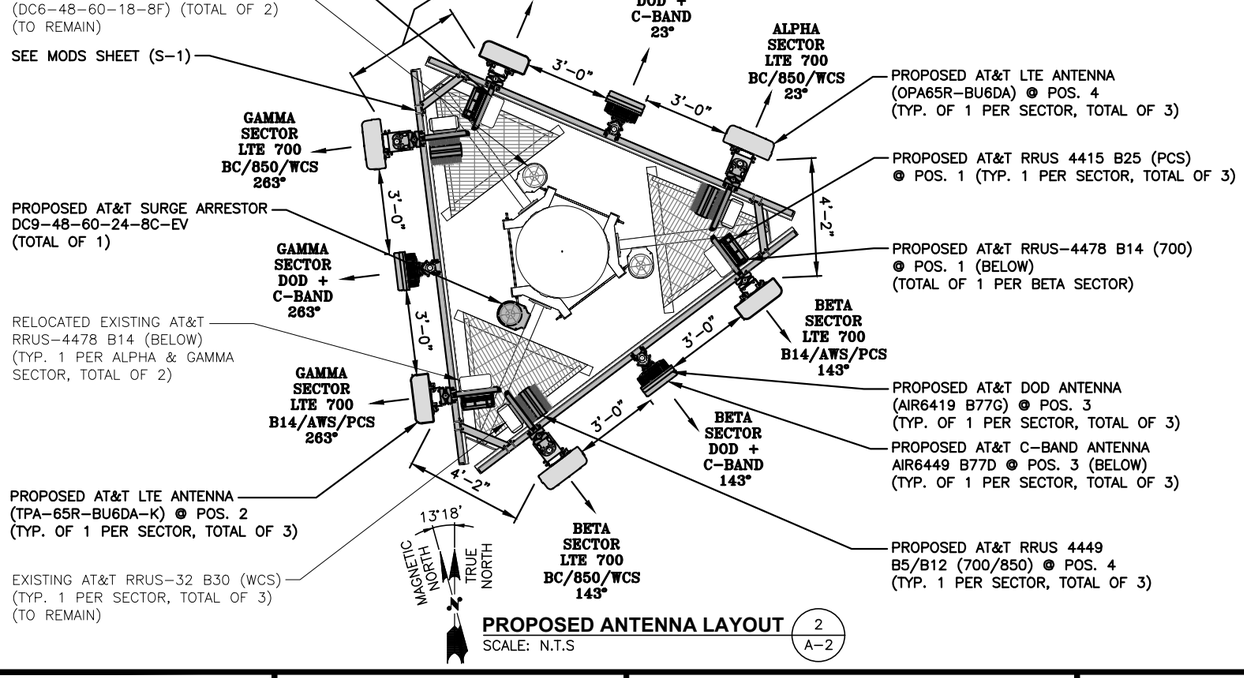
SITE NUMBER	DRAWING NUMBER	REV
CTL01118	A-1	3



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

1 / A-2



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 / A-2

NOTE:

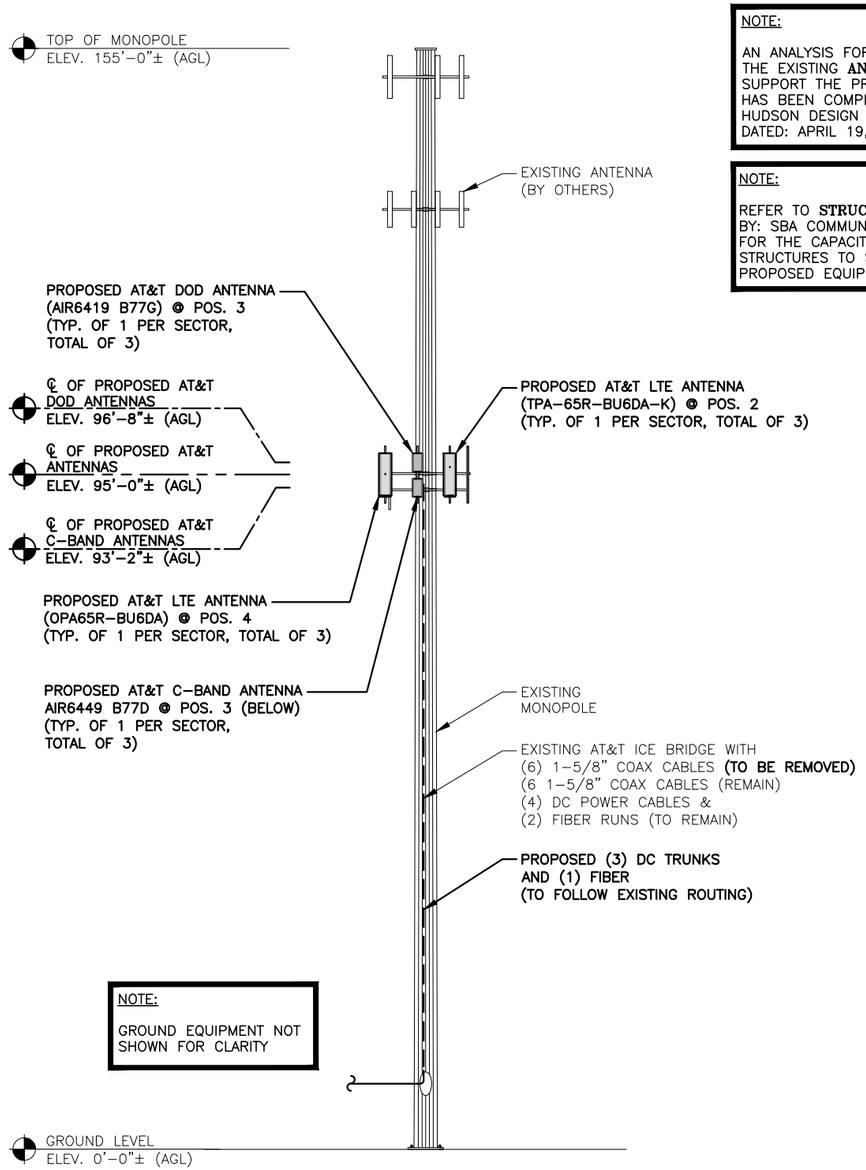
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 19, 2022.

NOTE:

REFER TO **STRUCTURAL ANALYSIS**
BY: SBA COMMUNICATIONS
FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



ELEVATION

22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

3 / A-2

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

ANTENNA LAYOUTS & ELEVATION

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	A-2	3

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	ANTENNA TIP HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	–	–	–	–	–	–	–	–	–	–	(2)1–5/8 COAX	(E) (1) RAYCAP DC6–48–60–18–8F
A2	**PROPOSED**	**LTE 700 B14/AWS/PCS**	**TPA–65R–BU6DA–K**	**71.2X20.7X7.7**	**95'–0"±**	**98'–0"**	**23°**	–	(E)(1) 4478 B14 (700) **(P)(1) 4415 B25 (PCS)** (E)(1) 4426 B66 (AWS)	– **16.5x13.4x5.9** –	(E)(2) DC POWER & (1) FIBER	
A3	**PROPOSED**	**DOD + C–BAND**	**AIR6419 B77G AIR6449 B77D (STACKED)**	**31.1X16.1X7.3 30.6X15.9X10.6**	**96'–8"± 93'–2"±**	**98'–0" 94'–5"**	**23°**	–	–	– –	–	
A4	**PROPOSED**	**LTE 700 BC/850/WCS**	**OPA65R–BU6DA**	**71.2X21X7.8**	**95'–0"±**	**98'–0"**	**23°**	–	**(P)(1) 4449 B5/B12 (850/700)** (E)(1) RRUS–32 B30 (WCS)	**17.9x13.2x10.4** –	**(P)(1) Y–CABLE**	
B1	–	–	–	–	–	–	–	–	–	–	(2)1–5/8 COAX	(E) (1) RAYCAP DC6–48–60–18–8F
B2	**PROPOSED**	**LTE 700 B14/AWS/PCS**	**TPA–65R–BU6DA–K**	**71.2X20.7X7.7**	**95'–0"±**	**98'–0"**	**143°**	–	**(P)(1) 4478 B14 (700)** **(P)(1) 4415 B25 (PCS)** (E)(1) 4426 B66 (AWS)	**18.1x13.4x8.3** **16.5x13.4x5.9** –	(E)(2) DC POWER & (1) FIBER	
B3	**PROPOSED**	**DOD + C–BAND**	**AIR6419 B77G AIR6449 B77D (STACKED)**	**31.1X16.1X7.3 30.6X15.9X10.6**	**96'–8"± 93'–2"±**	**98'–0" 94'–5"**	**143°**	–	–	– –	–	
B4	**PROPOSED**	**LTE 700 BC/850/WCS**	**OPA65R–BU6DA**	**71.2X21X7.8**	**95'–0"±**	**98'–0"**	**143°**	–	**(P)(1) 4449 B5/B12 (850/700)** (E)(1) RRUS–32 B30 (WCS)	**17.9x13.2x10.4** –	**(P)(1) Y–CABLE**	
C1	–	–	–	–	–	–	–	–	–	–	(2)1–5/8 COAX	**(P) (1) RAYCAP DC9–48–60–24–8C–EV**
C2	**PROPOSED**	**LTE 700 B14/AWS/PCS**	**TPA–65R–BU6DA–K**	**71.2X20.7X7.7**	**95'–0"±**	**98'–0"**	**263°**	–	(E)(1) 4478 B14 (700) **(P)(1) 4415 B25 (PCS)** (E)(1) 4426 B66 (AWS)	– **16.5x13.4x5.9** –	**(P)(3) DC POWER & (1) FIBER**	
C3	**PROPOSED**	**DOD + C–BAND**	**AIR6419 B77G AIR6449 B77D (STACKED)**	**31.1X16.1X7.3 30.6X15.9X10.6**	**96'–8"± 93'–2"±**	**98'–0" 94'–5"**	**263°**	–	–	– –	–	
C4	**PROPOSED**	**LTE 700 BC/850/WCS**	**OPA65R–BU6DA**	**71.2X21X7.8**	**95'–0"±**	**98'–0"**	**263°**	–	**(P)(1) 4449 B5/B12 (850/700)** (E)(1) RRUS–32 B30 (WCS)	**17.9x13.2x10.4** –	**(P)(1) Y–CABLE**	

FINAL ANTENNA SCHEDULE (1 / A–3)
SCALE: N.T.S

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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 19, 2022.

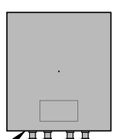
NOTE:
REFER TO **STRUCTURAL ANALYSIS** BY: SBA COMMUNICATIONS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
P(3)	**4449 (850/700)**	**17.9"x13.2"x10.4"**
E(2)	4478 B14 (700)	18.1"x13.4"x8.3"
P(1)	**4478 B14 (700)**	**18.1"x13.4"x8.3"**
P(3)	**4415**	**16.5"x13.4"x5.9"**
E(3)	4426	14.9"x13.2"x5.8"
E(3)	RRUS–32 (WCS)	27.2"x12.1"x7.0"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

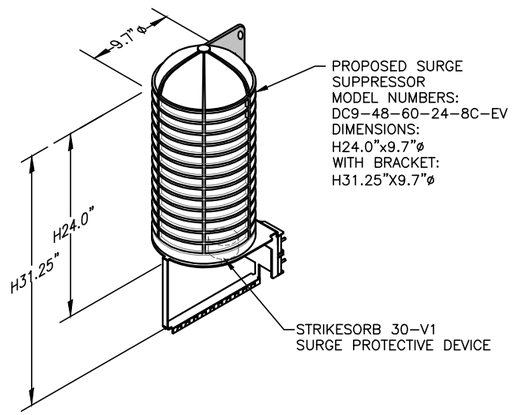
NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

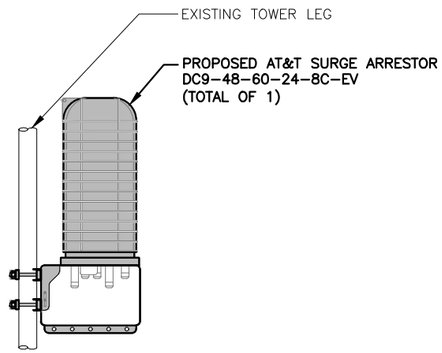
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (2 / A–3)
SCALE: N.T.S

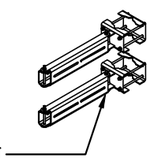


NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL (3 / A–3)
SCALE: N.T.S



DC SURGE ARRESTOR MOUNTING DETAIL (4 / A–3)
SCALE: N.T.S



DUAL RRU MOUNT DETAIL (5 / A–3)
SCALE: N.T.S

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

DETAILS

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	A–3	3

NOTE:

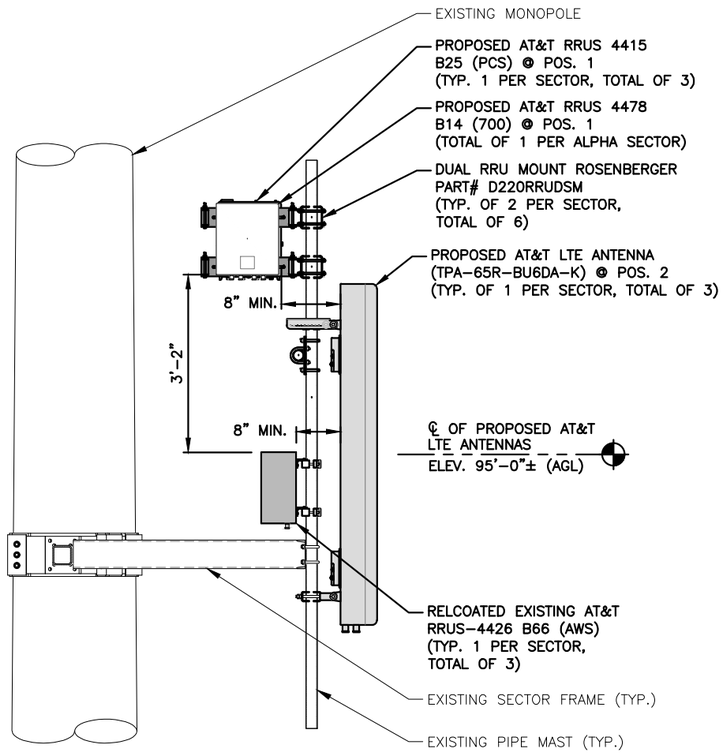
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 19, 2022.

NOTE:

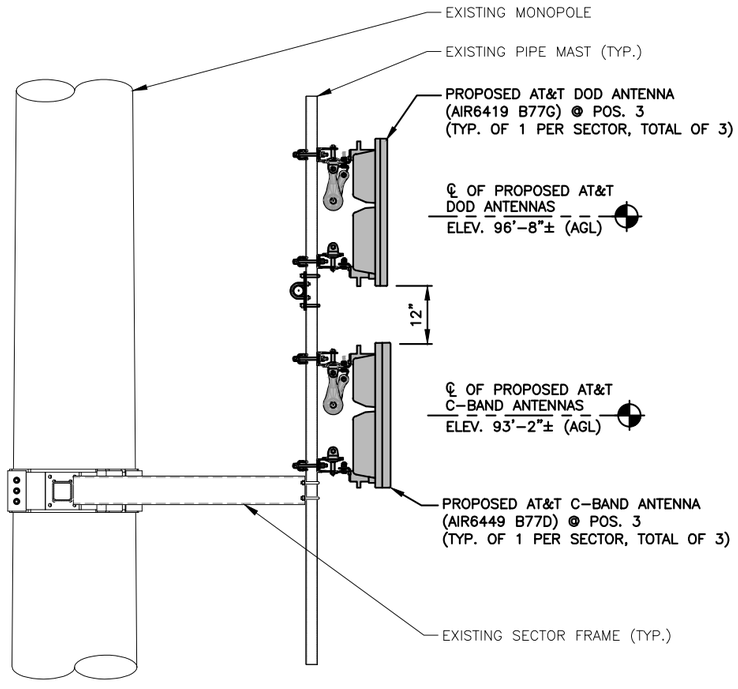
REFER TO **STRUCTURAL ANALYSIS** BY: SBA COMMUNICATIONS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



PROPOSED LTE ANTENNA MOUNTING DETAIL @ POS. 2

22x34 SCALE: 3/4"=1'-0" 11x17 SCALE: 3/8"=1'-0" 0 8" 1'-4" 2'-8" 4'-0"

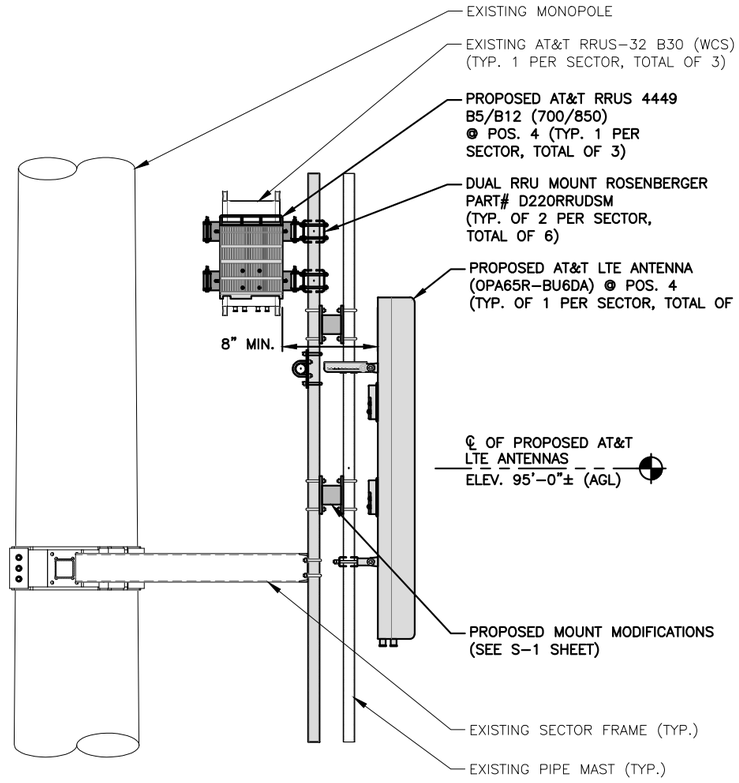
1 A-4



PROPOSED DOD + C-BAND ANTENNA MOUNTING DETAIL @ POS. 3

22x34 SCALE: 3/4"=1'-0" 11x17 SCALE: 3/8"=1'-0" 0 8" 1'-4" 2'-8" 4'-0"

2 A-4



PROPOSED LTE ANTENNA MOUNTING DETAIL @ POS. 4

22x34 SCALE: 3/4"=1'-0" 11x17 SCALE: 3/8"=1'-0" 0 8" 1'-4" 2'-8" 4'-0"

3 A-4

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: JP

AT&T

DETAILS

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	A-4	3

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

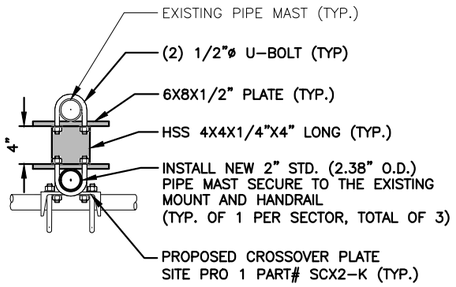
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

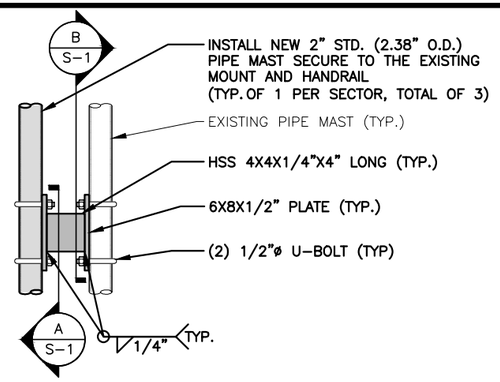
STRUCTURAL NOTES

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

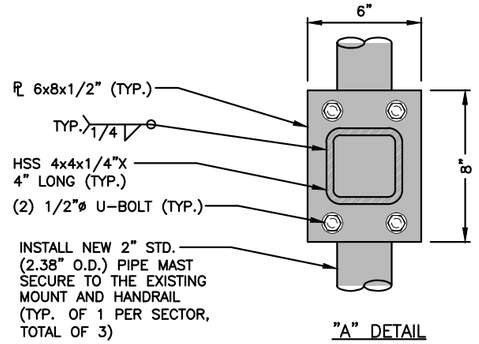
SITE NUMBER	DRAWING NUMBER	REV
CTL01118	SN-1	3



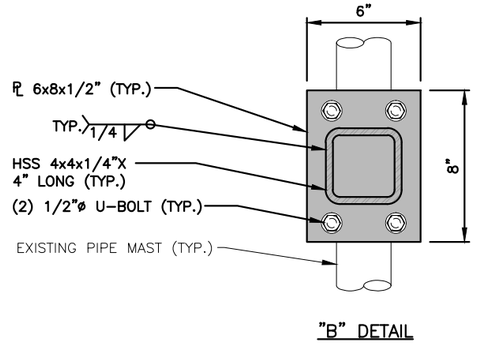
PLAN VIEW



SIDE VIEW



"A" DETAIL



"B" DETAIL

NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: APRIL 19, 2022.

NOTE:

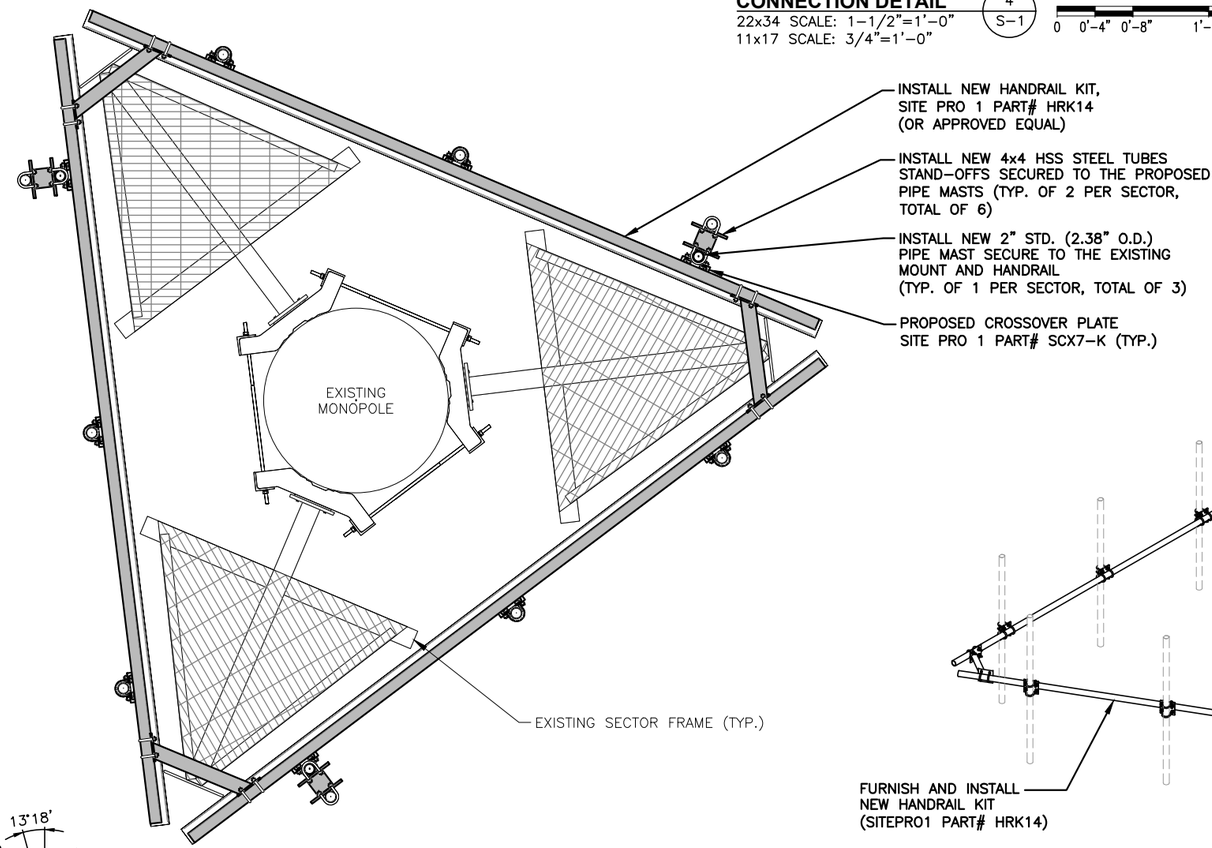
REFER TO **STRUCTURAL ANALYSIS** BY: SBA COMMUNICATIONS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

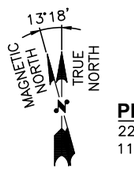
CONNECTION DETAIL

4 S-1

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

0 0'-4" 0'-8" 1'-4" 2'-0"



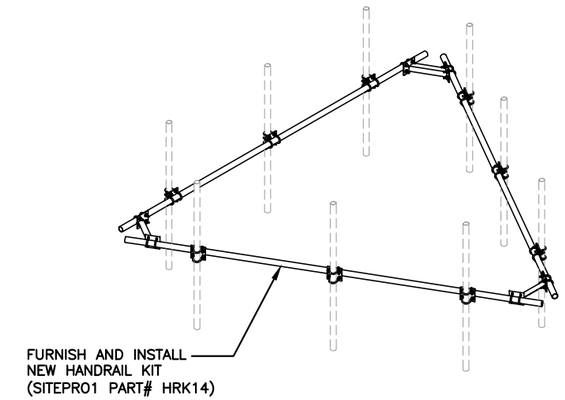


PROPOSED MOUNT MODIFICATIONS PLAN

1 S-1

22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

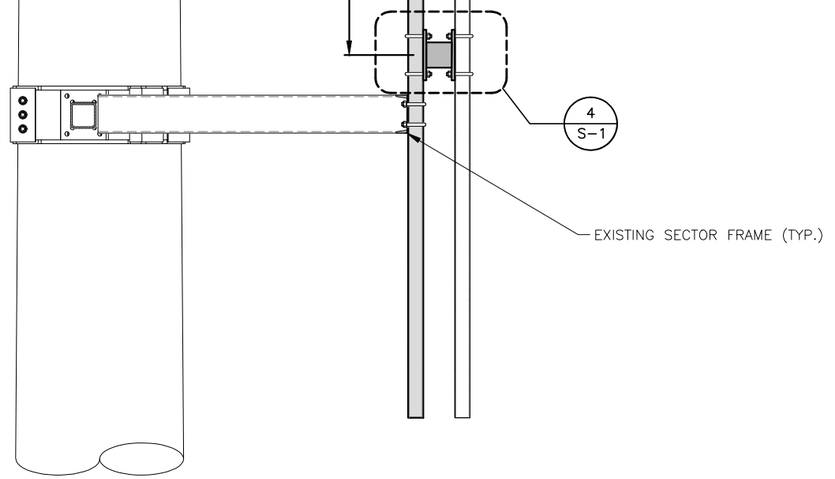
0 1'-0" 2'-0" 4'-0" 6'-0"



HANDRAIL KIT DETAIL

2 S-1

SCALE: N.T.S



PROPOSED MOUNT MODIFICATIONS DETAIL

3 S-1

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

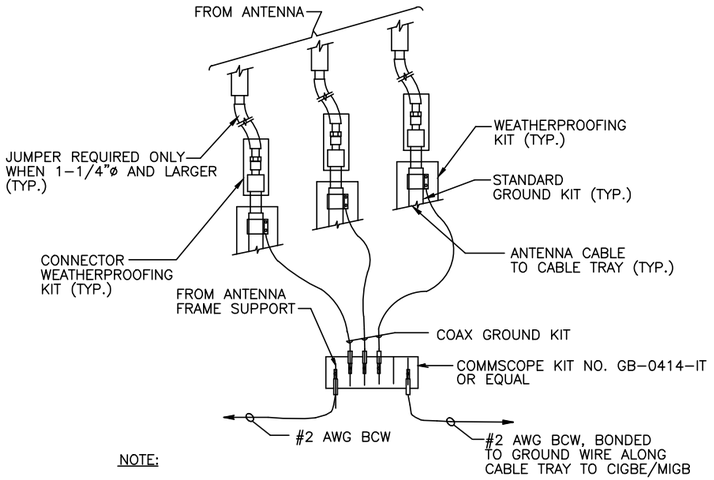
NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

MOUNT MODIFICATION DESIGN
5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	S-1	3

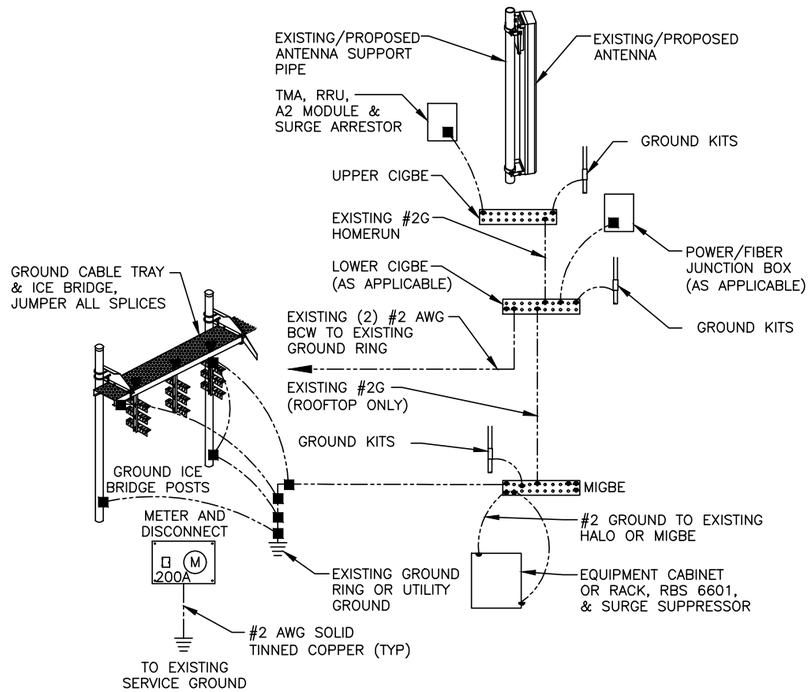


NOTE:

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

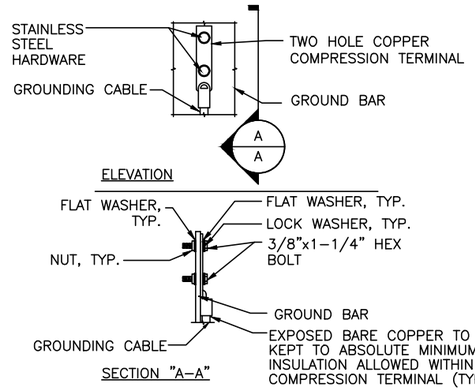
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S



NOTES:

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

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)

SCALE: N.T.S

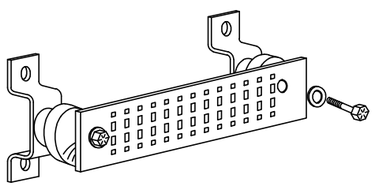
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
+24V POWER SUPPLY RETURN BAR (#2 AWG)
-48V POWER SUPPLY RETURN BAR (#2 AWG)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED) (4 / G-1)

SCALE: N.T.S

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

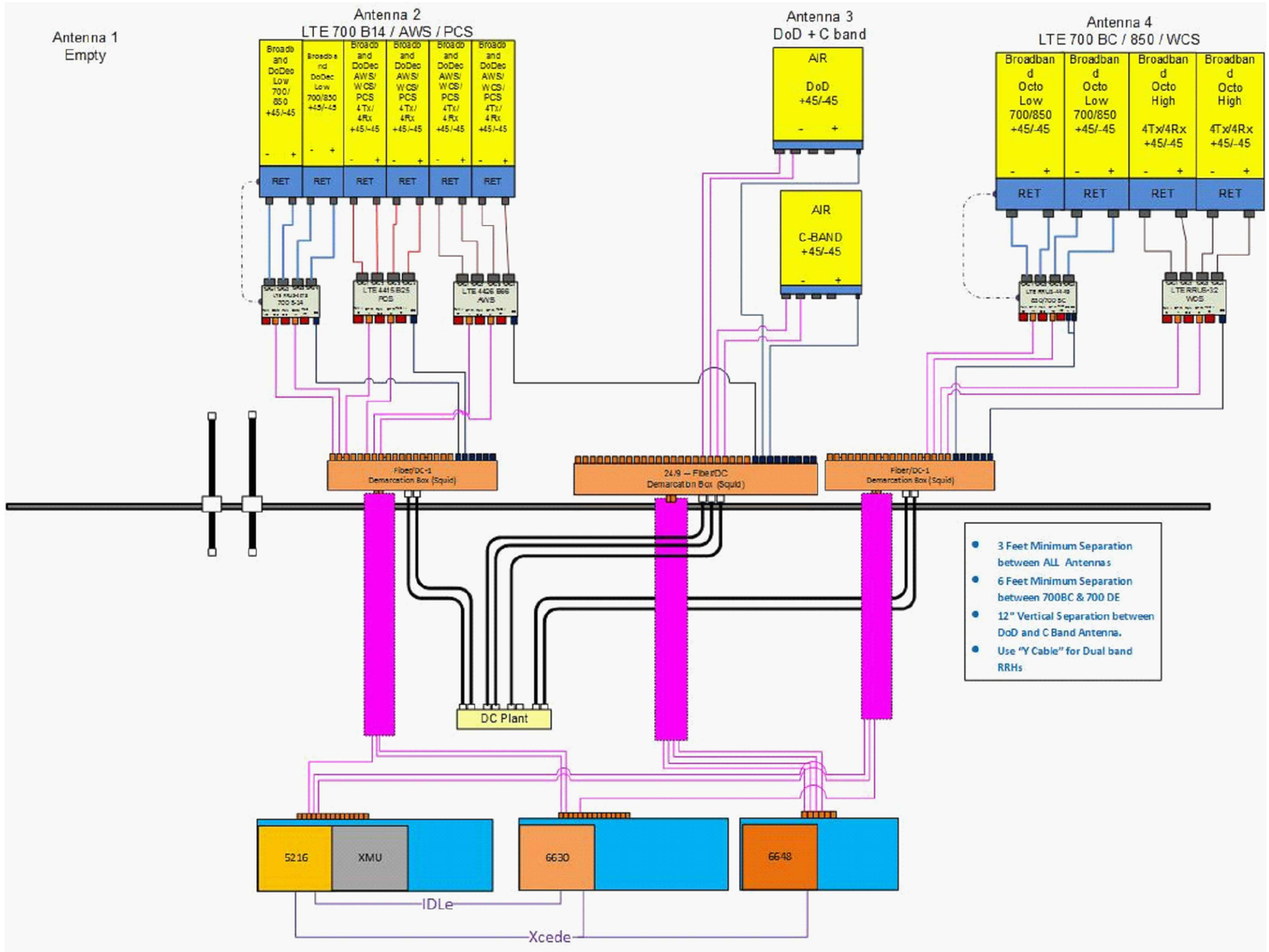
GROUNDING DETAILS

5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	G-1	3

NOTE:

REV: 1
DATED: 05/19/2022
RFDS ID: 4887929



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.
3. RFDS USED FOR REFERENCE.

NOTE:

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL01118
SITE NAME: TORRINGTON EAST MAIN ST

1925 EAST MAIN STREET
TORRINGTON, CT 06790
LITCHFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/23/22	ISSUED FOR CONSTRUCTION	GA	HC	DPH
2	06/08/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	05/19/22	ISSUED FOR CONSTRUCTION	TR	HC	DPH
A	05/06/22	ISSUED FOR REVIEW	JP	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: JP

AT&T

RF PLUMBING DIAGRAM
5G NR 1SR CBAND_4TXRX ANTENNA RETROFIT_UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01118	RF–1	3

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 153 ft Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT01499-S

Customer Site Name: Torrington

Carrier Name: AT&T (App#: 194043-1)

Carrier Site ID / Name: CT1118 / 132/Torrington

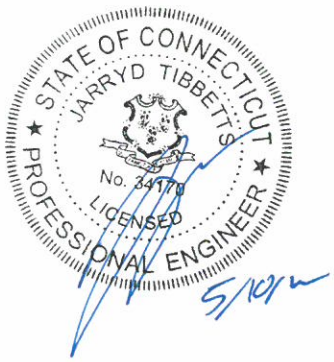
Site Location: 1925-1931 East Main Street

Torrington, Connecticut

Litchfield County

Latitude: 41.822991

Longitude: -73.077199



Analysis Result:

Max Structural Usage: 73.8% [Pass]

Max Foundation Usage: 67.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: +0.2%

Report Prepared By: Kevin Azisllari

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 153 ft Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT01499-S

Customer Site Name: Torrington

Carrier Name: AT&T (App#: 194043-1)

Carrier Site ID / Name: CT1118 / 132/Torrington

Site Location: 1925-1931 East Main Street

Torrington, Connecticut

Litchfield County

Latitude: 41.822991

Longitude: -73.077199

Analysis Result:

Max Structural Usage: 73.8% [Pass]

Max Foundation Usage: 67.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: +0.2%

Report Prepared By: Kevin Azisllari

Introduction

The purpose of this report is to summarize the analysis results on the 153 ft Nudd Corporation Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000
Foundation Drawing	Fred A. Nudd Corporation (Project No. 7783) foundation design drawings dated August 18, 2000
Geotechnical Report	Jaworski Geotech, Inc., Project # 99335G, Dated 11/3/1999
Modification Drawings	Vertical Structures, Inc., Site: Torrington, CT, Dated 9/9/2003 FDH Engineering, Inc. (Project No. 15BFJD1400) Modification Drawings for a 153' Monopole dated March 10, 2015
Mount Analysis	HDG, FA Number: 10042345, dated 04/19/2022

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 120.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 93.0 mph (3-Sec. Gust)
Wind Speed with Ice:	40 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.181, S_1 = 0.065

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	153.0	3	ALU 1900 MHz RRUs	Low Profile Platform	(4) 1 1/4"	Sprint*
2		3	ALU 800 MHz Filters			
3		3	ALU 800 MHz RRUs			
4		4	RFS ACU-A20-N RETs			
5		3	RFS APXVSPP18-C-A20 - Panel			
6		3	RFS APXVTM14-C-I20 - Panel			
7		3	TD-RRH8x20-25 RRHs			
8	131.0	3	Ericsson AIR6449 B41 - Panel	(3) T-Arms w/ (1) MetroSite Heavy Collar Mount (MS-H1436) (1) MetroSite Support Rail Kit (MS-HR35-18) (1) MetroSite Rotatable T-Arm Kit (MS-TAW-350RO) (6) 2" Antenna Mount Pipes (PX2375-10)	(2) 1 5/8" Fiber (8) 1 5/8" Coax (2) 1.90" Fiber	T-Mobile
9		3	RFS APXVAALL24_43-U-NA20 - Panel			
10		3	Commscope VV-65A-R1 - Panel			
11		3	Ericsson KRY 112 144/1 - TMAs			
12		3	Ericsson KRY 112 489/2 - TMAs			
13		3	Ericsson 4449 B71 + B85 - RRU			
14		3	Ericsson 4460 B25 + B66 - RRU			
15	123.0	3	Samsung - MT6407-77A - Panel	Low Profile Platform with (3) Andrew 2" SBS	(16) 1 5/8" (2) 1 5/8" Fiber	Verizon
16		6	CommScope - SBNHH-1D65B - Panel			
17		6	Antel - LPA-80063-6CF-EDIN-5 - Panel			
18		3	B2/B66A RRH-BR049 (RFV01U-D1A)			
19		3	B5/B13 RRH-BR04C (RFV01U-D2A)			
20		2	RFS DB-T1-6Z-8AB-0Z			
21	110.0	1	10' Omni	(1) Standoff	(1) 1/2"	Torrington PD
-	95.0	3	Powerwave 7770	(3) Sector Frame Commscope P/N MTC3615	(12) 1 5/8" (2) 1/2" Fiber (4) 3/4" DC	AT&T
-		2	KMW AM-X-CW-16-65-00T-RET			
-		1	Kathrein 800 10764 K			
-		4	Cci HPA-65R-BUU-H6			
-		2	Andrew SBNHH-1D65A			
-		6	Powerwave LGP17201 TMA			
-		6	Powerwave LGP21901 Diplexer			
-		3	PolyPhaser 1000860			
-		3	Ericsson RRUS 11			
-		3	Ericsson RRUS 12			
-		3	Ericsson 4426 B66			
-		3	Ericsson RRUS32			
-		3	Ericsson RRUS E2			
-		3	Ericsson RRUS A2			
-		2	Raycap DC6-48-60-18-8F			
37	70.0	1	GPS	(1) Standoff	(1) 1/2"	Unknown

* Sprint's equipment at 153' has been terminated but not removed. Thus, they are considered in this analysis.

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
22	97.0	3	Ericsson Air6419 B77G - Panel	Low Profile Platform + HRK14	(9) 1 5/8" (3) 1" DC (3) 1/2" Fiber (4) 3/4" DC	AT&T
23	95.0	3	Cci TPA65R-BU6DA-K - Panel			
24		3	Cci OPA65R-BU6DA - Panel			
25		6	Powerwave LGP17201 - TMA			
26		6	Powerwave LGP21901 - Diplexer			
27		3	PolyPhaser 1000860 - Diplexer			
28		3	Ericsson RRUS 4449 B5/B12 – RRU			
29		3	Ericsson RRUS 4478 B14 – RRU			
30		3	Ericsson 4426 B66 – RRU			
31		3	Ericsson RRUS 32 B30 – RRU			
32		3	Ericsson RRUS 4415 B25 – RRU			
33		3	Ericsson RRUS A2 – RRU			
34		2	Raycap DC6-48-60-18-8F – OVP			
35		1	Raycap DC9-48-60-24-8C-EV – OVP			
36	93.0	3	Ericcson Air6449 B77D - Panel			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**73.8%**	**64.3%**	**61.5%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3863.1	37.1	49.7

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.8804 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 73.80% at 45.0ft

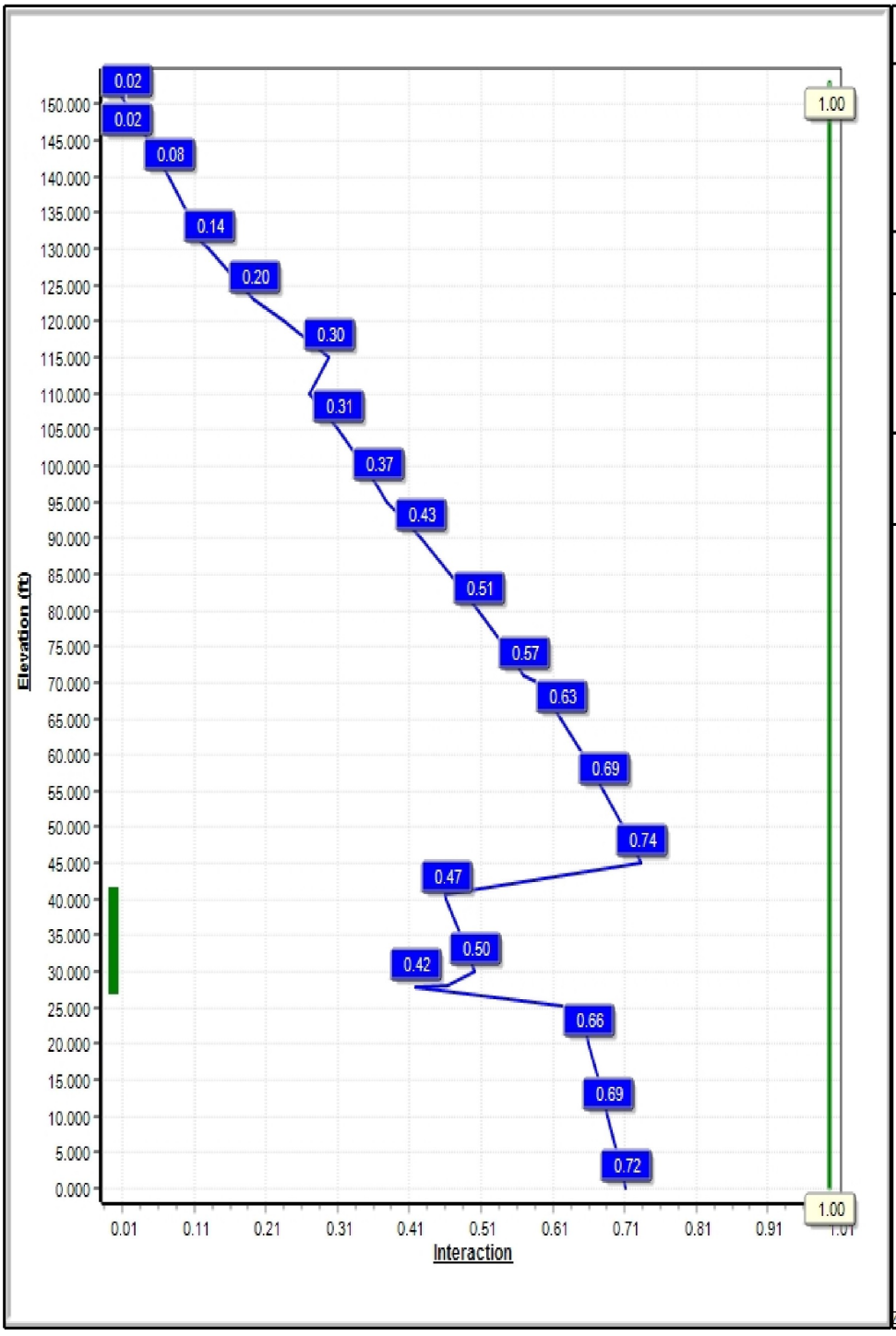
Structure:	CT01499-S-SBA	**Code:**	EIA/TIA-222-G	5/10/2022
Site Name:	Torrington	**Exposure:**	C	
Height:	153.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

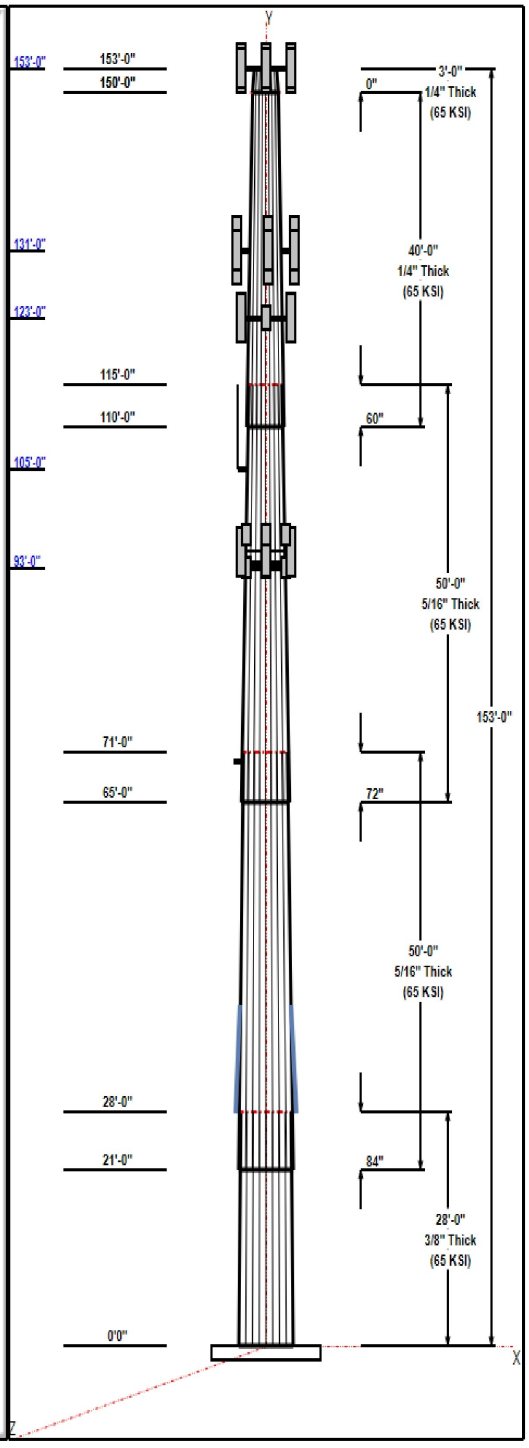
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 93 mph Wind

Iterations: 22





Structure: CT01499-S-SBA

Type: Tapered
Site Name: Torrington
Height: 153.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.24673

5/10/2022

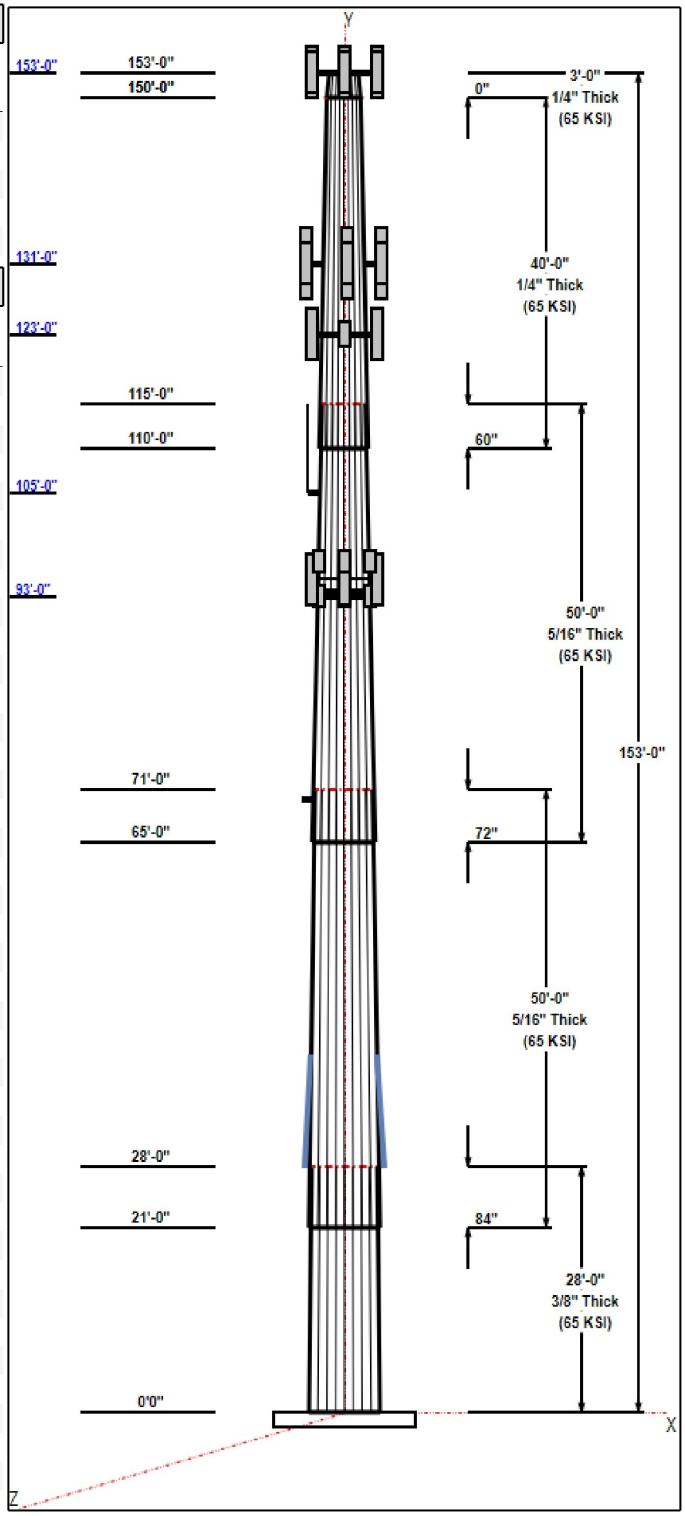
Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	28.00	53.09	60.00	0.375		0.24673	65
2	50.00	43.11	55.44	0.313	Slip	0.24673	65
3	50.00	32.88	45.21	0.313	Slip	0.24673	65
4	40.00	24.74	34.61	0.250	Slip	0.24673	65
5	3.00	24.00	24.74	0.250	Butt	0.24673	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
153.00	153.00	3	APXVTM14-C-I20	Sprint
153.00	153.00	3	APXVSPP18-C-A20	Sprint
153.00	153.00	3	1900 MHz RRUs	Sprint
153.00	153.00	3	800 MHz RRUs	Sprint
153.00	153.00	3	800 MHz Filters	Sprint
153.00	153.00	4	ACU-A20-N	Sprint
153.00	153.00	3	TD-RRH8x20-25	Sprint
153.00	153.00	1	Low Profile Platform	Sprint
153.00	153.00	1	Lightning Rod	
131.00	131.00	3	KRY 112 144/1	T-Mobile
131.00	131.00	3	KRY 112 489/2	T-Mobile
131.00	131.00	3	AIR6449 B41	T-Mobile
131.00	131.00	3	APXVAALL24_43-U-NA20	T-Mobile
131.00	131.00	3	VV-65A-R1	T-Mobile
131.00	131.00	3	4449 B71 + B85	T-Mobile
131.00	131.00	3	4460 B25 + B66	T-Mobile
131.00	131.00	3	T-Arms	T-Mobile
131.00	131.00	1	(3) T-Arm Kit	T-Mobile
123.00	123.00	3	MT6407-77A	Verizon
123.00	123.00	6	SBNHH-1D65B	Verizon
123.00	123.00	6	LPA-80063-6CF-EDIN-5	Verizon
123.00	123.00	3	B2/B66A RRH-BR049	Verizon
123.00	123.00	3	B5/B13 RRH-BR04C	Verizon
123.00	123.00	2	RFS DB-T1-6Z-8AB-0Z	Verizon
123.00	123.00	1	Low Profile Platform	Verizon
105.00	110.00	1	10' Omni	Torrington PD
105.00	105.00	1	Standoff	Torrington PD
97.00	97.00	3	Ericsson Air6419 B77G	AT&T
95.00	95.00	1	Low Profile Platform	AT&T
95.00	95.00	3	Cci TPA65R-BU6DA-K	AT&T
95.00	95.00	3	Cci OPA65R-BU6DA	AT&T
95.00	95.00	6	Powerwave LGP17201	AT&T
95.00	95.00	6	Powerwave LGP21901	AT&T
95.00	95.00	3	PolyPhaser 1000860	AT&T
95.00	95.00	3	Ericsson RRUS 4449	AT&T
95.00	95.00	3	Ericsson RRUS 4478 B14	AT&T
95.00	95.00	3	Ericsson 4426 B66	AT&T
95.00	95.00	3	Ericsson RRUS 32 B30	AT&T
95.00	95.00	3	Ericsson RRUS 4415 B25	AT&T
95.00	95.00	3	Ericsson RRUS A2	AT&T
95.00	95.00	2	Raycap DC6-48-60-18-8F	AT&T
95.00	95.00	1	Raycap	AT&T
95.00	95.00	1	HRK14	AT&T
93.00	93.00	3	Ericcson Air6449 B77D	AT&T



70.00	70.00	1	GPS	Unknown
70.00	70.00	1	Standoff	Unknown

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	153.00	Inside	1 1/4" Coax	Sprint
0.00	153.00	Outside	Safety Cable	
0.00	131.00	Inside	1 5/8" Fiber	T-Mobile
0.00	131.00	Inside	1 5/8" Coax	T-Mobile
0.00	131.00	Inside	1.90" Fiber	T-Mobile
0.00	123.00	Inside	1 5/8" Coax	Verizon
0.00	123.00	Inside	1 5/8" Coax	Verizon
0.00	123.00	Inside	1 5/8" Fiber	Verizon
0.00	105.00	Inside	1/2" Coax	Torrington PD
0.00	95.00	Outside	1 5/8" Coax	AT&T
0.00	95.00	Outside	1" DC	AT&T
0.00	95.00	Outside	1/2" Fiber	AT&T
0.00	95.00	Outside	3/4" DC	AT&T
24.25	44.25	Outside	1.25" Reinforcing plate	

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
18	2.00" F1554 105	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.5000	73.0	50.0	Round

Reactions

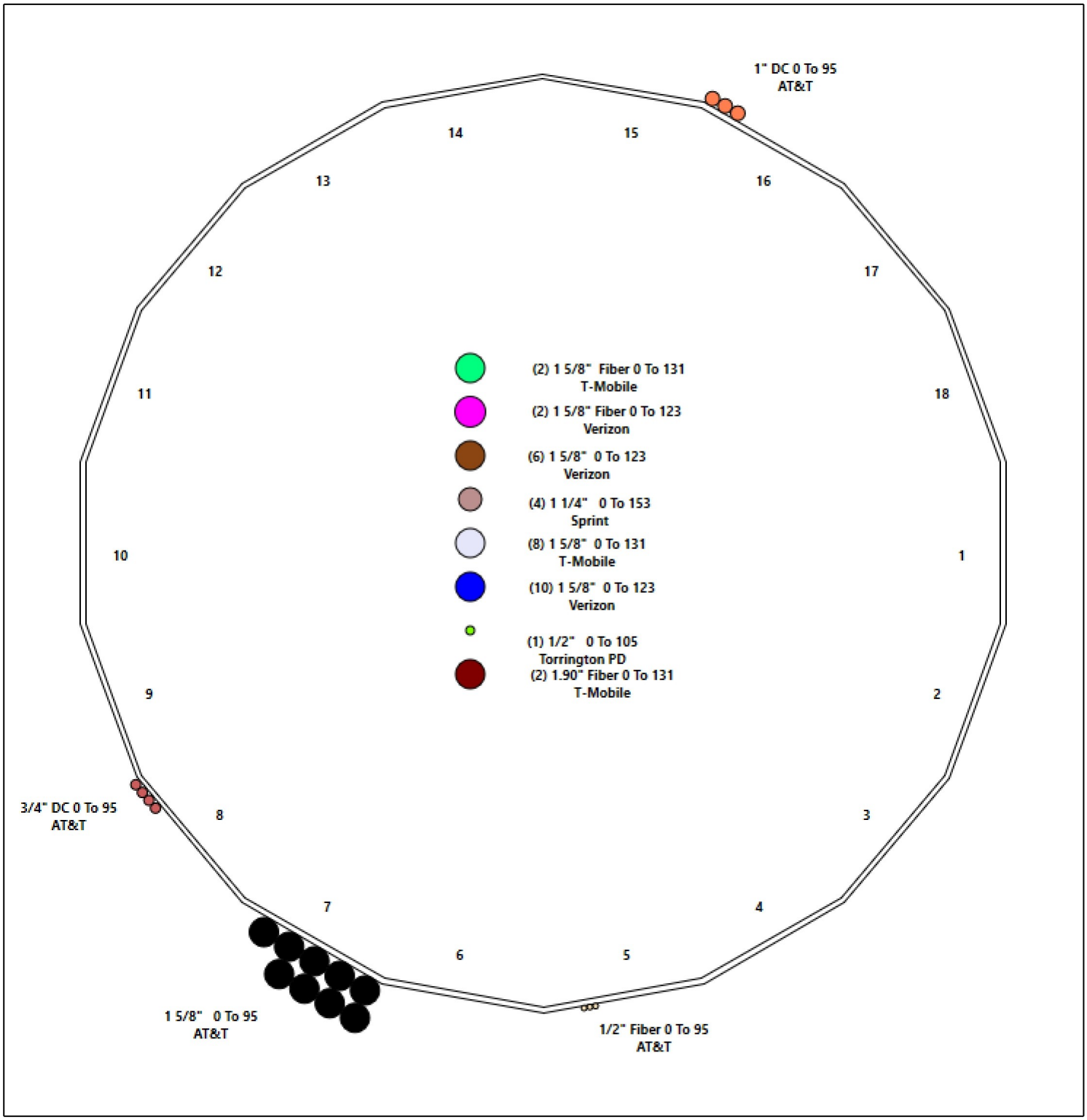
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 93 mph Wind	3863.1	37.1	49.7
0.9D + 1.6W 93 mph Wind	3832.5	37.1	37.2
1.2D + 1.0Di + 1.0Wi 40 mph Wind	737.5	7.2	83.9
1.2D + 1.0E	103.7	0.9	49.7
0.9D + 1.0E	102.7	0.9	37.3
1.0D + 1.0W 60 mph Wind	1000.3	9.7	41.4

Structure: CT01499-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Torrington
Height: 153.00 (ft)

5/10/2022

Tower Engineering Solutions



Shaft Properties

Structure:	CT01499-S-SBA		**Code:**	TIA-222-G	5/10/2022
Site Name:	Torrington		**Exposure:**	C	
Height:	153.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	28.000	0.3750	65		0.00	6,370
2	18	50.000	0.3125	65	Slip	84.00	8,262
3	18	50.000	0.3125	65	Slip	72.00	6,536
4	18	40.000	0.2500	65	Slip	60.00	3,178
5	18	3.000	0.2500	65	Flange	0.00	195
					Total Shaft Weight:		**24,542**

	Bottom						Top						
Sec. No.	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Taper**
1	60.00	0.00	70.97	31875.78	26.80	160.00	53.09	28.00	62.74	22030.0	23.55	141.5	0.246732
2	55.44	21.00	54.68	20998.34	29.87	177.42	43.11	71.00	42.45	9821.08	22.91	137.9	0.246732
3	45.21	65.00	44.53	11343.08	24.10	144.68	32.88	115.00	32.30	4326.93	17.14	105.2	0.246732
4	34.61	110.0	27.26	4066.53	23.00	138.44	24.74	150.00	19.43	1472.52	16.04	98.96	0.246732
5	24.74	150.0	19.43	1472.52	16.04	98.96	24.00	153.00	18.84	1343.00	15.52	96.00	0.246732

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	**Elev To (ft)**	**Qty**	**Description**	**Fy (ksi)**	**Fu (ksi)**	**Offset (in)**	**Description**	**Spacing (in)**	**Description**	**Spacing (in)**	**Lower Qty**	**Upper Qty**
27.75	40.75	3	PLT 8"x1.25"(1.25Hole)	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	14	14

Load Summary

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	153.00	APXVTM14-C-I20	3	56.00	6.34	0.79	216.79	7.456	0.79	0.00	0.00
2	153.00	APXVSPP18-C-A20	3	57.00	8.02	0.83	230.19	10.819	0.83	0.00	0.00
3	153.00	1900 MHz RRUs	3	44.00	3.80	0.88	153.38	5.193	0.88	0.00	0.00
4	153.00	800 MHz RRUs	3	53.00	2.49	0.92	127.11	3.636	0.92	0.00	0.00
5	153.00	800 MHz Filters	3	8.80	0.78	0.69	26.48	1.428	0.69	0.00	0.00
6	153.00	ACU-A20-N	4	1.00	0.14	0.90	5.30	0.437	0.90	0.00	0.00
7	153.00	TD-RRH8x20-25	3	70.00	4.05	0.69	180.73	4.865	0.69	0.00	0.00
8	153.00	Low Profile Platform	1	1200.00	25.00	1.00	2249.20	45.984	1.00	0.00	0.00
9	153.00	Lightning Rod	1	5.00	0.50	1.00	25.98	2.249	1.00	0.00	0.00
10	131.00	KRY 112 144/1	3	11.00	0.41	0.67	21.64	0.879	0.67	0.00	0.00
11	131.00	KRY 112 489/2	3	16.10	0.70	0.67	38.13	1.336	0.67	0.00	0.00
12	131.00	AIR6449 B41	3	103.00	5.65	0.71	238.27	6.588	0.71	0.00	0.00
13	131.00	APXVAALL24_43-U-NA20	3	122.80	20.24	0.73	544.04	22.114	0.73	0.00	0.00
14	131.00	VV-65A-R1	3	23.81	7.90	0.74	160.07	6.950	0.74	0.00	0.00
15	131.00	4449 B71 + B85	3	75.00	1.97	0.67	133.37	2.532	0.67	0.00	0.00
16	131.00	4460 B25 + B66	3	104.00	2.85	0.67	171.69	3.515	0.67	0.00	0.00
17	131.00	T-Arms	3	350.00	8.00	0.75	591.04	14.887	0.75	0.00	0.00
18	131.00	(3) T-Arm Kit	1	500.00	16.50	1.00	1085.39	32.409	1.00	0.00	0.00
19	123.00	MT6407-77A	3	79.40	4.69	0.70	196.11	5.618	0.70	0.00	0.00
20	123.00	SBNHH-1D65B	6	40.60	8.08	0.83	237.50	9.345	0.83	0.00	0.00
21	123.00	LPA-80063-6CF-EDIN-5	6	27.00	9.76	0.93	283.34	12.459	0.93	0.00	0.00
22	123.00	B2/B66A RRH-BR049	3	84.40	1.87	0.67	159.10	2.431	0.67	0.00	0.00
23	123.00	B5/B13 RRH-BR04C (RFV01U-D2A)	3	70.30	1.87	0.67	137.95	2.431	0.67	0.00	0.00
24	123.00	RFS DB-T1-6Z-8AB-0Z	2	18.90	4.80	0.71	137.60	5.785	0.71	0.00	0.00
25	123.00	Low Profile Platform	1	1200.00	25.00	1.00	2226.55	45.531	1.00	0.00	0.00
26	105.00	10' Omni	1	25.00	3.00	1.00	98.39	6.480	1.00	0.00	5.00
27	105.00	Standoff	1	40.00	2.63	1.00	117.47	8.389	1.00	0.00	0.00
28	97.00	Ericsson Air6419 B77G	3	66.10	3.80	0.76	158.21	4.562	0.76	0.00	0.00
29	95.00	Low Profile Platform	1	1500.00	40.00	1.00	3500.75	70.411	1.00	0.00	0.00
30	95.00	Cci TPA65R-BU6DA-K	3	67.50	12.87	0.72	352.73	14.278	0.72	0.00	0.00
31	95.00	Cci OPA65R-BU6DA	3	63.30	12.71	0.73	336.13	14.129	0.73	0.00	0.00
32	95.00	Powerwave LGP17201 TMA	6	31.00	1.95	0.67	67.51	2.902	0.67	0.00	0.00
33	95.00	Powerwave LGP21901 Diplexer	6	5.50	0.23	0.67	12.85	0.582	0.67	0.00	0.00
34	95.00	PolyPhaser 1000860	3	2.00	0.06	0.67	4.59	0.260	0.67	0.00	0.00
35	95.00	Ericsson RRUS 4449 B5/B12	3	71.00	1.97	0.67	122.00	2.493	0.67	0.00	0.00
36	95.00	Ericsson RRUS 4478 B14	3	59.90	1.84	0.67	104.80	2.343	0.67	0.00	0.00
37	95.00	Ericsson 4426 B66	3	48.50	1.15	0.67	85.30	1.601	0.67	0.00	0.00
38	95.00	Ericsson RRUS 32 B30	3	77.00	1.65	0.67	122.64	2.201	0.67	0.00	0.00
39	95.00	Ericsson RRUS 4415 B25	3	46.00	1.64	0.67	85.27	2.132	0.67	0.00	0.00
40	95.00	Ericsson RRUS A2	3	21.20	1.86	0.67	55.70	2.790	0.67	0.00	0.00
41	95.00	Raycap DC6-48-60-18-8F	2	31.80	0.92	1.00	90.86	1.339	1.00	0.00	0.00
42	95.00	Raycap DC9-48-60-24-8C-EV	1	26.20	1.14	1.00	127.46	2.656	1.00	0.00	0.00
43	95.00	HRK14	1	302.36	8.13	1.00	645.16	15.721	1.00	0.00	0.00
44	93.00	Ericcson Air6449 B77D	3	88.00	4.13	0.85	217.99	4.945	0.85	0.00	0.00
45	70.00	GPS	1	10.00	1.00	1.00	37.17	1.660	1.00	0.00	0.00
46	70.00	Standoff	1	40.00	2.63	1.00	114.39	8.161	1.00	0.00	0.00
		Totals:	**127**	**11,395.89**			**29,227.61**				

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	153.00	(4) 1 1/4" Coax	0.00	Inside
0.00	153.00	(1) Safety Cable	0.38	Outside
0.00	131.00	(2) 1 5/8" Fiber	0.00	Inside
0.00	131.00	(8) 1 5/8" Coax	0.00	Inside
0.00	131.00	(2) 1.90" Fiber	0.00	Inside
0.00	123.00	(6) 1 5/8" Coax	0.00	Inside
0.00	123.00	(10) 1 5/8" Coax	0.00	Inside
0.00	123.00	(2) 1 5/8" Fiber	0.00	Inside
0.00	105.00	(1) 1/2" Coax	0.00	Inside
0.00	95.00	(9) 1 5/8" Coax	3.96	Outside
0.00	95.00	(3) 1" DC	1.00	Outside
0.00	95.00	(3) 1/2" Fiber	0.38	Outside
0.00	95.00	(4) 3/4" DC	0.75	Outside
24.25	44.25	(3) 1.25" Reinforcing plate	1.25	Outside

Shaft Section Properties

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Increment Length: **5 (ft)**

											Additional Reinforcing			
Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Area (in^2)	Ixp (in^4)	Iyp (in^4)	Weight (lb)
0.00		0.3750	60.000	70.966	31875.8	26.80	160.00	65	70	0.0				
5.00		0.3750	58.766	69.498	29937.9	26.22	156.71	65	71	1194.9				
10.00		0.3750	57.533	68.029	28080.1	25.64	153.42	65	71	1169.9				
15.00		0.3750	56.299	66.561	26300.9	25.06	150.13	65	72	1145.0				
20.00		0.3750	55.065	65.093	24598.5	24.48	146.84	65	73	1120.0				
21.00	Bot - Section 2	0.3750	54.819	64.799	24267.0	24.37	146.18	65	73	221.0				
25.00		0.3750	53.832	63.625	22971.1	23.90	143.55	65	73	1611.6				
27.75	RB1	0.3750	53.153	62.817	22107.5	23.58	141.74	65	74	1091.0	30.00	11437.3	11437.3	280.7
28.00	Top - Section 1	0.3125	53.717	52.968	19086.0	28.90	171.89	65	67	98.5	30.00	11411.9	11411.9	25.5
30.00		0.3125	53.223	52.479	18561.8	28.62	170.31	65	68	358.8	30.00	11209.4	11209.4	204.2
35.00		0.3125	51.989	51.255	17293.5	27.92	166.37	65	69	882.5	30.00	10711.1	10711.1	510.5
40.00		0.3125	50.756	50.032	16084.3	27.23	162.42	65	69	861.6	30.00	10224.2	10224.2	510.5
40.75	RT1	0.3125	50.571	49.848	15908.0	27.12	161.83	65	69	127.5	30.00	10152.1	10152.1	76.6
45.00		0.3125	49.522	48.808	14932.9	26.53	158.47	65	70	713.4				
50.00		0.3125	48.288	47.584	13837.7	25.84	154.52	65	71	820.0				
55.00		0.3125	47.055	46.361	12797.4	25.14	150.58	65	72	799.2				
60.00		0.3125	45.821	45.137	11810.7	24.44	146.63	65	73	778.4				
65.00	Bot - Section 3	0.3125	44.587	43.914	10876.0	23.75	142.68	65	73	757.6				
70.00		0.3125	43.354	42.690	9991.9	23.05	138.73	65	74	1484.0				
71.00	Top - Section 2	0.3125	43.732	43.065	10257.7	23.27	139.94	65	74	291.8				
75.00		0.3125	42.745	42.086	9574.0	22.71	136.78	65	75	579.5				
80.00		0.3125	41.511	40.863	8763.0	22.01	132.84	65	76	705.6				
85.00		0.3125	40.278	39.639	7999.1	21.32	128.89	65	76	684.8				
90.00		0.3125	39.044	38.416	7281.0	20.62	124.94	65	77	664.0				
93.00		0.3125	38.304	37.681	6871.5	20.20	122.57	65	78	388.4				
95.00		0.3125	37.810	37.192	6607.2	19.92	120.99	65	78	254.8				
97.00		0.3125	37.317	36.703	6349.8	19.65	119.41	65	78	251.4				
100.00		0.3125	36.577	35.968	5976.3	19.23	117.05	65	79	370.9				
105.00		0.3125	35.343	34.745	5386.9	18.53	113.10	65	80	601.6				
110.00	Bot - Section 4	0.3125	34.109	33.521	4837.6	17.84	109.15	65	80	580.7				
115.00	Top - Section 3	0.2500	33.376	26.284	3644.0	22.13	133.50	65	75	1015.4				
120.00		0.2500	32.142	25.306	3251.9	21.26	128.57	65	76	438.9				
123.00		0.2500	31.402	24.718	3030.7	20.74	125.61	65	77	255.3				
125.00		0.2500	30.908	24.327	2888.9	20.39	123.63	65	77	166.9				
130.00		0.2500	29.675	23.348	2554.0	19.52	118.70	65	78	405.6				
131.00		0.2500	29.428	23.152	2490.3	19.35	117.71	65	79	79.1				
135.00		0.2500	28.441	22.369	2246.1	18.65	113.76	65	79	309.8				
140.00		0.2500	27.208	21.390	1963.9	17.78	108.83	65	80	372.3				
145.00		0.2500	25.974	20.411	1706.4	16.91	103.90	65	82	355.6				
150.00	Top - Section 4	0.2500	24.740	19.432	1472.5	16.04	98.96	65	83	338.9				
150.00	Bot - Section 5	0.2500	24.740	19.432	1472.5	16.04	98.96	65	83					
153.00		0.2500	24.000	18.845	1343.0	15.52	96.00	65	83	195.4				
									Total Weight	**24541.5**				**1607.9**

Wind Loading - Shaft

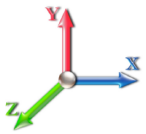
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	17.879	19.67	435.32	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	17.879	19.67	426.37	0.664 *	0.000	5.00	25.125	16.69	525.1	0.0	1433.9
10.00		1.00	0.85	17.879	19.67	417.42	0.669 *	0.000	5.00	24.603	16.45	517.7	0.0	1403.9
15.00		1.00	0.85	17.879	19.67	408.47	0.673 *	0.000	5.00	24.081	16.21	510.2	0.0	1373.9
20.00		1.00	0.90	18.971	20.87	411.53	0.678 *	0.000	5.00	23.559	15.98	533.4	0.0	1344.0
21.00	Bot - Section 2	1.00	0.91	19.166	21.08	411.80	0.681 *	0.000	1.00	4.649	3.17	106.8	0.0	265.2
25.00		1.00	0.95	19.883	21.87	411.87	0.692 *	0.000	4.00	18.599	12.87	450.4	0.0	1933.9
27.75	RB1	1.00	0.97	20.325	22.36	411.18	0.732 *	0.000	2.75	12.593	9.22	329.8	0.0	1309.2
28.00	Top - Section 1	1.00	0.97	20.363	22.40	411.09	0.734 *	0.000	0.25	1.137	0.83	29.9	0.0	118.2
30.00		1.00	0.98	20.661	22.73	415.11	0.732 *	0.000	2.00	9.049	6.63	241.0	0.0	430.6
35.00		1.00	1.01	21.343	23.48	412.12	0.737 *	0.000	5.00	22.257	16.40	616.0	0.0	1059.0
40.00		1.00	1.04	21.951	24.15	408.04	0.744 *	0.000	5.00	21.735	16.16	624.4	0.0	1034.0
40.75	RT1	1.00	1.05	22.037	24.24	407.34	0.748 *	0.000	0.75	3.215	2.40	93.2	0.0	152.9
45.00		1.00	1.07	22.502	24.75	403.08	0.743 *	0.000	4.25	17.998	13.37	529.4	0.0	856.0
50.00		1.00	1.09	23.007	25.31	397.43	0.709 *	0.000	5.00	20.692	14.67	594.1	0.0	984.0
55.00		1.00	1.12	23.473	25.82	391.18	0.716 *	0.000	5.00	20.170	14.43	596.3	0.0	959.0
60.00		1.00	1.14	23.907	26.30	384.43	0.723 *	0.000	5.00	19.648	14.20	597.3	0.0	934.0
65.00	Bot - Section 3	1.00	1.16	24.313	26.74	377.24	0.730 *	0.000	5.00	19.126	13.96	597.3	0.0	909.1
70.00	Appurtenance(s)	1.00	1.17	24.696	27.17	369.68	0.738 *	0.000	5.00	18.868	13.92	604.9	0.0	1780.8
71.00	Top - Section 2	1.00	1.18	24.770	27.25	368.12	0.742 *	0.000	1.00	3.711	2.76	120.1	0.0	350.2
75.00		1.00	1.19	25.057	27.56	367.14	0.742 *	0.000	4.00	14.635	10.86	479.1	0.0	695.4
80.00		1.00	1.21	25.400	27.94	358.98	0.750 *	0.000	5.00	17.824	13.37	597.5	0.0	846.8
85.00		1.00	1.22	25.726	28.30	350.54	0.759 *	0.000	5.00	17.302	13.13	594.5	0.0	821.8
90.00		1.00	1.24	26.037	28.64	341.85	0.768 *	0.000	5.00	16.780	12.89	590.8	0.0	796.8
93.00	Appurtenance(s)	1.00	1.25	26.218	28.84	336.53	0.776 *	0.000	3.00	9.818	7.62	351.7	0.0	466.1
95.00	Appurtenance(s)	1.00	1.25	26.336	28.97	332.94	0.781 *	0.000	2.00	6.441	5.03	233.3	0.0	305.7
97.00	Appurtenance(s)	1.00	1.26	26.451	29.10	329.32	0.650	0.000	2.00	6.357	4.13	192.4	0.0	301.7
100.00		1.00	1.27	26.621	29.28	323.82	0.650	0.000	3.00	9.379	6.10	285.6	0.0	445.1
105.00	Appurtenance(s)	1.00	1.28	26.896	29.59	314.51	0.650	0.000	5.00	15.214	9.89	468.1	0.0	721.9
110.00	Bot - Section 4	1.00	1.29	27.161	29.88	305.02	0.650	0.000	5.00	14.693	9.55	456.5	0.0	696.9
115.00	Top - Section 3	1.00	1.30	27.416	30.16	295.37	0.650	0.000	5.00	14.382	9.35	451.1	0.0	1218.5
120.00		1.00	1.32	27.663	30.43	290.08	0.650	0.000	5.00	13.860	9.01	438.6	0.0	526.6
123.00	Appurtenance(s)	1.00	1.32	27.807	30.59	284.13	0.650	0.000	3.00	8.066	5.24	256.6	0.0	306.4
125.00		1.00	1.33	27.902	30.69	280.14	0.650	0.000	2.00	5.273	3.43	168.3	0.0	200.3
130.00		1.00	1.34	28.133	30.95	270.07	0.650	0.000	5.00	12.816	8.33	412.5	0.0	486.7
131.00	Appurtenance(s)	1.00	1.34	28.179	31.00	268.05	0.650	0.000	1.00	2.501	1.63	80.6	0.0	94.9
135.00		1.00	1.35	28.358	31.19	259.88	0.650	0.000	4.00	9.794	6.37	317.7	0.0	371.8
140.00		1.00	1.36	28.576	31.43	249.56	0.650	0.000	5.00	11.772	7.65	384.8	0.0	446.7
145.00		1.00	1.37	28.788	31.67	239.12	0.650	0.000	5.00	11.250	7.31	370.5	0.0	426.7
150.00	Top - Section 4	1.00	1.38	28.994	31.89	228.58	0.650	0.000	5.00	10.728	6.97	355.8	0.0	406.7
153.00	Appurtenance(s)	1.00	1.38	29.115	32.03	222.21	0.650	0.000	3.00	6.187	4.02	206.1	0.0	234.4
								Totals:	**153.00**			**15,909.7**		**29,449.8**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

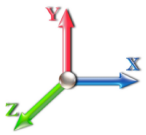
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	153.00	Lightning Rod	1	29.115	32.026	1.00	1.00	0.50	6.00	0.000	0.000	25.62	0.00	0.00
2	153.00	Low Profile Platform	1	29.115	32.026	1.00	1.00	25.00	1440.00	0.000	0.000	1281.05	0.00	0.00
3	153.00	TD-RRH8x20-25	3	29.115	32.026	0.62	0.90	7.55	252.00	0.000	0.000	386.63	0.00	0.00
4	153.00	ACU-A20-N	4	29.115	32.026	0.81	0.90	0.45	4.80	0.000	0.000	23.24	0.00	0.00
5	153.00	800 MHz Filters	3	29.115	32.026	0.62	0.90	1.45	31.68	0.000	0.000	74.46	0.00	0.00
6	153.00	800 MHz RRUs	3	29.115	32.026	0.83	0.90	6.19	190.80	0.000	0.000	316.94	0.00	0.00
7	153.00	1900 MHz RRUs	3	29.115	32.026	0.79	0.90	9.03	158.40	0.000	0.000	462.66	0.00	0.00
8	153.00	APXVSPP18-C-A20	3	29.115	32.026	0.75	0.90	17.97	205.20	0.000	0.000	920.97	0.00	0.00
9	153.00	APXVTM14-C-I20	3	29.115	32.026	0.71	0.90	13.52	201.60	0.000	0.000	692.96	0.00	0.00
10	131.00	AIR6449 B41	3	28.179	30.997	0.57	0.80	9.63	370.80	0.000	0.000	477.48	0.00	0.00
11	131.00	APXVAALL24_43-U-NA20	3	28.179	30.997	0.58	0.80	35.46	442.08	0.000	0.000	1758.65	0.00	0.00
12	131.00	KRY 112 489/2	3	28.179	30.997	0.54	0.80	1.13	57.96	0.000	0.000	55.82	0.00	0.00
13	131.00	KRY 112 144/1	3	28.179	30.997	0.54	0.80	0.66	39.60	0.000	0.000	32.70	0.00	0.00
14	131.00	4460 B25 + B66	3	28.179	30.997	0.54	0.80	4.58	374.40	0.000	0.000	227.28	0.00	0.00
15	131.00	VV-65A-R1	3	28.179	30.997	0.59	0.80	14.03	85.72	0.000	0.000	695.83	0.00	0.00
16	131.00	4449 B71 + B85	3	28.179	30.997	0.54	0.80	3.17	270.00	0.000	0.000	157.10	0.00	0.00
17	131.00	T-Arms	3	28.179	30.997	0.56	0.75	13.50	1260.00	0.000	0.000	669.53	0.00	0.00
18	131.00	(3) T-Arm Kit	1	28.179	30.997	0.75	0.75	12.38	600.00	0.000	0.000	613.73	0.00	0.00
19	123.00	Low Profile Platform	1	27.807	30.588	1.00	1.00	25.00	1440.00	0.000	0.000	1223.52	0.00	0.00
20	123.00	RFS DB-T1-6Z-8AB-0Z	2	27.807	30.588	0.57	0.80	5.45	45.36	0.000	0.000	266.87	0.00	0.00
21	123.00	B5/B13 RRH-BR04C	3	27.807	30.588	0.54	0.80	3.01	253.08	0.000	0.000	147.16	0.00	0.00
22	123.00	B2/B66A RRH-BR049	3	27.807	30.588	0.54	0.80	3.01	303.84	0.000	0.000	147.16	0.00	0.00
23	123.00	LPA-80063-6CF-EDIN-5	6	27.807	30.588	0.74	0.80	43.57	194.40	0.000	0.000	2132.29	0.00	0.00
24	123.00	SBNHH-1D65B	6	27.807	30.588	0.66	0.80	32.19	292.32	0.000	0.000	1575.44	0.00	0.00
25	123.00	MT6407-77A	3	27.807	30.588	0.56	0.80	7.88	285.84	0.000	0.000	385.62	0.00	0.00
26	105.00	Standoff	1	26.896	29.586	1.00	1.00	2.63	48.00	0.000	0.000	124.50	0.00	0.00
27	105.00	10' Omni	1	27.161	29.877	1.00	1.00	3.00	30.00	0.000	5.000	143.41	0.00	717.05
28	97.00	Ericsson Air6419 B77G	3	26.451	29.096	0.57	0.75	6.50	237.96	0.000	0.000	302.51	0.00	0.00
29	95.00	Powerwave LGP21901	6	26.336	28.969	0.50	0.75	0.69	39.60	0.000	0.000	32.14	0.00	0.00
30	95.00	Ericsson RRUS 4449	3	26.336	28.969	0.50	0.75	2.97	255.60	0.000	0.000	137.65	0.00	0.00
31	95.00	PolyPhaser 1000860	3	26.336	28.969	0.50	0.75	0.09	7.20	0.000	0.000	4.19	0.00	0.00
32	95.00	Cci TPA65R-BU6DA-K	3	26.336	28.969	0.54	0.75	20.85	243.00	0.000	0.000	966.38	0.00	0.00
33	95.00	Powerwave LGP17201	6	26.336	28.969	0.50	0.75	5.88	223.20	0.000	0.000	272.51	0.00	0.00
34	95.00	Cci OPA65R-BU6DA	3	26.336	28.969	0.55	0.75	20.88	227.88	0.000	0.000	967.62	0.00	0.00
35	95.00	Low Profile Platform	1	26.336	28.969	1.00	1.00	40.00	1800.00	0.000	0.000	1854.02	0.00	0.00
36	95.00	Ericsson 4426 B66	3	26.336	28.969	0.50	0.75	1.73	174.60	0.000	0.000	80.35	0.00	0.00
37	95.00	Ericsson RRUS 4478 B14	3	26.336	28.969	0.50	0.75	2.77	215.64	0.000	0.000	128.57	0.00	0.00
38	95.00	Ericsson RRUS 32 B30	3	26.336	28.969	0.50	0.75	2.49	277.20	0.000	0.000	115.29	0.00	0.00
39	95.00	Ericsson RRUS 4415 B25	3	26.336	28.969	0.50	0.75	2.47	165.60	0.000	0.000	114.59	0.00	0.00
40	95.00	Ericsson RRUS A2	3	26.336	28.969	0.50	0.75	2.80	76.32	0.000	0.000	129.96	0.00	0.00
41	95.00	Raycap DC6-48-60-18-8F	2	26.336	28.969	0.75	0.75	1.38	76.32	0.000	0.000	63.96	0.00	0.00
42	95.00	Raycap	1	26.336	28.969	0.75	0.75	0.85	31.44	0.000	0.000	39.63	0.00	0.00
43	95.00	HRK14	1	26.336	28.969	1.00	1.00	8.13	362.83	0.000	0.000	376.83	0.00	0.00
44	93.00	Ericcson Air6449 B77D	3	26.218	28.840	0.64	0.75	7.90	316.80	0.000	0.000	364.47	0.00	0.00
45	70.00	Standoff	1	24.696	27.165	1.00	1.00	2.63	48.00	0.000	0.000	114.31	0.00	0.00
46	70.00	GPS	1	24.696	27.165	1.00	1.00	1.00	12.00	0.000	0.000	43.46	0.00	0.00
							Totals:		**13,675.07**			**21,127.09**		

Total Applied Force Summary

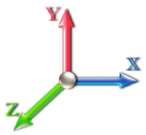
Structure:	CT01499-S-SBA		**Code:**	TIA-222-G	5/10/2022
Site Name:	Torrington		**Exposure:**	C	
Height:	153.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		525.15	1711.42	0.00	0.00
10.00		517.67	1681.44	0.00	0.00
15.00		510.20	1651.46	0.00	0.00
20.00		533.42	1621.49	0.00	0.00
21.00		106.82	320.70	0.00	0.00
25.00		450.40	2155.94	0.00	0.00
27.75		329.82	1461.81	0.00	0.00
28.00		29.91	132.07	0.00	0.00
30.00		240.96	541.58	0.00	0.00
35.00		616.02	1336.47	0.00	0.00
40.00		624.41	1311.49	0.00	0.00
40.75		93.23	194.57	0.00	0.00
45.00		529.44	1091.94	0.00	0.00
50.00		594.08	1261.52	0.00	0.00
55.00		596.31	1236.54	0.00	0.00
60.00		597.34	1211.56	0.00	0.00
65.00		597.33	1186.58	0.00	0.00
70.00	(2) attachments	762.65	2118.33	0.00	0.00
71.00		120.11	405.67	0.00	0.00
75.00		479.13	917.42	0.00	0.00
80.00		597.55	1124.29	0.00	0.00
85.00		594.47	1099.31	0.00	0.00
90.00		590.79	1074.33	0.00	0.00
93.00	(3) attachments	716.14	949.40	0.00	0.00
95.00	(44) attachments	5517.01	4593.17	0.00	0.00
97.00	(3) attachments	494.88	619.65	0.00	0.00
100.00		285.64	565.04	0.00	0.00
105.00	(2) attachments	736.05	999.74	0.00	717.05
110.00		456.53	895.80	0.00	0.00
115.00		451.09	1417.45	0.00	0.00
120.00		438.63	725.56	0.00	0.00
123.00	(24) attachments	6134.65	3240.59	0.00	0.00
125.00		168.30	234.62	0.00	0.00
130.00		412.48	572.55	0.00	0.00
131.00	(25) attachments	4768.73	3612.67	0.00	0.00
135.00		317.72	385.74	0.00	0.00
140.00		384.84	464.18	0.00	0.00
145.00		370.51	444.20	0.00	0.00
150.00		355.85	424.21	0.00	0.00
153.00	(24) attachments	4390.59	2735.41	0.00	0.00
	Totals:	**37,036.83**	**49,727.90**	**0.00**	**717.05**

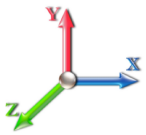
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.107	1.022	17.879	0.00	1.64
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.107	1.022	17.879	0.00	56.16
5.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.107	1.022	17.879	0.00	10.80
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.107	1.022	17.879	0.00	1.08
5.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.107	1.022	17.879	0.00	9.60
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.029	17.879	0.00	1.64
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.110	1.029	17.879	0.00	56.16
10.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.110	1.029	17.879	0.00	10.80
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.029	17.879	0.00	1.08
10.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.110	1.029	17.879	0.00	9.60
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.112	1.036	17.879	0.00	1.64
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.112	1.036	17.879	0.00	56.16
15.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.112	1.036	17.879	0.00	10.80
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.112	1.036	17.879	0.00	1.08
15.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.112	1.036	17.879	0.00	9.60
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.114	1.043	18.971	0.00	1.64
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.114	1.043	18.971	0.00	56.16
20.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.114	1.043	18.971	0.00	10.80
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.114	1.043	18.971	0.00	1.08
20.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.114	1.043	18.971	0.00	9.60
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.116	1.048	19.166	0.00	0.33
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.116	1.048	19.166	0.00	11.23
21.00	1" DC	Yes	1.00	0.000	1.00	0.08	0.00	0.116	1.048	19.166	0.00	2.16
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.116	1.048	19.166	0.00	0.22
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.116	1.048	19.166	0.00	1.92
25.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.122	1.065	19.883	0.00	1.31
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.122	1.065	19.883	0.00	44.93
25.00	1" DC	Yes	4.00	0.000	1.00	0.33	0.00	0.122	1.065	19.883	0.00	8.64
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.122	1.065	19.883	0.00	0.86
25.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.122	1.065	19.883	0.00	7.68
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.122	1.065	19.883	0.00	0.00
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.142	1.126	20.325	0.00	0.90
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	0.91	0.00	0.142	1.126	20.325	0.00	30.89
27.75	1" DC	Yes	2.75	0.000	1.00	0.23	0.00	0.142	1.126	20.325	0.00	5.94
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.09	0.00	0.142	1.126	20.325	0.00	0.59
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.17	0.00	0.142	1.126	20.325	0.00	5.28
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.29	0.00	0.142	1.126	20.325	0.00	0.00
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.01	0.00	0.143	1.129	20.363	0.00	0.08
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.143	1.129	20.363	0.00	2.81
28.00	1" DC	Yes	0.25	0.000	1.00	0.02	0.00	0.143	1.129	20.363	0.00	0.54
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.01	0.00	0.143	1.129	20.363	0.00	0.05
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.02	0.00	0.143	1.129	20.363	0.00	0.48
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.03	0.00	0.143	1.129	20.363	0.00	0.00
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.142	1.127	20.661	0.00	0.66
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.142	1.127	20.661	0.00	22.46
30.00	1" DC	Yes	2.00	0.000	1.00	0.17	0.00	0.142	1.127	20.661	0.00	4.32
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.142	1.127	20.661	0.00	0.43

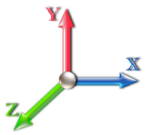
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.142	1.127	20.661	0.00	3.84
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.142	1.127	20.661	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.134	21.343	0.00	1.64
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.145	1.134	21.343	0.00	56.16
35.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.145	1.134	21.343	0.00	10.80
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.134	21.343	0.00	1.08
35.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.145	1.134	21.343	0.00	9.60
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.145	1.134	21.343	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.148	1.144	21.951	0.00	1.64
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.148	1.144	21.951	0.00	56.16
40.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.148	1.144	21.951	0.00	10.80
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.148	1.144	21.951	0.00	1.08
40.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.148	1.144	21.951	0.00	9.60
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.148	1.144	21.951	0.00	0.00
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.02	0.00	0.150	1.150	22.037	0.00	0.25
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.25	0.00	0.150	1.150	22.037	0.00	8.42
40.75	1" DC	Yes	0.75	0.000	1.00	0.06	0.00	0.150	1.150	22.037	0.00	1.62
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.02	0.00	0.150	1.150	22.037	0.00	0.16
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.05	0.00	0.150	1.150	22.037	0.00	1.44
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.150	1.150	22.037	0.00	0.00
45.00	Safety Cable	Yes	4.25	0.000	0.38	0.13	0.00	0.148	1.143	22.502	0.00	1.39
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	1.40	0.00	0.148	1.143	22.502	0.00	47.74
45.00	1" DC	Yes	4.25	0.000	1.00	0.35	0.00	0.148	1.143	22.502	0.00	9.18
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	0.13	0.00	0.148	1.143	22.502	0.00	0.92
45.00	3/4" DC	Yes	4.25	0.000	0.75	0.27	0.00	0.148	1.143	22.502	0.00	8.16
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	0.36	0.00	0.148	1.143	22.502	0.00	0.00
50.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.130	1.091	23.007	0.00	1.64
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.130	1.091	23.007	0.00	56.16
50.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.130	1.091	23.007	0.00	10.80
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.130	1.091	23.007	0.00	1.08
50.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.130	1.091	23.007	0.00	9.60
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.134	1.101	23.473	0.00	1.64
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.134	1.101	23.473	0.00	56.16
55.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.134	1.101	23.473	0.00	10.80
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.134	1.101	23.473	0.00	1.08
55.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.134	1.101	23.473	0.00	9.60
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.137	1.112	23.907	0.00	1.64
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.137	1.112	23.907	0.00	56.16
60.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.137	1.112	23.907	0.00	10.80
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.137	1.112	23.907	0.00	1.08
60.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.137	1.112	23.907	0.00	9.60
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.141	1.123	24.313	0.00	1.64
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.141	1.123	24.313	0.00	56.16
65.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.141	1.123	24.313	0.00	10.80
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.141	1.123	24.313	0.00	1.08
65.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.141	1.123	24.313	0.00	9.60
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.135	24.696	0.00	1.64

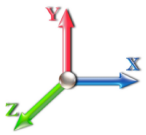
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.145	1.135	24.696	0.00	56.16
70.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.145	1.135	24.696	0.00	10.80
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.135	24.696	0.00	1.08
70.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.145	1.135	24.696	0.00	9.60
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.147	1.142	24.770	0.00	0.33
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.147	1.142	24.770	0.00	11.23
71.00	1" DC	Yes	1.00	0.000	1.00	0.08	0.00	0.147	1.142	24.770	0.00	2.16
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.147	1.142	24.770	0.00	0.22
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.147	1.142	24.770	0.00	1.92
75.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.147	1.142	25.057	0.00	1.31
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.147	1.142	25.057	0.00	44.93
75.00	1" DC	Yes	4.00	0.000	1.00	0.33	0.00	0.147	1.142	25.057	0.00	8.64
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.147	1.142	25.057	0.00	0.86
75.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.147	1.142	25.057	0.00	7.68
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.151	1.154	25.400	0.00	1.64
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.151	1.154	25.400	0.00	56.16
80.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.151	1.154	25.400	0.00	10.80
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.151	1.154	25.400	0.00	1.08
80.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.151	1.154	25.400	0.00	9.60
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.156	1.167	25.726	0.00	1.64
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.156	1.167	25.726	0.00	56.16
85.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.156	1.167	25.726	0.00	10.80
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.156	1.167	25.726	0.00	1.08
85.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.156	1.167	25.726	0.00	9.60
90.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.161	1.182	26.037	0.00	1.64
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.161	1.182	26.037	0.00	56.16
90.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.161	1.182	26.037	0.00	10.80
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.161	1.182	26.037	0.00	1.08
90.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.161	1.182	26.037	0.00	9.60
93.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.165	1.194	26.218	0.00	0.98
93.00	1 5/8" Coax	Yes	3.00	0.000	3.96	0.99	0.00	0.165	1.194	26.218	0.00	33.70
93.00	1" DC	Yes	3.00	0.000	1.00	0.25	0.00	0.165	1.194	26.218	0.00	6.48
93.00	1/2" Fiber	Yes	3.00	0.000	0.38	0.10	0.00	0.165	1.194	26.218	0.00	0.65
93.00	3/4" DC	Yes	3.00	0.000	0.75	0.19	0.00	0.165	1.194	26.218	0.00	5.76
95.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.167	1.202	26.336	0.00	0.66
95.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.167	1.202	26.336	0.00	22.46
95.00	1" DC	Yes	2.00	0.000	1.00	0.17	0.00	0.167	1.202	26.336	0.00	4.32
95.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.167	1.202	26.336	0.00	0.43
95.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.167	1.202	26.336	0.00	3.84
97.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.010	0.000	26.451	0.00	0.66
100.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.010	0.000	26.621	0.00	0.98
105.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.010	0.000	26.896	0.00	1.64
110.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	27.161	0.00	1.64
115.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	27.416	0.00	1.64
120.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	27.663	0.00	1.64
123.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.012	0.000	27.807	0.00	0.98
125.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.012	0.000	27.902	0.00	0.66

Linear Appurtenance Segment Forces (Factored)

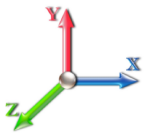
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
130.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.012	0.000	28.133	0.00	1.64
131.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.013	0.000	28.179	0.00	0.33
135.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.013	0.000	28.358	0.00	1.31
140.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.013	0.000	28.576	0.00	1.64
145.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.014	0.000	28.788	0.00	1.64
150.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.015	0.000	28.994	0.00	1.64
153.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.015	0.000	29.115	0.00	0.98
										Totals:	**0.0**	**1,525.3**

Calculated Forces

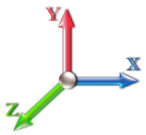
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 22

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.67	-37.11	0.00	-3863.1	0.00	3863.11	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.716
5.00	-47.85	-36.72	0.00	-3677.5	0.00	3677.56	4413.36	2206.68	10604.1	5309.95	0.09	-0.168	0.000	0.704
10.00	-46.07	-36.34	0.00	-3493.9	0.00	3493.94	4361.89	2180.94	10257.6	5136.44	0.36	-0.339	0.000	0.691
15.00	-44.31	-35.95	0.00	-3312.2	0.00	3312.26	4308.61	2154.31	9912.23	4963.48	0.81	-0.511	0.000	0.678
20.00	-42.63	-35.48	0.00	-3132.5	0.00	3132.52	4253.53	2126.77	9568.22	4791.22	1.44	-0.685	0.000	0.664
21.00	-42.25	-35.43	0.00	-3097.0	0.00	3097.04	4242.30	2121.15	9499.61	4756.87	1.58	-0.721	0.000	0.661
25.00	-40.03	-35.04	0.00	-2955.3	0.00	2955.31	4196.65	2098.33	9225.87	4619.79	2.25	-0.863	0.000	0.650
27.75	-38.54	-34.72	0.00	-2858.9	0.00	2858.97	4164.60	2082.30	9038.39	4525.91	2.78	-0.962	0.000	0.423
28.00	-38.40	-34.70	0.00	-2850.2	0.00	2850.29	3213.57	1606.78	7065.87	3538.19	2.83	-0.968	0.000	0.467
30.00	-37.80	-34.51	0.00	-2780.8	0.00	2780.88	3199.34	1599.67	6969.21	3489.78	3.24	-1.016	0.000	0.505
35.00	-36.40	-33.95	0.00	-2608.3	0.00	2608.32	3162.51	1581.26	6727.41	3368.71	4.38	-1.145	0.000	0.486
40.00	-35.06	-33.35	0.00	-2438.5	0.00	2438.56	3123.88	1561.94	6485.64	3247.64	5.65	-1.273	0.000	0.467
40.75	-34.83	-33.29	0.00	-2413.5	0.00	2413.56	3117.93	1558.96	6449.39	3229.49	5.85	-1.293	0.000	0.464
40.75	-34.83	-33.29	0.00	-2413.5	0.00	2413.56	3117.93	1558.96	6449.39	3229.49	5.85	-1.293	0.000	0.464
45.00	-33.66	-32.83	0.00	-2272.0	0.00	2272.09	3083.44	1541.72	6244.17	3126.72	7.05	-1.402	0.000	0.738
50.00	-32.30	-32.32	0.00	-2107.9	0.00	2107.96	3041.20	1520.60	6003.26	3006.09	8.63	-1.610	0.000	0.712
55.00	-30.97	-31.80	0.00	-1946.3	0.00	1946.37	2997.16	1498.58	5763.21	2885.89	10.43	-1.819	0.000	0.685
60.00	-29.66	-31.27	0.00	-1787.3	0.00	1787.39	2951.32	1475.66	5524.28	2766.24	12.45	-2.026	0.000	0.657
65.00	-28.39	-30.73	0.00	-1631.0	0.00	1631.06	2903.67	1451.83	5286.75	2647.30	14.68	-2.232	0.000	0.626
70.00	-26.24	-29.93	0.00	-1477.4	0.00	1477.43	2854.22	1427.11	5050.90	2529.20	17.13	-2.435	0.000	0.594
71.00	-25.79	-29.84	0.00	-1447.5	0.00	1447.50	2869.57	1434.79	5123.02	2565.32	17.64	-2.477	0.000	0.574
75.00	-24.80	-29.40	0.00	-1328.1	0.00	1328.13	2829.16	1414.58	4935.24	2471.29	19.79	-2.638	0.000	0.547
80.00	-23.62	-28.82	0.00	-1181.1	0.00	1181.14	2777.01	1388.51	4702.41	2354.70	22.65	-2.824	0.000	0.511
85.00	-22.46	-28.24	0.00	-1037.0	0.00	1037.02	2723.06	1361.53	4471.94	2239.29	25.71	-3.004	0.000	0.472
90.00	-21.36	-27.65	0.00	-895.81	0.00	895.81	2667.31	1333.66	4244.12	2125.22	28.95	-3.176	0.000	0.430
93.00	-20.41	-26.91	0.00	-812.87	0.00	812.87	2633.00	1316.50	4108.81	2057.46	30.97	-3.276	0.000	0.403
95.00	-16.12	-21.15	0.00	-759.06	0.00	759.06	2609.76	1304.88	4019.22	2012.60	32.36	-3.341	0.000	0.384
97.00	-15.50	-20.64	0.00	-716.76	0.00	716.76	2586.23	1293.12	3930.14	1967.99	33.77	-3.405	0.000	0.370
100.00	-14.91	-20.35	0.00	-654.83	0.00	654.83	2550.40	1275.20	3797.52	1901.58	35.94	-3.497	0.000	0.350
105.00	-13.91	-19.59	0.00	-552.35	0.00	552.35	2489.24	1244.62	3579.29	1792.30	39.68	-3.641	0.000	0.314
110.00	-13.01	-19.11	0.00	-454.39	0.00	454.39	2426.28	1213.14	3364.80	1684.90	43.57	-3.774	0.000	0.275
115.00	-11.59	-18.58	0.00	-358.86	0.00	358.86	1783.00	891.50	2427.68	1215.65	47.58	-3.893	0.000	0.302
120.00	-10.87	-18.11	0.00	-265.95	0.00	265.95	1739.91	869.95	2280.12	1141.75	51.71	-3.996	0.000	0.240
123.00	-8.06	-11.77	0.00	-211.61	0.00	211.61	1713.19	856.59	2192.59	1097.92	54.24	-4.059	0.000	0.198
125.00	-7.82	-11.60	0.00	-188.07	0.00	188.07	1695.01	847.51	2134.69	1068.93	55.95	-4.096	0.000	0.181
130.00	-7.27	-11.15	0.00	-130.09	0.00	130.09	1648.31	824.16	1991.67	997.31	60.28	-4.174	0.000	0.135
131.00	-4.01	-6.13	0.00	-118.95	0.00	118.95	1638.75	819.38	1963.38	983.15	61.16	-4.188	0.000	0.123
135.00	-3.65	-5.79	0.00	-94.42	0.00	94.42	1599.81	799.90	1851.33	927.04	64.69	-4.237	0.000	0.104
140.00	-3.21	-5.37	0.00	-65.48	0.00	65.48	1549.50	774.75	1713.96	858.25	69.15	-4.288	0.000	0.078
145.00	-2.79	-4.97	0.00	-38.61	0.00	38.61	1497.39	748.69	1579.82	791.09	73.66	-4.325	0.000	0.051
150.00	-2.39	-4.59	0.00	-13.76	0.00	13.76	1443.48	721.74	1449.20	725.68	78.20	-4.347	0.000	0.021
150.00	-2.39	-4.59	0.00	-13.76	0.00	13.76	1443.48	721.74	1449.20	725.68	78.20	-4.347	0.000	0.021
153.00	0.00	-4.39	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	80.93	-4.351	0.000	0.000

Wind Loading - Shaft

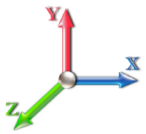
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	17.879	19.67	435.32	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	17.879	19.67	426.37	0.664 *	0.000	5.00	25.125	16.69	525.1	0.0	1075.4
10.00		1.00	0.85	17.879	19.67	417.42	0.669 *	0.000	5.00	24.603	16.45	517.7	0.0	1052.9
15.00		1.00	0.85	17.879	19.67	408.47	0.673 *	0.000	5.00	24.081	16.21	510.2	0.0	1030.5
20.00		1.00	0.90	18.971	20.87	411.53	0.678 *	0.000	5.00	23.559	15.98	533.4	0.0	1008.0
21.00	Bot - Section 2	1.00	0.91	19.166	21.08	411.80	0.681 *	0.000	1.00	4.649	3.17	106.8	0.0	198.9
25.00		1.00	0.95	19.883	21.87	411.87	0.692 *	0.000	4.00	18.599	12.87	450.4	0.0	1450.4
27.75	RB1	1.00	0.97	20.325	22.36	411.18	0.732 *	0.000	2.75	12.593	9.22	329.8	0.0	981.9
28.00	Top - Section 1	1.00	0.97	20.363	22.40	411.09	0.734 *	0.000	0.25	1.137	0.83	29.9	0.0	88.6
30.00		1.00	0.98	20.661	22.73	415.11	0.732 *	0.000	2.00	9.049	6.63	241.0	0.0	322.9
35.00		1.00	1.01	21.343	23.48	412.12	0.737 *	0.000	5.00	22.257	16.40	616.0	0.0	794.2
40.00		1.00	1.04	21.951	24.15	408.04	0.744 *	0.000	5.00	21.735	16.16	624.4	0.0	775.5
40.75	RT1	1.00	1.05	22.037	24.24	407.34	0.748 *	0.000	0.75	3.215	2.40	93.2	0.0	114.7
45.00		1.00	1.07	22.502	24.75	403.08	0.743 *	0.000	4.25	17.998	13.37	529.4	0.0	642.0
50.00		1.00	1.09	23.007	25.31	397.43	0.709 *	0.000	5.00	20.692	14.67	594.1	0.0	738.0
55.00		1.00	1.12	23.473	25.82	391.18	0.716 *	0.000	5.00	20.170	14.43	596.3	0.0	719.3
60.00		1.00	1.14	23.907	26.30	384.43	0.723 *	0.000	5.00	19.648	14.20	597.3	0.0	700.5
65.00	Bot - Section 3	1.00	1.16	24.313	26.74	377.24	0.730 *	0.000	5.00	19.126	13.96	597.3	0.0	681.8
70.00	Appurtenance(s)	1.00	1.17	24.696	27.17	369.68	0.738 *	0.000	5.00	18.868	13.92	604.9	0.0	1335.6
71.00	Top - Section 2	1.00	1.18	24.770	27.25	368.12	0.742 *	0.000	1.00	3.711	2.76	120.1	0.0	262.6
75.00		1.00	1.19	25.057	27.56	367.14	0.742 *	0.000	4.00	14.635	10.86	479.1	0.0	521.6
80.00		1.00	1.21	25.400	27.94	358.98	0.750 *	0.000	5.00	17.824	13.37	597.5	0.0	635.1
85.00		1.00	1.22	25.726	28.30	350.54	0.759 *	0.000	5.00	17.302	13.13	594.5	0.0	616.3
90.00		1.00	1.24	26.037	28.64	341.85	0.768 *	0.000	5.00	16.780	12.89	590.8	0.0	597.6
93.00	Appurtenance(s)	1.00	1.25	26.218	28.84	336.53	0.776 *	0.000	3.00	9.818	7.62	351.7	0.0	349.6
95.00	Appurtenance(s)	1.00	1.25	26.336	28.97	332.94	0.781 *	0.000	2.00	6.441	5.03	233.3	0.0	229.3
97.00	Appurtenance(s)	1.00	1.26	26.451	29.10	329.32	0.650	0.000	2.00	6.357	4.13	192.4	0.0	226.3
100.00		1.00	1.27	26.621	29.28	323.82	0.650	0.000	3.00	9.379	6.10	285.6	0.0	333.8
105.00	Appurtenance(s)	1.00	1.28	26.896	29.59	314.51	0.650	0.000	5.00	15.214	9.89	468.1	0.0	541.4
110.00	Bot - Section 4	1.00	1.29	27.161	29.88	305.02	0.650	0.000	5.00	14.693	9.55	456.5	0.0	522.7
115.00	Top - Section 3	1.00	1.30	27.416	30.16	295.37	0.650	0.000	5.00	14.382	9.35	451.1	0.0	913.9
120.00		1.00	1.32	27.663	30.43	290.08	0.650	0.000	5.00	13.860	9.01	438.6	0.0	395.0
123.00	Appurtenance(s)	1.00	1.32	27.807	30.59	284.13	0.650	0.000	3.00	8.066	5.24	256.6	0.0	229.8
125.00		1.00	1.33	27.902	30.69	280.14	0.650	0.000	2.00	5.273	3.43	168.3	0.0	150.2
130.00		1.00	1.34	28.133	30.95	270.07	0.650	0.000	5.00	12.816	8.33	412.5	0.0	365.0
131.00	Appurtenance(s)	1.00	1.34	28.179	31.00	268.05	0.650	0.000	1.00	2.501	1.63	80.6	0.0	71.2
135.00		1.00	1.35	28.358	31.19	259.88	0.650	0.000	4.00	9.794	6.37	317.7	0.0	278.8
140.00		1.00	1.36	28.576	31.43	249.56	0.650	0.000	5.00	11.772	7.65	384.8	0.0	335.0
145.00		1.00	1.37	28.788	31.67	239.12	0.650	0.000	5.00	11.250	7.31	370.5	0.0	320.0
150.00	Top - Section 4	1.00	1.38	28.994	31.89	228.58	0.650	0.000	5.00	10.728	6.97	355.8	0.0	305.1
153.00	Appurtenance(s)	1.00	1.38	29.115	32.03	222.21	0.650	0.000	3.00	6.187	4.02	206.1	0.0	175.8
								Totals:	**153.00**			**15,909.7**		**22,087.4**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

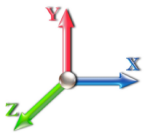
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	153.00	Lightning Rod	1	29.115	32.026	1.00	1.00	0.50	4.50	0.000	0.000	25.62	0.00	0.00
2	153.00	Low Profile Platform	1	29.115	32.026	1.00	1.00	25.00	1080.00	0.000	0.000	1281.05	0.00	0.00
3	153.00	TD-RRH8x20-25	3	29.115	32.026	0.62	0.90	7.55	189.00	0.000	0.000	386.63	0.00	0.00
4	153.00	ACU-A20-N	4	29.115	32.026	0.81	0.90	0.45	3.60	0.000	0.000	23.24	0.00	0.00
5	153.00	800 MHz Filters	3	29.115	32.026	0.62	0.90	1.45	23.76	0.000	0.000	74.46	0.00	0.00
6	153.00	800 MHz RRUs	3	29.115	32.026	0.83	0.90	6.19	143.10	0.000	0.000	316.94	0.00	0.00
7	153.00	1900 MHz RRUs	3	29.115	32.026	0.79	0.90	9.03	118.80	0.000	0.000	462.66	0.00	0.00
8	153.00	APXVSPP18-C-A20	3	29.115	32.026	0.75	0.90	17.97	153.90	0.000	0.000	920.97	0.00	0.00
9	153.00	APXVTM14-C-I20	3	29.115	32.026	0.71	0.90	13.52	151.20	0.000	0.000	692.96	0.00	0.00
10	131.00	AIR6449 B41	3	28.179	30.997	0.57	0.80	9.63	278.10	0.000	0.000	477.48	0.00	0.00
11	131.00	APXVAALL24_43-U-NA20	3	28.179	30.997	0.58	0.80	35.46	331.56	0.000	0.000	1758.65	0.00	0.00
12	131.00	KRY 112 489/2	3	28.179	30.997	0.54	0.80	1.13	43.47	0.000	0.000	55.82	0.00	0.00
13	131.00	KRY 112 144/1	3	28.179	30.997	0.54	0.80	0.66	29.70	0.000	0.000	32.70	0.00	0.00
14	131.00	4460 B25 + B66	3	28.179	30.997	0.54	0.80	4.58	280.80	0.000	0.000	227.28	0.00	0.00
15	131.00	VV-65A-R1	3	28.179	30.997	0.59	0.80	14.03	64.29	0.000	0.000	695.83	0.00	0.00
16	131.00	4449 B71 + B85	3	28.179	30.997	0.54	0.80	3.17	202.50	0.000	0.000	157.10	0.00	0.00
17	131.00	T-Arms	3	28.179	30.997	0.56	0.75	13.50	945.00	0.000	0.000	669.53	0.00	0.00
18	131.00	(3) T-Arm Kit	1	28.179	30.997	0.75	0.75	12.38	450.00	0.000	0.000	613.73	0.00	0.00
19	123.00	Low Profile Platform	1	27.807	30.588	1.00	1.00	25.00	1080.00	0.000	0.000	1223.52	0.00	0.00
20	123.00	RFS DB-T1-6Z-8AB-0Z	2	27.807	30.588	0.57	0.80	5.45	34.02	0.000	0.000	266.87	0.00	0.00
21	123.00	B5/B13 RRH-BR04C	3	27.807	30.588	0.54	0.80	3.01	189.81	0.000	0.000	147.16	0.00	0.00
22	123.00	B2/B66A RRH-BR049	3	27.807	30.588	0.54	0.80	3.01	227.88	0.000	0.000	147.16	0.00	0.00
23	123.00	LPA-80063-6CF-EDIN-5	6	27.807	30.588	0.74	0.80	43.57	145.80	0.000	0.000	2132.29	0.00	0.00
24	123.00	SBNHH-1D65B	6	27.807	30.588	0.66	0.80	32.19	219.24	0.000	0.000	1575.44	0.00	0.00
25	123.00	MT6407-77A	3	27.807	30.588	0.56	0.80	7.88	214.38	0.000	0.000	385.62	0.00	0.00
26	105.00	Standoff	1	26.896	29.586	1.00	1.00	2.63	36.00	0.000	0.000	124.50	0.00	0.00
27	105.00	10' Omni	1	27.161	29.877	1.00	1.00	3.00	22.50	0.000	5.000	143.41	0.00	717.05
28	97.00	Ericsson Air6419 B77G	3	26.451	29.096	0.57	0.75	6.50	178.47	0.000	0.000	302.51	0.00	0.00
29	95.00	Powerwave LGP21901	6	26.336	28.969	0.50	0.75	0.69	29.70	0.000	0.000	32.14	0.00	0.00
30	95.00	Ericsson RRUS 4449	3	26.336	28.969	0.50	0.75	2.97	191.70	0.000	0.000	137.65	0.00	0.00
31	95.00	PolyPhaser 1000860	3	26.336	28.969	0.50	0.75	0.09	5.40	0.000	0.000	4.19	0.00	0.00
32	95.00	Cci TPA65R-BU6DA-K	3	26.336	28.969	0.54	0.75	20.85	182.25	0.000	0.000	966.38	0.00	0.00
33	95.00	Powerwave LGP17201	6	26.336	28.969	0.50	0.75	5.88	167.40	0.000	0.000	272.51	0.00	0.00
34	95.00	Cci OPA65R-BU6DA	3	26.336	28.969	0.55	0.75	20.88	170.91	0.000	0.000	967.62	0.00	0.00
35	95.00	Low Profile Platform	1	26.336	28.969	1.00	1.00	40.00	1350.00	0.000	0.000	1854.02	0.00	0.00
36	95.00	Ericsson 4426 B66	3	26.336	28.969	0.50	0.75	1.73	130.95	0.000	0.000	80.35	0.00	0.00
37	95.00	Ericsson RRUS 4478 B14	3	26.336	28.969	0.50	0.75	2.77	161.73	0.000	0.000	128.57	0.00	0.00
38	95.00	Ericsson RRUS 32 B30	3	26.336	28.969	0.50	0.75	2.49	207.90	0.000	0.000	115.29	0.00	0.00
39	95.00	Ericsson RRUS 4415 B25	3	26.336	28.969	0.50	0.75	2.47	124.20	0.000	0.000	114.59	0.00	0.00
40	95.00	Ericsson RRUS A2	3	26.336	28.969	0.50	0.75	2.80	57.24	0.000	0.000	129.96	0.00	0.00
41	95.00	Raycap DC6-48-60-18-8F	2	26.336	28.969	0.75	0.75	1.38	57.24	0.000	0.000	63.96	0.00	0.00
42	95.00	Raycap	1	26.336	28.969	0.75	0.75	0.85	23.58	0.000	0.000	39.63	0.00	0.00
43	95.00	HRK14	1	26.336	28.969	1.00	1.00	8.13	272.12	0.000	0.000	376.83	0.00	0.00
44	93.00	Ericcson Air6449 B77D	3	26.218	28.840	0.64	0.75	7.90	237.60	0.000	0.000	364.47	0.00	0.00
45	70.00	Standoff	1	24.696	27.165	1.00	1.00	2.63	36.00	0.000	0.000	114.31	0.00	0.00
46	70.00	GPS	1	24.696	27.165	1.00	1.00	1.00	9.00	0.000	0.000	43.46	0.00	0.00
							Totals:		**10,256.30**			**21,127.09**		

Total Applied Force Summary

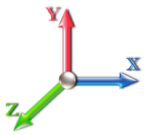
Structure:	CT01499-S-SBA		**Code:**	TIA-222-G	5/10/2022
Site Name:	Torrington		**Exposure:**	C	
Height:	153.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 19

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		525.15	1283.57	0.00	0.00
10.00		517.67	1261.08	0.00	0.00
15.00		510.20	1238.60	0.00	0.00
20.00		533.42	1216.11	0.00	0.00
21.00		106.82	240.52	0.00	0.00
25.00		450.40	1616.96	0.00	0.00
27.75		329.82	1096.35	0.00	0.00
28.00		29.91	99.05	0.00	0.00
30.00		240.96	406.19	0.00	0.00
35.00		616.02	1002.35	0.00	0.00
40.00		624.41	983.61	0.00	0.00
40.75		93.23	145.93	0.00	0.00
45.00		529.44	818.95	0.00	0.00
50.00		594.08	946.14	0.00	0.00
55.00		596.31	927.41	0.00	0.00
60.00		597.34	908.67	0.00	0.00
65.00		597.33	889.93	0.00	0.00
70.00	(2) attachments	762.65	1588.75	0.00	0.00
71.00		120.11	304.25	0.00	0.00
75.00		479.13	688.06	0.00	0.00
80.00		597.55	843.22	0.00	0.00
85.00		594.47	824.48	0.00	0.00
90.00		590.79	805.74	0.00	0.00
93.00	(3) attachments	716.14	712.05	0.00	0.00
95.00	(44) attachments	5517.01	3444.88	0.00	0.00
97.00	(3) attachments	494.88	464.74	0.00	0.00
100.00		285.64	423.78	0.00	0.00
105.00	(2) attachments	736.05	749.81	0.00	717.05
110.00		456.53	671.85	0.00	0.00
115.00		451.09	1063.09	0.00	0.00
120.00		438.63	544.17	0.00	0.00
123.00	(24) attachments	6134.65	2430.44	0.00	0.00
125.00		168.30	175.96	0.00	0.00
130.00		412.48	429.42	0.00	0.00
131.00	(25) attachments	4768.73	2709.50	0.00	0.00
135.00		317.72	289.30	0.00	0.00
140.00		384.84	348.14	0.00	0.00
145.00		370.51	333.15	0.00	0.00
150.00		355.85	318.16	0.00	0.00
153.00	(24) attachments	4390.59	2051.56	0.00	0.00
	Totals:	**37,036.83**	**37,295.93**	**0.00**	**717.05**

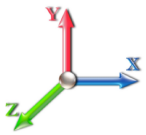
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.107	1.022	17.879	0.00	1.23
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.107	1.022	17.879	0.00	42.12
5.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.107	1.022	17.879	0.00	8.10
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.107	1.022	17.879	0.00	0.81
5.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.107	1.022	17.879	0.00	7.20
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.029	17.879	0.00	1.23
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.110	1.029	17.879	0.00	42.12
10.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.110	1.029	17.879	0.00	8.10
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.029	17.879	0.00	0.81
10.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.110	1.029	17.879	0.00	7.20
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.112	1.036	17.879	0.00	1.23
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.112	1.036	17.879	0.00	42.12
15.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.112	1.036	17.879	0.00	8.10
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.112	1.036	17.879	0.00	0.81
15.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.112	1.036	17.879	0.00	7.20
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.114	1.043	18.971	0.00	1.23
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.114	1.043	18.971	0.00	42.12
20.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.114	1.043	18.971	0.00	8.10
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.114	1.043	18.971	0.00	0.81
20.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.114	1.043	18.971	0.00	7.20
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.116	1.048	19.166	0.00	0.25
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.116	1.048	19.166	0.00	8.42
21.00	1" DC	Yes	1.00	0.000	1.00	0.08	0.00	0.116	1.048	19.166	0.00	1.62
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.116	1.048	19.166	0.00	0.16
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.116	1.048	19.166	0.00	1.44
25.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.122	1.065	19.883	0.00	0.98
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.122	1.065	19.883	0.00	33.70
25.00	1" DC	Yes	4.00	0.000	1.00	0.33	0.00	0.122	1.065	19.883	0.00	6.48
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.122	1.065	19.883	0.00	0.65
25.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.122	1.065	19.883	0.00	5.76
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.122	1.065	19.883	0.00	0.00
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.142	1.126	20.325	0.00	0.68
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	0.91	0.00	0.142	1.126	20.325	0.00	23.17
27.75	1" DC	Yes	2.75	0.000	1.00	0.23	0.00	0.142	1.126	20.325	0.00	4.46
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.09	0.00	0.142	1.126	20.325	0.00	0.45
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.17	0.00	0.142	1.126	20.325	0.00	3.96
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.29	0.00	0.142	1.126	20.325	0.00	0.00
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.01	0.00	0.143	1.129	20.363	0.00	0.06
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.143	1.129	20.363	0.00	2.11
28.00	1" DC	Yes	0.25	0.000	1.00	0.02	0.00	0.143	1.129	20.363	0.00	0.40
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.01	0.00	0.143	1.129	20.363	0.00	0.04
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.02	0.00	0.143	1.129	20.363	0.00	0.36
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.03	0.00	0.143	1.129	20.363	0.00	0.00
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.142	1.127	20.661	0.00	0.49
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.142	1.127	20.661	0.00	16.85
30.00	1" DC	Yes	2.00	0.000	1.00	0.17	0.00	0.142	1.127	20.661	0.00	3.24
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.142	1.127	20.661	0.00	0.32

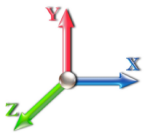
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.142	1.127	20.661	0.00	2.88
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.142	1.127	20.661	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.134	21.343	0.00	1.23
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.145	1.134	21.343	0.00	42.12
35.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.145	1.134	21.343	0.00	8.10
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.134	21.343	0.00	0.81
35.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.145	1.134	21.343	0.00	7.20
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.145	1.134	21.343	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.148	1.144	21.951	0.00	1.23
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.148	1.144	21.951	0.00	42.12
40.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.148	1.144	21.951	0.00	8.10
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.148	1.144	21.951	0.00	0.81
40.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.148	1.144	21.951	0.00	7.20
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.148	1.144	21.951	0.00	0.00
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.02	0.00	0.150	1.150	22.037	0.00	0.18
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.25	0.00	0.150	1.150	22.037	0.00	6.32
40.75	1" DC	Yes	0.75	0.000	1.00	0.06	0.00	0.150	1.150	22.037	0.00	1.21
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.02	0.00	0.150	1.150	22.037	0.00	0.12
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.05	0.00	0.150	1.150	22.037	0.00	1.08
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.150	1.150	22.037	0.00	0.00
45.00	Safety Cable	Yes	4.25	0.000	0.38	0.13	0.00	0.148	1.143	22.502	0.00	1.04
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	1.40	0.00	0.148	1.143	22.502	0.00	35.80
45.00	1" DC	Yes	4.25	0.000	1.00	0.35	0.00	0.148	1.143	22.502	0.00	6.88
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	0.13	0.00	0.148	1.143	22.502	0.00	0.69
45.00	3/4" DC	Yes	4.25	0.000	0.75	0.27	0.00	0.148	1.143	22.502	0.00	6.12
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	0.36	0.00	0.148	1.143	22.502	0.00	0.00
50.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.130	1.091	23.007	0.00	1.23
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.130	1.091	23.007	0.00	42.12
50.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.130	1.091	23.007	0.00	8.10
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.130	1.091	23.007	0.00	0.81
50.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.130	1.091	23.007	0.00	7.20
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.134	1.101	23.473	0.00	1.23
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.134	1.101	23.473	0.00	42.12
55.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.134	1.101	23.473	0.00	8.10
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.134	1.101	23.473	0.00	0.81
55.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.134	1.101	23.473	0.00	7.20
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.137	1.112	23.907	0.00	1.23
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.137	1.112	23.907	0.00	42.12
60.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.137	1.112	23.907	0.00	8.10
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.137	1.112	23.907	0.00	0.81
60.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.137	1.112	23.907	0.00	7.20
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.141	1.123	24.313	0.00	1.23
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.141	1.123	24.313	0.00	42.12
65.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.141	1.123	24.313	0.00	8.10
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.141	1.123	24.313	0.00	0.81
65.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.141	1.123	24.313	0.00	7.20
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.135	24.696	0.00	1.23

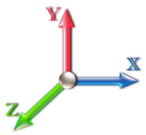
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.145	1.135	24.696	0.00	42.12
70.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.145	1.135	24.696	0.00	8.10
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.135	24.696	0.00	0.81
70.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.145	1.135	24.696	0.00	7.20
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.147	1.142	24.770	0.00	0.25
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.147	1.142	24.770	0.00	8.42
71.00	1" DC	Yes	1.00	0.000	1.00	0.08	0.00	0.147	1.142	24.770	0.00	1.62
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.147	1.142	24.770	0.00	0.16
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.147	1.142	24.770	0.00	1.44
75.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.147	1.142	25.057	0.00	0.98
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.147	1.142	25.057	0.00	33.70
75.00	1" DC	Yes	4.00	0.000	1.00	0.33	0.00	0.147	1.142	25.057	0.00	6.48
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.147	1.142	25.057	0.00	0.65
75.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.147	1.142	25.057	0.00	5.76
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.151	1.154	25.400	0.00	1.23
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.151	1.154	25.400	0.00	42.12
80.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.151	1.154	25.400	0.00	8.10
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.151	1.154	25.400	0.00	0.81
80.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.151	1.154	25.400	0.00	7.20
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.156	1.167	25.726	0.00	1.23
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.156	1.167	25.726	0.00	42.12
85.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.156	1.167	25.726	0.00	8.10
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.156	1.167	25.726	0.00	0.81
85.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.156	1.167	25.726	0.00	7.20
90.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.161	1.182	26.037	0.00	1.23
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.161	1.182	26.037	0.00	42.12
90.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.161	1.182	26.037	0.00	8.10
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.161	1.182	26.037	0.00	0.81
90.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.161	1.182	26.037	0.00	7.20
93.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.165	1.194	26.218	0.00	0.74
93.00	1 5/8" Coax	Yes	3.00	0.000	3.96	0.99	0.00	0.165	1.194	26.218	0.00	25.27
93.00	1" DC	Yes	3.00	0.000	1.00	0.25	0.00	0.165	1.194	26.218	0.00	4.86
93.00	1/2" Fiber	Yes	3.00	0.000	0.38	0.10	0.00	0.165	1.194	26.218	0.00	0.49
93.00	3/4" DC	Yes	3.00	0.000	0.75	0.19	0.00	0.165	1.194	26.218	0.00	4.32
95.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.167	1.202	26.336	0.00	0.49
95.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.167	1.202	26.336	0.00	16.85
95.00	1" DC	Yes	2.00	0.000	1.00	0.17	0.00	0.167	1.202	26.336	0.00	3.24
95.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.167	1.202	26.336	0.00	0.32
95.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.167	1.202	26.336	0.00	2.88
97.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.010	0.000	26.451	0.00	0.49
100.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.010	0.000	26.621	0.00	0.74
105.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.010	0.000	26.896	0.00	1.23
110.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	27.161	0.00	1.23
115.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	27.416	0.00	1.23
120.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	27.663	0.00	1.23
123.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.012	0.000	27.807	0.00	0.74
125.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.012	0.000	27.902	0.00	0.49

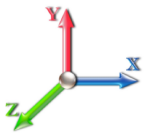
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
130.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.012	0.000	28.133	0.00	1.23
131.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.013	0.000	28.179	0.00	0.25
135.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.013	0.000	28.358	0.00	0.98
140.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.013	0.000	28.576	0.00	1.23
145.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.014	0.000	28.788	0.00	1.23
150.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.015	0.000	28.994	0.00	1.23
153.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.015	0.000	29.115	0.00	0.74
										Totals:	**0.0**	**1,144.0**

Calculated Forces

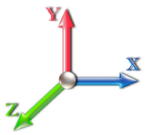
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 22

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-37.24	-37.09	0.00	-3832.4	0.00	3832.45	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.707
5.00	-35.85	-36.67	0.00	-3646.9	0.00	3646.99	4413.36	2206.68	10604.1	5309.95	0.09	-0.167	0.000	0.695
10.00	-34.48	-36.25	0.00	-3463.6	0.00	3463.65	4361.89	2180.94	10257.6	5136.44	0.36	-0.336	0.000	0.683
15.00	-33.14	-35.83	0.00	-3282.4	0.00	3282.40	4308.61	2154.31	9912.23	4963.48	0.80	-0.507	0.000	0.669
20.00	-31.87	-35.34	0.00	-3103.2	0.00	3103.26	4253.53	2126.77	9568.22	4791.22	1.42	-0.679	0.000	0.655
21.00	-31.57	-35.28	0.00	-3067.9	0.00	3067.92	4242.30	2121.15	9499.61	4756.87	1.57	-0.715	0.000	0.653
25.00	-29.89	-34.87	0.00	-2926.8	0.00	2926.80	4196.65	2098.33	9225.87	4619.79	2.23	-0.856	0.000	0.641
27.75	-28.77	-34.55	0.00	-2830.9	0.00	2830.91	4164.60	2082.30	9038.39	4525.91	2.75	-0.954	0.000	0.417
28.00	-28.65	-34.53	0.00	-2822.2	0.00	2822.28	3213.57	1606.78	7065.87	3538.19	2.80	-0.960	0.000	0.461
30.00	-28.20	-34.33	0.00	-2753.2	0.00	2753.22	3199.34	1599.67	6969.21	3489.78	3.22	-1.007	0.000	0.498
35.00	-27.13	-33.75	0.00	-2581.5	0.00	2581.59	3162.51	1581.26	6727.41	3368.71	4.34	-1.135	0.000	0.479
40.00	-26.12	-33.14	0.00	-2412.8	0.00	2412.84	3123.88	1561.94	6485.64	3247.64	5.60	-1.261	0.000	0.460
40.75	-25.94	-33.07	0.00	-2387.9	0.00	2387.98	3117.93	1558.96	6449.39	3229.49	5.80	-1.281	0.000	0.457
40.75	-25.94	-33.07	0.00	-2387.9	0.00	2387.98	3117.93	1558.96	6449.39	3229.49	5.80	-1.281	0.000	0.457
45.00	-25.04	-32.59	0.00	-2247.4	0.00	2247.43	3083.44	1541.72	6244.17	3126.72	6.99	-1.388	0.000	0.727
50.00	-24.00	-32.06	0.00	-2084.4	0.00	2084.46	3041.20	1520.60	6003.26	3006.09	8.55	-1.595	0.000	0.702
55.00	-22.98	-31.52	0.00	-1924.1	0.00	1924.16	2997.16	1498.58	5763.21	2885.89	10.33	-1.801	0.000	0.675
60.00	-21.98	-30.97	0.00	-1766.5	0.00	1766.56	2951.32	1475.66	5524.28	2766.24	12.33	-2.006	0.000	0.647
65.00	-21.00	-30.42	0.00	-1611.7	0.00	1611.71	2903.67	1451.83	5286.75	2647.30	14.54	-2.209	0.000	0.616
70.00	-19.39	-29.63	0.00	-1459.6	0.00	1459.63	2854.22	1427.11	5050.90	2529.20	16.97	-2.410	0.000	0.584
71.00	-19.03	-29.53	0.00	-1430.0	0.00	1430.00	2869.57	1434.79	5123.02	2565.32	17.47	-2.451	0.000	0.564
75.00	-18.28	-29.08	0.00	-1311.8	0.00	1311.87	2829.16	1414.58	4935.24	2471.29	19.60	-2.610	0.000	0.538
80.00	-17.38	-28.50	0.00	-1166.4	0.00	1166.49	2777.01	1388.51	4702.41	2354.70	22.43	-2.794	0.000	0.502
85.00	-16.50	-27.91	0.00	-1024.0	0.00	1024.01	2723.06	1361.53	4471.94	2239.29	25.45	-2.972	0.000	0.464
90.00	-15.66	-27.31	0.00	-884.46	0.00	884.46	2667.31	1333.66	4244.12	2125.22	28.66	-3.142	0.000	0.422
93.00	-14.95	-26.58	0.00	-802.52	0.00	802.52	2633.00	1316.50	4108.81	2057.46	30.67	-3.241	0.000	0.396
95.00	-11.81	-20.89	0.00	-749.36	0.00	749.36	2609.76	1304.88	4019.22	2012.60	32.04	-3.305	0.000	0.377
97.00	-11.34	-20.38	0.00	-707.58	0.00	707.58	2586.23	1293.12	3930.14	1967.99	33.43	-3.368	0.000	0.364
100.00	-10.90	-20.10	0.00	-646.44	0.00	646.44	2550.40	1275.20	3797.52	1901.58	35.58	-3.459	0.000	0.344
105.00	-10.15	-19.34	0.00	-545.24	0.00	545.24	2489.24	1244.62	3579.29	1792.30	39.28	-3.601	0.000	0.309
110.00	-9.47	-18.86	0.00	-448.55	0.00	448.55	2426.28	1213.14	3364.80	1684.90	43.12	-3.732	0.000	0.270
115.00	-8.40	-18.36	0.00	-354.25	0.00	354.25	1783.00	891.50	2427.68	1215.65	47.09	-3.850	0.000	0.297
120.00	-7.86	-17.89	0.00	-262.47	0.00	262.47	1739.91	869.95	2280.12	1141.75	51.18	-3.951	0.000	0.235
123.00	-5.85	-11.61	0.00	-208.79	0.00	208.79	1713.19	856.59	2192.59	1097.92	53.68	-4.013	0.000	0.194
125.00	-5.68	-11.43	0.00	-185.57	0.00	185.57	1695.01	847.51	2134.69	1068.93	55.37	-4.050	0.000	0.177
130.00	-5.27	-11.00	0.00	-128.40	0.00	128.40	1648.31	824.16	1991.67	997.31	59.65	-4.127	0.000	0.132
131.00	-2.91	-6.05	0.00	-117.40	0.00	117.40	1638.75	819.38	1963.38	983.15	60.52	-4.141	0.000	0.121
135.00	-2.64	-5.71	0.00	-93.22	0.00	93.22	1599.81	799.90	1851.33	927.04	64.00	-4.189	0.000	0.102
140.00	-2.32	-5.30	0.00	-64.66	0.00	64.66	1549.50	774.75	1713.96	858.25	68.42	-4.239	0.000	0.077
145.00	-2.01	-4.91	0.00	-38.15	0.00	38.15	1497.39	748.69	1579.82	791.09	72.87	-4.276	0.000	0.050
150.00	-1.72	-4.53	0.00	-13.60	0.00	13.60	1443.48	721.74	1449.20	725.68	77.36	-4.298	0.000	0.020
150.00	-1.72	-4.53	0.00	-13.60	0.00	13.60	1443.48	721.74	1449.20	725.68	77.36	-4.298	0.000	0.020
153.00	0.00	-4.39	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	80.06	-4.302	0.000	0.000

Wind Loading - Shaft

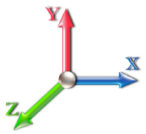
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	3.308	3.64	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	3.308	3.64	0.00	1.226 *	1.242	5.00	26.160	32.08	116.7	466.9	1900.8
10.00		1.00	0.85	3.308	3.64	0.00	1.234 *	1.331	5.00	25.712	31.74	115.5	490.9	1894.8
15.00		1.00	0.85	3.308	3.64	0.00	1.243 *	1.386	5.00	25.236	31.37	114.1	500.9	1874.9
20.00		1.00	0.90	3.509	3.86	0.00	1.252 *	1.427	5.00	24.748	30.98	119.6	504.9	1848.9
21.00	Bot - Section 2	1.00	0.91	3.546	3.90	0.00	1.257 *	1.434	1.00	4.888	6.15	24.0	101.0	366.2
25.00		1.00	0.95	3.678	4.05	0.00	1.278 *	1.459	4.00	19.572	25.00	101.2	408.8	2342.7
27.75	RB1	1.00	0.97	3.760	4.14	0.00	1.352 *	1.474	2.75	13.269	17.94	74.2	280.6	1589.8
28.00	Top - Section 1	1.00	0.97	3.767	4.14	0.00	1.355 *	1.476	0.25	1.198	1.62	6.7	25.5	143.7
30.00		1.00	0.98	3.822	4.20	0.00	1.352 *	1.486	2.00	9.544	12.90	54.2	203.7	634.2
35.00		1.00	1.01	3.948	4.34	0.00	1.360 *	1.509	5.00	23.515	31.99	138.9	505.6	1564.6
40.00		1.00	1.04	4.061	4.47	0.00	1.373 *	1.529	5.00	23.010	31.59	141.1	500.8	1534.8
40.75	RT1	1.00	1.05	4.077	4.48	0.00	1.380 *	1.532	0.75	3.407	4.70	21.1	75.0	227.9
45.00		1.00	1.07	4.163	4.58	0.00	1.371 *	1.547	4.25	19.094	26.18	119.9	420.7	1276.7
50.00		1.00	1.09	4.256	4.68	0.00	1.309 *	1.564	5.00	21.995	28.79	134.8	488.3	1472.3
55.00		1.00	1.12	4.342	4.78	0.00	1.321 *	1.579	5.00	21.485	28.39	135.6	480.9	1439.9
60.00		1.00	1.14	4.423	4.86	0.00	1.334 *	1.592	5.00	20.975	27.98	136.1	472.9	1406.9
65.00	Bot - Section 3	1.00	1.16	4.498	4.95	0.00	1.347 *	1.605	5.00	20.463	27.57	136.4	464.4	1373.5
70.00	Appurtenance(s)	1.00	1.17	4.569	5.03	0.00	1.362 *	1.617	5.00	20.216	27.53	138.3	461.8	2242.6
71.00	Top - Section 2	1.00	1.18	4.582	5.04	0.00	1.371 *	1.619	1.00	3.981	5.46	27.5	92.0	442.2
75.00		1.00	1.19	4.635	5.10	0.00	1.371 *	1.628	4.00	15.721	21.55	109.9	362.0	1057.4
80.00		1.00	1.21	4.699	5.17	0.00	1.384 *	1.639	5.00	19.190	26.57	137.3	442.9	1289.7
85.00		1.00	1.22	4.759	5.24	0.00	1.401 *	1.649	5.00	18.676	26.16	137.0	433.0	1254.7
90.00		1.00	1.24	4.817	5.30	0.00	1.418 *	1.658	5.00	18.162	25.76	136.5	422.7	1219.5
93.00	Appurtenance(s)	1.00	1.25	4.850	5.34	0.00	1.433 *	1.664	3.00	10.650	15.26	81.4	249.9	716.0
95.00	Appurtenance(s)	1.00	1.25	4.872	5.36	0.00	1.443 *	1.667	2.00	6.996	10.09	54.1	164.9	470.6
97.00	Appurtenance(s)	1.00	1.26	4.893	5.38	0.00	1.200	1.671	2.00	6.914	8.30	44.7	163.2	464.9
100.00		1.00	1.27	4.925	5.42	0.00	1.200	1.676	3.00	10.217	12.26	66.4	240.9	686.0
105.00	Appurtenance(s)	1.00	1.28	4.976	5.47	0.00	1.200	1.684	5.00	16.618	19.94	109.1	390.5	1112.4
110.00	Bot - Section 4	1.00	1.29	5.025	5.53	0.00	1.200	1.692	5.00	16.102	19.32	106.8	379.3	1076.2
115.00	Top - Section 3	1.00	1.30	5.072	5.58	0.00	1.200	1.699	5.00	15.798	18.96	105.8	373.3	1591.8
120.00		1.00	1.32	5.117	5.63	0.00	1.200	1.707	5.00	15.282	18.34	103.2	361.7	888.4
123.00	Appurtenance(s)	1.00	1.32	5.144	5.66	0.00	1.200	1.711	3.00	8.921	10.71	60.6	212.8	519.2
125.00		1.00	1.33	5.162	5.68	0.00	1.200	1.714	2.00	5.844	7.01	39.8	140.0	340.3
130.00		1.00	1.34	5.204	5.72	0.00	1.200	1.720	5.00	14.250	17.10	97.9	338.2	824.9
131.00	Appurtenance(s)	1.00	1.34	5.213	5.73	0.00	1.200	1.722	1.00	2.788	3.35	19.2	67.2	162.1
135.00		1.00	1.35	5.246	5.77	0.00	1.200	1.727	4.00	10.945	13.13	75.8	261.0	632.7
140.00		1.00	1.36	5.286	5.81	0.00	1.200	1.733	5.00	13.217	15.86	92.2	314.1	760.8
145.00		1.00	1.37	5.325	5.86	0.00	1.200	1.739	5.00	12.700	15.24	89.3	301.8	728.5
150.00	Top - Section 4	1.00	1.38	5.364	5.90	0.00	1.200	1.745	5.00	12.183	14.62	86.3	289.4	696.1
153.00	Appurtenance(s)	1.00	1.38	5.386	5.92	0.00	1.200	1.749	3.00	7.061	8.47	50.2	169.1	403.6
								Totals:	**153.00**			**3,659.4**		**42,473.3**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

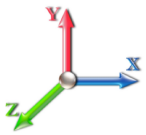
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	153.00	Lightning Rod	1	5.386	5.925	1.00	1.00	2.25	20.98	0.000	0.000	13.32	0.00	0.00
2	153.00	Low Profile Platform	1	5.386	5.925	1.00	1.00	45.98	2189.20	0.000	0.000	272.44	0.00	0.00
3	153.00	TD-RRH8x20-25	3	5.386	5.925	0.62	0.90	9.06	584.18	0.000	0.000	53.70	0.00	0.00
4	153.00	ACU-A20-N	4	5.386	5.925	0.81	0.90	1.42	16.82	0.000	0.000	8.39	0.00	0.00
5	153.00	800 MHz Filters	3	5.386	5.925	0.62	0.90	2.66	69.71	0.000	0.000	15.76	0.00	0.00
6	153.00	800 MHz RRUs	3	5.386	5.925	0.83	0.90	9.03	349.82	0.000	0.000	53.51	0.00	0.00
7	153.00	1900 MHz RRUs	3	5.386	5.925	0.79	0.90	12.34	392.94	0.000	0.000	73.10	0.00	0.00
8	153.00	APXVSPP18-C-A20	3	5.386	5.925	0.75	0.90	24.25	576.28	0.000	0.000	143.65	0.00	0.00
9	153.00	APXVTM14-C-I20	3	5.386	5.925	0.71	0.90	15.90	683.98	0.000	0.000	94.22	0.00	0.00
10	131.00	AIR6449 B41	3	5.213	5.734	0.57	0.80	11.23	681.52	0.000	0.000	64.37	0.00	0.00
11	131.00	APXVAALL24_43-U-NA20	3	5.213	5.734	0.58	0.80	38.74	1705.80	0.000	0.000	222.16	0.00	0.00
12	131.00	KRY 112 489/2	3	5.213	5.734	0.54	0.80	2.15	104.86	0.000	0.000	12.32	0.00	0.00
13	131.00	KRY 112 144/1	3	5.213	5.734	0.54	0.80	1.41	62.21	0.000	0.000	8.10	0.00	0.00
14	131.00	4460 B25 + B66	3	5.213	5.734	0.54	0.80	5.65	511.45	0.000	0.000	32.41	0.00	0.00
15	131.00	VV-65A-R1	3	5.213	5.734	0.59	0.80	12.34	494.48	0.000	0.000	70.78	0.00	0.00
16	131.00	4449 B71 + B85	3	5.213	5.734	0.54	0.80	4.07	275.30	0.000	0.000	23.34	0.00	0.00
17	131.00	T-Arms	3	5.213	5.734	0.56	0.75	25.12	1773.13	0.000	0.000	144.05	0.00	0.00
18	131.00	(3) T-Arm Kit	1	5.213	5.734	0.75	0.75	24.31	1035.39	0.000	0.000	139.38	0.00	0.00
19	123.00	Low Profile Platform	1	5.144	5.659	1.00	1.00	45.53	2166.55	0.000	0.000	257.64	0.00	0.00
20	123.00	RFS DB-T1-6Z-8AB-0Z	2	5.144	5.659	0.57	0.80	6.57	228.56	0.000	0.000	37.19	0.00	0.00
21	123.00	B5/B13 RRH-BR04C	3	5.144	5.659	0.54	0.80	3.91	456.04	0.000	0.000	22.12	0.00	0.00
22	123.00	B2/B66A RRH-BR049	3	5.144	5.659	0.54	0.80	3.91	527.93	0.000	0.000	22.12	0.00	0.00
23	123.00	LPA-80063-6CF-EDIN-5	6	5.144	5.659	0.74	0.80	55.61	1283.07	0.000	0.000	314.70	0.00	0.00
24	123.00	SBNHH-1D65B	6	5.144	5.659	0.66	0.80	37.23	1473.72	0.000	0.000	210.67	0.00	0.00
25	123.00	MT6407-77A	3	5.144	5.659	0.56	0.80	9.44	635.96	0.000	0.000	53.41	0.00	0.00
26	105.00	Standoff	1	4.976	5.473	1.00	1.00	8.39	102.47	0.000	0.000	45.92	0.00	0.00
27	105.00	10' Omni	1	5.025	5.527	1.00	1.00	6.48	81.69	0.000	5.000	35.82	0.00	179.08
28	97.00	Ericsson Air6419 B77G	3	4.893	5.383	0.57	0.75	7.80	446.18	0.000	0.000	41.99	0.00	0.00
29	95.00	Powerwave LGP21901	6	4.872	5.359	0.50	0.75	1.75	70.48	0.000	0.000	9.40	0.00	0.00
30	95.00	Ericsson RRUS 4449	3	4.872	5.359	0.50	0.75	3.76	367.79	0.000	0.000	20.14	0.00	0.00
31	95.00	PolyPhaser 1000860	3	4.872	5.359	0.50	0.75	0.39	12.58	0.000	0.000	2.10	0.00	0.00
32	95.00	Cci TPA65R-BU6DA-K	3	4.872	5.359	0.54	0.75	23.13	893.78	0.000	0.000	123.95	0.00	0.00
33	95.00	Powerwave LGP17201	6	4.872	5.359	0.50	0.75	8.75	376.87	0.000	0.000	46.89	0.00	0.00
34	95.00	Cci OPA65R-BU6DA	3	4.872	5.359	0.55	0.75	23.21	1046.38	0.000	0.000	124.36	0.00	0.00
35	95.00	Low Profile Platform	1	4.872	5.359	1.00	1.00	70.41	4600.75	0.000	0.000	377.34	0.00	0.00
36	95.00	Ericsson 4426 B66	3	4.872	5.359	0.50	0.75	2.41	285.00	0.000	0.000	12.93	0.00	0.00
37	95.00	Ericsson RRUS 4478 B14	3	4.872	5.359	0.50	0.75	3.53	315.25	0.000	0.000	18.93	0.00	0.00
38	95.00	Ericsson RRUS 32 B30	3	4.872	5.359	0.50	0.75	3.32	414.13	0.000	0.000	17.78	0.00	0.00
39	95.00	Ericsson RRUS 4415 B25	3	4.872	5.359	0.50	0.75	3.21	255.20	0.000	0.000	17.23	0.00	0.00
40	95.00	Ericsson RRUS A2	3	4.872	5.359	0.50	0.75	4.21	149.21	0.000	0.000	22.54	0.00	0.00
41	95.00	Raycap DC6-48-60-18-8F	2	4.872	5.359	0.75	0.75	2.01	159.05	0.000	0.000	10.76	0.00	0.00
42	95.00	Raycap	1	4.872	5.359	0.75	0.75	1.99	115.60	0.000	0.000	10.68	0.00	0.00
43	95.00	HRK14	1	4.872	5.359	1.00	1.00	15.72	1008.00	0.000	0.000	84.25	0.00	0.00
44	93.00	Ericcson Air6449 B77D	3	4.850	5.335	0.64	0.75	9.46	706.78	0.000	0.000	50.45	0.00	0.00
45	70.00	Standoff	1	4.569	5.025	1.00	1.00	8.16	99.39	0.000	0.000	41.01	0.00	0.00
46	70.00	GPS	1	4.569	5.025	1.00	1.00	1.66	31.17	0.000	0.000	8.34	0.00	0.00
							Totals:		**29,837.65**			**3,485.66**		

Total Applied Force Summary

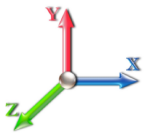
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		116.71	2364.99	0.00	0.00
10.00		115.48	2374.76	0.00	0.00
15.00		114.13	2364.84	0.00	0.00
20.00		119.61	2346.27	0.00	0.00
21.00		23.97	465.98	0.00	0.00
25.00		101.17	2750.91	0.00	0.00
27.75		74.18	1888.47	0.00	0.00
28.00		6.73	170.86	0.00	0.00
30.00		54.25	852.48	0.00	0.00
35.00		138.92	2115.32	0.00	0.00
40.00		141.09	2090.06	0.00	0.00
40.75		21.09	311.33	0.00	0.00
45.00		119.89	1746.35	0.00	0.00
50.00		134.79	1995.67	0.00	0.00
55.00		135.59	1966.22	0.00	0.00
60.00		136.12	1935.96	0.00	0.00
65.00		136.42	1905.00	0.00	0.00
70.00	(2) attachments	187.69	2907.07	0.00	0.00
71.00		27.50	549.03	0.00	0.00
75.00		109.86	1486.31	0.00	0.00
80.00		137.32	1827.86	0.00	0.00
85.00		136.97	1794.91	0.00	0.00
90.00		136.49	1761.58	0.00	0.00
93.00	(3) attachments	131.88	1748.62	0.00	0.00
95.00	(44) attachments	953.38	10758.23	0.00	0.00
97.00	(3) attachments	86.65	998.86	0.00	0.00
100.00		66.42	817.71	0.00	0.00
105.00	(2) attachments	190.88	1516.23	0.00	179.08
110.00		106.80	1295.13	0.00	0.00
115.00		105.77	1810.90	0.00	0.00
120.00		103.23	1107.65	0.00	0.00
123.00	(24) attachments	978.42	7422.70	0.00	0.00
125.00		39.82	382.84	0.00	0.00
130.00		97.90	931.40	0.00	0.00
131.00	(25) attachments	736.09	6827.56	0.00	0.00
135.00		75.79	663.33	0.00	0.00
140.00		92.22	799.17	0.00	0.00
145.00		89.27	767.05	0.00	0.00
150.00		86.25	734.79	0.00	0.00
153.00	(24) attachments	778.29	5310.76	0.00	0.00
	Totals:	**7,145.01**	**83,865.16**	**0.00**	**179.08**

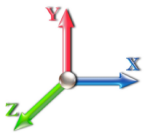
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.38	1.19	0.00	0.107	1.022	3.308	0.00	12.93
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.69	0.00	0.107	1.022	3.308	0.00	166.38
5.00	1" DC	Yes	5.00	0.000	1.00	1.45	0.00	0.107	1.022	3.308	0.00	35.97
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.19	0.00	0.107	1.022	3.308	0.00	16.19
5.00	3/4" DC	Yes	5.00	0.000	0.75	1.35	0.00	0.107	1.022	3.308	0.00	34.45
10.00	Safety Cable	Yes	5.00	0.000	0.38	1.27	0.00	0.110	1.029	3.308	0.00	14.46
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.76	0.00	0.110	1.029	3.308	0.00	173.96
10.00	1" DC	Yes	5.00	0.000	1.00	1.53	0.00	0.110	1.029	3.308	0.00	38.41
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.27	0.00	0.110	1.029	3.308	0.00	17.99
10.00	3/4" DC	Yes	5.00	0.000	0.75	1.42	0.00	0.110	1.029	3.308	0.00	36.89
15.00	Safety Cable	Yes	5.00	0.000	0.38	1.31	0.00	0.112	1.036	3.308	0.00	15.46
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.81	0.00	0.112	1.036	3.308	0.00	178.69
15.00	1" DC	Yes	5.00	0.000	1.00	1.57	0.00	0.112	1.036	3.308	0.00	39.96
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.31	0.00	0.112	1.036	3.308	0.00	19.15
15.00	3/4" DC	Yes	5.00	0.000	0.75	1.47	0.00	0.112	1.036	3.308	0.00	38.45
20.00	Safety Cable	Yes	5.00	0.000	0.38	1.35	0.00	0.114	1.043	3.509	0.00	16.21
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.84	0.00	0.114	1.043	3.509	0.00	182.19
20.00	1" DC	Yes	5.00	0.000	1.00	1.61	0.00	0.114	1.043	3.509	0.00	41.13
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.35	0.00	0.114	1.043	3.509	0.00	20.02
20.00	3/4" DC	Yes	5.00	0.000	0.75	1.50	0.00	0.114	1.043	3.509	0.00	39.62
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.27	0.00	0.116	1.048	3.546	0.00	3.27
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.57	0.00	0.116	1.048	3.546	0.00	36.56
21.00	1" DC	Yes	1.00	0.000	1.00	0.32	0.00	0.116	1.048	3.546	0.00	8.27
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.27	0.00	0.116	1.048	3.546	0.00	4.03
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.30	0.00	0.116	1.048	3.546	0.00	7.96
25.00	Safety Cable	Yes	4.00	0.000	0.38	1.10	0.00	0.122	1.065	3.678	0.00	13.46
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	2.29	0.00	0.122	1.065	3.678	0.00	147.99
25.00	1" DC	Yes	4.00	0.000	1.00	1.31	0.00	0.122	1.065	3.678	0.00	33.66
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	1.10	0.00	0.122	1.065	3.678	0.00	16.58
25.00	3/4" DC	Yes	4.00	0.000	0.75	1.22	0.00	0.122	1.065	3.678	0.00	32.45
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.26	0.00	0.122	1.065	3.678	0.00	5.44
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.76	0.00	0.142	1.126	3.760	0.00	9.42
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	1.58	0.00	0.142	1.126	3.760	0.00	102.48
27.75	1" DC	Yes	2.75	0.000	1.00	0.90	0.00	0.142	1.126	3.760	0.00	23.39
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.76	0.00	0.142	1.126	3.760	0.00	11.59
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.85	0.00	0.142	1.126	3.760	0.00	22.56
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.96	0.00	0.142	1.126	3.760	0.00	20.20
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.07	0.00	0.143	1.129	3.767	0.00	0.86
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.14	0.00	0.143	1.129	3.767	0.00	9.32
28.00	1" DC	Yes	0.25	0.000	1.00	0.08	0.00	0.143	1.129	3.767	0.00	2.13
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.07	0.00	0.143	1.129	3.767	0.00	1.06
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.08	0.00	0.143	1.129	3.767	0.00	2.05
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.09	0.00	0.143	1.129	3.767	0.00	1.84
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.56	0.00	0.142	1.127	3.822	0.00	6.94
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	1.16	0.00	0.142	1.127	3.822	0.00	74.93
30.00	1" DC	Yes	2.00	0.000	1.00	0.66	0.00	0.142	1.127	3.822	0.00	17.15
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.56	0.00	0.142	1.127	3.822	0.00	8.53

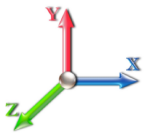
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.62	0.00	0.142	1.127	3.822	0.00	16.54
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.70	0.00	0.142	1.127	3.822	0.00	14.84
35.00	Safety Cable	Yes	5.00	0.000	0.38	1.42	0.00	0.145	1.134	3.948	0.00	17.80
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.91	0.00	0.145	1.134	3.948	0.00	189.35
35.00	1" DC	Yes	5.00	0.000	1.00	1.67	0.00	0.145	1.134	3.948	0.00	43.56
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.42	0.00	0.145	1.134	3.948	0.00	21.86
35.00	3/4" DC	Yes	5.00	0.000	0.75	1.57	0.00	0.145	1.134	3.948	0.00	42.05
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	1.78	0.00	0.145	1.134	3.948	0.00	37.87
40.00	Safety Cable	Yes	5.00	0.000	0.38	1.43	0.00	0.148	1.144	4.061	0.00	18.21
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.92	0.00	0.148	1.144	4.061	0.00	191.14
40.00	1" DC	Yes	5.00	0.000	1.00	1.69	0.00	0.148	1.144	4.061	0.00	44.18
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.43	0.00	0.148	1.144	4.061	0.00	22.32
40.00	3/4" DC	Yes	5.00	0.000	0.75	1.59	0.00	0.148	1.144	4.061	0.00	42.66
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	1.80	0.00	0.148	1.144	4.061	0.00	38.54
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.22	0.00	0.150	1.150	4.077	0.00	2.74
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.44	0.00	0.150	1.150	4.077	0.00	28.71
40.75	1" DC	Yes	0.75	0.000	1.00	0.25	0.00	0.150	1.150	4.077	0.00	6.64
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.22	0.00	0.150	1.150	4.077	0.00	3.36
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.24	0.00	0.150	1.150	4.077	0.00	6.41
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.27	0.00	0.150	1.150	4.077	0.00	5.80
45.00	Safety Cable	Yes	4.25	0.000	0.38	1.23	0.00	0.148	1.143	4.163	0.00	15.79
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	2.50	0.00	0.148	1.143	4.163	0.00	163.82
45.00	1" DC	Yes	4.25	0.000	1.00	1.45	0.00	0.148	1.143	4.163	0.00	38.02
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	1.23	0.00	0.148	1.143	4.163	0.00	19.33
45.00	3/4" DC	Yes	4.25	0.000	0.75	1.36	0.00	0.148	1.143	4.163	0.00	36.73
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	1.27	0.00	0.148	1.143	4.163	0.00	27.40
50.00	Safety Cable	Yes	5.00	0.000	0.38	1.46	0.00	0.130	1.091	4.256	0.00	18.91
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.95	0.00	0.130	1.091	4.256	0.00	194.18
50.00	1" DC	Yes	5.00	0.000	1.00	1.72	0.00	0.130	1.091	4.256	0.00	45.23
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.46	0.00	0.130	1.091	4.256	0.00	23.13
50.00	3/4" DC	Yes	5.00	0.000	0.75	1.62	0.00	0.130	1.091	4.256	0.00	43.72
55.00	Safety Cable	Yes	5.00	0.000	0.38	1.47	0.00	0.134	1.101	4.342	0.00	19.22
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.97	0.00	0.134	1.101	4.342	0.00	195.50
55.00	1" DC	Yes	5.00	0.000	1.00	1.73	0.00	0.134	1.101	4.342	0.00	45.69
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.47	0.00	0.134	1.101	4.342	0.00	23.48
55.00	3/4" DC	Yes	5.00	0.000	0.75	1.63	0.00	0.134	1.101	4.342	0.00	44.18
60.00	Safety Cable	Yes	5.00	0.000	0.38	1.49	0.00	0.137	1.112	4.423	0.00	19.51
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.98	0.00	0.137	1.112	4.423	0.00	196.73
60.00	1" DC	Yes	5.00	0.000	1.00	1.74	0.00	0.137	1.112	4.423	0.00	46.12
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.49	0.00	0.137	1.112	4.423	0.00	23.81
60.00	3/4" DC	Yes	5.00	0.000	0.75	1.64	0.00	0.137	1.112	4.423	0.00	44.61
65.00	Safety Cable	Yes	5.00	0.000	0.38	1.50	0.00	0.141	1.123	4.498	0.00	19.78
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	2.99	0.00	0.141	1.123	4.498	0.00	197.86
65.00	1" DC	Yes	5.00	0.000	1.00	1.75	0.00	0.141	1.123	4.498	0.00	46.52
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.50	0.00	0.141	1.123	4.498	0.00	24.12
65.00	3/4" DC	Yes	5.00	0.000	0.75	1.65	0.00	0.141	1.123	4.498	0.00	45.01
70.00	Safety Cable	Yes	5.00	0.000	0.38	1.51	0.00	0.145	1.135	4.569	0.00	20.03

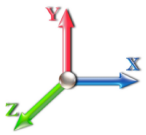
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.00	0.00	0.145	1.135	4.569	0.00	198.93
70.00	1" DC	Yes	5.00	0.000	1.00	1.76	0.00	0.145	1.135	4.569	0.00	46.89
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.51	0.00	0.145	1.135	4.569	0.00	24.41
70.00	3/4" DC	Yes	5.00	0.000	0.75	1.66	0.00	0.145	1.135	4.569	0.00	45.38
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.30	0.00	0.147	1.142	4.582	0.00	4.02
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.60	0.00	0.147	1.142	4.582	0.00	39.83
71.00	1" DC	Yes	1.00	0.000	1.00	0.35	0.00	0.147	1.142	4.582	0.00	9.39
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.30	0.00	0.147	1.142	4.582	0.00	4.89
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.33	0.00	0.147	1.142	4.582	0.00	9.09
75.00	Safety Cable	Yes	4.00	0.000	0.38	1.21	0.00	0.147	1.142	4.635	0.00	16.21
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	2.41	0.00	0.147	1.142	4.635	0.00	159.94
75.00	1" DC	Yes	4.00	0.000	1.00	1.42	0.00	0.147	1.142	4.635	0.00	37.80
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	1.21	0.00	0.147	1.142	4.635	0.00	19.74
75.00	3/4" DC	Yes	4.00	0.000	0.75	1.34	0.00	0.147	1.142	4.635	0.00	36.59
80.00	Safety Cable	Yes	5.00	0.000	0.38	1.52	0.00	0.151	1.154	4.699	0.00	20.49
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.02	0.00	0.151	1.154	4.699	0.00	200.87
80.00	1" DC	Yes	5.00	0.000	1.00	1.78	0.00	0.151	1.154	4.699	0.00	47.58
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.52	0.00	0.151	1.154	4.699	0.00	24.93
80.00	3/4" DC	Yes	5.00	0.000	0.75	1.68	0.00	0.151	1.154	4.699	0.00	46.07
85.00	Safety Cable	Yes	5.00	0.000	0.38	1.53	0.00	0.156	1.167	4.759	0.00	20.71
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.02	0.00	0.156	1.167	4.759	0.00	201.76
85.00	1" DC	Yes	5.00	0.000	1.00	1.79	0.00	0.156	1.167	4.759	0.00	47.90
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.53	0.00	0.156	1.167	4.759	0.00	25.18
85.00	3/4" DC	Yes	5.00	0.000	0.75	1.69	0.00	0.156	1.167	4.759	0.00	46.38
90.00	Safety Cable	Yes	5.00	0.000	0.38	1.54	0.00	0.161	1.182	4.817	0.00	20.91
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.03	0.00	0.161	1.182	4.817	0.00	202.60
90.00	1" DC	Yes	5.00	0.000	1.00	1.80	0.00	0.161	1.182	4.817	0.00	48.20
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.54	0.00	0.161	1.182	4.817	0.00	25.41
90.00	3/4" DC	Yes	5.00	0.000	0.75	1.69	0.00	0.161	1.182	4.817	0.00	46.68
93.00	Safety Cable	Yes	3.00	0.000	0.38	0.93	0.00	0.165	1.194	4.850	0.00	12.62
93.00	1 5/8" Coax	Yes	3.00	0.000	3.96	1.82	0.00	0.165	1.194	4.850	0.00	121.85
93.00	1" DC	Yes	3.00	0.000	1.00	1.08	0.00	0.165	1.194	4.850	0.00	29.02
93.00	1/2" Fiber	Yes	3.00	0.000	0.38	0.93	0.00	0.165	1.194	4.850	0.00	15.33
93.00	3/4" DC	Yes	3.00	0.000	0.75	1.02	0.00	0.165	1.194	4.850	0.00	28.12
95.00	Safety Cable	Yes	2.00	0.000	0.38	0.62	0.00	0.167	1.202	4.872	0.00	8.44
95.00	1 5/8" Coax	Yes	2.00	0.000	3.96	1.22	0.00	0.167	1.202	4.872	0.00	81.36
95.00	1" DC	Yes	2.00	0.000	1.00	0.72	0.00	0.167	1.202	4.872	0.00	19.39
95.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.62	0.00	0.167	1.202	4.872	0.00	10.25
95.00	3/4" DC	Yes	2.00	0.000	0.75	0.68	0.00	0.167	1.202	4.872	0.00	18.79
97.00	Safety Cable	Yes	2.00	0.000	0.38	0.62	0.00	0.010	0.000	4.893	0.00	8.47
100.00	Safety Cable	Yes	3.00	0.000	0.38	0.93	0.00	0.010	0.000	4.925	0.00	12.78
105.00	Safety Cable	Yes	5.00	0.000	0.38	1.56	0.00	0.010	0.000	4.976	0.00	21.48
110.00	Safety Cable	Yes	5.00	0.000	0.38	1.57	0.00	0.011	0.000	5.025	0.00	21.65
115.00	Safety Cable	Yes	5.00	0.000	0.38	1.57	0.00	0.011	0.000	5.072	0.00	21.82
120.00	Safety Cable	Yes	5.00	0.000	0.38	1.58	0.00	0.011	0.000	5.117	0.00	21.98
123.00	Safety Cable	Yes	3.00	0.000	0.38	0.95	0.00	0.012	0.000	5.144	0.00	13.24
125.00	Safety Cable	Yes	2.00	0.000	0.38	0.63	0.00	0.012	0.000	5.162	0.00	8.85

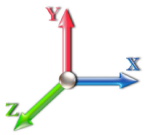
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
130.00	Safety Cable	Yes	5.00	0.000	0.38	1.59	0.00	0.012	0.000	5.204	0.00	22.29
131.00	Safety Cable	Yes	1.00	0.000	0.38	0.32	0.00	0.013	0.000	5.213	0.00	4.46
135.00	Safety Cable	Yes	4.00	0.000	0.38	1.28	0.00	0.013	0.000	5.246	0.00	17.95
140.00	Safety Cable	Yes	5.00	0.000	0.38	1.60	0.00	0.013	0.000	5.286	0.00	22.57
145.00	Safety Cable	Yes	5.00	0.000	0.38	1.61	0.00	0.014	0.000	5.325	0.00	22.71
150.00	Safety Cable	Yes	5.00	0.000	0.38	1.61	0.00	0.015	0.000	5.364	0.00	22.85
153.00	Safety Cable	Yes	3.00	0.000	0.38	0.97	0.00	0.015	0.000	5.386	0.00	13.76
										Totals:	**0.0**	**6,476.5**

Calculated Forces

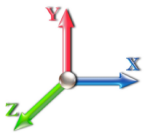
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-83.86	-7.17	0.00	-737.53	0.00	737.53	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.153
5.00	-81.49	-7.10	0.00	-701.69	0.00	701.69	4413.36	2206.68	10604.1	5309.95	0.02	-0.032	0.000	0.151
10.00	-79.12	-7.02	0.00	-666.20	0.00	666.20	4361.89	2180.94	10257.6	5136.44	0.07	-0.065	0.000	0.148
15.00	-76.75	-6.95	0.00	-631.08	0.00	631.08	4308.61	2154.31	9912.23	4963.48	0.15	-0.097	0.000	0.145
20.00	-74.40	-6.85	0.00	-596.33	0.00	596.33	4253.53	2126.77	9568.22	4791.22	0.27	-0.131	0.000	0.142
21.00	-73.93	-6.85	0.00	-589.47	0.00	589.47	4242.30	2121.15	9499.61	4756.87	0.30	-0.138	0.000	0.141
25.00	-71.18	-6.77	0.00	-562.08	0.00	562.08	4196.65	2098.33	9225.87	4619.79	0.43	-0.165	0.000	0.139
27.75	-69.29	-6.70	0.00	-543.46	0.00	543.46	4164.60	2082.30	9038.39	4525.91	0.53	-0.183	0.000	0.090
28.00	-69.12	-6.70	0.00	-541.79	0.00	541.79	3213.57	1606.78	7065.87	3538.19	0.54	-0.185	0.000	0.100
30.00	-68.26	-6.66	0.00	-528.38	0.00	528.38	3199.34	1599.67	6969.21	3489.78	0.62	-0.194	0.000	0.108
35.00	-66.14	-6.55	0.00	-495.07	0.00	495.07	3162.51	1581.26	6727.41	3368.71	0.83	-0.218	0.000	0.104
40.00	-64.05	-6.41	0.00	-462.34	0.00	462.34	3123.88	1561.94	6485.64	3247.64	1.08	-0.242	0.000	0.100
40.75	-63.74	-6.40	0.00	-457.53	0.00	457.53	3117.93	1558.96	6449.39	3229.49	1.11	-0.246	0.000	0.099
40.75	-63.74	-6.40	0.00	-457.53	0.00	457.53	3117.93	1558.96	6449.39	3229.49	1.11	-0.246	0.000	0.099
45.00	-61.99	-6.31	0.00	-430.32	0.00	430.32	3083.44	1541.72	6244.17	3126.72	1.34	-0.267	0.000	0.158
50.00	-59.99	-6.20	0.00	-398.79	0.00	398.79	3041.20	1520.60	6003.26	3006.09	1.64	-0.306	0.000	0.152
55.00	-58.02	-6.10	0.00	-367.77	0.00	367.77	2997.16	1498.58	5763.21	2885.89	1.99	-0.346	0.000	0.147
60.00	-56.08	-5.99	0.00	-337.28	0.00	337.28	2951.32	1475.66	5524.28	2766.24	2.37	-0.385	0.000	0.141
65.00	-54.18	-5.87	0.00	-307.35	0.00	307.35	2903.67	1451.83	5286.75	2647.30	2.79	-0.424	0.000	0.135
70.00	-51.27	-5.68	0.00	-277.98	0.00	277.98	2854.22	1427.11	5050.90	2529.20	3.26	-0.462	0.000	0.128
71.00	-50.72	-5.67	0.00	-272.30	0.00	272.30	2869.57	1434.79	5123.02	2565.32	3.36	-0.470	0.000	0.124
75.00	-49.23	-5.57	0.00	-249.62	0.00	249.62	2829.16	1414.58	4935.24	2471.29	3.76	-0.500	0.000	0.118
80.00	-47.40	-5.45	0.00	-221.75	0.00	221.75	2777.01	1388.51	4702.41	2354.70	4.31	-0.535	0.000	0.111
85.00	-45.60	-5.32	0.00	-194.51	0.00	194.51	2723.06	1361.53	4471.94	2239.29	4.88	-0.569	0.000	0.104
90.00	-43.84	-5.19	0.00	-167.90	0.00	167.90	2667.31	1333.66	4244.12	2125.22	5.50	-0.601	0.000	0.095
93.00	-42.09	-5.05	0.00	-152.34	0.00	152.34	2633.00	1316.50	4108.81	2057.46	5.88	-0.620	0.000	0.090
95.00	-31.34	-3.98	0.00	-142.25	0.00	142.25	2609.76	1304.88	4019.22	2012.60	6.14	-0.632	0.000	0.083
97.00	-30.34	-3.89	0.00	-134.29	0.00	134.29	2586.23	1293.12	3930.14	1967.99	6.41	-0.644	0.000	0.080
100.00	-29.53	-3.83	0.00	-122.61	0.00	122.61	2550.40	1275.20	3797.52	1901.58	6.82	-0.661	0.000	0.076
105.00	-28.01	-3.63	0.00	-103.29	0.00	103.29	2489.24	1244.62	3579.29	1792.30	7.53	-0.688	0.000	0.069
110.00	-26.72	-3.52	0.00	-85.13	0.00	85.13	2426.28	1213.14	3364.80	1684.90	8.26	-0.713	0.000	0.062
115.00	-24.91	-3.40	0.00	-67.52	0.00	67.52	1783.00	891.50	2427.68	1215.65	9.02	-0.735	0.000	0.070
120.00	-23.80	-3.29	0.00	-50.52	0.00	50.52	1739.91	869.95	2280.12	1141.75	9.80	-0.755	0.000	0.058
123.00	-16.39	-2.22	0.00	-40.65	0.00	40.65	1713.19	856.59	2192.59	1097.92	10.28	-0.767	0.000	0.047
125.00	-16.01	-2.17	0.00	-36.22	0.00	36.22	1695.01	847.51	2134.69	1068.93	10.60	-0.774	0.000	0.043
130.00	-15.08	-2.07	0.00	-25.35	0.00	25.35	1648.31	824.16	1991.67	997.31	11.42	-0.789	0.000	0.035
131.00	-8.26	-1.24	0.00	-23.28	0.00	23.28	1638.75	819.38	1963.38	983.15	11.59	-0.792	0.000	0.029
135.00	-7.60	-1.15	0.00	-18.33	0.00	18.33	1599.81	799.90	1851.33	927.04	12.26	-0.801	0.000	0.025
140.00	-6.80	-1.05	0.00	-12.57	0.00	12.57	1549.50	774.75	1713.96	858.25	13.10	-0.811	0.000	0.019
145.00	-6.03	-0.95	0.00	-7.32	0.00	7.32	1497.39	748.69	1579.82	791.09	13.96	-0.818	0.000	0.013
150.00	-5.30	-0.85	0.00	-2.56	0.00	2.56	1443.48	721.74	1449.20	725.68	14.81	-0.822	0.000	0.007
150.00	-5.30	-0.85	0.00	-2.56	0.00	2.56	1443.48	721.74	1449.20	725.68	14.81	-0.822	0.000	0.007
153.00	0.00	-0.78	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	15.33	-0.823	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

IES Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	20
Gust Response Factor	1.10				**Sds**	0.12		**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.04		**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.40		**SA**	0.02	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1194.9	0.00	0.03	0.02	15.75	
10.00		1169.9	0.01	0.05	0.03	21.75	
15.00		1144.9	0.02	0.06	0.04	24.25	
20.00		1119.9	0.03	0.07	0.04	25.19	
21.00	Bot - Section 2	221.00	0.04	0.07	0.04	5.01	
25.00		1611.6	0.05	0.07	0.04	37.46	
27.75	RB1	1090.9	0.06	0.07	0.04	25.71	
28.00	Top - Section 1	98.49	0.06	0.07	0.04	2.32	
30.00		358.81	0.07	0.07	0.04	8.55	
35.00		882.46	0.10	0.07	0.04	21.53	
40.00		861.64	0.13	0.07	0.03	21.54	
40.75	RT1	127.45	0.13	0.07	0.03	3.20	
45.00		713.37	0.16	0.07	0.03	18.19	
50.00		820.00	0.20	0.06	0.02	21.07	
55.00		799.19	0.24	0.06	0.02	20.11	
60.00		778.37	0.29	0.05	0.01	18.19	
65.00	Bot - Section 3	757.55	0.34	0.04	0.01	14.89	
70.00	Appurtenance(s)	1534.0	0.40	0.02	0.01	20.63	
71.00	Top - Section 2	291.81	0.41	0.02	0.01	3.47	
75.00		579.50	0.45	0.00	0.01	2.74	
80.00		705.64	0.52	-0.02	0.01	-3.88	
85.00		684.82	0.58	-0.05	0.01	-10.47	
90.00		664.01	0.65	-0.07	0.02	-15.14	
93.00	Appurtenance(s)	652.41	0.70	-0.09	0.03	-16.84	
95.00	Appurtenance(s)	3735.1	0.73	-0.10	0.04	-101.31	
97.00	Appurtenance(s)	449.75	0.76	-0.10	0.04	-12.54	
100.00		370.92	0.81	-0.11	0.06	-10.40	
105.00	Appurtenance(s)	666.55	0.89	-0.12	0.08	-17.13	
110.00	Bot - Section 4	580.73	0.98	-0.11	0.12	-11.78	
115.00	Top - Section 3	1015.4	1.07	-0.09	0.17	-12.08	
120.00		438.87	1.16	-0.03	0.23	-0.25	
123.00	Appurtenance(s)	2601.0	1.22	0.03	0.27	19.84	
125.00		166.89	1.26	0.07	0.30	2.28	
130.00		405.56	1.36	0.22	0.40	12.55	
131.00	Appurtenance(s)	2996.2	1.39	0.26	0.42	104.11	
135.00		309.79	1.47	0.43	0.51	15.87	
140.00		372.25	1.58	0.73	0.65	27.79	
145.00		355.60	1.70	1.11	0.81	36.02	
150.00	Top - Section 4	338.95	1.82	1.62	1.01	44.47	
153.00	Appurtenance(s)	2270.7	1.89	1.98	1.14	342.35	
	Totals:	**35,937.4**				**725.0**	**Total Wind:** **37,036.8**

Calculated Forces

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Iterations 20

Gust Response Factor	1.10			**Sds**	0.12			**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.04			**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.40	**SA**	0.02	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-49.73	-0.94	0.00	-103.74	0.00	103.74	4463.02	2231.51	10951.4	5483.88		0.00	0.00	0.030
5.00	-48.02	-0.93	0.00	-99.05	0.00	99.05	4413.36	2206.68	10604.1	5309.95		0.00	0.00	0.030
10.00	-46.33	-0.91	0.00	-94.42	0.00	94.42	4361.89	2180.94	10257.6	5136.44		0.01	-0.01	0.029
15.00	-44.68	-0.89	0.00	-89.88	0.00	89.88	4308.61	2154.31	9912.23	4963.48		0.02	-0.01	0.028
20.00	-43.06	-0.86	0.00	-85.44	0.00	85.44	4253.53	2126.77	9568.22	4791.22		0.04	-0.02	0.028
21.00	-42.74	-0.86	0.00	-84.58	0.00	84.58	4242.30	2121.15	9499.61	4756.87		0.04	-0.02	0.028
25.00	-40.59	-0.82	0.00	-81.14	0.00	81.14	4196.65	2098.33	9225.87	4619.79		0.06	-0.02	0.027
27.75	-39.12	-0.80	0.00	-78.87	0.00	78.87	4164.60	2082.30	9038.39	4525.91		0.08	-0.03	0.018
28.00	-38.99	-0.80	0.00	-78.67	0.00	78.67	3213.57	1606.78	7065.87	3538.19		0.08	-0.03	0.020
30.00	-38.45	-0.79	0.00	-77.07	0.00	77.07	3199.34	1599.67	6969.21	3489.78		0.09	-0.03	0.021
35.00	-37.11	-0.77	0.00	-73.12	0.00	73.12	3162.51	1581.26	6727.41	3368.71		0.12	-0.03	0.021
40.00	-35.80	-0.75	0.00	-69.27	0.00	69.27	3123.88	1561.94	6485.64	3247.64		0.15	-0.03	0.020
40.75	-35.61	-0.75	0.00	-68.71	0.00	68.71	3117.93	1558.96	6449.39	3229.49		0.16	-0.04	0.020
40.75	-35.61	-0.75	0.00	-68.71	0.00	68.71	3117.93	1558.96	6449.39	3229.49		0.16	-0.04	0.020
45.00	-34.51	-0.73	0.00	-65.54	0.00	65.54	3083.44	1541.72	6244.17	3126.72		0.19	-0.04	0.032
50.00	-33.25	-0.71	0.00	-61.88	0.00	61.88	3041.20	1520.60	6003.26	3006.09		0.24	-0.04	0.032
55.00	-32.02	-0.69	0.00	-58.32	0.00	58.32	2997.16	1498.58	5763.21	2885.89		0.29	-0.05	0.031
60.00	-30.81	-0.68	0.00	-54.84	0.00	54.84	2951.32	1475.66	5524.28	2766.24		0.34	-0.06	0.030
65.00	-29.62	-0.67	0.00	-51.45	0.00	51.45	2903.67	1451.83	5286.75	2647.30		0.40	-0.06	0.030
70.00	-27.50	-0.65	0.00	-48.12	0.00	48.12	2854.22	1427.11	5050.90	2529.20		0.47	-0.07	0.029
71.00	-27.09	-0.64	0.00	-47.47	0.00	47.47	2869.57	1434.79	5123.02	2565.32		0.49	-0.07	0.028
75.00	-26.18	-0.64	0.00	-44.90	0.00	44.90	2829.16	1414.58	4935.24	2471.29		0.55	-0.08	0.027
80.00	-25.05	-0.64	0.00	-41.69	0.00	41.69	2777.01	1388.51	4702.41	2354.70		0.64	-0.08	0.027
85.00	-23.95	-0.64	0.00	-38.48	0.00	38.48	2723.06	1361.53	4471.94	2239.29		0.73	-0.09	0.026
90.00	-22.88	-0.64	0.00	-35.26	0.00	35.26	2667.31	1333.66	4244.12	2125.22		0.82	-0.10	0.025
93.00	-21.93	-0.64	0.00	-33.33	0.00	33.33	2633.00	1316.50	4108.81	2057.46		0.89	-0.10	0.025
95.00	-17.34	-0.64	0.00	-32.04	0.00	32.04	2609.76	1304.88	4019.22	2012.60		0.93	-0.10	0.023
97.00	-16.72	-0.64	0.00	-30.77	0.00	30.77	2586.23	1293.12	3930.14	1967.99		0.97	-0.11	0.022
100.00	-16.15	-0.64	0.00	-28.86	0.00	28.86	2550.40	1275.20	3797.52	1901.58		1.04	-0.11	0.022
105.00	-15.15	-0.64	0.00	-25.68	0.00	25.68	2489.24	1244.62	3579.29	1792.30		1.16	-0.12	0.020
110.00	-14.26	-0.64	0.00	-22.49	0.00	22.49	2426.28	1213.14	3364.80	1684.90		1.28	-0.12	0.019
115.00	-12.84	-0.63	0.00	-19.31	0.00	19.31	1783.00	891.50	2427.68	1215.65		1.41	-0.13	0.023
120.00	-12.11	-0.63	0.00	-16.14	0.00	16.14	1739.91	869.95	2280.12	1141.75		1.55	-0.13	0.021
123.00	-8.87	-0.61	0.00	-14.24	0.00	14.24	1713.19	856.59	2192.59	1097.92		1.64	-0.14	0.018
125.00	-8.64	-0.60	0.00	-13.02	0.00	13.02	1695.01	847.51	2134.69	1068.93		1.70	-0.14	0.017
130.00	-8.06	-0.59	0.00	-10.00	0.00	10.00	1648.31	824.16	1991.67	997.31		1.85	-0.15	0.015
131.00	-4.45	-0.48	0.00	-9.41	0.00	9.41	1638.75	819.38	1963.38	983.15		1.88	-0.15	0.012
135.00	-4.07	-0.46	0.00	-7.50	0.00	7.50	1599.81	799.90	1851.33	927.04		2.00	-0.15	0.011
140.00	-3.60	-0.43	0.00	-5.19	0.00	5.19	1549.50	774.75	1713.96	858.25		2.16	-0.16	0.008
145.00	-3.16	-0.40	0.00	-3.03	0.00	3.03	1497.39	748.69	1579.82	791.09		2.33	-0.16	0.006
150.00	-2.73	-0.35	0.00	-1.05	0.00	1.05	1443.48	721.74	1449.20	725.68		2.50	-0.16	0.003
150.00	-2.73	-0.35	0.00	-1.05	0.00	1.05	1443.48	721.74	1449.20	725.68		2.50	-0.16	0.003
153.00	0.00	-0.34	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38		2.60	-0.16	0.000

Seismic Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	19
Gust Response Factor	1.10				**Sds**	0.12		**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.04		**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.40		**SA**	0.02	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1194.9	0.00	0.03	0.02	15.75	
10.00		1169.9	0.01	0.05	0.03	21.75	
15.00		1144.9	0.02	0.06	0.04	24.25	
20.00		1119.9	0.03	0.07	0.04	25.19	
21.00	Bot - Section 2	221.00	0.04	0.07	0.04	5.01	
25.00		1611.6	0.05	0.07	0.04	37.46	
27.75	RB1	1090.9	0.06	0.07	0.04	25.71	
28.00	Top - Section 1	98.49	0.06	0.07	0.04	2.32	
30.00		358.81	0.07	0.07	0.04	8.55	
35.00		882.46	0.10	0.07	0.04	21.53	
40.00		861.64	0.13	0.07	0.03	21.54	
40.75	RT1	127.45	0.13	0.07	0.03	3.20	
45.00		713.37	0.16	0.07	0.03	18.19	
50.00		820.00	0.20	0.06	0.02	21.07	
55.00		799.19	0.24	0.06	0.02	20.11	
60.00		778.37	0.29	0.05	0.01	18.19	
65.00	Bot - Section 3	757.55	0.34	0.04	0.01	14.89	
70.00	Appurtenance(s)	1534.0	0.40	0.02	0.01	20.63	
71.00	Top - Section 2	291.81	0.41	0.02	0.01	3.47	
75.00		579.50	0.45	0.00	0.01	2.74	
80.00		705.64	0.52	-0.02	0.01	-3.88	
85.00		684.82	0.58	-0.05	0.01	-10.47	
90.00		664.01	0.65	-0.07	0.02	-15.14	
93.00	Appurtenance(s)	652.41	0.70	-0.09	0.03	-16.84	
95.00	Appurtenance(s)	3735.1	0.73	-0.10	0.04	-101.31	
97.00	Appurtenance(s)	449.75	0.76	-0.10	0.04	-12.54	
100.00		370.92	0.81	-0.11	0.06	-10.40	
105.00	Appurtenance(s)	666.55	0.89	-0.12	0.08	-17.13	
110.00	Bot - Section 4	580.73	0.98	-0.11	0.12	-11.78	
115.00	Top - Section 3	1015.4	1.07	-0.09	0.17	-12.08	
120.00		438.87	1.16	-0.03	0.23	-0.25	
123.00	Appurtenance(s)	2601.0	1.22	0.03	0.27	19.84	
125.00		166.89	1.26	0.07	0.30	2.28	
130.00		405.56	1.36	0.22	0.40	12.55	
131.00	Appurtenance(s)	2996.2	1.39	0.26	0.42	104.11	
135.00		309.79	1.47	0.43	0.51	15.87	
140.00		372.25	1.58	0.73	0.65	27.79	
145.00		355.60	1.70	1.11	0.81	36.02	
150.00	Top - Section 4	338.95	1.82	1.62	1.01	44.47	
153.00	Appurtenance(s)	2270.7	1.89	1.98	1.14	342.35	
	Totals:	**35,937.4**				**725.0**	**Total Wind:** **37,036.8**

Calculated Forces

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 36

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Iterations 19

Gust Response Factor	1.10			**Sds**	0.12			**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.04			**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.40	**SA**	0.02			**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-37.30	-0.94	0.00	-102.71	0.00	102.71	4463.02	2231.51	10951.4	5483.88		0.00	0.00	0.027
5.00	-36.01	-0.92	0.00	-98.02	0.00	98.02	4413.36	2206.68	10604.1	5309.95		0.00	0.00	0.027
10.00	-34.75	-0.90	0.00	-93.40	0.00	93.40	4361.89	2180.94	10257.6	5136.44		0.01	-0.01	0.026
15.00	-33.51	-0.88	0.00	-88.88	0.00	88.88	4308.61	2154.31	9912.23	4963.48		0.02	-0.01	0.026
20.00	-32.30	-0.86	0.00	-84.46	0.00	84.46	4253.53	2126.77	9568.22	4791.22		0.04	-0.02	0.025
21.00	-32.06	-0.86	0.00	-83.61	0.00	83.61	4242.30	2121.15	9499.61	4756.87		0.04	-0.02	0.025
25.00	-30.44	-0.82	0.00	-80.18	0.00	80.18	4196.65	2098.33	9225.87	4619.79		0.06	-0.02	0.025
27.75	-29.34	-0.79	0.00	-77.93	0.00	77.93	4164.60	2082.30	9038.39	4525.91		0.07	-0.03	0.016
28.00	-29.24	-0.79	0.00	-77.73	0.00	77.73	3213.57	1606.78	7065.87	3538.19		0.08	-0.03	0.018
30.00	-28.84	-0.78	0.00	-76.15	0.00	76.15	3199.34	1599.67	6969.21	3489.78		0.09	-0.03	0.019
35.00	-27.83	-0.76	0.00	-72.23	0.00	72.23	3162.51	1581.26	6727.41	3368.71		0.12	-0.03	0.019
40.00	-26.85	-0.74	0.00	-68.41	0.00	68.41	3123.88	1561.94	6485.64	3247.64		0.15	-0.03	0.018
40.75	-26.71	-0.74	0.00	-67.85	0.00	67.85	3117.93	1558.96	6449.39	3229.49		0.16	-0.03	0.018
40.75	-26.71	-0.74	0.00	-67.85	0.00	67.85	3117.93	1558.96	6449.39	3229.49		0.16	-0.03	0.018
45.00	-25.89	-0.72	0.00	-64.71	0.00	64.71	3083.44	1541.72	6244.17	3126.72		0.19	-0.04	0.029
50.00	-24.94	-0.70	0.00	-61.09	0.00	61.09	3041.20	1520.60	6003.26	3006.09		0.23	-0.04	0.029
55.00	-24.01	-0.69	0.00	-57.57	0.00	57.57	2997.16	1498.58	5763.21	2885.89		0.28	-0.05	0.028
60.00	-23.10	-0.67	0.00	-54.14	0.00	54.14	2951.32	1475.66	5524.28	2766.24		0.34	-0.06	0.027
65.00	-22.21	-0.66	0.00	-50.79	0.00	50.79	2903.67	1451.83	5286.75	2647.30		0.40	-0.06	0.027
70.00	-20.62	-0.64	0.00	-47.50	0.00	47.50	2854.22	1427.11	5050.90	2529.20		0.47	-0.07	0.026
71.00	-20.32	-0.63	0.00	-46.87	0.00	46.87	2869.57	1434.79	5123.02	2565.32		0.48	-0.07	0.025
75.00	-19.63	-0.63	0.00	-44.34	0.00	44.34	2829.16	1414.58	4935.24	2471.29		0.55	-0.08	0.025
80.00	-18.79	-0.63	0.00	-41.18	0.00	41.18	2777.01	1388.51	4702.41	2354.70		0.63	-0.08	0.024
85.00	-17.96	-0.63	0.00	-38.02	0.00	38.02	2723.06	1361.53	4471.94	2239.29		0.72	-0.09	0.024
90.00	-17.16	-0.63	0.00	-34.86	0.00	34.86	2667.31	1333.66	4244.12	2125.22		0.81	-0.09	0.023
93.00	-16.45	-0.63	0.00	-32.96	0.00	32.96	2633.00	1316.50	4108.81	2057.46		0.87	-0.10	0.022
95.00	-13.00	-0.63	0.00	-31.69	0.00	31.69	2609.76	1304.88	4019.22	2012.60		0.92	-0.10	0.021
97.00	-12.54	-0.63	0.00	-30.44	0.00	30.44	2586.23	1293.12	3930.14	1967.99		0.96	-0.10	0.020
100.00	-12.11	-0.63	0.00	-28.56	0.00	28.56	2550.40	1275.20	3797.52	1901.58		1.03	-0.11	0.020
105.00	-11.36	-0.63	0.00	-25.42	0.00	25.42	2489.24	1244.62	3579.29	1792.30		1.14	-0.11	0.019
110.00	-10.69	-0.63	0.00	-22.28	0.00	22.28	2426.28	1213.14	3364.80	1684.90		1.27	-0.12	0.018
115.00	-9.63	-0.63	0.00	-19.14	0.00	19.14	1783.00	891.50	2427.68	1215.65		1.40	-0.13	0.021
120.00	-9.08	-0.63	0.00	-16.01	0.00	16.01	1739.91	869.95	2280.12	1141.75		1.53	-0.13	0.019
123.00	-6.65	-0.60	0.00	-14.13	0.00	14.13	1713.19	856.59	2192.59	1097.92		1.62	-0.14	0.017
125.00	-6.48	-0.60	0.00	-12.93	0.00	12.93	1695.01	847.51	2134.69	1068.93		1.68	-0.14	0.016
130.00	-6.05	-0.59	0.00	-9.93	0.00	9.93	1648.31	824.16	1991.67	997.31		1.83	-0.14	0.014
131.00	-3.34	-0.47	0.00	-9.35	0.00	9.35	1638.75	819.38	1963.38	983.15		1.86	-0.15	0.012
135.00	-3.05	-0.46	0.00	-7.45	0.00	7.45	1599.81	799.90	1851.33	927.04		1.98	-0.15	0.010
140.00	-2.70	-0.43	0.00	-5.16	0.00	5.16	1549.50	774.75	1713.96	858.25		2.14	-0.15	0.008
145.00	-2.37	-0.39	0.00	-3.01	0.00	3.01	1497.39	748.69	1579.82	791.09		2.30	-0.16	0.005
150.00	-2.05	-0.35	0.00	-1.04	0.00	1.04	1443.48	721.74	1449.20	725.68		2.47	-0.16	0.003
150.00	-2.05	-0.35	0.00	-1.04	0.00	1.04	1443.48	721.74	1449.20	725.68		2.47	-0.16	0.003
153.00	0.00	-0.34	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38		2.57	-0.16	0.000

Wind Loading - Shaft

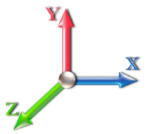
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	280.85	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	275.08	0.664 *	0.000	5.00	25.125	16.69	136.6	0.0	1194.9
10.00		1.00	0.85	7.442	8.19	269.30	0.669 *	0.000	5.00	24.603	16.45	134.7	0.0	1169.9
15.00		1.00	0.85	7.442	8.19	263.53	0.673 *	0.000	5.00	24.081	16.21	132.7	0.0	1145.0
20.00		1.00	0.90	7.896	8.69	265.50	0.678 *	0.000	5.00	23.559	15.98	138.8	0.0	1120.0
21.00	Bot - Section 2	1.00	0.91	7.978	8.78	265.68	0.681 *	0.000	1.00	4.649	3.17	27.8	0.0	221.0
25.00		1.00	0.95	8.276	9.10	265.73	0.692 *	0.000	4.00	18.599	12.87	117.2	0.0	1611.6
27.75	RB1	1.00	0.97	8.460	9.31	265.27	0.732 *	0.000	2.75	12.593	9.22	85.8	0.0	1091.0
28.00	Top - Section 1	1.00	0.97	8.476	9.32	265.22	0.734 *	0.000	0.25	1.137	0.83	7.8	0.0	98.5
30.00		1.00	0.98	8.600	9.46	267.81	0.732 *	0.000	2.00	9.049	6.63	62.7	0.0	358.8
35.00		1.00	1.01	8.883	9.77	265.88	0.737 *	0.000	5.00	22.257	16.40	160.3	0.0	882.5
40.00		1.00	1.04	9.137	10.05	263.25	0.744 *	0.000	5.00	21.735	16.16	162.4	0.0	861.6
40.75	RT1	1.00	1.05	9.173	10.09	262.80	0.748 *	0.000	0.75	3.215	2.40	24.3	0.0	127.5
45.00		1.00	1.07	9.366	10.30	260.05	0.743 *	0.000	4.25	17.998	13.37	137.7	0.0	713.4
50.00		1.00	1.09	9.576	10.53	256.40	0.709 *	0.000	5.00	20.692	14.67	154.5	0.0	820.0
55.00		1.00	1.12	9.770	10.75	252.37	0.716 *	0.000	5.00	20.170	14.43	155.1	0.0	799.2
60.00		1.00	1.14	9.951	10.95	248.02	0.723 *	0.000	5.00	19.648	14.20	155.4	0.0	778.4
65.00	Bot - Section 3	1.00	1.16	10.120	11.13	243.38	0.730 *	0.000	5.00	19.126	13.96	155.4	0.0	757.6
70.00	Appurtenance(s)	1.00	1.17	10.279	11.31	238.50	0.738 *	0.000	5.00	18.868	13.92	157.4	0.0	1484.0
71.00	Top - Section 2	1.00	1.18	10.310	11.34	237.50	0.742 *	0.000	1.00	3.711	2.76	31.2	0.0	291.8
75.00		1.00	1.19	10.430	11.47	236.87	0.742 *	0.000	4.00	14.635	10.86	124.6	0.0	579.5
80.00		1.00	1.21	10.572	11.63	231.60	0.750 *	0.000	5.00	17.824	13.37	155.4	0.0	705.6
85.00		1.00	1.22	10.708	11.78	226.15	0.759 *	0.000	5.00	17.302	13.13	154.6	0.0	684.8
90.00		1.00	1.24	10.838	11.92	220.55	0.768 *	0.000	5.00	16.780	12.89	153.7	0.0	664.0
93.00	Appurtenance(s)	1.00	1.25	10.913	12.00	217.12	0.776 *	0.000	3.00	9.818	7.62	91.5	0.0	388.4
95.00	Appurtenance(s)	1.00	1.25	10.962	12.06	214.80	0.781 *	0.000	2.00	6.441	5.03	60.7	0.0	254.8
97.00	Appurtenance(s)	1.00	1.26	11.010	12.11	212.46	0.650	0.000	2.00	6.357	4.13	50.0	0.0	251.4
100.00		1.00	1.27	11.081	12.19	208.92	0.650	0.000	3.00	9.379	6.10	74.3	0.0	370.9
105.00	Appurtenance(s)	1.00	1.28	11.195	12.31	202.91	0.650	0.000	5.00	15.214	9.89	121.8	0.0	601.6
110.00	Bot - Section 4	1.00	1.29	11.305	12.44	196.79	0.650	0.000	5.00	14.693	9.55	118.8	0.0	580.7
115.00	Top - Section 3	1.00	1.30	11.412	12.55	190.56	0.650	0.000	5.00	14.382	9.35	117.3	0.0	1015.4
120.00		1.00	1.32	11.514	12.67	187.15	0.650	0.000	5.00	13.860	9.01	114.1	0.0	438.9
123.00	Appurtenance(s)	1.00	1.32	11.574	12.73	183.31	0.650	0.000	3.00	8.066	5.24	66.7	0.0	255.3
125.00		1.00	1.33	11.614	12.78	180.74	0.650	0.000	2.00	5.273	3.43	43.8	0.0	166.9
130.00		1.00	1.34	11.710	12.88	174.24	0.650	0.000	5.00	12.816	8.33	107.3	0.0	405.6
131.00	Appurtenance(s)	1.00	1.34	11.729	12.90	172.93	0.650	0.000	1.00	2.501	1.63	21.0	0.0	79.1
135.00		1.00	1.35	11.803	12.98	167.66	0.650	0.000	4.00	9.794	6.37	82.7	0.0	309.8
140.00		1.00	1.36	11.894	13.08	161.01	0.650	0.000	5.00	11.772	7.65	100.1	0.0	372.3
145.00		1.00	1.37	11.982	13.18	154.27	0.650	0.000	5.00	11.250	7.31	96.4	0.0	355.6
150.00	Top - Section 4	1.00	1.38	12.068	13.27	147.47	0.650	0.000	5.00	10.728	6.97	92.6	0.0	338.9
153.00	Appurtenance(s)	1.00	1.38	12.119	13.33	143.36	0.650	0.000	3.00	6.187	4.02	53.6	0.0	195.4
								Totals:	**153.00**			**4,138.8**		**24,541.5**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

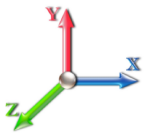
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 38	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	153.00	Lightning Rod	1	12.119	13.330	1.00	1.00	0.50	5.00	0.000	0.000	6.67	0.00	0.00
2	153.00	Low Profile Platform	1	12.119	13.330	1.00	1.00	25.00	1200.00	0.000	0.000	333.26	0.00	0.00
3	153.00	TD-RRH8x20-25	3	12.119	13.330	0.62	0.90	7.55	210.00	0.000	0.000	100.58	0.00	0.00
4	153.00	ACU-A20-N	4	12.119	13.330	0.81	0.90	0.45	4.00	0.000	0.000	6.05	0.00	0.00
5	153.00	800 MHz Filters	3	12.119	13.330	0.62	0.90	1.45	26.40	0.000	0.000	19.37	0.00	0.00
6	153.00	800 MHz RRUs	3	12.119	13.330	0.83	0.90	6.19	159.00	0.000	0.000	82.45	0.00	0.00
7	153.00	1900 MHz RRUs	3	12.119	13.330	0.79	0.90	9.03	132.00	0.000	0.000	120.36	0.00	0.00
8	153.00	APXVSPP18-C-A20	3	12.119	13.330	0.75	0.90	17.97	171.00	0.000	0.000	239.59	0.00	0.00
9	153.00	APXVTM14-C-I20	3	12.119	13.330	0.71	0.90	13.52	168.00	0.000	0.000	180.27	0.00	0.00
10	131.00	AIR6449 B41	3	11.729	12.902	0.57	0.80	9.63	309.00	0.000	0.000	124.21	0.00	0.00
11	131.00	APXVAALL24_43-U-NA20	3	11.729	12.902	0.58	0.80	35.46	368.40	0.000	0.000	457.50	0.00	0.00
12	131.00	KRY 112 489/2	3	11.729	12.902	0.54	0.80	1.13	48.30	0.000	0.000	14.52	0.00	0.00
13	131.00	KRY 112 144/1	3	11.729	12.902	0.54	0.80	0.66	33.00	0.000	0.000	8.51	0.00	0.00
14	131.00	4460 B25 + B66	3	11.729	12.902	0.54	0.80	4.58	312.00	0.000	0.000	59.13	0.00	0.00
15	131.00	VV-65A-R1	3	11.729	12.902	0.59	0.80	14.03	71.43	0.000	0.000	181.02	0.00	0.00
16	131.00	4449 B71 + B85	3	11.729	12.902	0.54	0.80	3.17	225.00	0.000	0.000	40.87	0.00	0.00
17	131.00	T-Arms	3	11.729	12.902	0.56	0.75	13.50	1050.00	0.000	0.000	174.17	0.00	0.00
18	131.00	(3) T-Arm Kit	1	11.729	12.902	0.75	0.75	12.38	500.00	0.000	0.000	159.66	0.00	0.00
19	123.00	Low Profile Platform	1	11.574	12.732	1.00	1.00	25.00	1200.00	0.000	0.000	318.29	0.00	0.00
20	123.00	RFS DB-T1-6Z-8AB-0Z	2	11.574	12.732	0.57	0.80	5.45	37.80	0.000	0.000	69.42	0.00	0.00
21	123.00	B5/B13 RRH-BR04C	3	11.574	12.732	0.54	0.80	3.01	210.90	0.000	0.000	38.28	0.00	0.00
22	123.00	B2/B66A RRH-BR049	3	11.574	12.732	0.54	0.80	3.01	253.20	0.000	0.000	38.28	0.00	0.00
23	123.00	LPA-80063-6CF-EDIN-5	6	11.574	12.732	0.74	0.80	43.57	162.00	0.000	0.000	554.71	0.00	0.00
24	123.00	SBNHH-1D65B	6	11.574	12.732	0.66	0.80	32.19	243.60	0.000	0.000	409.85	0.00	0.00
25	123.00	MT6407-77A	3	11.574	12.732	0.56	0.80	7.88	238.20	0.000	0.000	100.32	0.00	0.00
26	105.00	Standoff	1	11.195	12.315	1.00	1.00	2.63	40.00	0.000	0.000	32.39	0.00	0.00
27	105.00	10' Omni	1	11.305	12.436	1.00	1.00	3.00	25.00	0.000	5.000	37.31	0.00	186.54
28	97.00	Ericsson Air6419 B77G	3	11.010	12.111	0.57	0.75	6.50	198.30	0.000	0.000	78.70	0.00	0.00
29	95.00	Powerwave LGP21901	6	10.962	12.058	0.50	0.75	0.69	33.00	0.000	0.000	8.36	0.00	0.00
30	95.00	Ericsson RRUS 4449	3	10.962	12.058	0.50	0.75	2.97	213.00	0.000	0.000	35.81	0.00	0.00
31	95.00	PolyPhaser 1000860	3	10.962	12.058	0.50	0.75	0.09	6.00	0.000	0.000	1.09	0.00	0.00
32	95.00	Cci TPA65R-BU6DA-K	3	10.962	12.058	0.54	0.75	20.85	202.50	0.000	0.000	251.40	0.00	0.00
33	95.00	Powerwave LGP17201	6	10.962	12.058	0.50	0.75	5.88	186.00	0.000	0.000	70.89	0.00	0.00
34	95.00	Cci OPA65R-BU6DA	3	10.962	12.058	0.55	0.75	20.88	189.90	0.000	0.000	251.72	0.00	0.00
35	95.00	Low Profile Platform	1	10.962	12.058	1.00	1.00	40.00	1500.00	0.000	0.000	482.32	0.00	0.00
36	95.00	Ericsson 4426 B66	3	10.962	12.058	0.50	0.75	1.73	145.50	0.000	0.000	20.90	0.00	0.00
37	95.00	Ericsson RRUS 4478 B14	3	10.962	12.058	0.50	0.75	2.77	179.70	0.000	0.000	33.45	0.00	0.00
38	95.00	Ericsson RRUS 32 B30	3	10.962	12.058	0.50	0.75	2.49	231.00	0.000	0.000	29.99	0.00	0.00
39	95.00	Ericsson RRUS 4415 B25	3	10.962	12.058	0.50	0.75	2.47	138.00	0.000	0.000	29.81	0.00	0.00
40	95.00	Ericsson RRUS A2	3	10.962	12.058	0.50	0.75	2.80	63.60	0.000	0.000	33.81	0.00	0.00
41	95.00	Raycap DC6-48-60-18-8F	2	10.962	12.058	0.75	0.75	1.38	63.60	0.000	0.000	16.64	0.00	0.00
42	95.00	Raycap	1	10.962	12.058	0.75	0.75	0.85	26.20	0.000	0.000	10.31	0.00	0.00
43	95.00	HRK14	1	10.962	12.058	1.00	1.00	8.13	302.36	0.000	0.000	98.03	0.00	0.00
44	93.00	Ericcson Air6449 B77D	3	10.913	12.004	0.64	0.75	7.90	264.00	0.000	0.000	94.82	0.00	0.00
45	70.00	Standoff	1	10.279	11.307	1.00	1.00	2.63	40.00	0.000	0.000	29.74	0.00	0.00
46	70.00	GPS	1	10.279	11.307	1.00	1.00	1.00	10.00	0.000	0.000	11.31	0.00	0.00
							Totals:		**11,395.89**			**5,496.12**		

Total Applied Force Summary

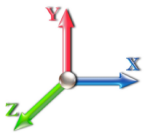
Structure:	CT01499-S-SBA		**Code:**	TIA-222-G	5/10/2022
Site Name:	Torrington		**Exposure:**	C	
Height:	153.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	B - Competent Rock	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 39

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		136.61	1426.18	0.00	0.00
10.00		134.67	1401.20	0.00	0.00
15.00		132.73	1376.22	0.00	0.00
20.00		138.77	1351.24	0.00	0.00
21.00		27.79	267.25	0.00	0.00
25.00		117.17	1796.62	0.00	0.00
27.75		85.80	1218.17	0.00	0.00
28.00		7.78	110.06	0.00	0.00
30.00		62.68	451.32	0.00	0.00
35.00		160.25	1113.72	0.00	0.00
40.00		162.44	1092.91	0.00	0.00
40.75		24.25	162.14	0.00	0.00
45.00		137.73	909.95	0.00	0.00
50.00		154.55	1051.27	0.00	0.00
55.00		155.13	1030.45	0.00	0.00
60.00		155.40	1009.63	0.00	0.00
65.00		155.39	988.82	0.00	0.00
70.00	(2) attachments	198.40	1765.28	0.00	0.00
71.00		31.25	338.06	0.00	0.00
75.00		124.64	764.52	0.00	0.00
80.00		155.45	936.91	0.00	0.00
85.00		154.65	916.09	0.00	0.00
90.00		153.69	895.27	0.00	0.00
93.00	(3) attachments	186.30	791.17	0.00	0.00
95.00	(44) attachments	1435.23	3827.64	0.00	0.00
97.00	(3) attachments	128.74	516.37	0.00	0.00
100.00		74.31	470.86	0.00	0.00
105.00	(2) attachments	191.48	833.12	0.00	186.54
110.00		118.76	746.50	0.00	0.00
115.00		117.35	1181.21	0.00	0.00
120.00		114.11	604.64	0.00	0.00
123.00	(24) attachments	1595.90	2700.49	0.00	0.00
125.00		43.78	195.51	0.00	0.00
130.00		107.31	477.13	0.00	0.00
131.00	(25) attachments	1240.56	3010.56	0.00	0.00
135.00		82.65	321.45	0.00	0.00
140.00		100.12	386.82	0.00	0.00
145.00		96.39	370.17	0.00	0.00
150.00		92.57	353.51	0.00	0.00
153.00	(24) attachments	1142.19	2279.51	0.00	0.00
	Totals:	**9,634.97**	**41,439.92**	**0.00**	**186.54**

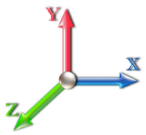
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.107	1.022	7.442	0.00	1.37
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.107	1.022	7.442	0.00	46.80
5.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.107	1.022	7.442	0.00	9.00
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.107	1.022	7.442	0.00	0.90
5.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.107	1.022	7.442	0.00	8.00
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.029	7.442	0.00	1.37
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.110	1.029	7.442	0.00	46.80
10.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.110	1.029	7.442	0.00	9.00
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.029	7.442	0.00	0.90
10.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.110	1.029	7.442	0.00	8.00
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.112	1.036	7.442	0.00	1.37
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.112	1.036	7.442	0.00	46.80
15.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.112	1.036	7.442	0.00	9.00
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.112	1.036	7.442	0.00	0.90
15.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.112	1.036	7.442	0.00	8.00
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.114	1.043	7.896	0.00	1.37
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.114	1.043	7.896	0.00	46.80
20.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.114	1.043	7.896	0.00	9.00
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.114	1.043	7.896	0.00	0.90
20.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.114	1.043	7.896	0.00	8.00
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.116	1.048	7.978	0.00	0.27
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.116	1.048	7.978	0.00	9.36
21.00	1" DC	Yes	1.00	0.000	1.00	0.08	0.00	0.116	1.048	7.978	0.00	1.80
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.116	1.048	7.978	0.00	0.18
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.116	1.048	7.978	0.00	1.60
25.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.122	1.065	8.276	0.00	1.09
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.122	1.065	8.276	0.00	37.44
25.00	1" DC	Yes	4.00	0.000	1.00	0.33	0.00	0.122	1.065	8.276	0.00	7.20
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.122	1.065	8.276	0.00	0.72
25.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.122	1.065	8.276	0.00	6.40
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.122	1.065	8.276	0.00	0.00
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.142	1.126	8.460	0.00	0.75
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	0.91	0.00	0.142	1.126	8.460	0.00	25.74
27.75	1" DC	Yes	2.75	0.000	1.00	0.23	0.00	0.142	1.126	8.460	0.00	4.95
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.09	0.00	0.142	1.126	8.460	0.00	0.49
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.17	0.00	0.142	1.126	8.460	0.00	4.40
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.29	0.00	0.142	1.126	8.460	0.00	0.00
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.01	0.00	0.143	1.129	8.476	0.00	0.07
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.143	1.129	8.476	0.00	2.34
28.00	1" DC	Yes	0.25	0.000	1.00	0.02	0.00	0.143	1.129	8.476	0.00	0.45
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.01	0.00	0.143	1.129	8.476	0.00	0.04
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.02	0.00	0.143	1.129	8.476	0.00	0.40
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.03	0.00	0.143	1.129	8.476	0.00	0.00
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.142	1.127	8.600	0.00	0.55
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.142	1.127	8.600	0.00	18.72
30.00	1" DC	Yes	2.00	0.000	1.00	0.17	0.00	0.142	1.127	8.600	0.00	3.60
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.142	1.127	8.600	0.00	0.36

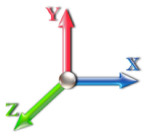
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 41	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.142	1.127	8.600	0.00	3.20
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.142	1.127	8.600	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.134	8.883	0.00	1.37
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.145	1.134	8.883	0.00	46.80
35.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.145	1.134	8.883	0.00	9.00
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.134	8.883	0.00	0.90
35.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.145	1.134	8.883	0.00	8.00
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.145	1.134	8.883	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.148	1.144	9.137	0.00	1.37
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.148	1.144	9.137	0.00	46.80
40.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.148	1.144	9.137	0.00	9.00
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.148	1.144	9.137	0.00	0.90
40.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.148	1.144	9.137	0.00	8.00
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.148	1.144	9.137	0.00	0.00
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.02	0.00	0.150	1.150	9.173	0.00	0.20
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.25	0.00	0.150	1.150	9.173	0.00	7.02
40.75	1" DC	Yes	0.75	0.000	1.00	0.06	0.00	0.150	1.150	9.173	0.00	1.35
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.02	0.00	0.150	1.150	9.173	0.00	0.14
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.05	0.00	0.150	1.150	9.173	0.00	1.20
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.150	1.150	9.173	0.00	0.00
45.00	Safety Cable	Yes	4.25	0.000	0.38	0.13	0.00	0.148	1.143	9.366	0.00	1.16
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	1.40	0.00	0.148	1.143	9.366	0.00	39.78
45.00	1" DC	Yes	4.25	0.000	1.00	0.35	0.00	0.148	1.143	9.366	0.00	7.65
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	0.13	0.00	0.148	1.143	9.366	0.00	0.77
45.00	3/4" DC	Yes	4.25	0.000	0.75	0.27	0.00	0.148	1.143	9.366	0.00	6.80
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	0.36	0.00	0.148	1.143	9.366	0.00	0.00
50.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.130	1.091	9.576	0.00	1.37
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.130	1.091	9.576	0.00	46.80
50.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.130	1.091	9.576	0.00	9.00
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.130	1.091	9.576	0.00	0.90
50.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.130	1.091	9.576	0.00	8.00
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.134	1.101	9.770	0.00	1.37
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.134	1.101	9.770	0.00	46.80
55.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.134	1.101	9.770	0.00	9.00
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.134	1.101	9.770	0.00	0.90
55.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.134	1.101	9.770	0.00	8.00
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.137	1.112	9.951	0.00	1.37
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.137	1.112	9.951	0.00	46.80
60.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.137	1.112	9.951	0.00	9.00
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.137	1.112	9.951	0.00	0.90
60.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.137	1.112	9.951	0.00	8.00
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.141	1.123	10.120	0.00	1.37
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.141	1.123	10.120	0.00	46.80
65.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.141	1.123	10.120	0.00	9.00
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.141	1.123	10.120	0.00	0.90
65.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.141	1.123	10.120	0.00	8.00
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.135	10.279	0.00	1.37

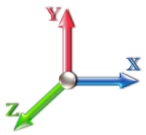
Linear Appurtenance Segment Forces (Factored)

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 42	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.145	1.135	10.279	0.00	46.80
70.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.145	1.135	10.279	0.00	9.00
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.145	1.135	10.279	0.00	0.90
70.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.145	1.135	10.279	0.00	8.00
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.147	1.142	10.310	0.00	0.27
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.147	1.142	10.310	0.00	9.36
71.00	1" DC	Yes	1.00	0.000	1.00	0.08	0.00	0.147	1.142	10.310	0.00	1.80
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.147	1.142	10.310	0.00	0.18
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.147	1.142	10.310	0.00	1.60
75.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.147	1.142	10.430	0.00	1.09
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.147	1.142	10.430	0.00	37.44
75.00	1" DC	Yes	4.00	0.000	1.00	0.33	0.00	0.147	1.142	10.430	0.00	7.20
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.147	1.142	10.430	0.00	0.72
75.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.147	1.142	10.430	0.00	6.40
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.151	1.154	10.572	0.00	1.37
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.151	1.154	10.572	0.00	46.80
80.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.151	1.154	10.572	0.00	9.00
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.151	1.154	10.572	0.00	0.90
80.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.151	1.154	10.572	0.00	8.00
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.156	1.167	10.708	0.00	1.37
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.156	1.167	10.708	0.00	46.80
85.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.156	1.167	10.708	0.00	9.00
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.156	1.167	10.708	0.00	0.90
85.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.156	1.167	10.708	0.00	8.00
90.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.161	1.182	10.838	0.00	1.37
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.161	1.182	10.838	0.00	46.80
90.00	1" DC	Yes	5.00	0.000	1.00	0.42	0.00	0.161	1.182	10.838	0.00	9.00
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.161	1.182	10.838	0.00	0.90
90.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.161	1.182	10.838	0.00	8.00
93.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.165	1.194	10.913	0.00	0.82
93.00	1 5/8" Coax	Yes	3.00	0.000	3.96	0.99	0.00	0.165	1.194	10.913	0.00	28.08
93.00	1" DC	Yes	3.00	0.000	1.00	0.25	0.00	0.165	1.194	10.913	0.00	5.40
93.00	1/2" Fiber	Yes	3.00	0.000	0.38	0.10	0.00	0.165	1.194	10.913	0.00	0.54
93.00	3/4" DC	Yes	3.00	0.000	0.75	0.19	0.00	0.165	1.194	10.913	0.00	4.80
95.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.167	1.202	10.962	0.00	0.55
95.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.167	1.202	10.962	0.00	18.72
95.00	1" DC	Yes	2.00	0.000	1.00	0.17	0.00	0.167	1.202	10.962	0.00	3.60
95.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.167	1.202	10.962	0.00	0.36
95.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.167	1.202	10.962	0.00	3.20
97.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.010	0.000	11.010	0.00	0.55
100.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.010	0.000	11.081	0.00	0.82
105.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.010	0.000	11.195	0.00	1.37
110.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	11.305	0.00	1.37
115.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	11.412	0.00	1.37
120.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.011	0.000	11.514	0.00	1.37
123.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.012	0.000	11.574	0.00	0.82
125.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.012	0.000	11.614	0.00	0.55

Linear Appurtenance Segment Forces (Factored)

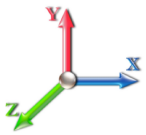
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 43	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
130.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.012	0.000	11.710	0.00	1.37
131.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.013	0.000	11.729	0.00	0.27
135.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.013	0.000	11.803	0.00	1.09
140.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.013	0.000	11.894	0.00	1.37
145.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.014	0.000	11.982	0.00	1.37
150.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.015	0.000	12.068	0.00	1.37
153.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.015	0.000	12.119	0.00	0.82
										Totals:	**0.0**	**1,271.1**

Calculated Forces

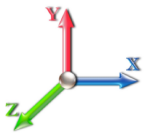
Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 44	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 21

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-41.44	-9.65	0.00	-1000.3	0.00	1000.34	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.192
5.00	-40.00	-9.54	0.00	-952.09	0.00	952.09	4413.36	2206.68	10604.1	5309.95	0.02	-0.044	0.000	0.188
10.00	-38.59	-9.44	0.00	-904.37	0.00	904.37	4361.89	2180.94	10257.6	5136.44	0.09	-0.088	0.000	0.185
15.00	-37.21	-9.33	0.00	-857.18	0.00	857.18	4308.61	2154.31	9912.23	4963.48	0.21	-0.132	0.000	0.181
20.00	-35.86	-9.21	0.00	-810.53	0.00	810.53	4253.53	2126.77	9568.22	4791.22	0.37	-0.177	0.000	0.178
21.00	-35.59	-9.19	0.00	-801.32	0.00	801.32	4242.30	2121.15	9499.61	4756.87	0.41	-0.187	0.000	0.177
25.00	-33.78	-9.09	0.00	-764.56	0.00	764.56	4196.65	2098.33	9225.87	4619.79	0.58	-0.223	0.000	0.174
27.75	-32.56	-9.00	0.00	-739.57	0.00	739.57	4164.60	2082.30	9038.39	4525.91	0.72	-0.249	0.000	0.113
28.00	-32.45	-9.00	0.00	-737.32	0.00	737.32	3213.57	1606.78	7065.87	3538.19	0.73	-0.251	0.000	0.125
30.00	-32.00	-8.95	0.00	-719.33	0.00	719.33	3199.34	1599.67	6969.21	3489.78	0.84	-0.263	0.000	0.135
35.00	-30.88	-8.80	0.00	-674.60	0.00	674.60	3162.51	1581.26	6727.41	3368.71	1.13	-0.296	0.000	0.130
40.00	-29.79	-8.64	0.00	-630.60	0.00	630.60	3123.88	1561.94	6485.64	3247.64	1.46	-0.329	0.000	0.125
40.75	-29.62	-8.62	0.00	-624.12	0.00	624.12	3117.93	1558.96	6449.39	3229.49	1.51	-0.335	0.000	0.124
40.75	-29.62	-8.62	0.00	-624.12	0.00	624.12	3117.93	1558.96	6449.39	3229.49	1.51	-0.335	0.000	0.124
45.00	-28.71	-8.50	0.00	-587.47	0.00	587.47	3083.44	1541.72	6244.17	3126.72	1.82	-0.363	0.000	0.197
50.00	-27.65	-8.37	0.00	-544.97	0.00	544.97	3041.20	1520.60	6003.26	3006.09	2.23	-0.417	0.000	0.190
55.00	-26.61	-8.23	0.00	-503.14	0.00	503.14	2997.16	1498.58	5763.21	2885.89	2.70	-0.470	0.000	0.183
60.00	-25.59	-8.09	0.00	-462.00	0.00	462.00	2951.32	1475.66	5524.28	2766.24	3.22	-0.524	0.000	0.176
65.00	-24.60	-7.94	0.00	-421.57	0.00	421.57	2903.67	1451.83	5286.75	2647.30	3.80	-0.577	0.000	0.168
70.00	-22.83	-7.74	0.00	-381.85	0.00	381.85	2854.22	1427.11	5050.90	2529.20	4.43	-0.630	0.000	0.159
71.00	-22.49	-7.72	0.00	-374.11	0.00	374.11	2869.57	1434.79	5123.02	2565.32	4.57	-0.641	0.000	0.154
75.00	-21.72	-7.60	0.00	-343.24	0.00	343.24	2829.16	1414.58	4935.24	2471.29	5.12	-0.682	0.000	0.147
80.00	-20.78	-7.45	0.00	-305.25	0.00	305.25	2777.01	1388.51	4702.41	2354.70	5.86	-0.730	0.000	0.137
85.00	-19.86	-7.30	0.00	-268.00	0.00	268.00	2723.06	1361.53	4471.94	2239.29	6.65	-0.777	0.000	0.127
90.00	-18.96	-7.14	0.00	-231.51	0.00	231.51	2667.31	1333.66	4244.12	2125.22	7.49	-0.821	0.000	0.116
93.00	-18.17	-6.95	0.00	-210.07	0.00	210.07	2633.00	1316.50	4108.81	2057.46	8.01	-0.847	0.000	0.109
95.00	-14.37	-5.46	0.00	-196.17	0.00	196.17	2609.76	1304.88	4019.22	2012.60	8.37	-0.864	0.000	0.103
97.00	-13.85	-5.33	0.00	-185.24	0.00	185.24	2586.23	1293.12	3930.14	1967.99	8.74	-0.880	0.000	0.099
100.00	-13.38	-5.26	0.00	-169.24	0.00	169.24	2550.40	1275.20	3797.52	1901.58	9.30	-0.904	0.000	0.094
105.00	-12.54	-5.06	0.00	-142.76	0.00	142.76	2489.24	1244.62	3579.29	1792.30	10.27	-0.941	0.000	0.085
110.00	-11.80	-4.94	0.00	-117.45	0.00	117.45	2426.28	1213.14	3364.80	1684.90	11.27	-0.976	0.000	0.075
115.00	-10.62	-4.80	0.00	-92.76	0.00	92.76	1783.00	891.50	2427.68	1215.65	12.31	-1.007	0.000	0.082
120.00	-10.01	-4.68	0.00	-68.74	0.00	68.74	1739.91	869.95	2280.12	1141.75	13.38	-1.033	0.000	0.066
123.00	-7.34	-3.04	0.00	-54.69	0.00	54.69	1713.19	856.59	2192.59	1097.92	14.04	-1.049	0.000	0.054
125.00	-7.14	-3.00	0.00	-48.61	0.00	48.61	1695.01	847.51	2134.69	1068.93	14.48	-1.059	0.000	0.050
130.00	-6.67	-2.88	0.00	-33.63	0.00	33.63	1648.31	824.16	1991.67	997.31	15.60	-1.079	0.000	0.038
131.00	-3.68	-1.58	0.00	-30.75	0.00	30.75	1638.75	819.38	1963.38	983.15	15.82	-1.083	0.000	0.034
135.00	-3.36	-1.50	0.00	-24.41	0.00	24.41	1599.81	799.90	1851.33	927.04	16.74	-1.096	0.000	0.028
140.00	-2.98	-1.39	0.00	-16.93	0.00	16.93	1549.50	774.75	1713.96	858.25	17.89	-1.109	0.000	0.022
145.00	-2.61	-1.29	0.00	-9.99	0.00	9.99	1497.39	748.69	1579.82	791.09	19.06	-1.118	0.000	0.014
150.00	-2.26	-1.19	0.00	-3.56	0.00	3.56	1443.48	721.74	1449.20	725.68	20.23	-1.124	0.000	0.006
150.00	-2.26	-1.19	0.00	-3.56	0.00	3.56	1443.48	721.74	1449.20	725.68	20.23	-1.124	0.000	0.006
153.00	0.00	-1.14	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	20.94	-1.125	0.000	0.000

Final Analysis Summary

Structure:	CT01499-S-SBA	**Code:**	TIA-222-G	5/10/2022	
Site Name:	Torrington	**Exposure:**	C		
Height:	153.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	B - Competent Rock		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 45	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 93 mph Wind	37.1	0.00	49.67	0.00	0.00	3863.11
0.9D + 1.6W 93 mph Wind	37.1	0.00	37.24	0.00	0.00	3832.45
1.2D + 1.0Di + 1.0Wi 40 mph Wind	7.2	0.00	83.86	0.00	0.00	737.53
1.2D + 1.0E	0.9	0.00	49.73	0.00	0.00	103.74
0.9D + 1.0E	0.9	0.00	37.30	0.00	0.00	102.71
1.0D + 1.0W 60 mph Wind	9.7	0.00	41.44	0.00	0.00	1000.34

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 93 mph Wind	-33.66	-32.83	0.00	-2272.0	0.00	-2272.0	3083.44	1541.7	6244.17	3126.72	45.00	0.738
0.9D + 1.6W 93 mph Wind	-25.04	-32.59	0.00	-2247.4	0.00	-2247.4	3083.44	1541.7	6244.17	3126.72	45.00	0.727
1.2D + 1.0Di + 1.0Wi 40 mph Wind	-61.99	-6.31	0.00	-430.32	0.00	-430.32	3083.44	1541.7	6244.17	3126.72	45.00	0.158
1.2D + 1.0E	-34.51	-0.73	0.00	-65.54	0.00	-65.54	3083.44	1541.7	6244.17	3126.72	45.00	0.032
0.9D + 1.0E	-25.89	-0.72	0.00	-64.71	0.00	-64.71	3083.44	1541.7	6244.17	3126.72	45.00	0.029
1.0D + 1.0W 60 mph Wind	-28.71	-8.50	0.00	-587.47	0.00	-587.47	3083.44	1541.7	6244.17	3126.72	45.00	0.197

Additional Steel Summary

			Intermediate Connectors			Lower Termination				Upper Termination				Max Member			
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	Vu (kips)	phi Vn (kips)	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	Pu (kips)	phi Pn (kips)	phi Tn (kips)	Ratio
27.8	40.8	(3) PLT-8"x1.25"(1.25Hole)	331.0	5.96	37.1	281.4	37.1	8	14	288.0	37.1	8	14	305.29	551.4	501.56	0.609

Monopole Mat Foundation Design

				Date
				5/10/2022
Customer Name:	AT&T	**TIA Standard:**	TIA-222-G
Site Name:		**Structure Height (Ft.):**	153
Site Number:	CT01499-S-SBA	**Engineer Name:**	K. Azisllari
Engr. Number:	128923	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

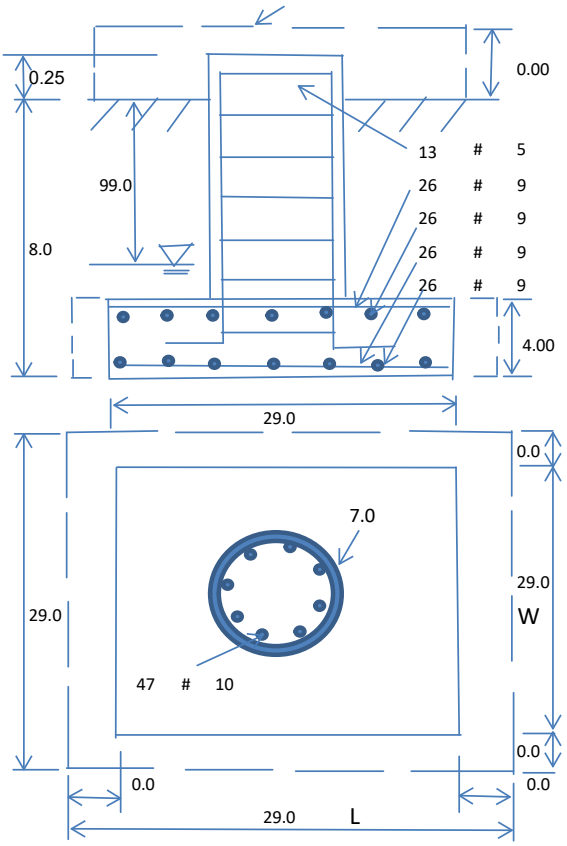
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	49.7	Shear Force (Kips):	37.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3863.1
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	8.0
Pier Height A. G. (ft.):	0.25	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	29	Width of Pad (ft.):	29
Final Length of pad (ft)	29.0	Final width of pad (ft):	29.0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	47	Tie Spacing (in):	8.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

Qty. of Rebar in Pad (L):	26	Qty. of Rebar in Pad (W):	26

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	26	Qty. of Rebar in Pad (W):	26
Apply 1.35 factor for e/w Per G:	1.35		

Soil Design Parameters:

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	4000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	Yes		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:			1.00	

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	3210.06	Total Dry Soil Weight (Kips):	401.26
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	401.26	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3527.56	Total Dry Concrete Weight (Kips):	529.13
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	529.13	Total Vertical Load on Base (Kips):	980.09

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1800	<	Allowable Factored Soil Bearing (psf):	3000	0.60	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	12862.3	>	Design Factored Momont (kips-ft):	3753	0.29	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	3.43	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90		Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65		Wind Load Factor on Concrete Design:	1.00		
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	1.27		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	9363.3	>	Design Factored Moment (Mu, Kips-F	4020.8	0.43	OK!
Calculated Shear Capacity (Kips):	838.2	>	Design Factored Shear (Kips):	37.1	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	3223.3	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9692.3	>	Design Factored Axial Load (Pu Kips):	49.7	0.01	OK!
Moment & Axial Strength Combination:	0.43	OK!	Check Tie Spacing (Design/Required):		0.6667	OK!
Pier Reinforcement Ratio:	0.011		Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	1467.1	>	One-Way Factored Shear (L-D. Kips):	241.4	0.16	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1467.1	>	One-Way Factored Shear (W-D., Kips)	241.4	0.16	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1346.0	>	One-Way Factored Shear (C-C, Kips):	211.5	0.16	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0017	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0017		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5122.1	>	Moment at Bottom (L-Dir. K-Ft):	1708.2	0.33	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5122.1	>	Moment at Bottom (W-Dir. K-Ft):	1708.2	0.33	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	7221.2	>	Moment at Bottom (C-C Dir. K-Ft):	2415.7	0.33	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0017	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0017		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	5122.1	>	Moment at the top (L-Dir K-Ft):	675.7	0.13	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	5122.1	>	Moment at the top (W-Dir K-Ft):	675.7	0.13	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	7221.2	>	Moment at the top (C-C Dir. K-Ft):	631.4	0.09	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	1545.2	k-ft.	Max. factored shear stress v_{u_CD}:		3.5	Psi
Max. factored shear stress v_{u_AB}:	7.6	Psi	Factored shear Strength ϕv_n:		189.7	Psi
Max. factored shear stress v_u:	7.6	Psi	Check Usage of Punching Shear Capacity:		0.04	OK!

April 19, 2022

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:	Site Number:	CT1118
	FA Number:	10042345
	PACE Number:	MRCTB060655
	PT Number:	2051A134W2
	Site Name:	TORRINGTON EAST MAIN ST
	Site Address:	1925 East Main Street Torrington, CT 06790

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI Communications to perform a mount analysis on the existing AT&T antenna/RRH mount to determine its capability of supporting the following additional loading:

- (2) 4478 B14 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (3) 4426 B66 RRH's (14.9"x13.2"x5.8" – Wt. = 49 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (2) DC6-48-60-18-8F Surge Arrestors (31.4"x10.2" Ø – Wt. = 33 lbs.)
- **(3) TPA65R-BU6DA-K Antennas (71.2"x20.7"x7.7" – Wt. = 69 lbs. /each)**
- **(3) AIR6419 Antennas (31.0"x16.1"x7.3" – Wt. = 66 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. = 82 lbs. /each)**
- **(3) OPA65R-BU6DA Antennas (71.2"x21.0"x7.8" – Wt. = 64 lbs. /each)**
- **(1) 4478 B14 RRH (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(3) 4415 B25 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(1) DC9-48-60-24-8C-EV Surge Arrestor (31.4"x10.2" Ø – Wt. = 29 lbs.)**

*Proposed equipment shown in bold.

No original structural design documents or fabrication drawings were available for the existing mount. Mount mapping report prepared by Tower Engineering Professionals, Inc. dated June 25, 2018, was used to perform this analysis. HDG conducted a ground audit of the existing AT&T antenna mount on December 21, 2021.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R16.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.16 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.182 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.065.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing monopole with ring mounts and threaded rods. HDG considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that existing mount **IS CAPABLE** of supporting the proposed installation with the following modifications.

- **Install proposed handrail kit, SitePro1 P/N HRK14 (or approved equal). Handrail is required per AT&T Technical Directive to stabilize existing cantilevered antennas.**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Proposed Mount Rating	42	LC4	58%	**PASS**

Reference Documents:

- Mount mapping report prepared by Tower Engineering Professionals, Inc.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mount must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

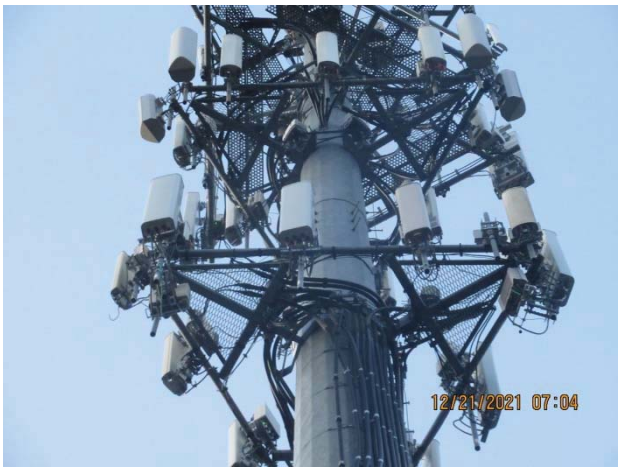
Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC

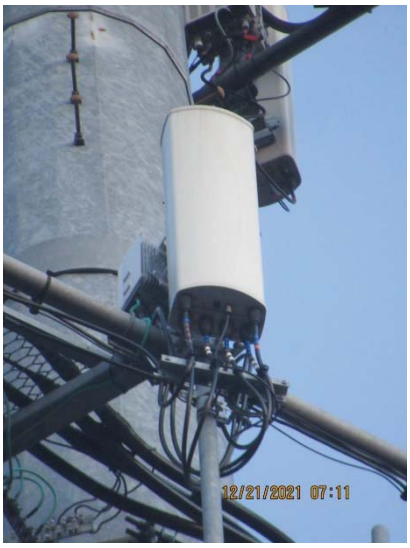
Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:



FIELD PHOTOS (CONT.):



HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	95.00	(ft)
z_g=	1200	(ft)
α=	7	

K_z= 0.974

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c\ K_t/K_h)]^2$ $K_h = e^{(f*z/H)}$

K_{zt}= 1

(If Category 1 then K_{zt}=1.0)

Category= **1**

K_h=	1	
K_c=	0.9	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	95	
z_s=	1100	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	0.96	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i =	1.00	in
Importance Factor = I=	1.00	(from Table 2-3)
K_{iz} =	1.11	(from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ t_{iz} = 1.11 in

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	155	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	0.974	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**32.77**	K_e=	0.96	(from 2.6.8)
$q_{z\ (ice)}$=	**5.69**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.05**	V_{max}=	120	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 4/21/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{-1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 1.11 in | **Angle =** 0 (deg) | **Equivalent Angle =** 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.44	1.24	417	83	26
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.93	1.20	137	29	9
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	133	28	8
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.39	1.24	422	84	26
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	2.18	1.20	41	10	3
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	2.62	1.21	29	8	2
4426 B66 RRH	14.9	13.2	5.8	1.37	1.13	1.20	54	13	3
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.00	1.20	0	2	0
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.90	1.20	46	11	3
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	3.89	1.26	55	14	3
DC6-48-60-18-8F Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	51	12	3
DC9-48-60-24-8C-EV Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	51	12	3
Plate 6x1/2	6.0	12.0		0.50	0.50	2.00	33		
2x2 Angle	2.0	12.0		0.17	0.17	2.00	11		
2-1/2x2-1/2 Angle	2.5	12.0		0.21	0.21	2.00	14		
2" Pipe	2.4	12.0		0.20	0.20	1.20	8		
3" Pipe	3.5	12.0		0.29	0.29	1.20	11		
HSS 4x4	4.0	12.0		0.33	0.33	1.25	14		

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.11	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	417	184	358
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	137	66	119
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	133	90	122
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	422	186	363
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	41	66	47
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	29	61	37
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	54	24	46
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	24	6
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	46	65	51
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	55	90	63

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	82	41	72
AIR6419 Antenna	33.3	18.3	9.5	4.24	2.20	1.82	3.50	1.20	1.24	29	16	26
AIR6449 Antenna	32.8	18.1	12.8	4.13	2.92	1.81	2.56	1.20	1.20	28	20	26
OPA65R-BU6DA Antenna	73.4	23.2	10.0	11.84	5.11	3.16	7.33	1.23	1.41	83	41	72
4478 B14 RRH (Side)	20.3	10.5	15.6	1.49	2.20	1.93	1.30	1.20	1.20	10	15	11
4415 B25 RRH (Side)	18.7	8.5	15.7	1.11	2.04	2.20	1.19	1.20	1.20	8	14	9
4426 B66 RRH	17.1	15.4	8.0	1.83	0.95	1.11	2.13	1.20	1.20	13	7	11
4426 B66 RRH (Shielded)	17.1	2.2	8.0	0.26	0.95	7.70	2.13	1.42	1.20	2	7	3
4449 B5/B12 RRH (Side)	20.1	11.6	15.4	1.62	2.16	1.73	1.30	1.20	1.20	11	15	12
RRUS-32 B30 RRH (Side)	29.4	9.2	14.3	1.88	2.93	3.19	2.05	1.23	1.20	13	20	15

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	26	12	22
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	9	4	7
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	8	6	8
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	26	12	23
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	4	3
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	2	4	2
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	3	1	3
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	1	0
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	3
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	4

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.11	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	417	184	242
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	137	66	84
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	133	90	101
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	422	186	245
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	41	66	60
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	29	61	53
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	54	24	31
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	24	18
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	46	65	60
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	55	90	81

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	82	41	51
AIR6419 Antenna	33.3	18.3	9.5	4.24	2.20	1.82	3.50	1.20	1.24	29	16	19
AIR6449 Antenna	32.8	18.1	12.8	4.13	2.92	1.81	2.56	1.20	1.20	28	20	22
OPA65R-BU6DA Antenna	73.4	23.2	10.0	11.84	5.11	3.16	7.33	1.23	1.41	83	41	51
4478 B14 RRH (Side)	20.3	10.5	15.6	1.49	2.20	1.93	1.30	1.20	1.20	10	15	14
4415 B25 RRH (Side)	18.7	8.5	15.7	1.11	2.04	2.20	1.19	1.20	1.20	8	14	12
4426 B66 RRH	17.1	15.4	8.0	1.83	0.95	1.11	2.13	1.20	1.20	13	7	8
4426 B66 RRH (Shielded)	17.1	2.2	8.0	0.26	0.95	7.70	2.13	1.42	1.20	2	7	5
4449 B5/B12 RRH (Side)	20.1	11.6	15.4	1.62	2.16	1.73	1.30	1.20	1.20	11	15	14
RRUS-32 B30 RRH (Side)	29.4	9.2	14.3	1.88	2.93	3.19	2.05	1.23	1.20	13	20	18

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	26	12	15
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	9	4	5
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	8	6	6
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	26	12	15
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	4	4
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	2	4	3
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	3	1	2
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	1	1
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	5

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.11	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	417	184	184
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	137	66	66
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	133	90	90
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	422	186	186
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	41	66	66
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	29	61	61
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	54	24	24
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	24	24
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	46	65	65
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	55	90	90

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	82	41	41
AIR6419 Antenna	33.3	18.3	9.5	4.24	2.20	1.82	3.50	1.20	1.24	29	16	16
AIR6449 Antenna	32.8	18.1	12.8	4.13	2.92	1.81	2.56	1.20	1.20	28	20	20
OPA65R-BU6DA Antenna	73.4	23.2	10.0	11.84	5.11	3.16	7.33	1.23	1.41	83	41	41
4478 B14 RRH (Side)	20.3	10.5	15.6	1.49	2.20	1.93	1.30	1.20	1.20	10	15	15
4415 B25 RRH (Side)	18.7	8.5	15.7	1.11	2.04	2.20	1.19	1.20	1.20	8	14	14
4426 B66 RRH	17.1	15.4	8.0	1.83	0.95	1.11	2.13	1.20	1.20	13	7	7
4426 B66 RRH (Shielded)	17.1	2.2	8.0	0.26	0.95	7.70	2.13	1.42	1.20	2	7	7
4449 B5/B12 RRH (Side)	20.1	11.6	15.4	1.62	2.16	1.73	1.30	1.20	1.20	11	15	15
RRUS-32 B30 RRH (Side)	29.4	9.2	14.3	1.88	2.93	3.19	2.05	1.23	1.20	13	20	20

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	26	12	12
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	9	4	4
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	8	6	6
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	26	12	12
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	4	4
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	2	4	4
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	3	1	1
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	1	1
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	6

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.11	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	417	184	242
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	137	66	84
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	133	90	101
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	422	186	245
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	41	66	60
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	29	61	53
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	54	24	31
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	24	18
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	46	65	60
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	55	90	81

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	82	41	51
AIR6419 Antenna	33.3	18.3	9.5	4.24	2.20	1.82	3.50	1.20	1.24	29	16	19
AIR6449 Antenna	32.8	18.1	12.8	4.13	2.92	1.81	2.56	1.20	1.20	28	20	22
OPA65R-BU6DA Antenna	73.4	23.2	10.0	11.84	5.11	3.16	7.33	1.23	1.41	83	41	51
4478 B14 RRH (Side)	20.3	10.5	15.6	1.49	2.20	1.93	1.30	1.20	1.20	10	15	14
4415 B25 RRH (Side)	18.7	8.5	15.7	1.11	2.04	2.20	1.19	1.20	1.20	8	14	12
4426 B66 RRH	17.1	15.4	8.0	1.83	0.95	1.11	2.13	1.20	1.20	13	7	8
4426 B66 RRH (Shielded)	17.1	2.2	8.0	0.26	0.95	7.70	2.13	1.42	1.20	2	7	5
4449 B5/B12 RRH (Side)	20.1	11.6	15.4	1.62	2.16	1.73	1.30	1.20	1.20	11	15	14
RRUS-32 B30 RRH (Side)	29.4	9.2	14.3	1.88	2.93	3.19	2.05	1.23	1.20	13	20	18

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	26	12	15
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	9	4	5
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	8	6	6
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	26	12	15
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	4	4
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	2	4	3
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	3	1	2
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	1	1
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	5

Date: 4/19/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.11	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	417	184	358
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	137	66	119
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	133	90	122
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	422	186	363
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	41	66	47
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	29	61	37
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	54	24	46
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	24	6
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	46	65	51
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	55	90	63

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	82	41	72
AIR6419 Antenna	33.3	18.3	9.5	4.24	2.20	1.82	3.50	1.20	1.24	29	16	26
AIR6449 Antenna	32.8	18.1	12.8	4.13	2.92	1.81	2.56	1.20	1.20	28	20	26
OPA65R-BU6DA Antenna	73.4	23.2	10.0	11.84	5.11	3.16	7.33	1.23	1.41	83	41	72
4478 B14 RRH (Side)	20.3	10.5	15.6	1.49	2.20	1.93	1.30	1.20	1.20	10	15	11
4415 B25 RRH (Side)	18.7	8.5	15.7	1.11	2.04	2.20	1.19	1.20	1.20	8	14	9
4426 B66 RRH	17.1	15.4	8.0	1.83	0.95	1.11	2.13	1.20	1.20	13	7	11
4426 B66 RRH (Shielded)	17.1	2.2	8.0	0.26	0.95	7.70	2.13	1.42	1.20	2	7	3
4449 B5/B12 RRH (Side)	20.1	11.6	15.4	1.62	2.16	1.73	1.30	1.20	1.20	11	15	12
RRUS-32 B30 RRH (Side)	29.4	9.2	14.3	1.88	2.93	3.19	2.05	1.23	1.20	13	20	15

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	26	12	22
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	9	4	7
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	8	6	8
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	26	12	23
4478 B14 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	4	3
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	2	4	2
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	3	1	3
4426 B66 RRH (Shielded)	14.9	0.0	5.8	0.00	0.60	0.00	2.57	1.20	1.20	0	1	0
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	3
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	4

Date: 4/21/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.11 in.
Density of ice: 56 pcf

TPA65R-BU6DA-K Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		187 lbs
Weight of object:	69.0 lbs	
Combined weight of ice and object:		256 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:

Height (in):	31.1	
Width (in):	16.1	
Depth (in):	7.3	
Total weight of ice on object:		66 lbs
Weight of object:	66.0 lbs	
Combined weight of ice and object:		132 lbs

AIR6449 Antenna

Weight of ice based on total radial SF area:

Height (in):	30.6	
Width (in):	15.9	
Depth (in):	10.6	
Total weight of ice on object:		70 lbs
Weight of object:	82.0 lbs	
Combined weight of ice and object:		152 lbs

OPA65R-BU6DA Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	21.0	
Depth (in):	7.8	
Total weight of ice on object:		189 lbs
Weight of object:	64.0 lbs	
Combined weight of ice and object:		253 lbs

4478 B14 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		35 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		95 lbs

4415 B25 RRH

Weight of ice based on total radial SF area:

Height (in):	16.5	
Width (in):	13.5	
Depth (in):	6.3	
Total weight of ice on object:		30 lbs
Weight of object:	50.0 lbs	
Combined weight of ice and object:		80 lbs

4426 B66 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	5.8	
Total weight of ice on object:		26 lbs
Weight of object:	49.0 lbs	
Combined weight of ice and object:		75 lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		35 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		108 lbs

RRUS-32 B30 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		46 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		106 lbs

DC6-48-60-18-8F Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	31.4	
Diameter(in):	10.2	
Total weight of ice on object:		40 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		73 lbs

DC9-48-60-24-8C-EV Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	31.4	
Diameter(in):	10.2	
Total weight of ice on object:		40 lbs
Weight of object:	29 lbs	
Combined weight of ice and object:		69 lbs

PL 6x1/2

Weight of ice based on total radial SF area:

Height (in):	6	
Width (in):	0.50	
Per foot weight of ice on object:		10 plf

L 2x2 Angles

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		5 plf

HSS 4x4

Weight of ice based on total radial SF area:

Height (in):	4	
Width (in):	4	
Per foot weight of ice on object:		9 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		6 plf

2" pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		5 plf

3" Pipe

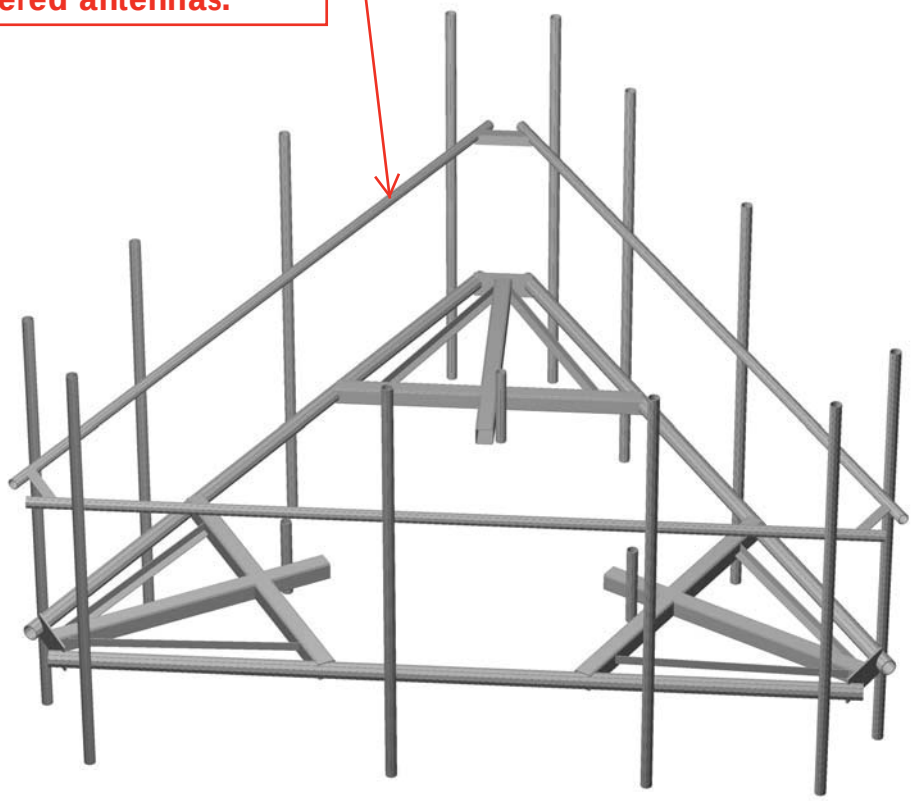
Per foot weight of ice:

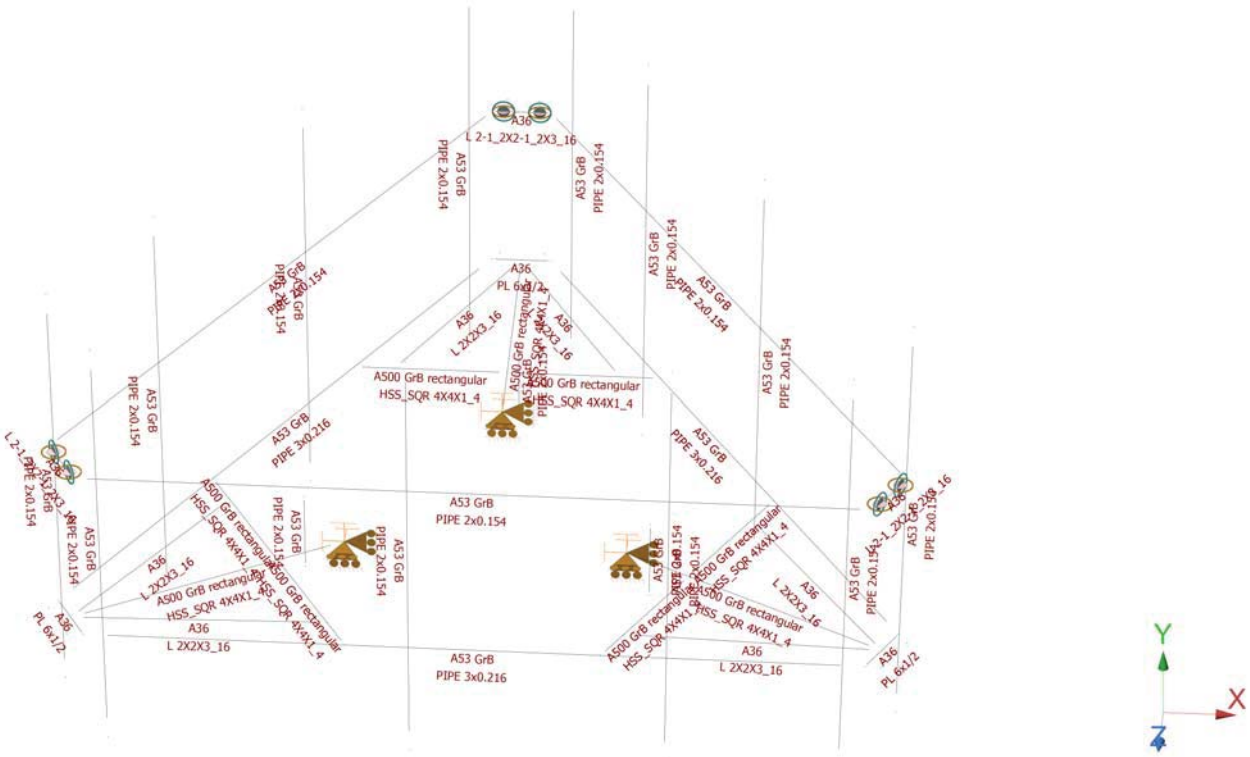
diameter (in):	3.5	
Per foot weight of ice on object:		6 plf

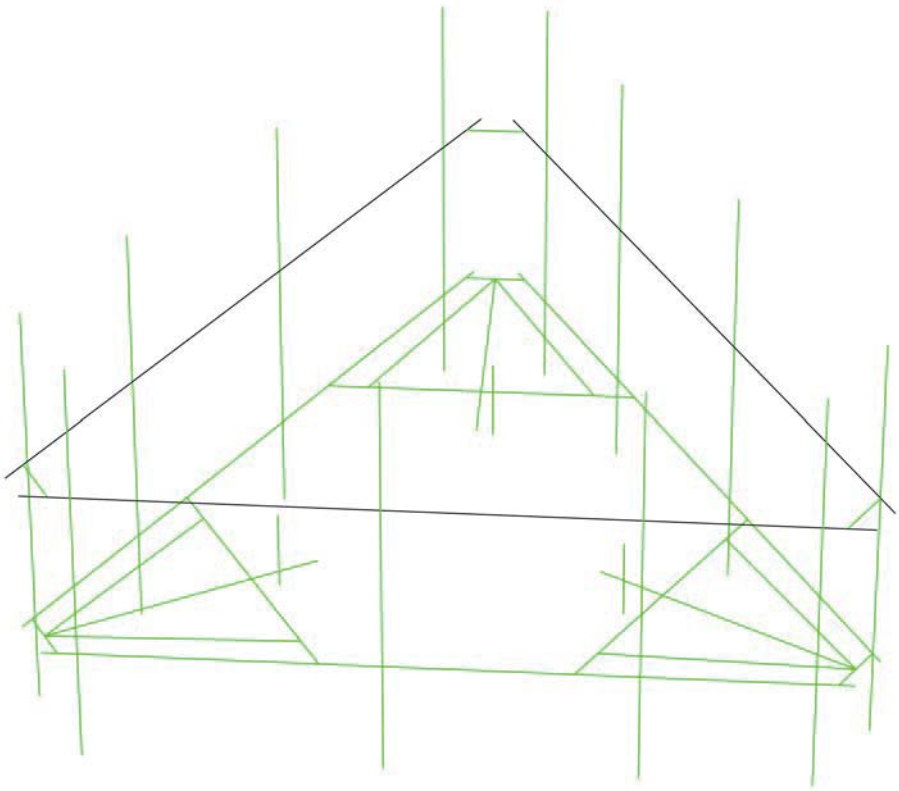
HUDSON
Design Group LLC

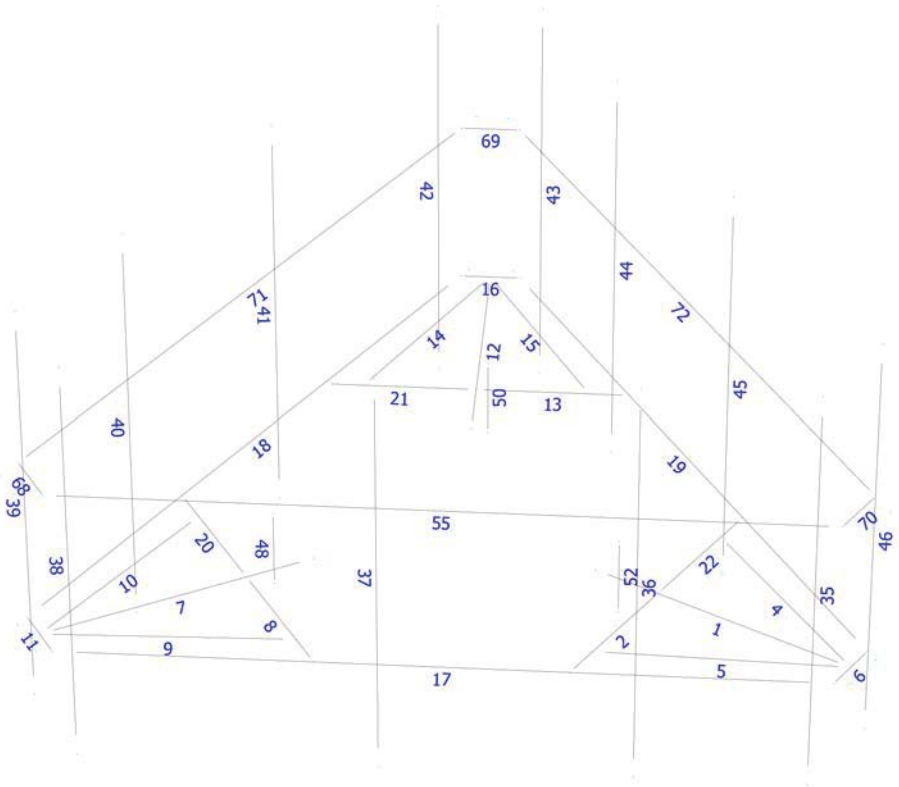
Mount Calculations
(Proposed Conditions)

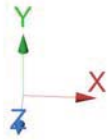
Install proposed handrail kit, SitePro1 P/N HRK14 (or approved equal). Handrail is required per AT&T Technical Directive to stabilize existing cantilevered antennas.




A36
L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 2x0.154
A36
PL 6x1/2
A36
L 2X2X3_16
A500 GrB rectangular
HSS_SQR 4X4X1_4
A53 GrB
PIPE 3x0.216
A53 GrB
PIPE 2x0.154
A36
L 2X2X3_16
A500 GrB rectangular
HSS_SQR 4X4X1_4
A36
PL 6x1/2
A36
L 2X2X3_16
A53 GrB
PIPE 3x0.216
Y
X
Z


Y
X
Z


69
42
43
16
44
41
14
12
15
72
21
50
13
45
40
18
19
68
39
55
70
46
38
20
48
37
52
22
10
36
35
7
4
8
1
11
2
9
17
5
6


Y
X
Z

RAM® Elements
CONNECT Edition

Current Date: 4/21/2022 1:16 PM
Units system: English

Load data

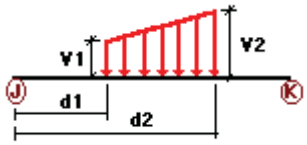
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

Distributed force on members

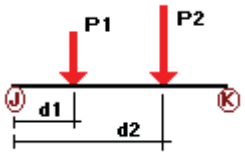


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	1	y	-0.01	-0.01	1.29	No	100.00	Yes
	2	y	-0.01	0.00	0.00	No	0.00	No
	4	y	-0.01	0.00	0.00	No	0.00	No
	5	y	-0.01	0.00	0.00	No	0.00	No
	7	y	-0.01	-0.01	1.29	No	100.00	Yes
	8	y	-0.01	0.00	0.00	No	0.00	No
	9	y	-0.01	0.00	0.00	No	0.00	No
	10	y	-0.01	0.00	0.00	No	0.00	No
	12	y	-0.01	-0.01	1.29	No	100.00	Yes
	13	y	-0.01	0.00	0.00	No	0.00	No
	14	y	-0.01	0.00	0.00	No	0.00	No
	15	y	-0.01	0.00	0.00	No	0.00	No
	20	y	-0.01	0.00	0.00	No	0.00	No
	21	y	-0.01	0.00	0.00	No	0.00	No
	22	y	-0.01	0.00	0.00	No	0.00	No
W0	1	z	-0.014	0.00	0.00	No	0.00	No

	2	z	-0.014	0.00	0.00	No	0.00	No
	4	z	-0.011	0.00	0.00	No	0.00	No
	5	z	-0.011	0.00	0.00	No	0.00	No
	6	z	-0.011	0.00	0.00	No	0.00	No
	7	z	-0.014	0.00	0.00	No	0.00	No
	8	z	-0.014	0.00	0.00	No	0.00	No
	9	z	-0.011	0.00	0.00	No	0.00	No
	10	z	-0.011	0.00	0.00	No	0.00	No
	11	z	-0.011	0.00	0.00	No	0.00	No
	12	z	-0.014	0.00	0.00	No	0.00	No
	13	z	-0.014	0.00	0.00	No	0.00	No
	14	z	-0.011	0.00	0.00	No	0.00	No
	15	z	-0.011	0.00	0.00	No	0.00	No
	16	z	-0.011	0.00	0.00	No	0.00	No
	17	z	-0.011	0.00	0.00	No	0.00	No
	18	z	-0.011	0.00	0.00	No	0.00	No
	19	z	-0.011	0.00	0.00	No	0.00	No
	20	z	-0.014	0.00	0.00	No	0.00	No
	21	z	-0.014	0.00	0.00	No	0.00	No
	22	z	-0.014	0.00	0.00	No	0.00	No
	35	z	-0.008	0.00	0.00	No	0.00	No
	39	z	-0.008	0.00	0.00	No	0.00	No
	40	z	-0.008	0.00	0.00	No	0.00	No
	41	z	-0.008	0.00	0.00	No	0.00	No
	42	z	-0.008	0.00	0.00	No	0.00	No
	43	z	-0.008	0.00	0.00	No	0.00	No
	44	z	-0.008	0.00	0.00	No	0.00	No
	45	z	-0.008	0.00	0.00	No	0.00	No
	46	z	-0.008	0.00	0.00	No	0.00	No
	48	z	-0.008	0.00	0.00	No	0.00	No
	50	z	-0.008	0.00	0.00	No	0.00	No
	52	z	-0.008	0.00	0.00	No	0.00	No
	55	z	-0.008	0.00	0.00	No	0.00	No
	68	z	-0.014	0.00	0.00	No	0.00	No
	69	z	-0.014	0.00	0.00	No	0.00	No
	70	z	-0.014	0.00	0.00	No	0.00	No
	71	z	-0.008	0.00	0.00	No	0.00	No
	72	z	-0.008	0.00	0.00	No	0.00	No
W30	1	x	-0.014	0.00	0.00	No	0.00	No
	2	x	-0.014	0.00	0.00	No	0.00	No
	4	x	-0.011	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
	7	x	-0.014	0.00	0.00	No	0.00	No
	8	x	-0.014	0.00	0.00	No	0.00	No
	9	x	-0.011	0.00	0.00	No	0.00	No
	10	x	-0.011	0.00	0.00	No	0.00	No
	11	x	-0.011	0.00	0.00	No	0.00	No
	12	x	-0.014	0.00	0.00	No	0.00	No
	13	x	-0.014	0.00	0.00	No	0.00	No
	14	x	-0.011	0.00	0.00	No	0.00	No
	15	x	-0.011	0.00	0.00	No	0.00	No
	16	x	-0.011	0.00	0.00	No	0.00	No
	18	x	-0.011	0.00	0.00	No	0.00	No
	19	x	-0.011	0.00	0.00	No	0.00	No
	20	x	-0.014	0.00	0.00	No	0.00	No
	21	x	-0.014	0.00	0.00	No	0.00	No
	22	x	-0.014	0.00	0.00	No	0.00	No
	35	x	-0.008	0.00	0.00	No	0.00	No
	36	x	-0.008	0.00	0.00	No	0.00	No

	37	x	-0.008	0.00	0.00	No	0.00	No
	38	x	-0.008	0.00	0.00	No	0.00	No
	39	x	-0.008	0.00	0.00	No	0.00	No
	40	x	-0.008	0.00	0.00	No	0.00	No
	41	x	-0.008	0.00	0.00	No	0.00	No
	42	x	-0.008	0.00	0.00	No	0.00	No
	43	x	-0.008	0.00	0.00	No	0.00	No
	44	x	-0.008	0.00	0.00	No	0.00	No
	45	x	-0.008	0.00	0.00	No	0.00	No
	46	x	-0.008	0.00	0.00	No	0.00	No
	48	x	-0.008	0.00	0.00	No	0.00	No
	50	x	-0.008	0.00	0.00	No	0.00	No
	52	x	-0.008	0.00	0.00	No	0.00	No
	68	x	-0.014	0.00	0.00	No	0.00	No
	69	x	-0.014	0.00	0.00	No	0.00	No
	70	x	-0.014	0.00	0.00	No	0.00	No
Di	1	y	-0.009	0.00	0.00	No	0.00	No
	2	y	-0.009	0.00	0.00	No	0.00	No
	4	y	-0.005	0.00	0.00	No	0.00	No
	5	y	-0.005	0.00	0.00	No	0.00	No
	6	y	-0.01	0.00	0.00	No	0.00	No
	7	y	-0.009	0.00	0.00	No	0.00	No
	8	y	-0.009	0.00	0.00	No	0.00	No
	9	y	-0.005	0.00	0.00	No	0.00	No
	10	y	-0.005	0.00	0.00	No	0.00	No
	11	y	-0.01	0.00	0.00	No	0.00	No
	12	y	-0.009	0.00	0.00	No	0.00	No
	13	y	-0.009	0.00	0.00	No	0.00	No
	14	y	-0.005	0.00	0.00	No	0.00	No
	15	y	-0.005	0.00	0.00	No	0.00	No
	16	y	-0.01	0.00	0.00	No	0.00	No
	17	y	-0.006	0.00	0.00	No	0.00	No
	18	y	-0.006	0.00	0.00	No	0.00	No
	19	y	-0.006	0.00	0.00	No	0.00	No
	20	y	-0.009	0.00	0.00	No	0.00	No
	21	y	-0.009	0.00	0.00	No	0.00	No
	22	y	-0.009	0.00	0.00	No	0.00	No
	35	y	-0.005	0.00	0.00	No	0.00	No
	36	y	-0.005	0.00	0.00	No	0.00	No
	37	y	-0.005	0.00	0.00	No	0.00	No
	38	y	-0.005	0.00	0.00	No	0.00	No
	39	y	-0.005	0.00	0.00	No	0.00	No
	40	y	-0.005	0.00	0.00	No	0.00	No
	41	y	-0.005	0.00	0.00	No	0.00	No
	42	y	-0.005	0.00	0.00	No	0.00	No
	43	y	-0.005	0.00	0.00	No	0.00	No
	44	y	-0.005	0.00	0.00	No	0.00	No
	45	y	-0.005	0.00	0.00	No	0.00	No
	46	y	-0.005	0.00	0.00	No	0.00	No
	48	y	-0.005	0.00	0.00	No	0.00	No
	50	y	-0.005	0.00	0.00	No	0.00	No
	52	y	-0.005	0.00	0.00	No	0.00	No
	55	y	-0.005	0.00	0.00	No	0.00	No
	68	y	-0.06	0.00	0.00	No	0.00	No
	69	y	-0.06	0.00	0.00	No	0.00	No
	70	y	-0.06	0.00	0.00	No	0.00	No
	71	y	-0.005	0.00	0.00	No	0.00	No
	72	y	-0.005	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	36	y	-0.035	1.50	No
		y	-0.035	6.50	No
		y	-0.06	0.50	No
		y	-0.05	0.50	No
		y	-0.049	4.00	No
	37	y	-0.033	1.25	No
		y	-0.033	3.00	No
		y	-0.041	5.00	No
		y	-0.041	6.75	No
	38	y	-0.032	1.50	No
		y	-0.032	6.50	No
		y	-0.073	0.50	No
		y	-0.06	0.50	No
	40	y	-0.035	1.50	No
		y	-0.035	6.50	No
		y	-0.06	0.50	No
		y	-0.05	0.50	No
		y	-0.049	4.00	No
	41	y	-0.033	1.25	No
		y	-0.033	3.00	No
		y	-0.041	5.00	No
		y	-0.041	6.75	No
	42	y	-0.032	1.50	No
		y	-0.032	6.50	No
		y	-0.073	0.50	No
		y	-0.06	0.50	No
	44	y	-0.035	1.50	No
		y	-0.035	6.50	No
		y	-0.06	0.50	No
		y	-0.05	0.50	No
		y	-0.049	4.00	No
	45	y	-0.033	1.25	No
		y	-0.033	3.00	No
		y	-0.041	5.00	No
		y	-0.041	6.75	No
	46	y	-0.032	1.50	No
		y	-0.032	6.50	No
		y	-0.073	0.50	No
		y	-0.06	0.50	No
	48	y	-0.033	0.50	No
	50	y	-0.033	0.50	No
	52	y	-0.029	0.50	No
W0	36	z	-0.209	1.50	No
		z	-0.209	6.50	No
		z	-0.041	0.50	No
		z	-0.029	0.50	No
	37	z	-0.069	1.25	No
		z	-0.069	3.00	No
		z	-0.067	5.00	No
		z	-0.067	6.75	No
	38	z	-0.211	1.50	No
		z	-0.211	6.50	No
		z	-0.046	0.50	No

		z	-0.055	0.50	No
	40	z	-0.122	1.50	No
		z	-0.122	6.50	No
		z	-0.06	0.50	No
		z	-0.018	4.00	No
	41	z	-0.042	1.25	No
		z	-0.042	3.00	No
		z	-0.051	5.00	No
		z	-0.051	6.75	No
	42	z	-0.123	1.50	No
		z	-0.123	6.50	No
		z	-0.081	0.50	No
	44	z	-0.122	1.50	No
		z	-0.122	6.50	No
		z	-0.06	0.50	No
		z	-0.018	4.00	No
	45	z	-0.042	1.25	No
		z	-0.042	3.00	No
		z	-0.051	5.00	No
		z	-0.051	6.75	No
	46	z	-0.123	1.50	No
		z	-0.123	6.50	No
		z	-0.081	0.50	No
	48	z	-0.051	0.50	No
	50	z	-0.051	0.50	No
	52	z	-0.051	0.50	No
W30	36	x	-0.093	1.50	No
		x	-0.093	6.50	No
		x	-0.066	0.50	No
		x	-0.024	4.00	No
	37	x	-0.034	1.25	No
		x	-0.034	3.00	No
		x	-0.045	5.00	No
		x	-0.045	6.75	No
	38	x	-0.093	1.50	No
		x	-0.093	6.50	No
		x	-0.09	0.50	No
	40	x	-0.18	1.50	No
		x	-0.18	6.50	No
		x	-0.047	0.50	No
		x	-0.006	4.00	No
	41	x	-0.06	1.25	No
		x	-0.06	3.00	No
		x	-0.062	5.00	No
		x	-0.062	6.75	No
	42	x	-0.182	1.50	No
		x	-0.182	6.50	No
		x	-0.063	0.50	No
	44	x	-0.18	1.50	No
		x	-0.18	6.50	No
		x	-0.047	0.50	No
		x	-0.006	4.00	No
	45	x	-0.06	1.25	No
		x	-0.06	3.00	No
		x	-0.062	5.00	No
		x	-0.062	6.75	No
	46	x	-0.182	1.50	No
		x	-0.182	6.50	No
		x	-0.063	0.50	No
	48	x	-0.051	0.50	No

	50	x	-0.051	0.50	No
	52	x	-0.051	0.50	No
Di	36	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.035	0.50	No
		y	-0.03	0.50	No
		y	-0.026	4.00	No
	37	y	-0.034	1.25	No
		y	-0.034	3.00	No
		y	-0.035	5.00	No
		y	-0.035	6.75	No
	38	y	-0.095	1.50	No
		y	-0.095	6.50	No
		y	-0.035	0.50	No
		y	-0.046	0.50	No
	40	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.035	0.50	No
		y	-0.03	0.50	No
		y	-0.026	4.00	No
	41	y	-0.034	1.25	No
		y	-0.034	3.00	No
		y	-0.035	5.00	No
		y	-0.035	6.75	No
	42	y	-0.095	1.50	No
		y	-0.095	6.50	No
		y	-0.035	0.50	No
		y	-0.046	0.50	No
	44	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.035	0.50	No
		y	-0.03	0.50	No
		y	-0.026	4.00	No
	45	y	-0.034	1.25	No
		y	-0.034	3.00	No
		y	-0.035	5.00	No
		y	-0.035	6.75	No
	46	y	-0.095	1.50	No
		y	-0.095	6.50	No
		y	-0.035	0.50	No
		y	-0.046	0.50	No
	48	y	-0.04	0.50	No
	50	y	-0.04	0.50	No
	52	y	-0.04	0.50	No
Wi0	36	z	-0.042	1.50	No
		z	-0.042	6.50	No
		z	-0.01	0.50	No
		z	-0.008	0.50	No
		z	-0.002	4.00	No
	37	z	-0.015	1.25	No
		z	-0.015	3.00	No
		z	-0.015	5.00	No
		z	-0.015	6.75	No
	38	z	-0.042	1.50	No
		z	-0.042	6.50	No
		z	-0.011	0.50	No
		z	-0.014	0.50	No
	40	z	-0.026	1.50	No
		z	-0.026	6.50	No
		z	-0.014	0.50	No

		z	-0.005	4.00	No
	41	z	-0.01	1.25	No
		z	-0.01	3.00	No
		z	-0.012	5.00	No
		z	-0.012	6.75	No
	42	z	-0.026	1.50	No
		z	-0.026	6.50	No
		z	-0.018	0.50	No
	44	z	-0.026	1.50	No
		z	-0.026	6.50	No
		z	-0.014	0.50	No
		z	-0.005	4.00	No
	45	z	-0.01	1.25	No
		z	-0.01	3.00	No
		z	-0.012	5.00	No
		z	-0.012	6.75	No
	46	z	-0.026	1.50	No
		z	-0.026	6.50	No
		z	-0.018	0.50	No
	48	z	-0.012	0.50	No
	50	z	-0.012	0.50	No
	52	z	-0.012	0.50	No
Wi30	36	x	-0.021	1.50	No
		x	-0.021	6.50	No
		x	-0.015	0.50	No
		x	-0.007	4.00	No
	37	x	-0.008	1.25	No
		x	-0.008	3.00	No
		x	-0.011	5.00	No
		x	-0.011	6.75	No
	38	x	-0.021	1.50	No
		x	-0.021	6.50	No
		x	-0.02	0.50	No
	40	x	-0.036	1.50	No
		x	-0.036	6.50	No
		x	-0.011	0.50	No
		x	-0.003	4.00	No
	41	x	-0.013	1.25	No
		x	-0.013	3.00	No
		x	-0.014	5.00	No
		x	-0.014	6.75	No
	42	x	-0.037	1.50	No
		x	-0.037	6.50	No
		x	-0.015	0.50	No
	44	x	-0.036	1.50	No
		x	-0.036	6.50	No
		x	-0.011	0.50	No
		x	-0.003	4.00	No
	45	x	-0.013	1.25	No
		x	-0.013	3.00	No
		x	-0.014	5.00	No
		x	-0.014	6.75	No
	46	x	-0.037	1.50	No
		x	-0.037	6.50	No
		x	-0.015	0.50	No
	48	x	-0.012	0.50	No
	50	x	-0.012	0.50	No
	52	x	-0.012	0.50	No
WL0	36	z	-0.014	1.50	No
		z	-0.014	6.50	No

		z	-0.003	0.50	No
		z	-0.002	0.50	No
	37	z	-0.005	1.25	No
		z	-0.005	3.00	No
		z	-0.005	5.00	No
		z	-0.005	6.75	No
	38	z	-0.014	1.50	No
		z	-0.014	6.50	No
		z	-0.003	0.50	No
		z	-0.003	0.50	No
	40	z	-0.008	1.50	No
		z	-0.008	6.50	No
		z	-0.004	0.50	No
		z	-0.001	4.00	No
	41	z	-0.003	1.25	No
		z	-0.003	3.00	No
		z	-0.004	5.00	No
		z	-0.004	6.75	No
	42	z	-0.008	1.50	No
		z	-0.008	6.50	No
		z	-0.005	0.50	No
	44	z	-0.008	1.50	No
		z	-0.008	6.50	No
		z	-0.004	0.50	No
		z	-0.001	4.00	No
	45	z	-0.003	1.25	No
		z	-0.003	3.00	No
		z	-0.004	5.00	No
		z	-0.004	6.75	No
	46	z	-0.008	1.50	No
		z	-0.008	6.50	No
		z	-0.005	0.50	No
	48	z	-0.003	0.50	No
	50	z	-0.003	0.50	No
	52	z	-0.003	0.50	No
WL30	36	x	-0.006	1.50	No
		x	-0.006	6.50	No
		x	-0.004	0.50	No
		x	-0.001	4.00	No
	37	x	-0.003	1.25	No
		x	-0.003	3.00	No
		x	-0.003	5.00	No
		x	-0.003	6.75	No
	38	x	-0.006	1.50	No
		x	-0.006	6.50	No
		x	-0.006	0.50	No
	40	x	-0.012	1.50	No
		x	-0.012	6.50	No
		x	-0.003	0.50	No
	41	x	-0.004	1.25	No
		x	-0.004	3.00	No
		x	-0.004	5.00	No
		x	-0.004	6.75	No
	42	x	-0.012	1.50	No
		x	-0.012	6.50	No
		x	-0.004	0.50	No
	44	x	-0.012	1.50	No
		x	-0.012	6.50	No
		x	-0.003	0.50	No
	45	x	-0.004	1.25	No

		x	-0.004	3.00	No
		x	-0.004	5.00	No
		x	-0.004	6.75	No
	46	x	-0.012	1.50	No
		x	-0.012	6.50	No
		x	-0.004	0.50	No
	48	x	-0.003	0.50	No
	50	x	-0.003	0.50	No
	52	x	-0.003	0.50	No
LL1	17	y	-0.25	50.00	Yes
LL2	17	y	-0.25	0.00	Yes
LLa1	35	y	-0.50	50.00	Yes
LLa2	36	y	-0.50	50.00	Yes
LLa3	37	y	-0.50	50.00	Yes
LLa4	38	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00

LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

RAM® Elements
CONNECT Edition

Current Date: 4/21/2022 1:17 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.4DL
LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+WL0+1.6LLa1
LC17=1.2DL+WL30+1.6LLa1
LC18=1.2DL-WL0+1.6LLa1
LC19=1.2DL-WL30+1.6LLa1
LC20=1.2DL+WL0+1.6LLa2
LC21=1.2DL+WL30+1.6LLa2
LC22=1.2DL-WL0+1.6LLa2
LC23=1.2DL-WL30+1.6LLa2
LC24=1.2DL+WL0+1.6LLa3
LC25=1.2DL+WL30+1.6LLa3
LC26=1.2DL-WL0+1.6LLa3
LC27=1.2DL-WL30+1.6LLa3
LC28=1.2DL+WL0+1.6LLa4
LC29=1.2DL+WL30+1.6LLa4
LC30=1.2DL-WL0+1.6LLa4
LC31=1.2DL-WL30+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_4	**1**	LC19 at 0.00%	0.36	OK	
		2	LC11 at 100.00%	0.16	OK	
		7	LC30 at 0.00%	**0.36**	**OK**	
		8	LC25 at 100.00%	0.16	OK	
		12	LC9 at 0.00%	0.34	OK	
		13	LC9 at 100.00%	0.16	OK	
		20	LC2 at 0.00%	0.17	OK	
		21	LC1 at 0.00%	0.17	OK	
		22	LC4 at 0.00%	0.16	OK	
	L 2-1_2X2-1_2X3_16	**68**	LC3 at 56.25%	**0.01**	**OK**	
		69	LC10 at 50.00%	0.01	OK	
		70	LC4 at 50.00%	0.01	OK	
	L 2X2X3_16	**4**	LC12 at 100.00%	0.14	OK	
		5	LC3 at 100.00%	0.17	OK	
		9	LC29 at 100.00%	0.15	OK	
		10	LC2 at 100.00%	**0.19**	**OK**	
		14	LC9 at 100.00%	0.15	OK	

	15	LC1 at 100.00%	0.19	OK
PIPE 2x0.154	**35**	LC3 at 72.92%	0.37	OK
	36	LC1 at 72.92%	0.51	OK
	37	LC1 at 72.92%	**0.58**	**OK**
	38	LC1 at 72.92%	0.55	OK
	39	LC3 at 72.92%	0.57	OK
	40	LC3 at 72.92%	0.49	OK
	41	LC4 at 72.92%	0.52	OK
	42	LC4 at 72.92%	0.55	OK
	43	LC2 at 72.92%	0.49	OK
	44	LC2 at 72.92%	0.55	OK
	45	LC2 at 72.92%	0.48	OK
	46	LC3 at 72.92%	0.46	OK
	48	LC2 at 65.63%	0.02	OK
	50	LC1 at 65.63%	0.02	OK
	52	LC4 at 65.63%	0.02	OK
	55	LC4 at 7.14%	0.25	With warnings
	71	LC3 at 7.14%	0.26	With warnings
	72	LC1 at 7.14%	0.25	With warnings
PIPE 3x0.216	**17**	LC4 at 65.28%	0.17	OK
	18	LC3 at 65.97%	**0.20**	**OK**
	19	LC2 at 65.97%	0.20	OK
PL 6x1/2	**6**	LC4 at 50.00%	**0.14**	**OK**
	11	LC3 at 50.00%	0.13	OK
	16	LC1 at 50.00%	0.12	OK

RAM® Elements
CONNECT Edition

Current Date: 4/21/2022 1:17 PM
Units system: English

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
2	2.4898	0.00	1.4375	0
3	7.0004	0.00	4.0417	0
5	5.0203	0.00	-0.3621	0
6	2.1965	0.00	4.5288	0
9	4.6501	0.00	0.2791	0
10	2.5668	0.00	3.8876	0
11	7.2816	0.00	3.5545	0
12	6.7191	0.00	4.5288	0
13	-2.4898	0.00	1.4375	0
14	0.00	0.00	-2.875	0
15	-7.0004	0.00	4.0417	0
16	0.00	0.00	-8.0833	0
17	-3.6084	0.00	2.0833	0
18	0.00	0.00	-4.1667	0
20	-2.8238	0.00	-4.1667	0
22	2.8238	0.00	-4.1667	0
23	-2.5668	0.00	3.8876	0
24	-2.0833	0.00	-4.1667	0
25	-4.6501	0.00	0.2791	0
26	2.0833	0.00	-4.1667	0
27	-6.7191	0.00	4.5288	0
28	-0.5625	0.00	-8.0833	0
29	-7.2816	0.00	3.5545	0

30	0.5625	0.00	-8.0833	0
32	7.00	0.00	4.5288	0
33	-7.00	0.00	4.5288	0
34	-0.4221	0.00	-8.3266	0
35	-7.4221	0.00	3.7978	0
36	7.4221	0.00	3.7978	0
37	0.4221	0.00	-8.3266	0
40	-2.1965	0.00	4.5288	0
42	-5.0203	0.00	-0.3621	0
43	3.6084	0.00	2.0833	0
68	6.3333	-2.00	4.7738	0
69	6.3333	6.00	4.7738	0
70	3.3333	6.00	4.7738	0
71	3.3333	-2.00	4.7738	0
72	-1.0833	6.00	4.7738	0
73	-1.0833	-2.00	4.7738	0
74	-6.3333	6.00	4.7738	0
75	-6.3333	-2.00	4.7738	0
76	-7.3009	6.00	3.0979	0
77	-7.3009	-2.00	3.0979	0
78	-5.8009	6.00	0.4998	0
79	-5.8009	-2.00	0.4998	0
80	-3.5926	6.00	-3.3251	0
81	-3.5926	-2.00	-3.3251	0
82	-0.9676	6.00	-7.8717	0
83	-0.9676	-2.00	-7.8717	0
84	0.9676	6.00	-7.8717	0
85	0.9676	-2.00	-7.8717	0
86	2.4676	6.00	-5.2737	0
87	2.4676	-2.00	-5.2737	0
88	4.6759	6.00	-1.4487	0
89	4.6759	-2.00	-1.4487	0
90	7.3009	6.00	3.0979	0
91	7.3009	-2.00	3.0979	0
96	-3.1791	1.00	1.5353	0
97	-3.1791	-0.50	1.5353	0
102	0.26	1.00	-3.5208	0
103	2.9191	1.00	1.9856	0
104	0.26	-0.50	-3.5208	0
105	2.9191	-0.50	1.9856	0
134	-7.25	3.25	4.5288	0
135	7.25	3.25	4.5288	0
136	-6.75	3.25	4.5288	0
137	-7.2971	3.25	3.5813	0
138	-0.5471	3.25	-8.1101	0
139	0.5471	3.25	-8.1101	0
140	7.2971	3.25	3.5813	0
141	6.75	3.25	4.5288	0
142	-0.2971	3.25	-8.5431	0
143	-7.5471	3.25	4.0143	0
144	7.5471	3.25	4.0143	0
145	0.2971	3.25	-8.5431	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
2	1	1	1	1	1	1
13	1	1	1	1	1	1
14	1	1	1	1	1	1

Members

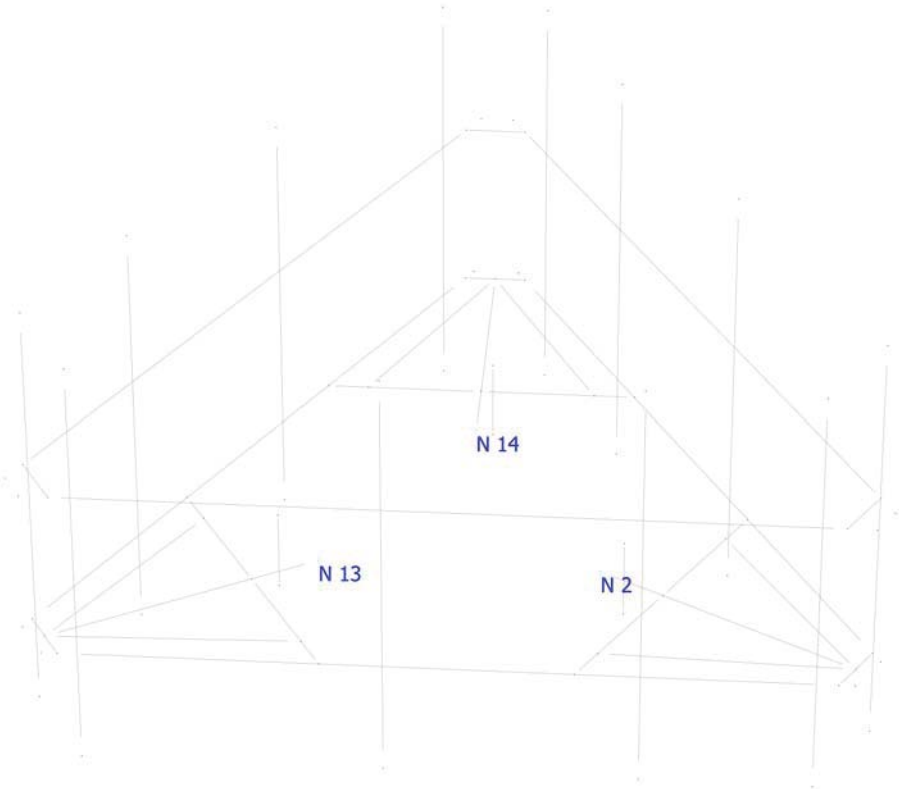
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	2	3		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
2	6	43		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
4	3	9		L 2X2X3_16	A36	0.00	0.00	0.00
5	3	10		L 2X2X3_16	A36	0.00	0.00	0.00
6	12	11		PL 6x1/2	A36	0.00	0.00	0.00
7	13	15		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
8	40	17		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
9	15	23		L 2X2X3_16	A36	0.00	0.00	0.00
10	15	25		L 2X2X3_16	A36	0.00	0.00	0.00
11	29	27		PL 6x1/2	A36	0.00	0.00	0.00
12	14	16		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
13	22	18		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
14	16	24		L 2X2X3_16	A36	0.00	0.00	0.00
15	16	26		L 2X2X3_16	A36	0.00	0.00	0.00
16	30	28		PL 6x1/2	A36	0.00	0.00	0.00
17	33	32		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
18	34	35		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
19	36	37		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
20	17	42		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
21	18	20		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
22	43	5		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
35	69	68		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
36	70	71		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
37	72	73		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
38	74	75		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
39	76	77		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
40	78	79		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
41	80	81		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
42	82	83		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
43	84	85		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
44	86	87		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
45	88	89		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
46	90	91		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
48	96	97		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
50	102	104		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
52	103	105		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
55	134	135		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
68	136	137		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
69	138	139		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
70	140	141		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
71	142	143		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
72	144	145		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
4	270.00	0	0.00	0.00	0.00
9	270.00	0	0.00	0.00	0.00
14	270.00	0	0.00	0.00	0.00
68	180.00	0	0.00	0.00	0.00
69	180.00	0	0.00	0.00	0.00
70	180.00	0	0.00	0.00	0.00

Hinges

	Node-J				Node-K						
Member	M33	M22	V3	V2	M33	M22	V3	V2	TOR	AXL	Axial rigidity
68	1	1	0	0	1	1	0	0	0	0	Full
69	1	1	0	0	1	1	0	0	0	0	Full
70	1	1	0	0	1	1	0	0	0	0	Full


N 14
N 13
N 2
Y
X
Z

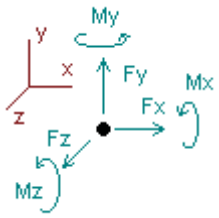
RAM® Elements
CONNECT Edition

Current Date: 4/21/2022 1:18 PM
Units system: English

Analysis result

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.4DL
LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+WL0+1.6LLa1
LC17=1.2DL+WL30+1.6LLa1
LC18=1.2DL-WL0+1.6LLa1
LC19=1.2DL-WL30+1.6LLa1
LC20=1.2DL+WL0+1.6LLa2
LC21=1.2DL+WL30+1.6LLa2
LC22=1.2DL-WL0+1.6LLa2
LC23=1.2DL-WL30+1.6LLa2
LC24=1.2DL+WL0+1.6LLa3
LC25=1.2DL+WL30+1.6LLa3
LC26=1.2DL-WL0+1.6LLa3
LC27=1.2DL-WL30+1.6LLa3
LC28=1.2DL+WL0+1.6LLa4
LC29=1.2DL+WL30+1.6LLa4
LC30=1.2DL-WL0+1.6LLa4
LC31=1.2DL-WL30+1.6LLa4

		Forces						Moments					
Node		**Fx** [Kip]	**Ic**	**Fy** [Kip]	**Ic**	**Fz** [Kip]	**Ic**	**Mx** [Kip*ft]	**Ic**	**My** [Kip*ft]	**Ic**	**Mz** [Kip*ft]	**Ic**
2	Max	1.652	LC2	2.701	LC12	1.405	LC1	0.39106	LC5	0.81902	LC3	4.80628	LC19
	Min	-1.594	LC8	0.367	LC6	-1.369	LC7	-3.29877	LC18	-0.82215	LC5	-0.30569	LC6
13	Max	1.612	LC6	2.702	LC10	1.449	LC1	0.85099	LC5	0.97757	LC1	-0.05161	LC8
	Min	-1.672	LC4	0.388	LC8	-1.416	LC7	-3.21815	LC3	-0.97491	LC7	-4.86979	LC29

14	Max	1.350	LC6	2.735	LC9	1.948	LC5	5.47969	LC9	1.31233	LC4	1.34793	LC4
	Min	-1.347	LC8	0.192	LC7	-2.017	LC3	-0.22194	LC7	-1.31211	LC6	-1.23863	LC6

HUDSON
Design Group LLC

Connection Check

Date: 4/21/2022
Project Name: TORRINGTON EAST MAIN ST
Project No.: CT1118
Designed By: KSBM **Checked By:** MSC

HUDSON Design Group LLC

CHECK CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A36 1/2" (Threaded Rod)

Allowable Tensile Load =

F_{Tall} = 4271 lbs.

Allowable Shear Load =

F_{Vall} = 2562 lbs.

TENSILE FORCES

Reaction **F =** 2017 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 1350 lbs. (See Bentley Output)
Reactions in Y direction: 2735 lbs. (See Bentley Output)

Resultant: 3050 lbs.

No. of Supports = 1
No. of Bolts / Support = 3

Tension Design Load /Bolts =

f_t = 672.33 lbs. < 4271 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v = 1016.68 lbs. < 2562 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.157	+	0.397	=	0.554	<	1.0	**Therefore, OK !**

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2019.

Information on the Property Records for the Municipality of Torrington was last updated on 2/17/2022.

Parcel Information

Location:	1927 E MAIN ST	Property Use:	Retail	Primary Use:	Neighborhood Shopping Center
Unique ID:	5571	Map Block Lot:	247/002/024	Acres:	9.39
490 Acres:	0.00	Zone:	LB	Volume / Page:	0697/0859
Developers Map / Lot:	5047/4913	Census:	H		

Value Information

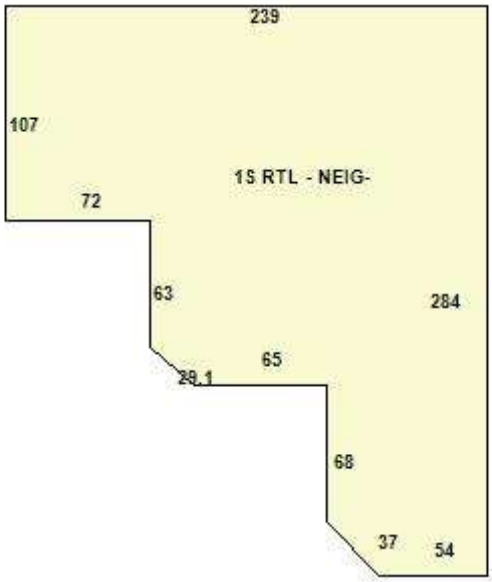
	Appraised Value	Assessed Value
Land	1,311,818	918,280
Buildings	2,594,519	1,816,160
Detached Outbuildings	221,273	154,890

	Appraised Value	Assessed Value
Total	4,127,610	2,889,330

Owner's Information

Owner's Data
TEP INCORPORATED PO BOX 876 TORRINGTON, CT 06790

Building 1



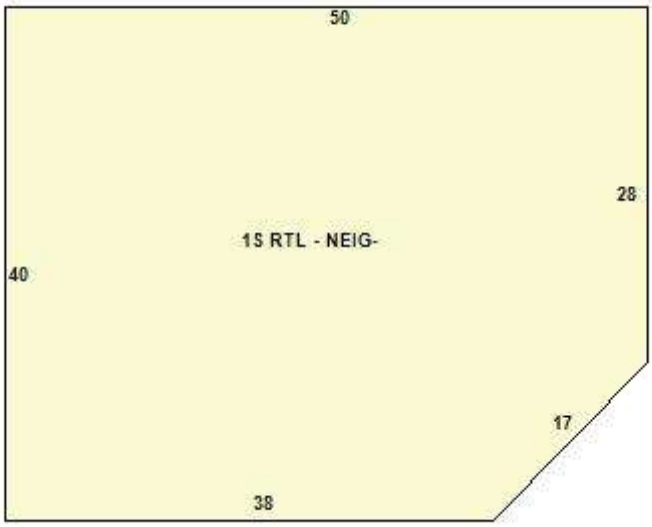
Category:	Retail	Use:	Neighborhood Shopping Center	GLA:	46,307
Stories:	1.00	Construction:	Masonry and Wood Frame	Year Built:	1994
Heating:	FHA Non Duct	Fuel:	Gas	Cooling Percent:	100
Siding:	Concrete Block	Roof Material:	Asphalt	Beds/Units:	0

Special Features

Mezzanine Finished Area	950
Mezzanine Unfinished Area	950
Wet Sprinklers	46200

Attached Components

Building 2



Category:	Retail	Use:	Neighborhood Shopping Center	GLA:	1,926
Stories:	1.00	Construction:	Reinforced Concrete	Year Built:	2006
Heating:	FHA	Fuel:	Gas	Cooling Percent:	100
Siding:	Concrete Block	Roof Material:	Asphalt	Beds/Units:	0

Special Features

Attached Components

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Canopy	1994	0.00	0.00	1,834
Canopy	2006	0.00	0.00	404
Fencing	1994	0.00	0.00	240
Loading Dock Cov	1994	0.00	0.00	480
Loading Dock Un	1994	0.00	0.00	80
Concrete Patio	1994	0.00	0.00	220
Paving	1994	0.00	0.00	122,022
Poles	1994	0.00	0.00	7
Frame Shed	1994	0.00	0.00	600
Frame Shed	1994	0.00	0.00	200

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
TEP INCORPORATED	0697	0859	04/20/1999		$0
PERGOLA HEATHER A	0697	0857	04/20/1999		$0
TEP INCORPORATED	0599	0410	05/27/1994		$699,000

Building Permits

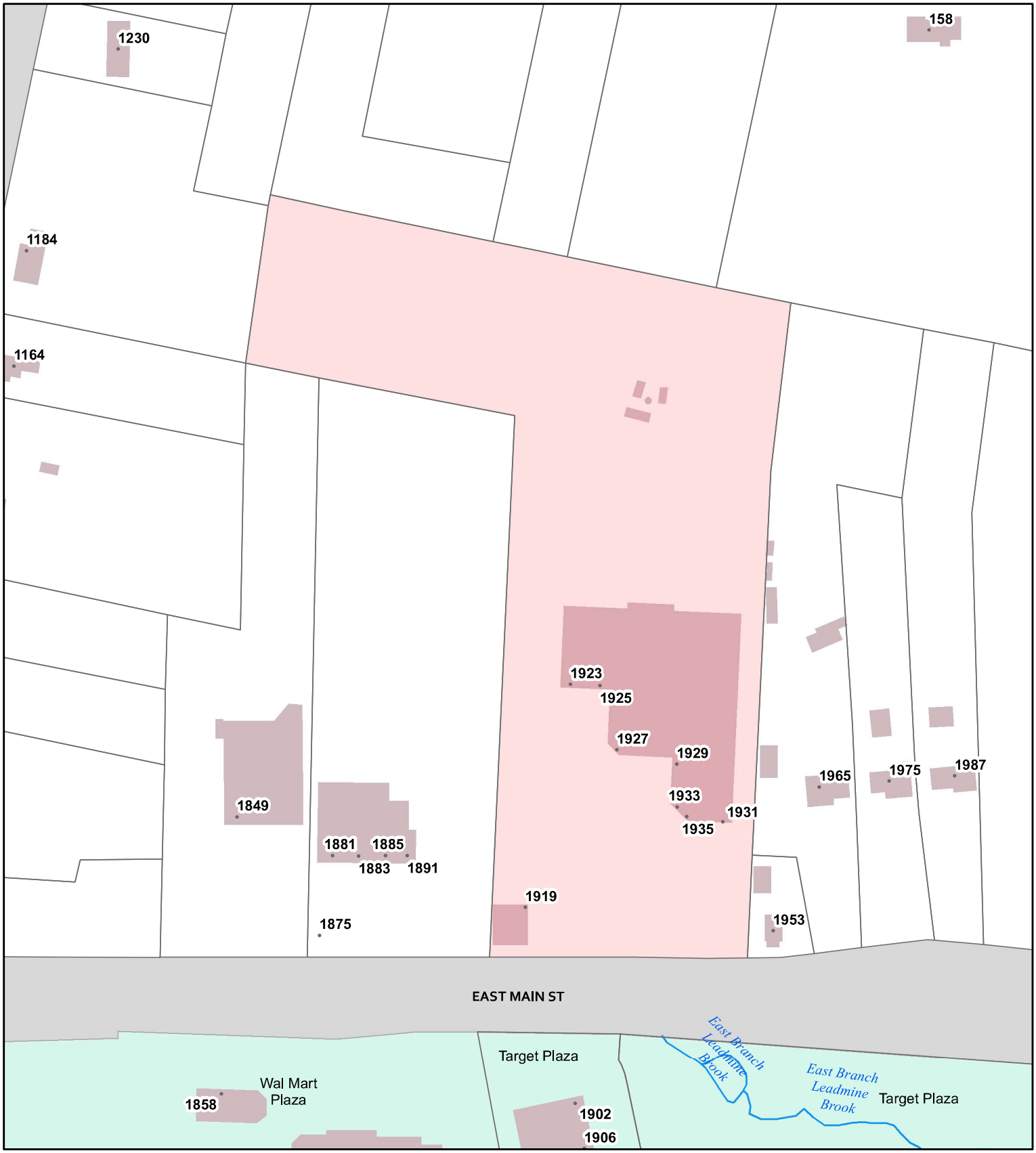
Permit Number	Permit Type	Date Opened	Reason
22-19 MEC	Mechanical	01/27/2022	HVAC MODIFICATIONS FOR QUEST LAB
22-12 PLU	Plumbing	01/27/2022	RENOVATIONS FOR NEW LAB- OFFICE FOR QUEST DIAGNOSTICS
21-197 PLU	Plumbing	11/30/2021	REPAIR LEAKING GAS LINE- (BIG LOTS)
	Building	12/31/2020	3 NEW CELL ANTENNAS & ASSOC EQUIP
20-125 Z	Commercial	12/11/2020	3 NEW CELL ANTENNAS
20-44 EL	Electrical	02/12/2020	NEW 2" PVC CONDUIT-FIBER OPTIC CARE UNDERGROUND/ATTACH TO T-MOBILE NEW CABINET=PP
19-951	Building	05/29/2019	CELL TOWER MODIFICATION- 6 ANTENNAS/REMOTE HEADS= PP
18-1934	Electrical	10/17/2018	ELECTRICAL
17-1935	Certificate of Completion	10/10/2017	CERT OF COMPL- REPL ANTENNA PANELS/HEADS-VERIZON
17-1850	Building	09/27/2017	REMOVE & REPLACE 2 WALL SIGNS/ 1 PYLON FACE
17-1849	Electrical	09/27/2017	FINAL ELEC FOR SIGNS
17-1082	Certificate of Completion	06/14/2017	CERT OF COMPL-MODIFY AT&T ANTENNA & REPL 3 RADIO HEADS
17-882	Building	05/23/2017	AT&T SIGNAGE & 3 LETTER SETS/1 PYLON SIGN =PP
17-441	Commercial	04/07/2017	VERIZON- REPL PANELS WITH NEW MODELS/REMOTE RADIO HEADS=PP
17-425 Z	Commercial	03/30/2017	REPL EXISTING ANTENNAS WITH NEW MODELS
17-345	Building	03/16/2017	MODIFY AT&T ANTENNA SITE- REPL 3 REMOTE RADIO UNITS
17-341 Z	Commercial	03/10/2017	ANTENNA MODIFICATION ON EXISTING TOWER
16-1966	Electrical	10/14/2016	DISCONNECT EXHAUST FAN/ADD QUAD OUTLET & REWIRE GFI & LIGHT SWITCH
16-1954	Plumbing	10/13/2016	REM TOILET & INSTALL 15 X 15 SINK
16-1389	Building	08/01/2016	REMOVE 1 TOILET & SINK IN RESTROOM/TURN INTO DRAW ROOM/COUNTER & SINK
15-2412	Building	12/23/2015	REPL ANTENNA PANELS & ADD REMOTE RADIO HEADS= PP
15-1825	Certificate of Completion	10/07/2015	CERT OF COMPL- MAINTENANCE/NEW FLAT PLATE REINFORCEMENT

Permit Number	Permit Type	Date Opened	Reason
15-1353	Building	08/12/2015	INSTALL NEW FLAT PLATE REINFORCEMENT & MAINTENANCE= PP
15-760	Building	05/22/2015	ADD 3 NEW ANTENNA/MODUALS/CABLES/ETC=PP
14-1909	Building	09/23/2014	AWNING FOR OUTER SEATING AREA=PP
14-1752 Z	Residential	08/27/2014	23 X 20 CANOPY OVER DINING AREA
14-1369	Building	07/11/2014	ADD 3 CELL ANTENNAS & ASSOC EQUIP= PP
13-5588	Building	08/13/2013	SWAP OUT ANTENNA @CELL TOWER
12-3174	Building	01/04/2013	INSTALL 3 NEW ANTENNAS & SUPPORT EQUIP/I NEW CABINET IN EXISTING SHELTER
12-3032	Commercial	12/07/2012	REPL 6 ANTENNA W/3 NEW & EQUIP CABINETS=PP
12-2968	Commercial	11/27/2012	REPL 6 ANTENNAS W/ NEW
12-1056	Mechanical	04/18/2012	6 FT HOOD/EXHAUST FAN FOR HIBACHI TABLE
12-470	Commercial	03/13/2012	ADD 1 NEW HIBACHI GRIDDLE
11-807	Commercial	07/21/2011	10 PEDICURE CHAIRS/2 MASSAGE ROOMS/1 BATH
11-1174	Certificate of Completion	07/15/2011	CERT OF COMPL-BLOOD DRAWING OFFICE
11-808	Commercial	06/01/2011	64' PARTITION WALL
11-771	Commercial	05/26/2011	OFFICE FITOUT- BLOOD DRAWING OFFICE
11-364	Commercial	04/08/2011	REPL EXISTING PANEL ANTENNA
10-1094	Certificate of Completion	07/02/2010	WALK IN COOLER/CHECKOUT COUNTER DRY SPRINKLERS
10-1003	Commercial	06/22/2010	ADD 3 DRY SPRINKLERS AND RELOCATE 3 SPRINKLERS
10-183	Commercial	03/17/2010	NEON WALL SIGN & PANEL FACE REPLCMNT
09-1397	Certificate of Completion	08/12/2009	CHG USE FROM AIG OFFICE TO H&R BLOCK OFFICE
07-000436	Commercial	04/12/2007	WALL SIGN
06-1133CO	Certificate of Occupancy	11/16/2006	NEW BLDG

Permit Number	Permit Type	Date Opened	Reason
06-1277CO	Certificate of Occupancy	11/16/2006	CINGULAR WIRELESS IN NEW BLDG
06-1277	Commercial	07/28/2006	TENANT FIT OUT
06-1133	Commercial	07/13/2006	CONSTRUCT NEW BLDG
06-458CO	Certificate of Occupancy	05/08/2006	CO PERMIT #06-458
06-458	Commercial	03/31/2006	INTERIOR ALTERATIONS
05-80	Commercial	04/07/2005	FREE-STANDING ATM
04-470	Commercial	09/16/2004	INT PARTITIONS - VERIZON
04-208A	Commercial	05/28/2004	INTERIOR ALTERATIONS
04-172A	Commercial	05/12/2004	WORK ON FOUNDATION - CHINESE REST
04-92	Commercial	04/06/2004	INSTALL PRE-FAB SHELTER & ANTENNAE (1925 E MAIN)
04-37	Commercial	02/10/2004	INT FRAMING
03-582	Commercial	11/24/2003	WIRELESS FACILITY
02-300	Commercial	07/18/2002	TOWER MODIFICATION
02-05	Commercial	01/10/2002	NEW ANTENNAE
00-416	Commercial	12/14/2000	CONCRETE PAD FOR TELECOM TOWER
00-402	Commercial	11/29/2000	ADD ANTENNAE TO TOWER
00-326	Commercial	09/14/2000	TELECOM TOWER
04-037CO	Certificate of Occupancy		04-037 CO ISSUED

City of Torrington, Connecticut - Assessment Parcel Map

Map/Block/Lot 247-002-024 **Address:** 247-002-024



Map Produced: January 2021

Approximate Scale: 1 inch = 177 feet

City Of Torrington

PLANNING AND ZONING COMMISSION
140 Main Street • Room 311
Torrington, CT 06790

Tel.: (860) 489-2220
Fax: (860) 489-2550

August 16, 2000

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Thomas Flynn, III
SBA, Inc., and Sprint PCS
49 Leavenworth Street - Suite 200
Waterbury, CT 06702

Re: Special Exception 00-20 and Site Plan 00-21
Applicant: SBA, Inc., and Sprint PCS;
Location: 1925 East Main Street, Torrington, CT
Proposal: Construct 155' telecommunication facility and associated equipment area.

Dear Mr. Flynn:

This is to confirm that at its August 9, 2000 meeting, the Planning and Zoning Commission approved the above referenced proposal with the following conditions:

The application is modified to allow for construction of a 155' expandable monopole wireless telecommunications tower and associated improvements. Structural work shall be performed on the tower to support vertical expansion to 163' should expansion be required in the future to accommodate co-location at this site. The tower is to be located 30 feet closer to the rear property line (northerly direction) and to be located in full compliance with fall zone setback requirements. The 155' height is to be adjusted downward for any increase in elevation gained by moving the tower toward the rear of the property. The recording mylar Site Plan will be modified to include these changes and the certified letter of approval containing all conditions of approval shall be reproduced and included on the recording mylar Site Plan. The lease area from the property owner T.E.P. Inc, must include the area of the proposed tower and full radius of the fall zone.

The 155' monopole wireless telecommunications tower and associated improvements are approved with the following conditions:

1. Per Section A 12.0 of the Regulations, the special exception shall be valid for 15 years. At the end of this time period, the tower shall be removed by Sprint Spectrum LP d/b/a Sprint PCS or SBA, Inc., a new special exception permit shall be required.

2. Per Section A 4.4.1 of the Regulations, the applicant must provide a plan for the handling of any hazardous materials using best management practices. If any hazardous materials are to be used on site, there shall be provisions for full containment of such materials. An enclosed containment area shall be provided with a sealed floor, designed to contain at least 110% of the volume of hazardous materials stored or used on the site. A 110% containment area specifically designed for the Sprint back up batteries shall be installed.

3. Per Section A 9.0. of the Regulations, within 90 days of beginning operations, the applicant shall submit existing measurements of radio frequency radiation (RFR) from the facility, signed and sealed by an RF Engineer, stating that the RFR measurements are accurate and below the maximum permissible exposure (MPE) limits as established by the FCC guidelines. The report shall be submitted to the office of the City Planner. This information shall be provided on an annual basis thereafter.

4. As offered by the applicant during the public hearing process, space shall be made available, at no charge, for municipal services equipment.

5. Per Section A 10.3 of the Regulations. the applicant shall submit a bond in an amount sufficient to cover the costs of removal of the regulated facility in the event the City must remove the facility. The bond amount must be approved by the City Engineer in a form acceptable to the Torrington Corporation Counsel.
6. As recommended by Torrington Fire Chief the applicant shall install a secure Knox-brand lock box on the exterior of the fence near the main entrance to allow the Fire Department quick access. The driveway must be maintained in all weather conditions in order to allow emergency access.

7. The area within the existing parking lot which is part of the fall zone perimeter will be cordoned off using 6" concrete filled bollards 48" height 48" on center which will act as a barrier to vehicular traffic.

8. The Landscaping plan will be revised to include both a stockade fence and 3 white pines 6'-8' in height planted 6' OC to screen the dumpster area and to contain debris from the lands N/F Daniel & Gina Masciarelli.

9. The applicant shall submit a bond estimate to be reviewed and approved by the City Planner for the proposed landscaping. A bond in a form acceptable to the Corporation Counsel be shall posted prior to issuance of the Zoning Permit. 25% of the posted bond shall remain in place for one year after the landscaping plan has been fully implemented to ensure successful growth of the plantings.

10. The applicant shall apply for a grading permit prior to issuance of the Zoning Permit and post the required bond for erosion and sedimentation in an amount approved by the City Engineer and in a form acceptable to the Corporation Counsel.

Enclosed please find three copies of the completed Certification of Special Exception form. Take all three copies to the City Clerk's Office where they will time stamp and record on the City Land Records one copy. Deliver one copy to the Planning and Zoning Department and retain one copy for your records.

Your Special Exception approval does not take effect until it is recorded on the Land Records. You can obtain a Zoning Permit only after the Certification is filed and certain conditions are complied with.

The applicant shall provide the Planning and Zoning Office with a recording mylar and three paper copies of the approved plan.

If you have any questions regarding this matter, please contact me.

Sincerely,

Martin J. Connor, AICP
City Planner

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.ct.gov/csc

February 20, 2004

Michele G. Briggs
Manager of Real Estate
Southwestern Bell Mobile Systems, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-143-040213** - Southwestern Bell Mobile Systems, LLC notice of intent to modify an existing telecommunications facility located at 1925-1931 East Main Street, Torrington, Connecticut.

Dear Ms. Briggs:

At a public meeting held on February 18, 2004, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated February 13, 2004. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: Honorable Owen J. Quinn, Jr., Mayor, City of Torrington
Martin Connor, City Planner, City of Torrington
Bryan Wilson, SBA, Inc.
Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae LLP
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP
Thomas F. Flynn III, Nextel Communications, Inc.
Sandy M. Carter, Verizon Wireless

G:\em\cing\torrington\dc021804.doc

CSC
CONNECTICUT SITING COUNCIL

SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

T + 561.995.7670
F + 561.995.7626

sbasite.com

LETTER OF AUTHORIZATION

SBA Site ID: CT01499-S, Torrington

Property Located at: 1925-1931 East Main Street, Torrington, CT, 06790-3102

THE CITY/COUNTY OF: Torrington / Litchfield

APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes AT&T and its authorized agents to file for all necessary zoning, planning and building permits (local, state and federal) for the purposes of installing, operating and maintaining a telecommunications facility on the existing tower on the property referenced above on behalf of T.E.P. Incorporated.

All approval conditions that may be granted to AT&T in connection with above referenced facility relating to this specific application are the sole responsibility of AT&T.

SBA Towers, LLC

Jason Silberstein

Executive VP, Site Leasing

Date: 7/05/2022

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com
$8.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0295 7081 61 0089 5000 0020 6790

U.S. POSTAGE PAID
Click-N-Ship®

07/14/2022 Mailed from 03079

PRIORITY MAIL®

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 07/16/22
Ref#: CT1118
0000

C009

HON ELINOR CARBONE, MAYOR JEREMY
TORRINGTON CITY HALL
140 MAIN ST
TORRINGTON CT 06790-5201

USPS TRACKING #

9405 5036 9930 0295 7081 61

Electronic Rate Approved #038555749

Cut on dotted line.

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com
$8.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0295 7081 78 0089 5000 0020 6790

U.S. POSTAGE PAID
Click-N-Ship®

07/14/2022 Mailed from 03079

PRIORITY MAIL®

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 07/16/22
Ref#: CT1118
0000

B008

TEP INCORPORATED
PO BOX 876
TORRINGTON CT 06790-0876

USPS TRACKING #

9405 5036 9930 0295 7081 78

Electronic Rate Approved #038555749

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com
$8.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0295 7081 85 0089 5000 0063 3487

U.S. POSTAGE PAID
Click-N-Ship®

07/14/2022 Mailed from 03079

PRIORITY MAIL®

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 07/18/22
Ref#: CT1118
0000

C036

SBA COMMUNICATIONS CORP
8051 CONGRESS AVE
BOCA RATON FL 33487-1307

USPS TRACKING #

9405 5036 9930 0295 7081 85

Electronic Rate Approved #038555749

Cut on dotted line.

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com
$9.25
US POSTAGE
Legal Flat Rt Env

9405 5036 9930 0295 7081 92 0092 5000 0020 6051

U.S. POSTAGE PAID
Click-N-Ship®

07/14/2022 Mailed from 03079

PRIORITY MAIL®

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 07/16/22

0000

C006

MELANIE BACHMAN EXECUTIVE DIRECTOR
CT SITING COUNCIL
10 FRANKLIN SQ
NEW BRITAIN CT 06051-2655

USPS TRACKING #

9405 5036 9930 0295 7081 92

Electronic Rate Approved #038555749

Hollis Redding Mayor & City Planner Copies

From: auto-reply@usps.com
Sent: Thursday, July 14, 2022 1:32 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Friday, July 15, 2022 arriving by 9:00pm 9405503699300295708161

UNITED S

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 11:48 am on July 14, 2022 in MERIDE

Tracking Number: **9405503699300295708161**

Expected Delivery By

Fri
15
July

By 9:00pm

Tracking & Delivery Op

My Account

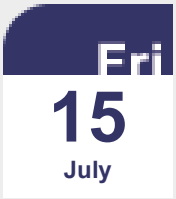
From: auto-reply@usps.com
Sent: Thursday, July 14, 2022 12:03 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Friday, July 15, 2022 arriving by 9:00pm 9405503699300295708178

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 11:48 am on July 14, 2022 in MERIDE

Tracking Number: **9405503699300295708178**

Expected Delivery By



By 9:00pm

My Account

Hollis Redding Tower Owner Copy

From: auto-reply@usps.com
Sent: Thursday, July 14, 2022 12:03 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Monday, July 18, 2022 arriving by 9:00pm 9405503699300295708185

UNITED S

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 11:48 am on July 14, 2022 in MERIDE

Tracking Number: **9405503699300295708185**

Expected Delivery By

Mon
18
July

By 9:00pm

Tracking & Delivery Op

My Account