



**Centek Engineering, Inc.**  
3-2 North Branford Road  
Branford, Connecticut 06405  
Phone: (203) 488-0580  
Fax: (203) 488-8587

**Steven L. Levine**  
Real Estate Consultant

**HAND DELIVERED**

February 8, 2017

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

**Notice of Exempt Modification: Existing Telecommunications Facility at 1925 East Main Street, Torrington**

Dear Ms. Bachman:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, copies of this letter are being sent to the chief elected official and the Planning & Zoning Department of the municipality in which the affected cell site is located, the property owner of record, and the tower owner or operator.

UMTS technology offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the Internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

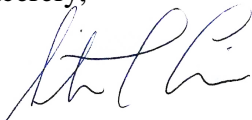
The changes to the facility do not constitute modifications as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical and environmental characteristics of the site will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not increase.
2. The proposed changes will not extend the site boundaries.
3. The proposed changes will not increase the noise level at the site boundary by six decibels or more, or to levels that exceed state and local criteria.
4. The changes will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996, as amended, and the State Department of Energy and Environmental Protection, pursuant to Section 22a-162 of the Connecticut General Statutes.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The proposed equipment changes will not impair the structural integrity of the facility, as determined in a certification provided by a professional engineer licensed in Connecticut.

For the foregoing reasons, AT&T respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (860) 830-0380 with questions concerning this matter. Thank you for your consideration.

Sincerely,



Steven L. Levine  
Real Estate Consultant

cc: Chief Elected Official, City of Torrington (by email)  
Planning & Zoning Department, City of Torrington (by email)  
Property Owner of Record – TEP Incorporated  
Tower Owner / Operator – SBA (by email)

Attachments

**NEW CINGULAR WIRELESS  
Equipment Modification**

1925 (aka 1927) East Main St., Torrington  
Geographic Coordinates: N 41-49-23.8 W 73-04-36.1  
Site Number 1118  
Prior Exempt Mods approved 2/04, 5/09, 11/12, 2/14, 5/15

**Tower Owner/Manager:** SBA

**Land Owner of Record:** TEP Incorporated

Please see the attached Torrington Assessor's card and property map.

**Original Permitting:** Torrington Planning and Zoning officials issued a Special Exception for SBA's East Main Street tower on August 9, 2000. (See attached approval.) Although Condition 1 of the Special Exception stated that the approval would expire in August 2015, Torrington City Planner Martin Connor has advised SBA that, "provided the required removal bond for the cell tower in the amount of \$59,759.00 remains in place no further Special Exception renewal is required." SBA reports that it is in compliance with maintenance of the removal bond. (See the attached email chain addressing this matter.) No condition of the local approval will be violated by the proposed equipment modifications.

**Lease Area:** The attached lease exhibit from TS-VOICESTREAM-143-001102 shows the 60 x 60 ft fenced compound as approved by local P&Z three months prior to Voicestream's filing. The Council subsequently approved co-location by AT&T in 2004. Comparison of the 2000 site plan with the proposed site plan, attached, shows that the fenced compound still measures 60 x 60 ft. Since all proposed modifications will occur either on the existing tower structure or within AT&T's existing equipment shelter, the proposed modifications will not extend either AT&T's lease area or the existing overall site boundaries.

**Equipment Configuration:** 155 ft Monopole (Max. height 155 ft per zoning approval)

**Current and/or Approved:** Platform mount @ 95 ft  
 Three PowerWave 7770 antennas @ 95 ft c.l.  
 Two CCI OPA-65R-LCUU-H6 antennas @ 95 ft c.l.  
 Three CCI HPA-65R-BUU-H6 antennas @ 95 ft c.l.  
 One Andrew SBNH-1D65A antenna @ 95 ft c.l.  
 Six PowerWave TMA's @ 95 ft  
 One surge arrester @ 95 ft  
 Six Ericsson RRUS-11 remote radio heads @ 95 ft  
 Twelve lines 1 5/8 inch coax  
 One fiber and two DC cables  
 Equipment shelter

**Proposed Modifications:** Remove three RRUS-11 remote radio heads.  
 Install three RRUS-12 remote radio heads.

**Power Density:**

Worst-case calculations with 10 dB reduction for existing wireless operations at the site indicate a radio frequency electromagnetic radiation power density, measured at six feet above ground level beside the tower, of approximately 25.3 % of the standard adopted by the FCC. As depicted in the second table below, the total radio frequency electromagnetic radiation power density following proposed modifications would be approximately 21.3 % of the standard.

**Existing**

Carrier & Technology	Frequency (MHz)	Antennas (Total for All Sectors)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	Percent of Limit
Other Users *								14.97
AT&T *	850/1900		95	4				1.27
AT&T *	700/850/2300		95	8				5.40
AT&T *	2100		95	2				1.76
AT&T *	700		95	2				1.85
<b>Total</b>								<b>25.25%</b>

\* Per CSC records.

## Proposed

Carrier & Technology	Frequency (MHz)	Antennas (Total for All Sectors)	Centerline Ht (feet)	Number of Channels	Power Per Channel (Watts)	Power Density (mW/cm <sup>2</sup> )	Standard Limits (mW/cm <sup>2</sup> )	Percent of Limit
Other Users *								14.97
AT&T LTE	740	2 CCI OPA 1 Andrew 1 CCI HPA	95	1	1476	0.0670	0.4933	1.36
AT&T LTE	1900	3 CCI HPA	95	2	3664	0.3327	1.0000	3.33
AT&T LTE	2300	2 CCI OPA 1 Andrew	95	1	1285	0.0583	1.0000	0.58
AT&T UMTS	880	3 PowerWave	95	2	325	0.0295	0.5867	0.50
AT&T UMTS	1900	3 PowerWave	95	1	667	0.0303	1.0000	0.30
AT&T GSM	880	2 CCI OPA 1 Andrew	95	1	325	0.0148	0.5867	0.25
<b>Total</b>								<b>21.30%</b>

\* Per CSC records.

### Structural information:

The attached structural analysis demonstrates that the tower and foundation have adequate structural capacity to accommodate the proposed equipment modifications. (Tower Engineering Solutions, 2-2-17)

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 2014.



Information on the Property Records for the Municipality of Torrington was last updated on

**Assessor's Card**

**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	70% Assessed Value
Land	1,257,418	880,190
Buildings	3,073,910	2,151,740
Detached Outbuildings	227,816	159,470
<b>Total</b>	<b>4,559,144</b>	<b>3,191,400</b>

**Owner's Information**

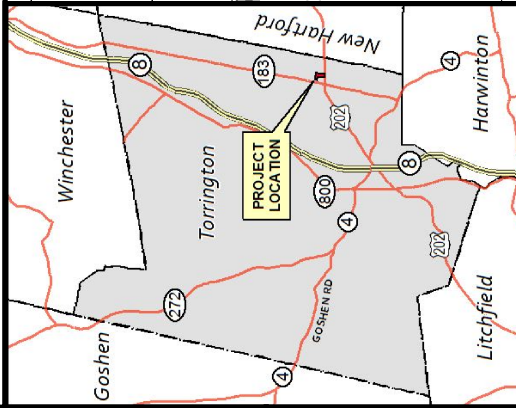
Owner's Data
TEP INCORPORATED PO BOX 876 TORRINGTON CT 06790

# Property Owners for 1927 E. Main St. and Vicinity in Torrington, CT

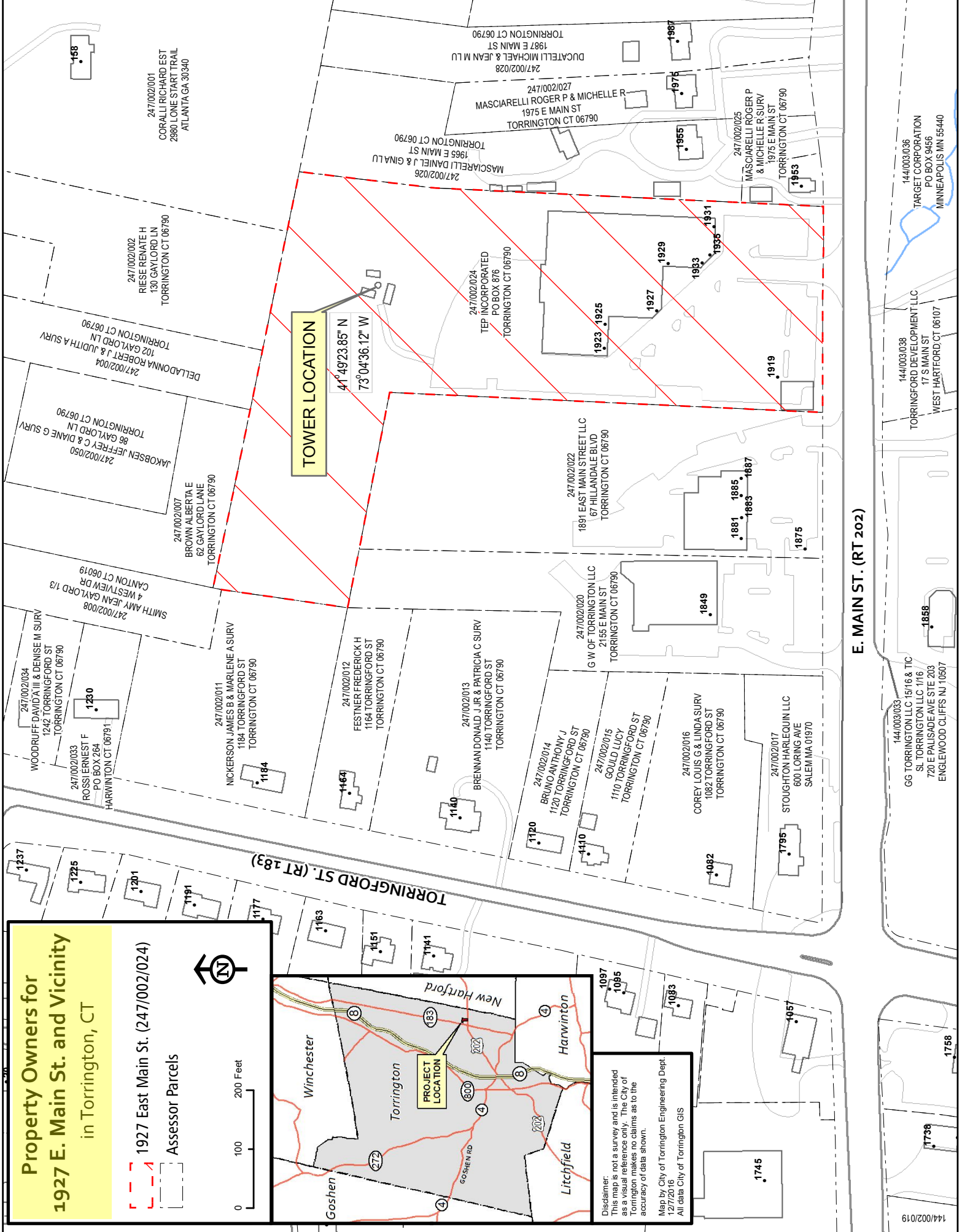
1927 East Main St. (247/002/024)  
Assessor Parcels



0 100 200 Feet



**Disclaimer:**  
This map is not a survey and is intended as a visual reference only. The City of Torrington makes no claims as to the accuracy of data shown.  
Map by: City of Torrington Engineering Dept.  
12/7/2016  
All data City of Torrington GIS



E. MAIN ST. (RT 202)

144/002/019  
17738  
1745  
1097  
1085  
1033  
1758  
144/003/033  
GG TORRINGTON LLC 15/16 & TIC  
SL TORRINGTON LLC 1/16  
720 E PALISADE AVE STE 203  
ENGLEWOOD CLIFFS NJ 10607  
1858  
144/003/038  
TORRINGTON DEVELOPMENT, LLC  
17 S MAIN ST  
WEST HARTFORD CT 06107  
144/003/036  
TARGET CORPORATION  
PO BOX 9456  
MINNEAPOLIS MN 55440

Zoning Approval - August 2000

CITY OF TORRINGTON
CERTIFICATION OF SPECIAL EXCEPTION

Aug 22 1 00 PM '00

- a. Applicant's Name: SBA, Inc. and Sprint PCS, Thomas Flynn, III
b. Applicant's Address: 49 Leavenworth Street, Suite 200, Waterbury, CT 06702
c. Address of the Property: 1925-1931 East Main Street, Torrington, CT
d. Owner of Record: T.E.P., Inc.
e. Owner's Address: 1925-1931 East Main Street, Torrington, CT
f. Date of Special Exception: August 9, 2000
g. Nature of Special Exception: Construct 155' telecommunication facility and associated equipment area.
h. Section(s) of the Regulations which are applicable for the Special Exception: Addendum A, wireless communications facilities, A.1.0 et seq.
i. Conditions attached to the approval:

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:

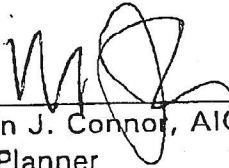
- 1. Per Section A 12.0 of the Regulations, the special exception shall be valid for 15 years. At the end of this time period, the tower shall be removed by Sprint Spectrum LP d/b/a Sprint PCS or SBA, Inc., a new special exception permit shall be required.
2. Per Section A 4.4.1 of the Regulations, the 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.

**THIS CERTIFICATION IS FILED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 8-3D OF THE CONNECTICUT GENERAL STATUTES**

  
\_\_\_\_\_  
Martin J. Connor, AICP  
City Planner

**Torrington Planning & Zoning Department's  
Email Statement Re: Status of Local Zoning Approval  
For Tower at 1925 East Main Street, Torrington**

**From:** Mark Luther <mluther@sbsite.com>  
**To:** Carl Aquilina <Carl.Aquilina@SAI-Comm.com>

**[Other Recipients Omitted]**

**Sent:** Tuesday, February 7, 2017 4:11 PM  
**Subject:** RE: Thank You for Submitting Your Collocation Application [CT01499-S-07 / Torrington : AT&T] / [Tenant ID: CT1118 / 132/Torrington]-AMENDMENT-LTE / APP #: 53021, SA ordered-Complete

Carl, I received what's below from SBA Zoning Dept.....let me know if this covers it for you to proceed.

Hi Mark,

I received the following email from the City of Torrington with regards to the Special Exception renewal. We do have a removal bond in place so I will scan his email into the PMD for future reference. We really appreciate you bringing any compliance issues to our attention.

**Hi Patches, provided the required removal bond for the cell tower in the amount of \$59,759.00 remains in place no further Special Exception renewal is required. Thanks,**

**Martin J Connor, AICP, City Planner  
City of Torrington  
140 Main Street  
Torrington, CT 06790  
860-489-2220**

**Patches Estes**  
*Zoning Compliance Specialist*

PROPOSED UNDERGROUND ELEC AND TELCO FROM DEMARC TO LOAD CENTER AND 2'x3' HOFFMAN BOX

(E) ELECTRICAL AND TELCO DEMARC LOCATION

**SBA, INC**

By *Edward G. Dupont*  
(Authorized Signature)  
Name: Edward G. Dupont  
Title: Construction Coordinator

Date: 10/3/00

(3)(N) NORTEL SB000 BTS CABINETS

PROPOSED VSM EQUIPMENT SET ON 10'x20' CONCRETE SLAB

(N) ICE BRIDGE

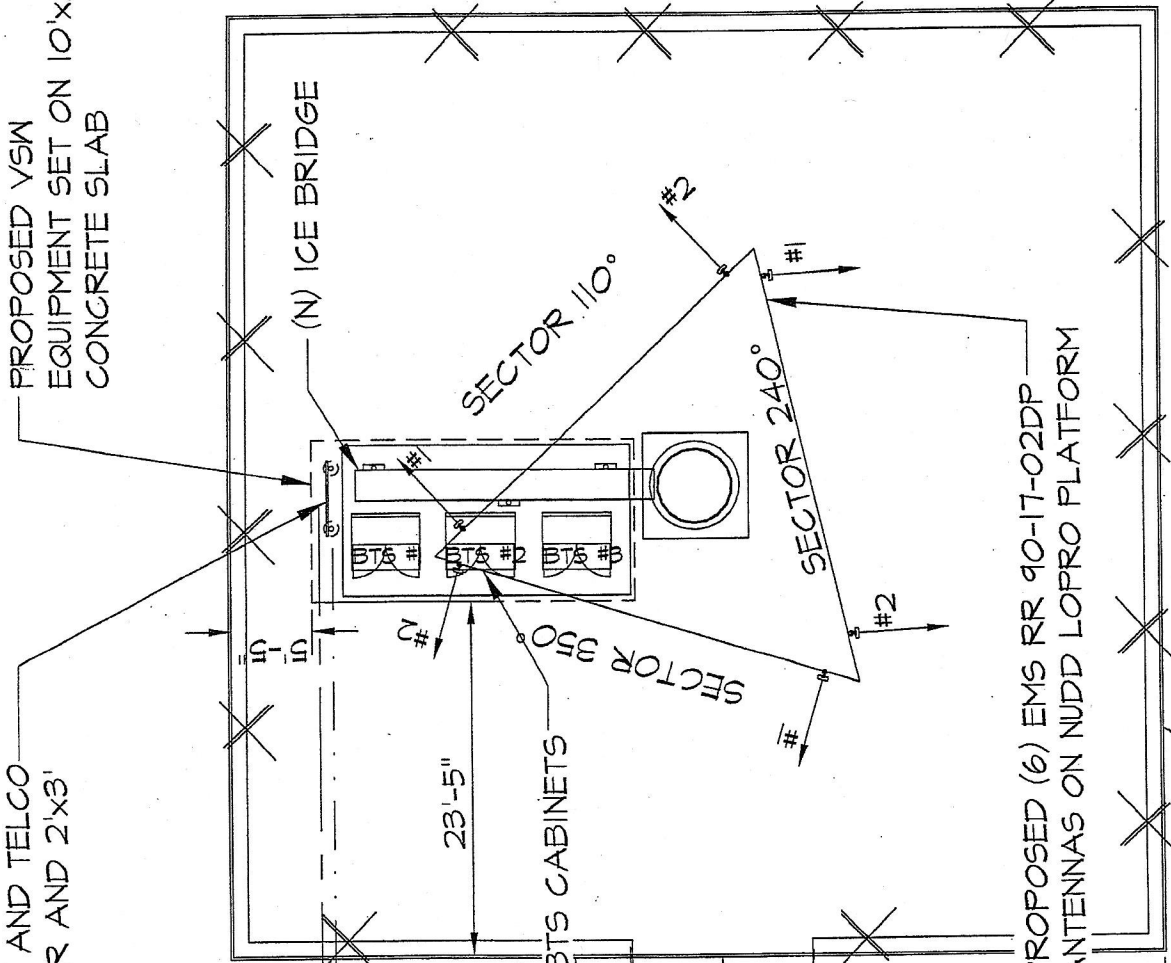
SECTOR 110°

SECTOR 350°

SECTOR 240°

(E) GRAVEL PARKING AND ACCESS DRIVE PROPOSED (6) EMS RR 90-17-02DP ANTENNAS ON NUDD LOPRO PLATFORM

(E) 60x60 COMPOUND AREA



PROJECT INFORMATION:  
TORRINGTON  
CT-11-586A  
SBA  
150 EAST MAIN STREET  
TORRINGTON, CT  
LITCHFIELD COUNTY  
CURRENT ISSUE DATE:  
10/24/00

ISSUED FOR:  
LEASE EXHIBIT  
REV. DATE: DESCRIPTION: BY:

REV. DATE	DESCRIPTION	BY
10/24/00	ISSUED FOR LEASE EXHIBIT	TK

PLANS PREPARED BY:  
**SCIENTECH.**  
44 SHELTER ROCK RD.  
DANBURY, CT 06810  
TEL: 203-746-5500  
FAX: 203-746-5212

APPROVALS:  
PROPERTY OWNER  
ZONING  
CONSTRUCTION  
OPERATIONS  
RF  
NETWORK  
CONTRACTOR

DRAWN BY: \_\_\_\_\_  
TK  
LICENSURE: \_\_\_\_\_  
CHK. \_\_\_\_\_  
RG  
APV. \_\_\_\_\_  
SG

SHEET TITLE:  
SITE PLAN

SHEET NUMBER:  
**L1**  
REVISION:  
**A**

**P&Z-Approved Site Plan + T-Mobile Colo  
October, 2000**



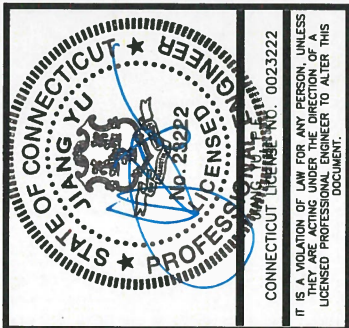


27 NORTHWESTERN DRIVE  
 SALEM, NH 03079

**CT1118**  
**TORRINGTON EAST**  
**MAIN STREET**

CONSTRUCTION DRAWINGS	
0	02/03/17 ISSUED FOR CONSTRUCTION
A	10/05/17 ISSUED FOR REVIEW

**Dewberry**  
 Dewberry Engineers Inc.  
 600 PASSIPPANY ROAD  
 SUITE 301  
 PASSIPPANY, NJ 07054  
 PHONE: 973.739.8400  
 FAX: 973.739.9710



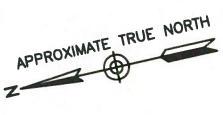
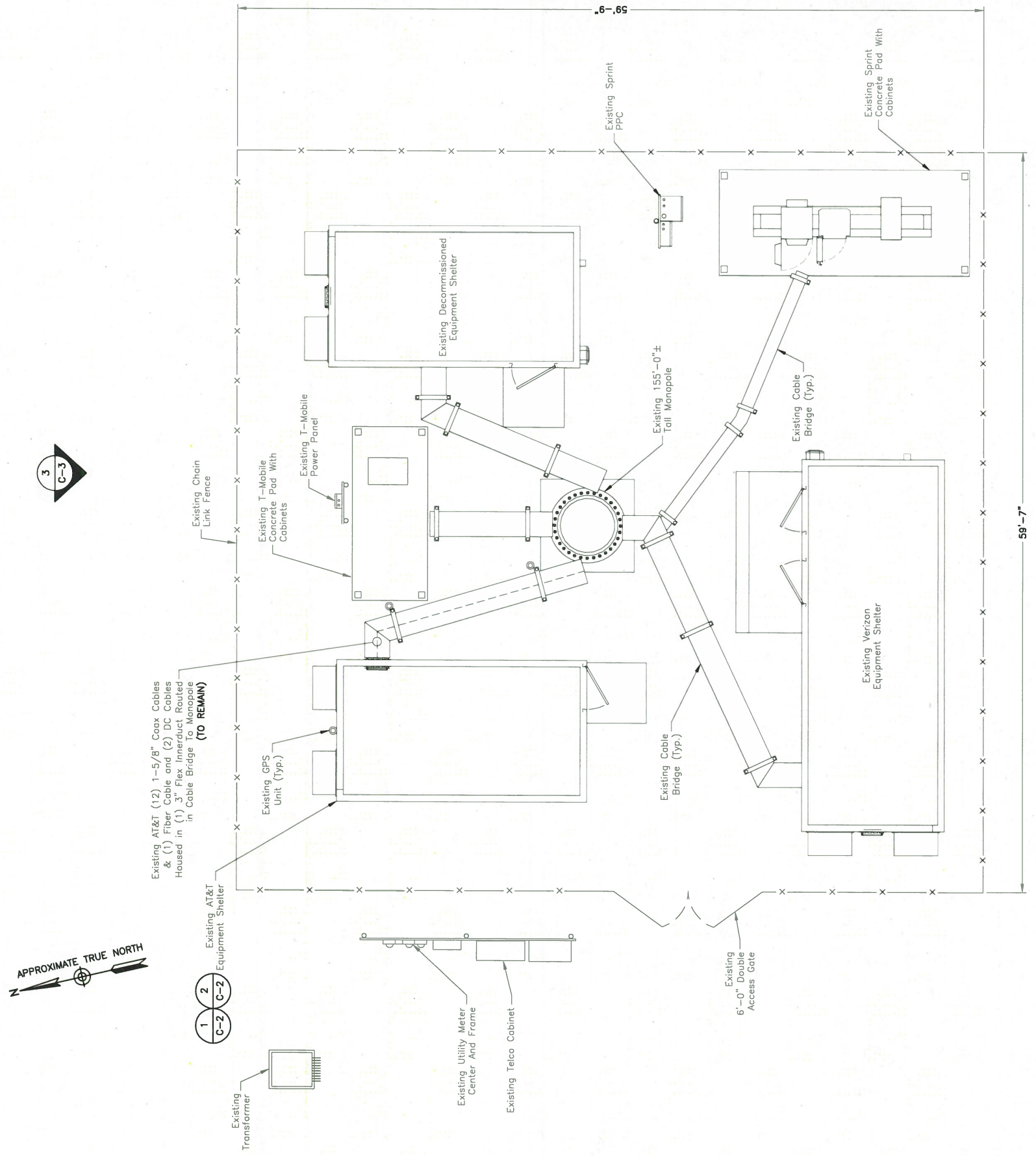
CONNECTICUT LICENSE NO. 0023222  
 IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS  
 THE PERSON IS A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS  
 DOCUMENT.

DRAWN BY: BJR  
 REVIEWED BY: DER  
 CHECKED BY: GHN  
 PROJECT NUMBER: 50055106  
 JOB NUMBER: 50055676  
 SITE ADDRESS:

1925 EAST MAIN STREET  
 TORRINGTON, CT 06790  
 LITCHFIELD COUNTY

SHEET TITLE  
 COMPOUND PLAN  
 SHEET NUMBER

C-1



1  
2  
C-2  
C-2

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



- NOTES:**
1. NORTH SHOWN AS APPROXIMATE.
  2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
  3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRU'S, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH THE STRUCTURAL ANALYSIS BY ENGINEERING SOLUTIONS DATED FEBRUARY 2, 2017.

CONSTRUCTION DRAWINGS	
0	02/03/17 ISSUED FOR CONSTRUCTION
A	10/05/17 ISSUED FOR REVIEW

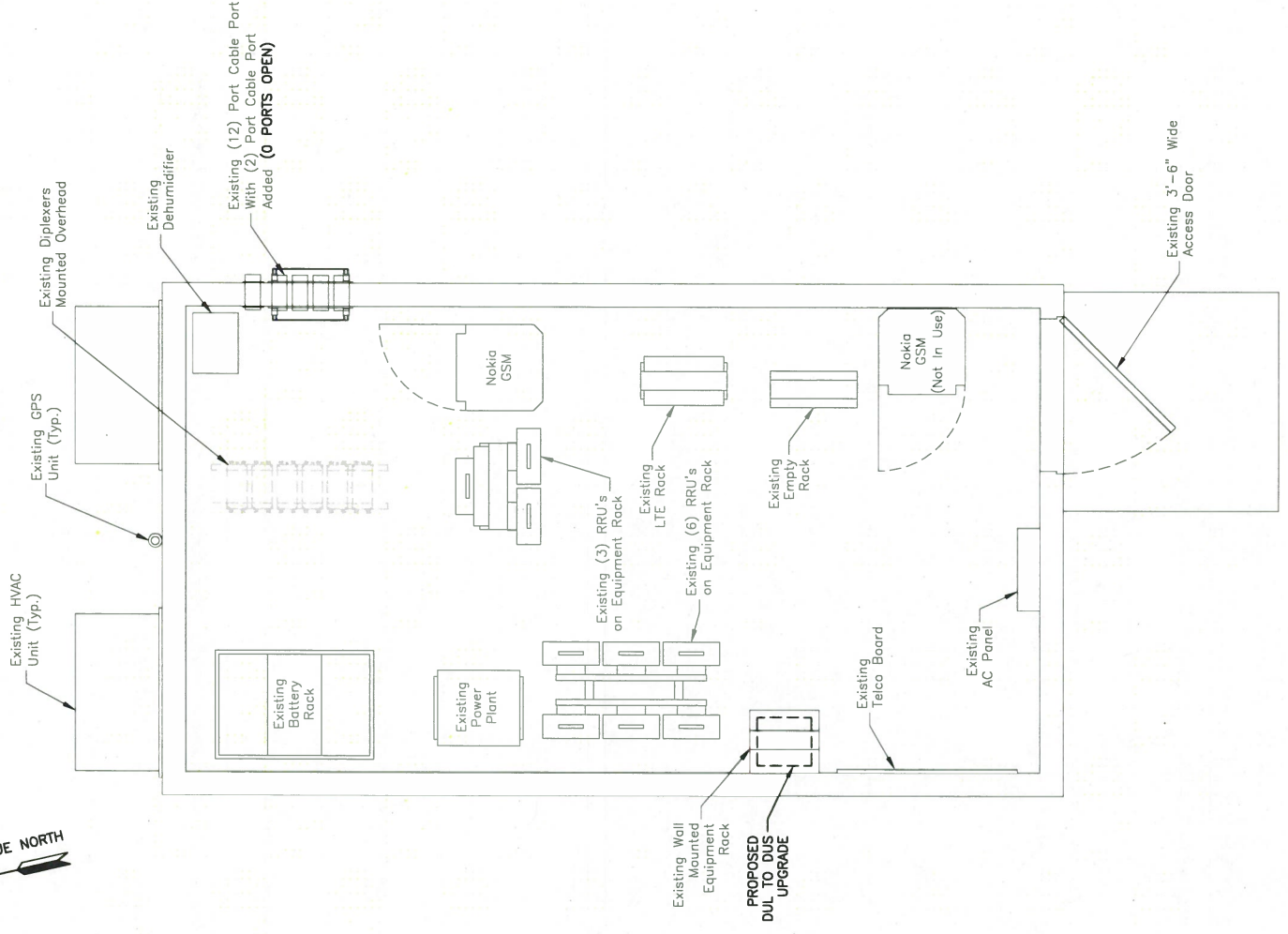
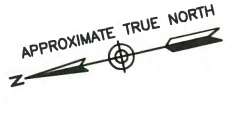
**JIAN YU**  
STATE OF CONNECTICUT  
PROFESSIONAL ENGINEER  
LICENSE NO. 28223  
DATE OF EXPIRATION: 12/31/2024

CONNECTICUT LICENSE NO. 0023222  
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS  
SPECIFICALLY AUTHORIZED BY THE STATE OF  
CONNECTICUT, TO REPRODUCE OR TRANSMIT THIS  
DOCUMENT.

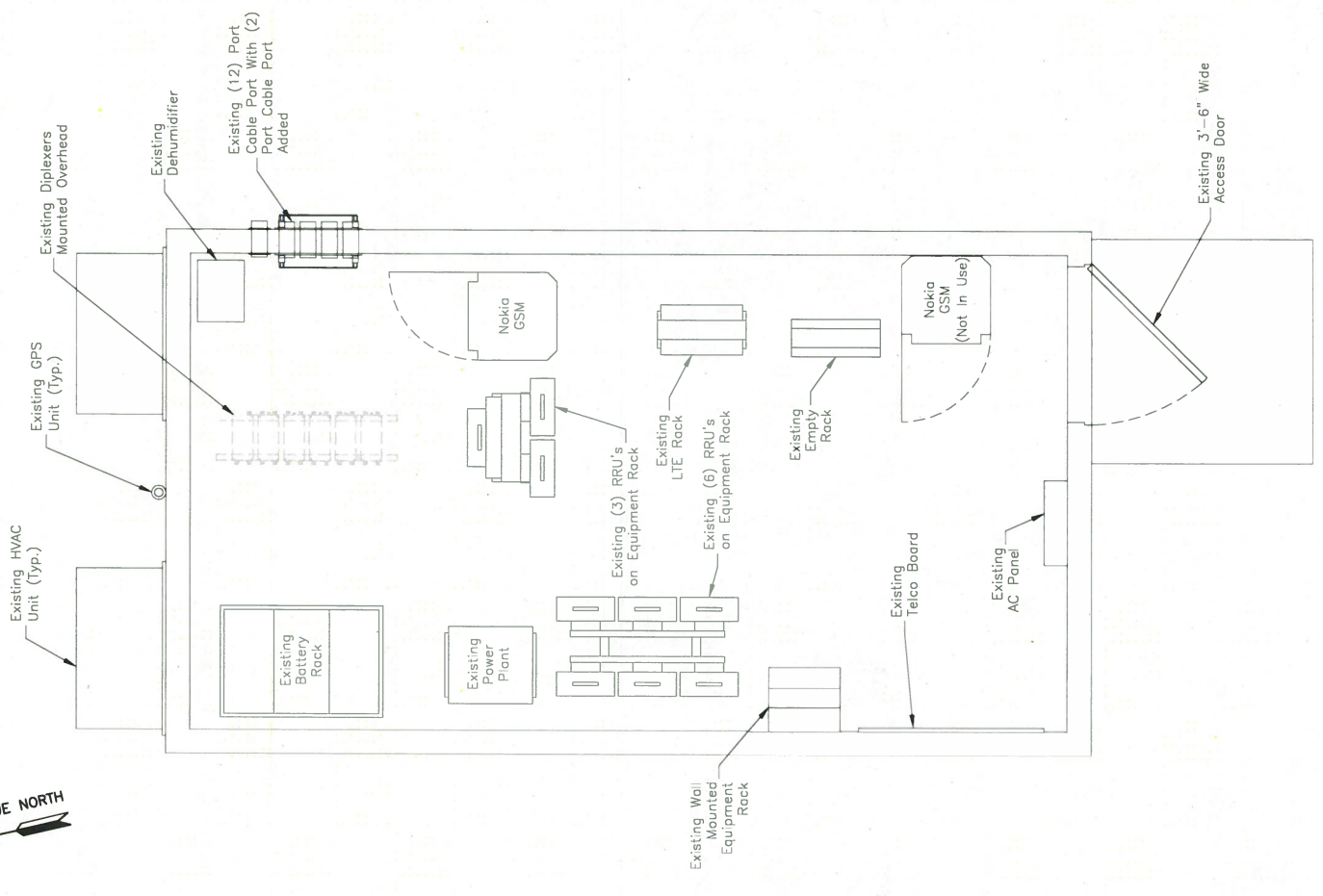
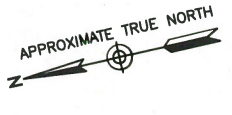
DRAWN BY:	BJR
REVIEWED BY:	DER
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50065676
SITE ADDRESS:	

1925 EAST MAIN STREET  
TORRINGTON, CT 06790  
LITCHFIELD COUNTY

SHEET TITLE	
EXISTING & PROPOSED SHELTER LAYOUTS	
SHEET NUMBER	

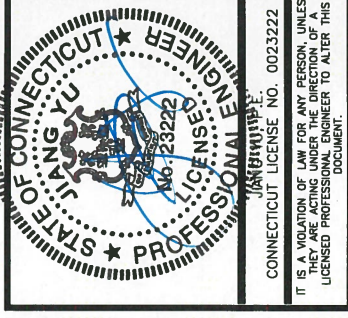


**2**  
**PROPOSED SHELTER LAYOUT**  
SCALE: 1/4"=1' FOR 11"x17"  
1/2"=1' FOR 22"x34"  
0' 1' 2' 4'



**1**  
**EXISTING SHELTER LAYOUT**  
SCALE: 1/4"=1' FOR 11"x17"  
1/2"=1' FOR 22"x34"  
0' 1' 2' 4'

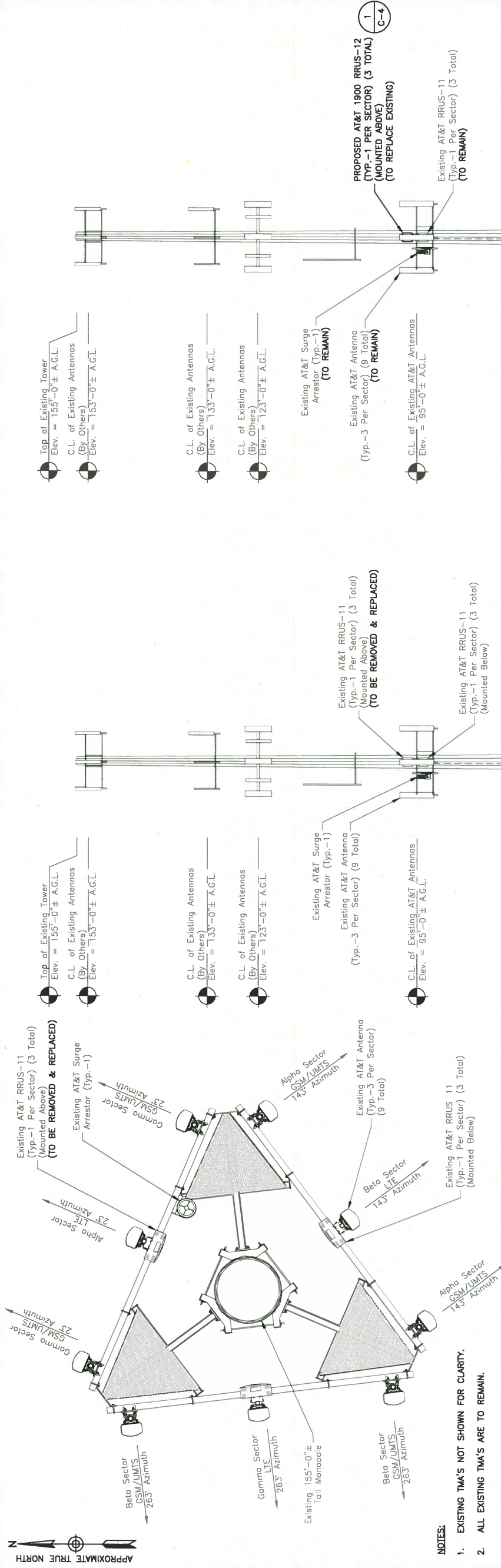
CONSTRUCTION DRAWINGS	
0	02/03/17 ISSUED FOR CONSTRUCTION
1	01/05/17 ISSUED FOR REVIEW



DRAWN BY:	BUR
REVIEWED BY:	DER
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50065676
SITE ADDRESS:	

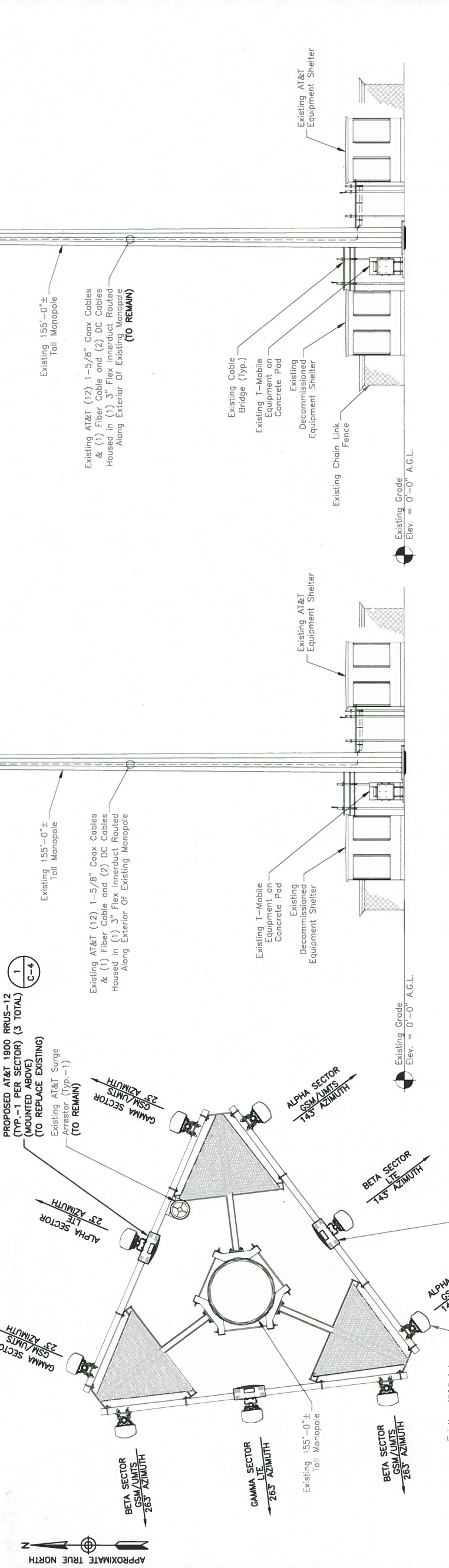
1925 EAST MAIN STREET  
TORRINGTON, CT 06790  
LITCHFIELD COUNTY

SHEET TITLE	ANTENNA LAYOUTS & ELEVATIONS
SHEET NUMBER	



**EXISTING ANTENNA LAYOUT**  
SCALE: N.T.S.

- NOTES:**
- EXISTING TMA'S NOT SHOWN FOR CLARITY.
  - ALL EXISTING TMA'S ARE TO REMAIN.



**PROPOSED ANTENNA LAYOUT**  
SCALE: N.T.S.

- NOTES:**
- EXISTING TMA'S NOT SHOWN FOR CLARITY.
  - ALL EXISTING TMA'S ARE TO REMAIN.

**EXISTING NORTH ELEVATION**  
SCALE: 1"=20' FOR 11'x17"  
1"=10' FOR 22'x34"



NOTE:  
1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRUS'S, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY TOWER ENGINEERING SOLUTIONS DATED FEBRUARY 2, 2017.

**PROPOSED NORTH ELEVATION**  
SCALE: 1"=20' FOR 11'x17"  
1"=10' FOR 22'x34"



NOTE:  
1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRUS'S, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY TOWER ENGINEERING SOLUTIONS DATED FEBRUARY 2, 2017.



**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

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## Structural Analysis Report

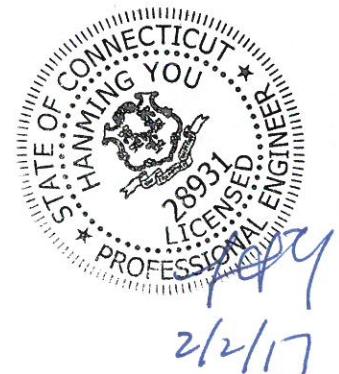
Existing 153 ft Nudd Corporation Monopole  
Customer Name: SBA Communications Corp  
Customer Site Number: CT01499-S  
Customer Site Name: Torrington  
Carrier Name: AT&T  
Carrier Site ID / Name: N/A / Torrington East  
Site Location: 1925-1931 East Main Street  
Torrington, Connecticut  
Litchfield County  
Latitude: 41.822991  
Longitude: -73.077199

### Analysis Result:

Max Structural Usage: 68.5% [Pass]

Max Foundation Usage: 41% [Pass]

Report Prepared By : Jie Chen





## 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

<b>Tower Drawings</b>	Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000
<b>Foundation Drawing</b>	Fred A. Nudd Corporation (Project No. 7783) foundation design drawings dated August 18, 2000
<b>Geotechnical Report</b>	Jaworski Geotech, Inc., Project # 99335G, Dated 11/3/1999
<b>Modification Drawings</b>	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

## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G. 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.

<b>Wind Speed Used in the Analysis:</b>	Ultimate Design Wind Speed $V_{ult} = 120.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 93.0$ mph (3-Sec. Gust)
<b>Wind Speed with Ice:</b>	40 mph (3-Sec. Gust) with 1" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Seismic Parameters:</b>	$S_S = 0.184$ , $S_1 = 0.065$

## 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 APXVSP18-C-A20 - Panel			
6		3	RFS APXVTM14-C-I20 - Panel			
7		3	TD-RRH8x20-25 RRHs			
8	133.0	6	EMS - RR90-17-02DP - Panel	Low Profile Platform	(12) 1 5/8"	T-Mobile
9	123.0	9	Commscope SBNHH-1D65B - Panel	Low Profile Platform	(16) 1 5/8" (2) 1 5/8" Fiber	Verizon
10		6	Antel LPA-80063/6CF - Panel			
11		3	Alcatel Lucent B66 4X45 AWS			
12		3	Alcatel Lucent RRH2x60-700			
13		3	Alcatel Lucent RRH2X60-PCS			
14		2	RFS DB-T1-6Z-8AB-0Z			
15	110.0	1	10' Omni	(1) Standoff	(1) 1/2"	Torrington PD
-	95.0	3	Polyphaser 1000860	(3) Sector Frame	(12) 1 5/8" (2) 1/2" Fiber (4) 3/4" DC	AT&T
-		3	Powerwave 7770 - Panel			
-		4	CCI/HPA-65R-BUU H6 - Panel			
-		6	Powerwave LGP21401			
-		6	Powerwave LGP21903			
-		3	CCI OPA-65R-LCUU-H6 - Panel			
-		2	Raycap/Squid			
-		6	Ericsson RRUS-11			
-		3	Ericsson RRUS-12			
-		3	Ericsson RRUS-32			
-		3	Ericsson RRUS-A2			
-		3	Ericsson RRUS-E2			
-		2	Andrew SBNH-1D65A - Panel			
29	70.0	1	GPS	(1) Standoff	(1) 1/2"	Unknown

## 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
16	95.0	3	Polyphaser 1000860	(3) Sector Frame	(12) 1 5/8" (2) 1/2" Fiber (4) 3/4" DC	AT&T
17		3	Powerwave 7770 - Panel			
18		4	CCI/HPA-65R-BUU H6 - Panel			
19		6	Powerwave LGP21401			
20		6	Powerwave LGP21903			
21		3	CCI OPA-65R-LCUU-H6 - Panel			
22		2	Raycap/Squid			
23		6	Ericsson RRUS-11			
24		3	Ericsson RRUS-12			
25		3	Ericsson RRUS-32			
26		3	Ericsson RRUS-A2			
27		3	Ericsson RRUS-E2			
28		2	Andrew SBNH-1D65A - Panel			

See 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:	<b>68.5%</b>	<b>61.1%</b>	<b>58.4%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	3692.0	31.2
Analysis Reactions	3609.8	35.1
Factored Reactions*	4984.2	42.1
% of Design Reactions	72.4%	83.3%

\* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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 ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.9657 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 ANSI/TIA-222-G standards and the 2012 IBC under the design basic wind speed specified in the Analysis Criteria.

## 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

2/2/2017

Page: 2



### Shaft Properties

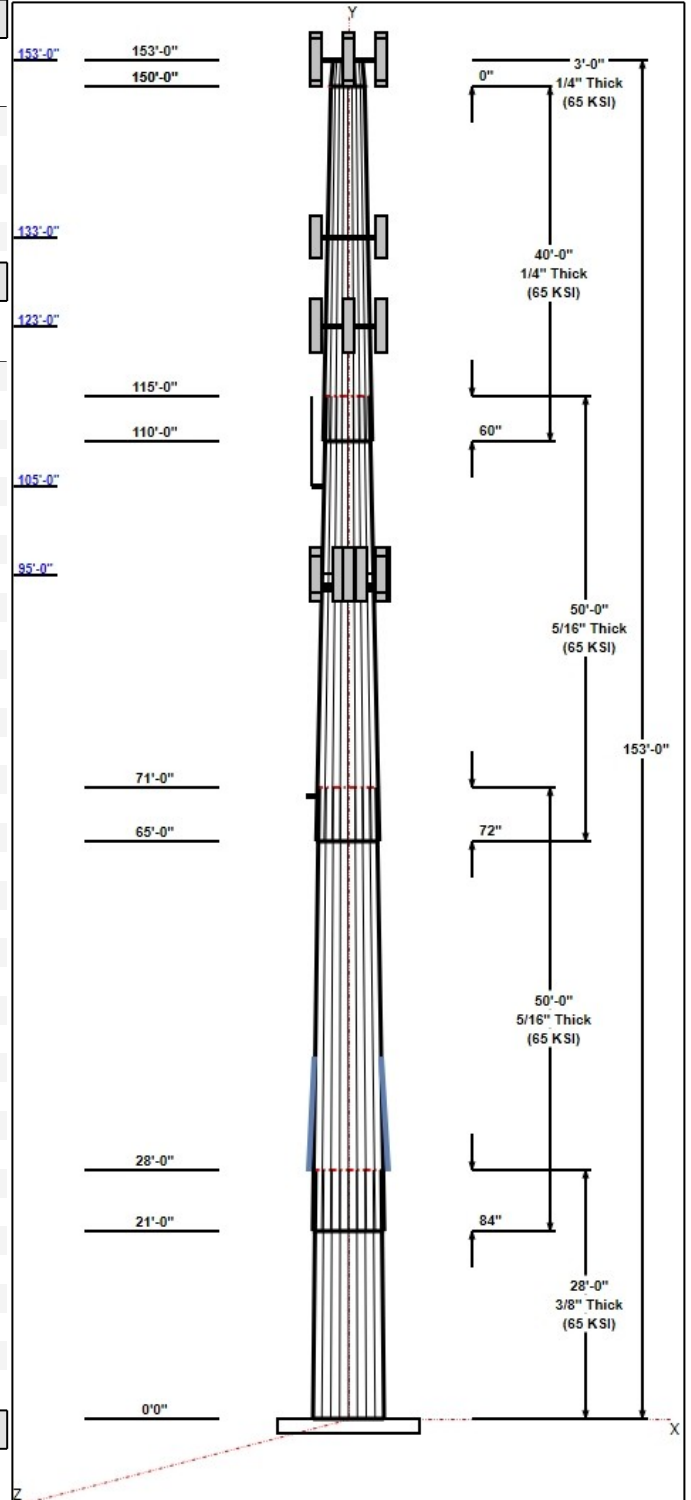
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	28.00	53.09	60.00	0.375		0.24673	65
2	50.00	43.11	55.44	0.313	Slip	0.24673	65
3	50.00	32.88	45.21	0.313	Slip	0.24673	65
4	40.00	24.74	34.61	0.250	Slip	0.24673	65
5	3.00	24.00	24.74	0.250	Butt	0.24673	65

### 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	APXVSP18-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	
133.00	133.00	6	RR90-17-02DP	T-Mobile
133.00	133.00	1	Low Profile Platform	T-Mobile
123.00	123.00	3	B66 4X45 AWS	Verizon
123.00	123.00	9	SBNHH-1D65B	Verizon
123.00	123.00	6	LPA-80063/6CF	Verizon
123.00	123.00	3	RRH2X60-PCS	Verizon
123.00	126.00	3	RRH2x60-700	Verizon
123.00	123.00	2	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
95.00	95.00	4	HPA-65R-BUU-H6	AT&T
95.00	95.00	3	7770	AT&T
95.00	95.00	2	SBNH-1D65A	AT&T
95.00	95.00	3	OPA-65R-LCUU-H6	AT&T
95.00	95.00	6	LGP21401	AT&T
95.00	95.00	6	LGP21903	AT&T
95.00	95.00	6	RRUS-11	AT&T
95.00	95.00	3	RRUS-12	AT&T
95.00	95.00	3	RRUS-A2	AT&T
95.00	95.00	3	RRUS-32	AT&T
95.00	95.00	3	RRUS-E2	AT&T
95.00	95.00	3	1000860	AT&T
95.00	95.00	2	Raycap/Squid	AT&T
95.00	95.00	3	Sector Frame	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	133.00	Inside	1 5/8" Coax	T-Mobile
0.00	123.00	Inside	1 5/8" Coax	Verizon
0.00	123.00	Inside	1 5/8" Coax	Verizon



## Notice Emailed to City and Tower Owner

To: <Elinor\_Carbone@Torringtonct.org>; <Martin\_Connor@Torringtonct.org>; <MLuther@SBAsite.com>;

Cc: CSC-DL Siting Council <siting.council@ct.gov>;

### **New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 1925 East Main Street, Torrington**

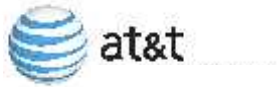
In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

As required by Regulations of Connecticut State Agencies (“R.C.S.A.”) Section 16-50j-73, the Connecticut Siting Council has been notified of the changes and will review AT&T’s proposal. Please accept this letter as notification under Section 16-50j-73 and Siting Council policy of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The enclosed Notice fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council’s procedures, please contact the undersigned at 860-830-0380 or Ms. Melanie Bachman, Acting Executive Director, Connecticut Siting Council at (860) 827-2935.

Thank you.

-- Steve Levine, for AT&T



**Centek Engineering, Inc.**  
3-2 North Branford Road  
Branford, Connecticut 06405  
Phone: (203) 488-0580  
Fax: (203) 488-8587

**Steven L. Levine**  
Real Estate Consultant

February 9, 2017

TEP Incorporated  
PO Box 876  
Torrington, CT 06790

**Notice of Exempt Modification: Existing Telecommunications Facility at 1925 – 1931 East Main Street, Torrington**

To Whom It May Concern:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System (“UMTS”) and Long Term Evolution (“LTE”) capabilities, and enhance system performance in the State of Connecticut, New Cingular Wireless PCS, LLC (“AT&T”) will be changing its equipment configuration at certain cell sites.

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Sincerely,

A handwritten signature in black ink, appearing to read "S. L. Levine".

Steven L. Levine  
Real Estate Consultant

Enclosure





**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

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## Structural Analysis Report

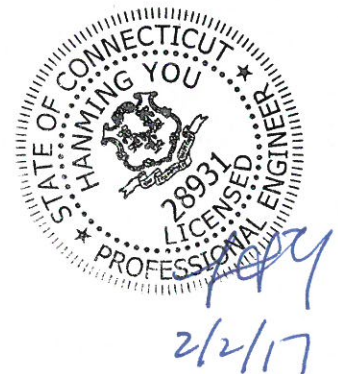
Existing 153 ft Nudd Corporation Monopole  
Customer Name: SBA Communications Corp  
Customer Site Number: CT01499-S  
Customer Site Name: Torrington  
Carrier Name: AT&T  
Carrier Site ID / Name: N/A / Torrington East  
Site Location: 1925-1931 East Main Street  
Torrington, Connecticut  
Litchfield County  
Latitude: 41.822991  
Longitude: -73.077199

### Analysis Result:

Max Structural Usage: 68.5% [Pass]

Max Foundation Usage: 41% [Pass]

Report Prepared By : Jie Chen





**Tower Engineering Solutions**

Phone (972) 483-0607, Fax (972) 975-9615  
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

---

## **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**

**Carrier Site ID / Name: N/A / Torrington East**

**Site Location: 1925-1931 East Main Street**

**Torrington, Connecticut**

**Litchfield County**

**Latitude: 41.822991**

**Longitude: -73.077199**

### **Analysis Result:**

**Max Structural Usage: 68.5% [Pass]**

**Max Foundation Usage: 41% [Pass]**

**Report Prepared By : Jie Chen**

## 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

<b>Tower Drawings</b>	Fred A. Nudd Corporation (Project No. 7783) original design drawings dated August 18, 2000
<b>Foundation Drawing</b>	Fred A. Nudd Corporation (Project No. 7783) foundation design drawings dated August 18, 2000
<b>Geotechnical Report</b>	Jaworski Geotech, Inc., Project # 99335G, Dated 11/3/1999
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## Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G. 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.

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<b>Wind Speed with Ice:</b>	40 mph (3-Sec. Gust) with 1" radial ice concurrent
<b>Operational Wind Speed:</b>	60 mph + 0" Radial ice
<b>Standard/Codes:</b>	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
<b>Exposure Category:</b>	C
<b>Structure Class:</b>	II
<b>Topographic Category:</b>	1
<b>Crest Height:</b>	0 ft
<b>Seismic Parameters:</b>	$S_S = 0.184$ , $S_1 = 0.065$

## 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
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5		3	RFS APXVSP18-C-A20 - Panel			
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-		3	Powerwave 7770 - Panel			
-		4	CCI/HPA-65R-BUU H6 - Panel			
-		6	Powerwave LGP21401			
-		6	Powerwave LGP21903			
-		3	CCI OPA-65R-LCUU-H6 - Panel			
-		2	Raycap/Squid			
-		6	Ericsson RRUS-11			
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-		3	Ericsson RRUS-32			
-		3	Ericsson RRUS-A2			
-		3	Ericsson RRUS-E2			
-		2	Andrew SBNH-1D65A - Panel			
29	70.0	1	GPS	(1) Standoff	(1) 1/2"	Unknown

## 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.

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23		6	Ericsson RRUS-11			
24		3	Ericsson RRUS-12			
25		3	Ericsson RRUS-32			
26		3	Ericsson RRUS-A2			
27		3	Ericsson RRUS-E2			
28		2	Andrew SBNH-1D65A - Panel			

See 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:	<b>68.5%</b>	<b>61.1%</b>	<b>58.4%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## **Foundations**

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	3692.0	31.2
Analysis Reactions	3609.8	35.1
Factored Reactions*	4984.2	42.1
% of Design Reactions	72.4%	83.3%

\* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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 ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.9657 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 ANSI/TIA-222-G standards and the 2012 IBC under the design basic wind speed 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 analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. 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 EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
7. 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.
8. 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.
9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.



# Usage Diagram - Max Ratio 68.49% at 45.0ft

**Structure:** CT01499-S-SBA  
**Site Name:** Torrington  
**Height:** 153.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-G  
**Exposure:** C  
**Gh:** 1.1

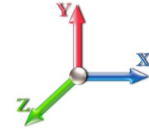
2/2/2017



Page: 1

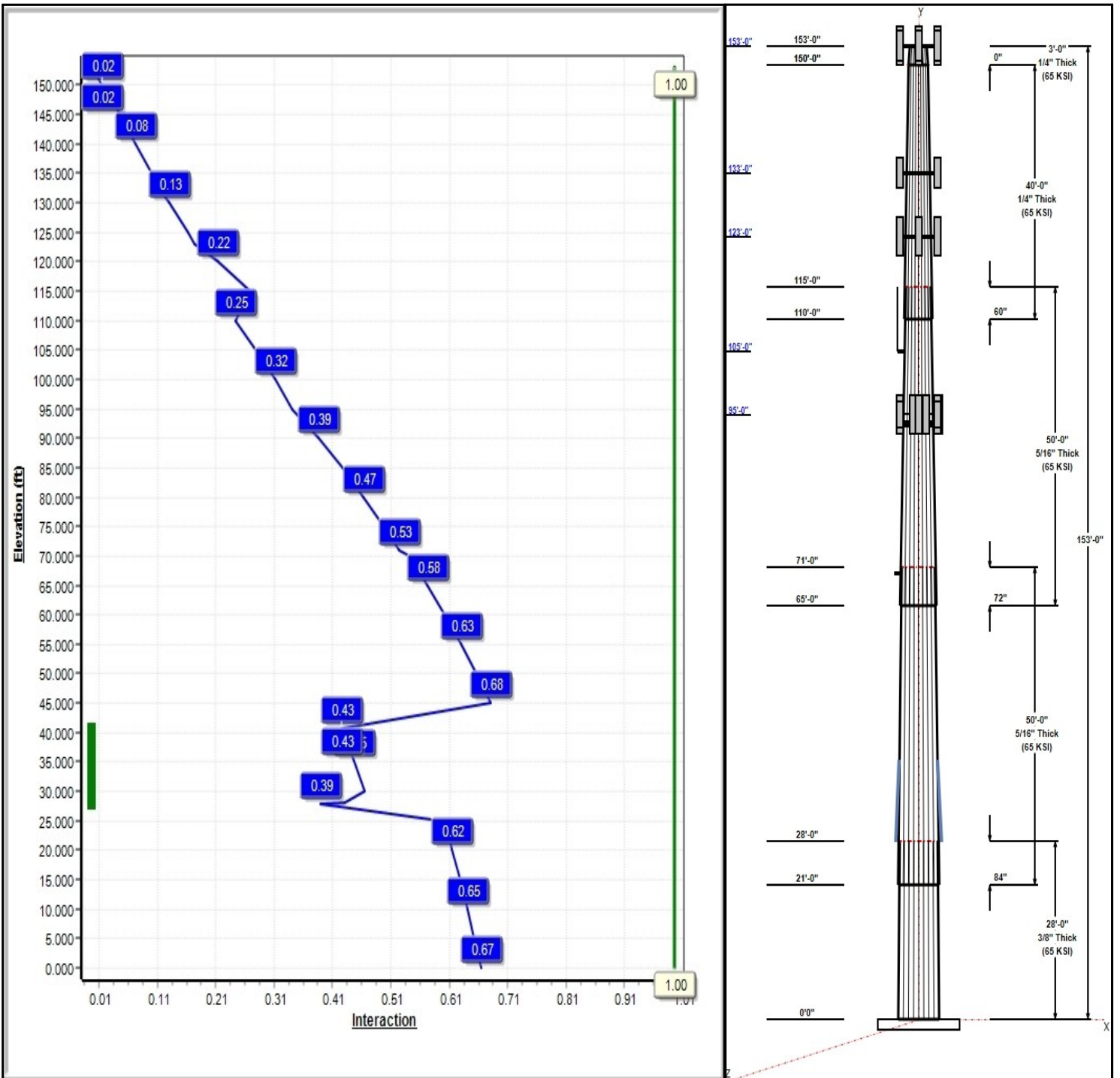
**Dead Load Factor:** 1.20  
**Wind Load Factor:** 1.60

**Load Case : 1.2D + 1.6W 93 mph Wind**



**Iterations:** 22

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## 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

2/2/2017

Page: 2



### Shaft Properties

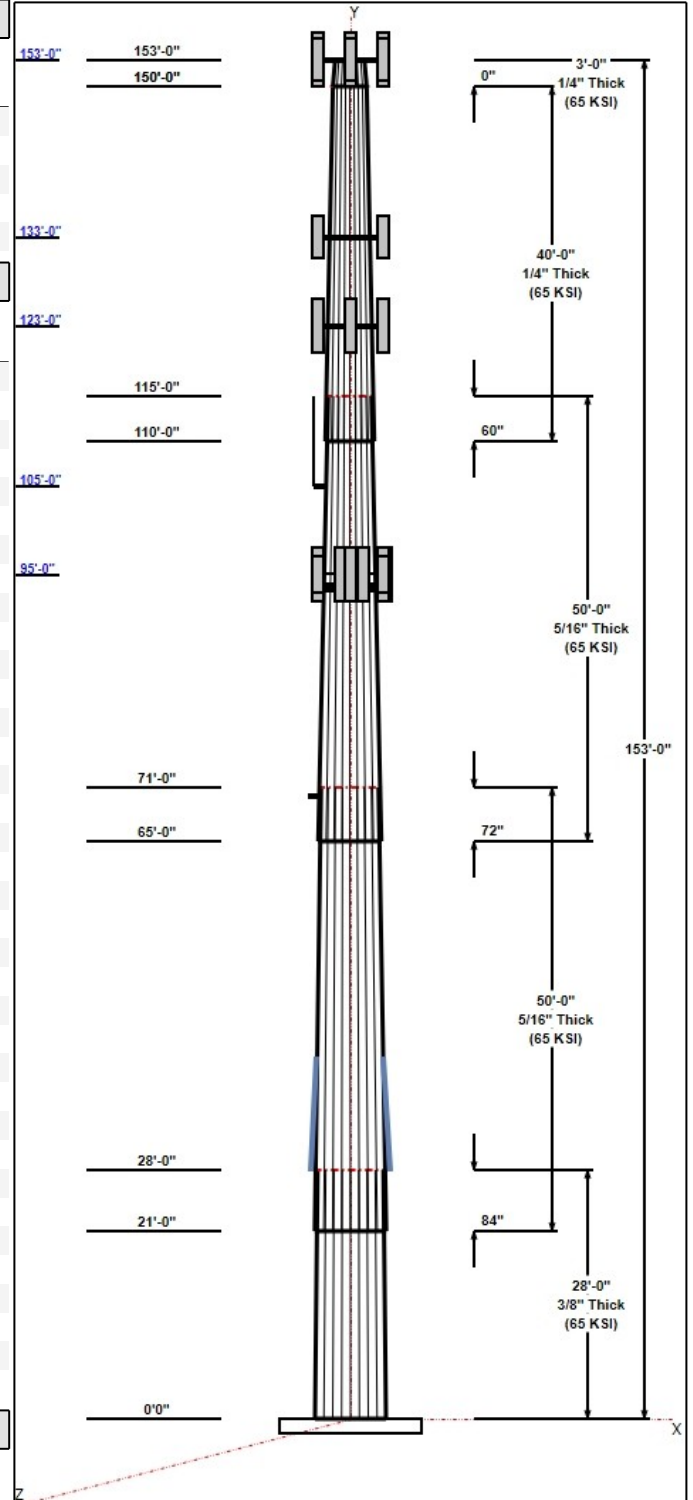
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	28.00	53.09	60.00	0.375		0.24673	65
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153.00	153.00	3	800 MHz Filters	Sprint
153.00	153.00	4	ACU-A20-N	Sprint
153.00	153.00	3	TD-RRH8x20-25	Sprint
153.00	153.00	1	Low Profile Platform	Sprint
153.00	153.00	1	Lightning Rod	
133.00	133.00	6	RR90-17-02DP	T-Mobile
133.00	133.00	1	Low Profile Platform	T-Mobile
123.00	123.00	3	B66 4X45 AWS	Verizon
123.00	123.00	9	SBNHH-1D65B	Verizon
123.00	123.00	6	LPA-80063/6CF	Verizon
123.00	123.00	3	RRH2X60-PCS	Verizon
123.00	126.00	3	RRH2x60-700	Verizon
123.00	123.00	2	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
95.00	95.00	4	HPA-65R-BUU-H6	AT&T
95.00	95.00	3	7770	AT&T
95.00	95.00	2	SBNH-1D65A	AT&T
95.00	95.00	3	OPA-65R-LCUU-H6	AT&T
95.00	95.00	6	LGP21401	AT&T
95.00	95.00	6	LGP21903	AT&T
95.00	95.00	6	RRUS-11	AT&T
95.00	95.00	3	RRUS-12	AT&T
95.00	95.00	3	RRUS-A2	AT&T
95.00	95.00	3	RRUS-32	AT&T
95.00	95.00	3	RRUS-E2	AT&T
95.00	95.00	3	1000860	AT&T
95.00	95.00	2	Raycap/Squid	AT&T
95.00	95.00	3	Sector Frame	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	133.00	Inside	1 5/8" Coax	T-Mobile
0.00	123.00	Inside	1 5/8" Coax	Verizon
0.00	123.00	Inside	1 5/8" Coax	Verizon



**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

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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	1/2" 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**

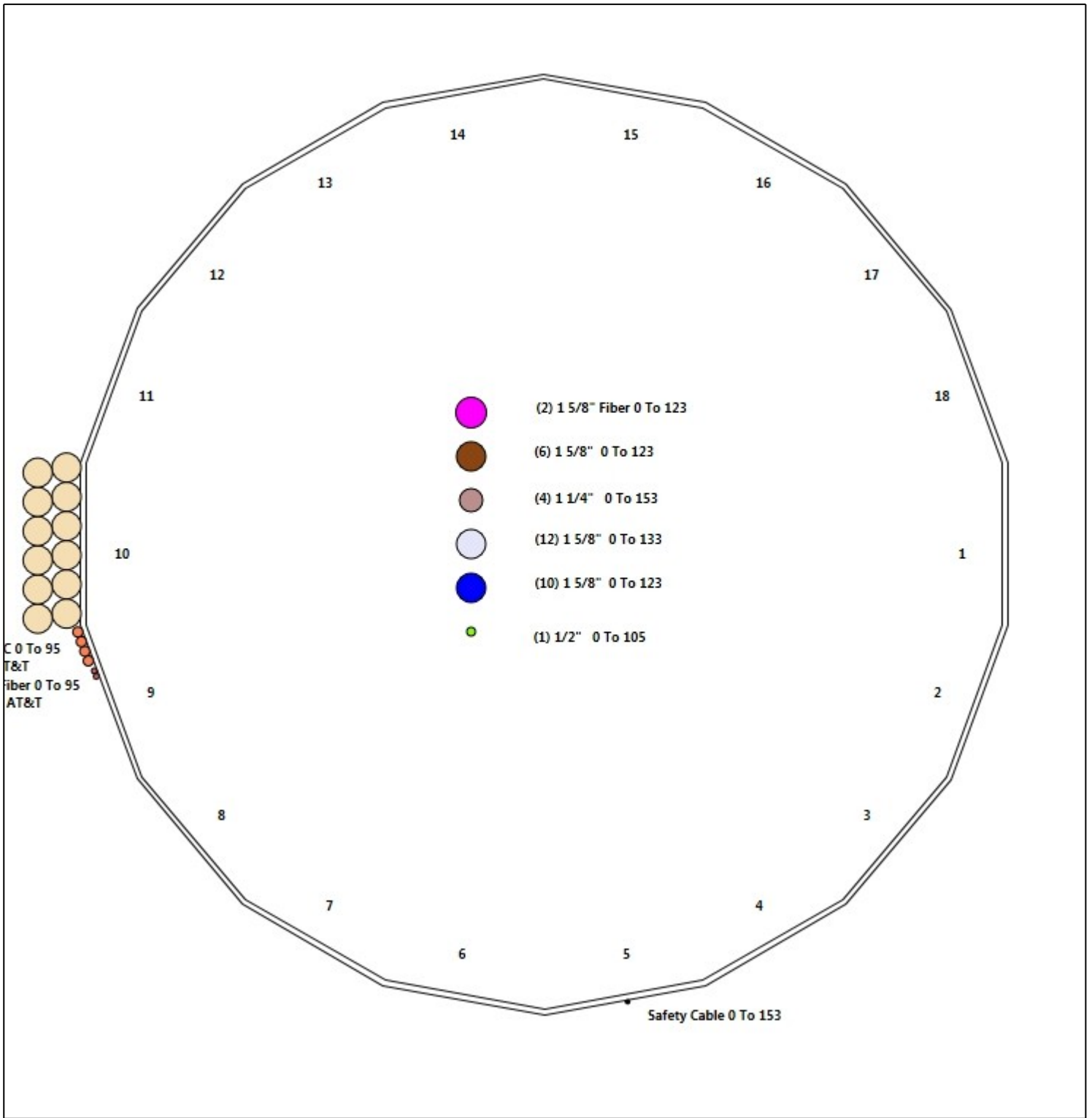
Load Case	Moment	Shear	Axial
1.2D + 1.6W 93 mph Wind	3609.8	35.1	47.2
0.9D + 1.6W 93 mph Wind	3584.2	35.1	35.4
1.2D + 1.0Di + 1.0Wi 40 mph Wind	747.4	7.2	92.2
1.2D + 1.0E	98.7	0.9	47.3
0.9D + 1.0E	97.9	0.9	35.5
1.0D + 1.0W 60 mph Wind	935.2	9.1	39.4

# Structure: CT01499-S-SBA - Coax Line Placement

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

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## Shaft Properties

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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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
<b>Total Shaft Weight:</b>							<b>24,542</b>

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

Elev From (ft)		Elev To (ft)		Qty	Description	Fy (ksi)	Fu (ksi)	Offset (in)	Intermediate Connectors		Termination Connectors		
		Spacing (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

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	153.00	APXVTM14-C-I20	3	56.00	6.34	0.79	285.08	7.859	0.79	0.00	0.00
2	153.00	APXVSP18-C-A20	3	57.00	8.02	0.83	287.93	11.752	0.83	0.00	0.00
3	153.00	1900 MHz RRUs	3	44.00	3.80	0.88	189.84	5.657	0.88	0.00	0.00
4	153.00	800 MHz RRUs	3	53.00	2.49	0.92	151.81	4.018	0.92	0.00	0.00
5	153.00	800 MHz Filters	3	8.80	0.78	0.69	32.37	1.644	0.69	0.00	0.00
6	153.00	ACU-A20-N	4	1.00	0.14	0.90	6.74	0.536	0.90	0.00	0.00
7	153.00	TD-RRH8x20-25	3	70.00	4.05	0.69	228.13	5.165	0.69	0.00	0.00
8	153.00	Low Profile Platform	1	1200.00	25.00	1.00	2598.94	52.979	1.00	0.00	0.00
9	153.00	Lightning Rod	1	5.00	0.50	1.00	32.98	2.832	1.00	0.00	0.00
10	133.00	RR90-17-02DP	6	13.50	4.36	0.68	155.89	5.699	0.68	0.00	0.00
11	133.00	Low Profile Platform	1	1200.00	25.00	1.00	2579.48	52.590	1.00	0.00	0.00
12	123.00	B66 4X45 AWS	3	64.00	2.60	0.80	181.64	3.544	0.80	0.00	0.00
13	123.00	SBNHH-1D65B	9	40.60	8.08	0.83	319.83	9.805	0.83	0.00	0.00
14	123.00	LPA-80063/6CF	6	27.00	9.60	0.94	420.49	11.401	0.94	0.00	0.00
15	123.00	RRH2X60-PCS	3	55.00	2.20	0.89	173.64	3.055	0.89	0.00	0.00
16	123.00	RRH2x60-700	3	60.00	3.50	0.76	174.10	4.532	0.76	0.00	3.00
17	123.00	DB-T1-6Z-8AB-OZ	2	18.90	4.80	0.90	217.24	5.966	0.90	0.00	0.00
18	123.00	Low Profile Platform	1	1200.00	25.00	1.00	2568.74	52.375	1.00	0.00	0.00
19	105.00	10' Omni	1	25.00	3.00	1.00	122.86	7.640	1.00	0.00	5.00
20	105.00	Standoff	1	40.00	2.63	1.00	143.29	10.309	1.00	0.00	0.00
21	95.00	HPA-65R-BUU-H6	4	51.00	9.66	0.90	381.32	11.428	0.90	0.00	0.00
22	95.00	7770	3	35.00	5.50	0.73	218.05	6.881	0.73	0.00	0.00
23	95.00	SBNH-1D65A	2	38.40	5.38	0.90	199.91	7.906	0.90	0.00	0.00
24	95.00	OPA-65R-LCUU-H6	3	80.00	9.66	0.79	389.28	11.428	0.79	0.00	0.00
25	95.00	LGP21401	6	14.10	1.29	0.67	45.95	2.354	0.67	0.00	0.00
26	95.00	LGP21903	6	5.50	0.27	0.84	16.24	0.777	0.84	0.00	0.00
27	95.00	RRUS-11	6	55.00	4.42	0.68	169.59	6.330	0.68	0.00	0.00
28	95.00	RRUS-12	3	60.00	3.15	0.67	154.65	4.749	0.67	0.00	0.00
29	95.00	RRUS-A2	3	21.20	1.86	0.62	67.20	3.100	0.62	0.00	0.00
30	95.00	RRUS-32	3	77.00	3.87	0.87	230.04	4.344	0.87	0.00	0.00
31	95.00	RRUS-E2	3	57.30	2.81	0.70	175.45	3.695	0.70	0.00	0.00
32	95.00	1000860	3	2.00	0.06	1.00	5.46	0.327	1.00	0.00	0.00
33	95.00	Raycap/Squid	2	31.80	1.47	0.90	110.55	2.361	0.90	0.00	0.00
34	95.00	Sector Frame	3	500.00	17.50	0.75	1389.22	35.240	0.75	0.00	0.00
35	70.00	GPS	1	10.00	1.00	1.00	46.22	1.880	1.00	0.00	0.00
36	70.00	Standoff	1	40.00	2.63	1.00	139.19	10.004	1.00	0.00	0.00
<b>Totals:</b>			<b>112</b>	<b>9,063.10</b>			<b>31,568.37</b>				

### 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	0.00	Outside
0.00	133.00	(12) 1 5/8" Coax	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

## Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
0.00	123.00	(2) 1 5/8" Fiber		0.00							
0.00	105.00	(1) 1/2" Coax		0.00							
0.00	95.00	(12) 1 5/8" Coax		4.00							
0.00	95.00	(2) 1/2" Fiber		0.00							
0.00	95.00	(4) 3/4" DC		1.00							
24.25	44.25	(3) 1.25" Reinforcing plate		1.00							

## Shaft Section Properties

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**Increment Length:** 5 (ft)

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)	Additional Reinforcing			
											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				
95.00		0.3125	37.810	37.192	6607.2	19.92	120.99	65	78	643.2				
100.00		0.3125	36.577	35.968	5976.3	19.23	117.05	65	79	622.4				
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				
133.00		0.2500	28.935	22.760	2366.1	19.00	115.74	65	79	235.3				
135.00		0.2500	28.441	22.369	2246.1	18.65	113.76	65	79	153.6				
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				
<b>Total Weight</b>										<b>24541.5</b>				
											<b>1607.9</b>			



## Wind Loading - Shaft

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



**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	0.650	0.000	5.00	25.125	16.33	513.9	0.0	1433.9
10.00		1.00	0.85	17.879	19.67	417.42	0.650	0.000	5.00	24.603	15.99	503.2	0.0	1403.9
15.00		1.00	0.85	17.879	19.67	408.47	0.650	0.000	5.00	24.081	15.65	492.5	0.0	1373.9
20.00		1.00	0.90	18.971	20.87	411.53	0.650	0.000	5.00	23.559	15.31	511.3	0.0	1344.0
21.00	Bot - Section 2	1.00	0.91	19.166	21.08	411.80	0.650	0.000	1.00	4.649	3.02	101.9	0.0	265.2
25.00		1.00	0.95	19.883	21.87	411.87	0.657 *	0.000	4.00	18.599	12.21	427.4	0.0	1933.9
27.75	RB1	1.00	0.97	20.325	22.36	411.18	0.696 *	0.000	2.75	12.593	8.77	313.6	0.0	1309.2
28.00	Top - Section 1	1.00	0.97	20.363	22.40	411.09	0.698 *	0.000	0.25	1.137	0.79	28.4	0.0	118.2
30.00		1.00	0.98	20.661	22.73	415.11	0.696 *	0.000	2.00	9.049	6.30	229.1	0.0	430.6
35.00		1.00	1.01	21.343	23.48	412.12	0.700 *	0.000	5.00	22.257	15.59	585.5	0.0	1059.0
40.00		1.00	1.04	21.951	24.15	408.04	0.706 *	0.000	5.00	21.735	15.35	593.0	0.0	1034.0
40.75	RT1	1.00	1.05	22.037	24.24	407.34	0.710 *	0.000	0.75	3.215	2.28	88.5	0.0	152.9
45.00		1.00	1.07	22.502	24.75	403.08	0.704 *	0.000	4.25	17.998	12.68	502.1	0.0	856.0
50.00		1.00	1.09	23.007	25.31	397.43	0.670 *	0.000	5.00	20.692	13.86	561.2	0.0	984.0
55.00		1.00	1.12	23.473	25.82	391.18	0.675 *	0.000	5.00	20.170	13.62	562.7	0.0	959.0
60.00		1.00	1.14	23.907	26.30	384.43	0.681 *	0.000	5.00	19.648	13.38	563.2	0.0	934.0
65.00	Bot - Section 3	1.00	1.16	24.313	26.74	377.24	0.687 *	0.000	5.00	19.126	13.15	562.6	0.0	909.1
70.00	Appurtenance(s)	1.00	1.17	24.696	27.17	369.68	0.694 *	0.000	5.00	18.868	13.09	569.1	0.0	1780.8
71.00	Top - Section 2	1.00	1.18	24.770	27.25	368.12	0.698 *	0.000	1.00	3.711	2.59	112.9	0.0	350.2
75.00		1.00	1.19	25.057	27.56	367.14	0.698 *	0.000	4.00	14.635	10.21	450.5	0.0	695.4
80.00		1.00	1.21	25.400	27.94	358.98	0.704 *	0.000	5.00	17.824	12.55	561.2	0.0	846.8
85.00		1.00	1.22	25.726	28.30	350.54	0.712 *	0.000	5.00	17.302	12.32	557.7	0.0	821.8
90.00		1.00	1.24	26.037	28.64	341.85	0.720 *	0.000	5.00	16.780	12.08	553.6	0.0	796.8
95.00	Appurtenance(s)	1.00	1.25	26.336	28.97	332.94	0.728 *	0.000	5.00	16.258	11.84	548.9	0.0	771.8
100.00		1.00	1.27	26.621	29.28	323.82	0.650	0.000	5.00	15.736	10.23	479.3	0.0	746.8
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	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
133.00	Appurtenance(s)	1.00	1.34	28.269	31.10	263.97	0.650	0.000	3.00	7.439	4.84	240.6	0.0	282.4
135.00		1.00	1.35	28.358	31.19	259.88	0.650	0.000	2.00	4.855	3.16	157.5	0.0	184.3
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
<b>* Cf Adjusted by Linear Load Ra Effect</b>								<b>Totals:</b>		<b>153.00</b>		<b>15,340.4</b>		<b>29,449.8</b>

## Discrete Appurtenance Forces

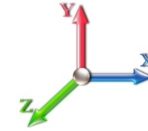
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)	CaAa 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	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
2	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
3	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
4	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
5	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
6	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
7	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
8	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
9	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
10	133.00	Low Profile Platform	1	28.269	31.096	1.00	1.00	25.00	1440.00	0.000	0.000	1243.82	0.00	0.00
11	133.00	RR90-17-02DP	6	28.269	31.096	0.54	0.80	14.23	97.20	0.000	0.000	708.04	0.00	0.00
12	123.00	LPA-80063/6CF	6	27.807	30.588	0.75	0.80	43.32	194.40	0.000	0.000	2119.89	0.00	0.00
13	123.00	B66 4X45 AWS	3	27.807	30.588	0.64	0.80	4.99	230.40	0.000	0.000	244.31	0.00	0.00
14	123.00	SBNHH-1D65B	9	27.807	30.588	0.66	0.80	48.29	438.48	0.000	0.000	2363.17	0.00	0.00
15	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
16	123.00	RRH2X60-PCS	3	27.807	30.588	0.71	0.80	4.70	198.00	0.000	0.000	229.98	0.00	0.00
17	123.00	RRH2x60-700	3	27.949	30.744	0.61	0.80	6.38	216.00	0.000	3.000	314.03	0.00	942.08
18	123.00	DB-T1-6Z-8AB-0Z	2	27.807	30.588	0.72	0.80	6.91	45.36	0.000	0.000	338.28	0.00	0.00
19	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
20	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
21	95.00	HPA-65R-BUU-H6	4	26.336	28.969	0.72	0.80	27.82	244.80	0.000	0.000	1289.51	0.00	0.00
22	95.00	7770	3	26.336	28.969	0.58	0.80	9.64	126.00	0.000	0.000	446.63	0.00	0.00
23	95.00	SBNH-1D65A	2	26.336	28.969	0.72	0.80	7.75	92.16	0.000	0.000	359.09	0.00	0.00
24	95.00	OPA-65R-LCUU-H6	3	26.336	28.969	0.63	0.80	18.32	288.00	0.000	0.000	848.93	0.00	0.00
25	95.00	LGP21401	6	26.336	28.969	0.54	0.80	4.15	101.52	0.000	0.000	192.29	0.00	0.00
26	95.00	LGP21903	6	26.336	28.969	0.67	0.80	1.09	39.60	0.000	0.000	50.46	0.00	0.00
27	95.00	RRUS-11	6	26.336	28.969	0.54	0.80	14.43	396.00	0.000	0.000	668.69	0.00	0.00
28	95.00	RRUS-12	3	26.336	28.969	0.54	0.80	5.07	216.00	0.000	0.000	234.78	0.00	0.00
29	95.00	RRUS-A2	3	26.336	28.969	0.50	0.80	2.77	76.32	0.000	0.000	128.28	0.00	0.00
30	95.00	RRUS-32	3	26.336	28.969	0.70	0.80	8.08	277.20	0.000	0.000	374.54	0.00	0.00
31	95.00	RRUS-E2	3	26.336	28.969	0.56	0.80	4.72	206.28	0.000	0.000	218.81	0.00	0.00
32	95.00	1000860	3	26.336	28.969	1.00	1.00	0.18	7.20	0.000	0.000	8.34	0.00	0.00
33	95.00	Raycap/Squid	2	26.336	28.969	0.72	0.80	2.12	76.32	0.000	0.000	98.11	0.00	0.00
34	95.00	Sector Frame	3	26.336	28.969	0.56	0.75	29.53	1800.00	0.000	0.000	1368.79	0.00	0.00
35	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
36	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
<b>Totals:</b>								<b>10,875.72</b>			<b>19,682.52</b>			

## Total Applied Force Summary

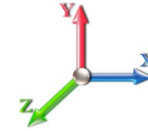
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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		513.90	1725.46	0.00	0.00
10.00		503.22	1695.48	0.00	0.00
15.00		492.54	1665.50	0.00	0.00
20.00		511.28	1635.53	0.00	0.00
21.00		101.94	323.51	0.00	0.00
25.00		427.39	2167.17	0.00	0.00
27.75		313.64	1469.53	0.00	0.00
28.00		28.44	132.77	0.00	0.00
30.00		229.14	547.20	0.00	0.00
35.00		585.50	1350.51	0.00	0.00
40.00		593.02	1325.53	0.00	0.00
40.75		88.51	196.67	0.00	0.00
45.00		502.09	1103.87	0.00	0.00
50.00		561.18	1275.56	0.00	0.00
55.00		562.74	1250.58	0.00	0.00
60.00		563.15	1225.60	0.00	0.00
65.00		562.56	1200.62	0.00	0.00
70.00	(2) attachments	726.84	2132.37	0.00	0.00
71.00		112.92	408.48	0.00	0.00
75.00		450.46	928.65	0.00	0.00
80.00		561.23	1138.33	0.00	0.00
85.00		557.68	1113.35	0.00	0.00
90.00		553.55	1088.37	0.00	0.00
95.00	(50) attachments	6836.14	5010.78	0.00	0.00
100.00		479.25	953.20	0.00	0.00
105.00	(2) attachments	736.05	1006.22	0.00	717.05
110.00		456.53	902.28	0.00	0.00
115.00		451.09	1423.93	0.00	0.00
120.00		438.63	732.04	0.00	0.00
123.00	(27) attachments	7089.76	3192.27	0.00	942.08
125.00		168.30	237.21	0.00	0.00
130.00		412.48	579.03	0.00	0.00
133.00	(7) attachments	2192.44	1875.03	0.00	0.00
135.00		157.50	191.27	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
<b>Totals:</b>		<b>35,022.89</b>	<b>47,271.92</b>	<b>0.00</b>	<b>1,659.14</b>

## Linear Appurtenance Segment Forces (Factored)

**Structure:** CT01499-S-SBA

**Code:** EIA/TIA-222-G

2/2/2017

**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

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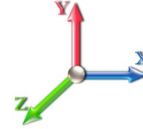


**Load Case:** 1.2D + 1.6W 93 mph Wind

**Iterations** 22

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60



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	0.091	0.000	17.879	0.00	1.64
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.091	0.000	17.879	0.00	74.88
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.091	0.000	17.879	0.00	0.72
5.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.091	0.000	17.879	0.00	9.60
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.093	0.000	17.879	0.00	1.64
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.093	0.000	17.879	0.00	74.88
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.093	0.000	17.879	0.00	0.72
10.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.093	0.000	17.879	0.00	9.60
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.095	0.000	17.879	0.00	1.64
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.095	0.000	17.879	0.00	74.88
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.095	0.000	17.879	0.00	0.72
15.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.095	0.000	17.879	0.00	9.60
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.097	0.000	18.971	0.00	1.64
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.097	0.000	18.971	0.00	74.88
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.097	0.000	18.971	0.00	0.72
20.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.097	0.000	18.971	0.00	9.60
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.098	0.000	19.166	0.00	0.33
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.098	0.000	19.166	0.00	14.98
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.098	0.000	19.166	0.00	0.14
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.098	0.000	19.166	0.00	1.92
25.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.103	1.010	19.883	0.00	1.31
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.103	1.010	19.883	0.00	59.90
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.103	1.010	19.883	0.00	0.58
25.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.103	1.010	19.883	0.00	7.68
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.103	1.010	19.883	0.00	0.00
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.124	1.071	20.325	0.00	0.90
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	0.91	0.00	0.124	1.071	20.325	0.00	41.18
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.09	0.00	0.124	1.071	20.325	0.00	0.40
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.17	0.00	0.124	1.071	20.325	0.00	5.28
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.29	0.00	0.124	1.071	20.325	0.00	0.00
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.01	0.00	0.125	1.074	20.363	0.00	0.08
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.125	1.074	20.363	0.00	3.74
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.01	0.00	0.125	1.074	20.363	0.00	0.04
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.02	0.00	0.125	1.074	20.363	0.00	0.48
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.03	0.00	0.125	1.074	20.363	0.00	0.00
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.124	1.071	20.661	0.00	0.66
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.124	1.071	20.661	0.00	29.95
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.124	1.071	20.661	0.00	0.29
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.124	1.071	20.661	0.00	3.84
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.124	1.071	20.661	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.126	1.077	21.343	0.00	1.64
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.126	1.077	21.343	0.00	74.88
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.126	1.077	21.343	0.00	0.72
35.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.126	1.077	21.343	0.00	9.60
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.126	1.077	21.343	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.129	1.086	21.951	0.00	1.64
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.129	1.086	21.951	0.00	74.88

## Linear Appurtenance Segment Forces (Factored)

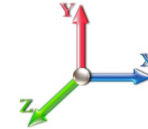
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.129	1.086	21.951	0.00	0.72
40.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.129	1.086	21.951	0.00	9.60
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.129	1.086	21.951	0.00	0.00
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.02	0.00	0.131	1.092	22.037	0.00	0.25
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.25	0.00	0.131	1.092	22.037	0.00	11.23
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.02	0.00	0.131	1.092	22.037	0.00	0.11
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.05	0.00	0.131	1.092	22.037	0.00	1.44
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.131	1.092	22.037	0.00	0.00
45.00	Safety Cable	Yes	4.25	0.000	0.38	0.13	0.00	0.128	1.084	22.502	0.00	1.39
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	1.40	0.00	0.128	1.084	22.502	0.00	63.65
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	0.13	0.00	0.128	1.084	22.502	0.00	0.61
45.00	3/4" DC	Yes	4.25	0.000	0.75	0.27	0.00	0.128	1.084	22.502	0.00	8.16
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	0.36	0.00	0.128	1.084	22.502	0.00	0.00
50.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.030	23.007	0.00	1.64
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.110	1.030	23.007	0.00	74.88
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.030	23.007	0.00	0.72
50.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.110	1.030	23.007	0.00	9.60
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.113	1.039	23.473	0.00	1.64
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.113	1.039	23.473	0.00	74.88
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.113	1.039	23.473	0.00	0.72
55.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.113	1.039	23.473	0.00	9.60
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.116	1.048	23.907	0.00	1.64
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.116	1.048	23.907	0.00	74.88
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.116	1.048	23.907	0.00	0.72
60.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.116	1.048	23.907	0.00	9.60
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.119	1.058	24.313	0.00	1.64
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.119	1.058	24.313	0.00	74.88
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.119	1.058	24.313	0.00	0.72
65.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.119	1.058	24.313	0.00	9.60
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.123	1.068	24.696	0.00	1.64
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.123	1.068	24.696	0.00	74.88
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.123	1.068	24.696	0.00	0.72
70.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.123	1.068	24.696	0.00	9.60
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.125	1.074	24.770	0.00	0.33
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.125	1.074	24.770	0.00	14.98
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.125	1.074	24.770	0.00	0.14
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.125	1.074	24.770	0.00	1.92
75.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.125	1.074	25.057	0.00	1.31
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.125	1.074	25.057	0.00	59.90
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.125	1.074	25.057	0.00	0.58
75.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.125	1.074	25.057	0.00	7.68
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.128	1.084	25.400	0.00	1.64
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.128	1.084	25.400	0.00	74.88
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.128	1.084	25.400	0.00	0.72
80.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.128	1.084	25.400	0.00	9.60
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.132	1.095	25.726	0.00	1.64
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.132	1.095	25.726	0.00	74.88

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

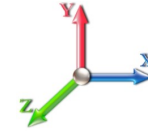


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**Load Case:** 1.2D + 1.6W 93 mph Wind

**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)
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.132	1.095	25.726	0.00	0.72
85.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.132	1.095	25.726	0.00	9.60
90.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.136	1.107	26.037	0.00	1.64
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.136	1.107	26.037	0.00	74.88
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.136	1.107	26.037	0.00	0.72
90.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.136	1.107	26.037	0.00	9.60
95.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.140	1.121	26.336	0.00	1.64
95.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.140	1.121	26.336	0.00	74.88
95.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.140	1.121	26.336	0.00	0.72
95.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.140	1.121	26.336	0.00	9.60
100.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.010	0.000	26.621	0.00	1.64
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
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
133.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.013	0.000	28.269	0.00	0.98
135.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.013	0.000	28.358	0.00	0.66
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
<b>Totals:</b>											<b>0.0</b>	<b>1,668.9</b>

## Calculated Forces

**Structure:** CT01499-S-SBA

**Code:** EIA/TIA-222-G

2/2/2017

**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

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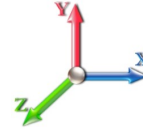


**Load Case:** 1.2D + 1.6W 93 mph Wind

**Iterations** 22

**Dead Load Factor** 1.20

**Wind Load Factor** 1.60



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	-47.22	-35.09	0.00	-3609.8	0.00	3609.80	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.669
5.00	-45.40	-34.70	0.00	-3434.3	0.00	3434.36	4413.36	2206.68	10604.1	5309.95	0.09	-0.157	0.000	0.657
10.00	-43.61	-34.31	0.00	-3260.8	0.00	3260.87	4361.89	2180.94	10257.6	5136.44	0.34	-0.316	0.000	0.645
15.00	-41.86	-33.92	0.00	-3089.3	0.00	3089.32	4308.61	2154.31	9912.23	4963.48	0.75	-0.477	0.000	0.632
20.00	-40.17	-33.46	0.00	-2919.7	0.00	2919.71	4253.53	2126.77	9568.22	4791.22	1.34	-0.640	0.000	0.619
21.00	-39.80	-33.42	0.00	-2886.2	0.00	2886.24	4242.30	2121.15	9499.61	4756.87	1.48	-0.673	0.000	0.616
25.00	-37.57	-33.04	0.00	-2752.5	0.00	2752.58	4196.65	2098.33	9225.87	4619.79	2.10	-0.805	0.000	0.605
27.75	-36.08	-32.73	0.00	-2661.7	0.00	2661.73	4164.60	2082.30	9038.39	4525.91	2.59	-0.898	0.000	0.394
28.00	-35.93	-32.72	0.00	-2653.5	0.00	2653.55	3213.57	1606.78	7065.87	3538.19	2.64	-0.903	0.000	0.435
30.00	-35.34	-32.53	0.00	-2588.1	0.00	2588.12	3199.34	1599.67	6969.21	3489.78	3.03	-0.948	0.000	0.470
35.00	-33.94	-31.99	0.00	-2425.4	0.00	2425.48	3162.51	1581.26	6727.41	3368.71	4.09	-1.068	0.000	0.452
40.00	-32.58	-31.41	0.00	-2265.5	0.00	2265.53	3123.88	1561.94	6485.64	3247.64	5.27	-1.187	0.000	0.433
40.75	-32.36	-31.35	0.00	-2241.9	0.00	2241.97	3117.93	1558.96	6449.39	3229.49	5.46	-1.205	0.000	0.431
40.75	-32.36	-31.35	0.00	-2241.9	0.00	2241.97	3117.93	1558.96	6449.39	3229.49	5.46	-1.205	0.000	0.431
45.00	-31.18	-30.91	0.00	-2108.7	0.00	2108.73	3083.44	1541.72	6244.17	3126.72	6.58	-1.306	0.000	0.685
50.00	-29.82	-30.41	0.00	-1954.2	0.00	1954.21	3041.20	1520.60	6003.26	3006.09	8.05	-1.499	0.000	0.660
55.00	-28.49	-29.91	0.00	-1802.1	0.00	1802.14	2997.16	1498.58	5763.21	2885.89	9.72	-1.693	0.000	0.634
60.00	-27.18	-29.40	0.00	-1652.5	0.00	1652.57	2951.32	1475.66	5524.28	2766.24	11.60	-1.885	0.000	0.607
65.00	-25.90	-28.88	0.00	-1505.5	0.00	1505.56	2903.67	1451.83	5286.75	2647.30	13.68	-2.075	0.000	0.578
70.00	-23.75	-28.12	0.00	-1361.1	0.00	1361.14	2854.22	1427.11	5050.90	2529.20	15.95	-2.262	0.000	0.547
71.00	-23.30	-28.03	0.00	-1333.0	0.00	1333.02	2869.57	1434.79	5123.02	2565.32	16.43	-2.301	0.000	0.528
75.00	-22.31	-27.61	0.00	-1220.8	0.00	1220.89	2829.16	1414.58	4935.24	2471.29	18.42	-2.449	0.000	0.502
80.00	-21.12	-27.06	0.00	-1082.8	0.00	1082.85	2777.01	1388.51	4702.41	2354.70	21.08	-2.620	0.000	0.468
85.00	-19.96	-26.50	0.00	-947.57	0.00	947.57	2723.06	1361.53	4471.94	2239.29	23.91	-2.784	0.000	0.431
90.00	-18.83	-25.95	0.00	-815.05	0.00	815.05	2667.31	1333.66	4244.12	2125.22	26.91	-2.941	0.000	0.391
95.00	-14.14	-18.89	0.00	-685.31	0.00	685.31	2609.76	1304.88	4019.22	2012.60	30.07	-3.088	0.000	0.346
100.00	-13.17	-18.39	0.00	-590.86	0.00	590.86	2550.40	1275.20	3797.52	1901.58	33.38	-3.225	0.000	0.316
105.00	-12.17	-17.63	0.00	-498.19	0.00	498.19	2489.24	1244.62	3579.29	1792.30	36.83	-3.355	0.000	0.283
110.00	-11.26	-17.14	0.00	-410.06	0.00	410.06	2426.28	1213.14	3364.80	1684.90	40.41	-3.475	0.000	0.248
115.00	-9.84	-16.62	0.00	-324.37	0.00	324.37	1783.00	891.50	2427.68	1215.65	44.10	-3.583	0.000	0.273
120.00	-9.12	-16.15	0.00	-241.28	0.00	241.28	1739.91	869.95	2280.12	1141.75	47.91	-3.676	0.000	0.217
123.00	-6.38	-8.87	0.00	-191.91	0.00	191.91	1713.19	856.59	2192.59	1097.92	50.23	-3.733	0.000	0.179
125.00	-6.15	-8.69	0.00	-174.17	0.00	174.17	1695.01	847.51	2134.69	1068.93	51.80	-3.767	0.000	0.167
130.00	-5.59	-8.25	0.00	-130.71	0.00	130.71	1648.31	824.16	1991.67	997.31	55.79	-3.842	0.000	0.135
133.00	-3.87	-5.94	0.00	-105.97	0.00	105.97	1619.42	809.71	1907.13	954.98	58.22	-3.882	0.000	0.113
135.00	-3.68	-5.77	0.00	-94.10	0.00	94.10	1599.81	799.90	1851.33	927.04	59.85	-3.906	0.000	0.104
140.00	-3.24	-5.35	0.00	-65.26	0.00	65.26	1549.50	774.75	1713.96	858.25	63.96	-3.956	0.000	0.078
145.00	-2.82	-4.96	0.00	-38.49	0.00	38.49	1497.39	748.69	1579.82	791.09	68.12	-3.994	0.000	0.051
150.00	-2.42	-4.57	0.00	-13.71	0.00	13.71	1443.48	721.74	1449.20	725.68	72.32	-4.016	0.000	0.021
150.00	-2.42	-4.57	0.00	-13.71	0.00	13.71	1443.48	721.74	1449.20	725.68	72.32	-4.016	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	74.84	-4.020	0.000	0.000

## Wind Loading - Shaft

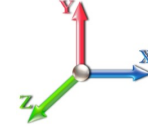
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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	0.650	0.000	5.00	25.125	16.33	513.9	0.0	1075.4
10.00		1.00	0.85	17.879	19.67	417.42	0.650	0.000	5.00	24.603	15.99	503.2	0.0	1052.9
15.00		1.00	0.85	17.879	19.67	408.47	0.650	0.000	5.00	24.081	15.65	492.5	0.0	1030.5
20.00		1.00	0.90	18.971	20.87	411.53	0.650	0.000	5.00	23.559	15.31	511.3	0.0	1008.0
21.00	Bot - Section 2	1.00	0.91	19.166	21.08	411.80	0.650	0.000	1.00	4.649	3.02	101.9	0.0	198.9
25.00		1.00	0.95	19.883	21.87	411.87	0.657 *	0.000	4.00	18.599	12.21	427.4	0.0	1450.4
27.75	RB1	1.00	0.97	20.325	22.36	411.18	0.696 *	0.000	2.75	12.593	8.77	313.6	0.0	981.9
28.00	Top - Section 1	1.00	0.97	20.363	22.40	411.09	0.698 *	0.000	0.25	1.137	0.79	28.4	0.0	88.6
30.00		1.00	0.98	20.661	22.73	415.11	0.696 *	0.000	2.00	9.049	6.30	229.1	0.0	322.9
35.00		1.00	1.01	21.343	23.48	412.12	0.700 *	0.000	5.00	22.257	15.59	585.5	0.0	794.2
40.00		1.00	1.04	21.951	24.15	408.04	0.706 *	0.000	5.00	21.735	15.35	593.0	0.0	775.5
40.75	RT1	1.00	1.05	22.037	24.24	407.34	0.710 *	0.000	0.75	3.215	2.28	88.5	0.0	114.7
45.00		1.00	1.07	22.502	24.75	403.08	0.704 *	0.000	4.25	17.998	12.68	502.1	0.0	642.0
50.00		1.00	1.09	23.007	25.31	397.43	0.670 *	0.000	5.00	20.692	13.86	561.2	0.0	738.0
55.00		1.00	1.12	23.473	25.82	391.18	0.675 *	0.000	5.00	20.170	13.62	562.7	0.0	719.3
60.00		1.00	1.14	23.907	26.30	384.43	0.681 *	0.000	5.00	19.648	13.38	563.2	0.0	700.5
65.00	Bot - Section 3	1.00	1.16	24.313	26.74	377.24	0.687 *	0.000	5.00	19.126	13.15	562.6	0.0	681.8
70.00	Appurtenance(s)	1.00	1.17	24.696	27.17	369.68	0.694 *	0.000	5.00	18.868	13.09	569.1	0.0	1335.6
71.00	Top - Section 2	1.00	1.18	24.770	27.25	368.12	0.698 *	0.000	1.00	3.711	2.59	112.9	0.0	262.6
75.00		1.00	1.19	25.057	27.56	367.14	0.698 *	0.000	4.00	14.635	10.21	450.5	0.0	521.6
80.00		1.00	1.21	25.400	27.94	358.98	0.704 *	0.000	5.00	17.824	12.55	561.2	0.0	635.1
85.00		1.00	1.22	25.726	28.30	350.54	0.712 *	0.000	5.00	17.302	12.32	557.7	0.0	616.3
90.00		1.00	1.24	26.037	28.64	341.85	0.720 *	0.000	5.00	16.780	12.08	553.6	0.0	597.6
95.00	Appurtenance(s)	1.00	1.25	26.336	28.97	332.94	0.728 *	0.000	5.00	16.258	11.84	548.9	0.0	578.9
100.00		1.00	1.27	26.621	29.28	323.82	0.650	0.000	5.00	15.736	10.23	479.3	0.0	560.1
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	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
133.00	Appurtenance(s)	1.00	1.34	28.269	31.10	263.97	0.650	0.000	3.00	7.439	4.84	240.6	0.0	211.8
135.00		1.00	1.35	28.358	31.19	259.88	0.650	0.000	2.00	4.855	3.16	157.5	0.0	138.2
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
								<b>Totals:</b>	<b>153.00</b>			<b>15,340.4</b>	<b>22,087.4</b>	

\* Cf Adjusted by Linear Load Ra Effect



## Discrete Appurtenance Forces

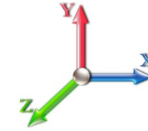
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)	CaAa 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	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
2	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
3	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
4	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
5	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
6	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
7	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
8	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
9	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
10	133.00	Low Profile Platform	1	28.269	31.096	1.00	1.00	25.00	1080.00	0.000	0.000	1243.82	0.00	0.00
11	133.00	RR90-17-02DP	6	28.269	31.096	0.54	0.80	14.23	72.90	0.000	0.000	708.04	0.00	0.00
12	123.00	LPA-80063/6CF	6	27.807	30.588	0.75	0.80	43.32	145.80	0.000	0.000	2119.89	0.00	0.00
13	123.00	B66 4X45 AWS	3	27.807	30.588	0.64	0.80	4.99	172.80	0.000	0.000	244.31	0.00	0.00
14	123.00	SBNHH-1D65B	9	27.807	30.588	0.66	0.80	48.29	328.86	0.000	0.000	2363.17	0.00	0.00
15	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
16	123.00	RRH2X60-PCS	3	27.807	30.588	0.71	0.80	4.70	148.50	0.000	0.000	229.98	0.00	0.00
17	123.00	RRH2x60-700	3	27.949	30.744	0.61	0.80	6.38	162.00	0.000	3.000	314.03	0.00	942.08
18	123.00	DB-T1-6Z-8AB-0Z	2	27.807	30.588	0.72	0.80	6.91	34.02	0.000	0.000	338.28	0.00	0.00
19	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
20	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
21	95.00	HPA-65R-BUU-H6	4	26.336	28.969	0.72	0.80	27.82	183.60	0.000	0.000	1289.51	0.00	0.00
22	95.00	7770	3	26.336	28.969	0.58	0.80	9.64	94.50	0.000	0.000	446.63	0.00	0.00
23	95.00	SBNH-1D65A	2	26.336	28.969	0.72	0.80	7.75	69.12	0.000	0.000	359.09	0.00	0.00
24	95.00	OPA-65R-LCUU-H6	3	26.336	28.969	0.63	0.80	18.32	216.00	0.000	0.000	848.93	0.00	0.00
25	95.00	LGP21401	6	26.336	28.969	0.54	0.80	4.15	76.14	0.000	0.000	192.29	0.00	0.00
26	95.00	LGP21903	6	26.336	28.969	0.67	0.80	1.09	29.70	0.000	0.000	50.46	0.00	0.00
27	95.00	RRUS-11	6	26.336	28.969	0.54	0.80	14.43	297.00	0.000	0.000	668.69	0.00	0.00
28	95.00	RRUS-12	3	26.336	28.969	0.54	0.80	5.07	162.00	0.000	0.000	234.78	0.00	0.00
29	95.00	RRUS-A2	3	26.336	28.969	0.50	0.80	2.77	57.24	0.000	0.000	128.28	0.00	0.00
30	95.00	RRUS-32	3	26.336	28.969	0.70	0.80	8.08	207.90	0.000	0.000	374.54	0.00	0.00
31	95.00	RRUS-E2	3	26.336	28.969	0.56	0.80	4.72	154.71	0.000	0.000	218.81	0.00	0.00
32	95.00	1000860	3	26.336	28.969	1.00	1.00	0.18	5.40	0.000	0.000	8.34	0.00	0.00
33	95.00	Raycap/Squid	2	26.336	28.969	0.72	0.80	2.12	57.24	0.000	0.000	98.11	0.00	0.00
34	95.00	Sector Frame	3	26.336	28.969	0.56	0.75	29.53	1350.00	0.000	0.000	1368.79	0.00	0.00
35	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
36	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:** 8,156.79

**19,682.52**

## Total Applied Force Summary

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

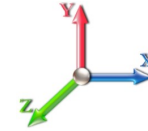


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**Load Case:** 0.9D + 1.6W 93 mph Wind

**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		513.90	1294.10	0.00	0.00
10.00		503.22	1271.61	0.00	0.00
15.00		492.54	1249.13	0.00	0.00
20.00		511.28	1226.64	0.00	0.00
21.00		101.94	242.63	0.00	0.00
25.00		427.39	1625.38	0.00	0.00
27.75		313.64	1102.15	0.00	0.00
28.00		28.44	99.58	0.00	0.00
30.00		229.14	410.40	0.00	0.00
35.00		585.50	1012.88	0.00	0.00
40.00		593.02	994.14	0.00	0.00
40.75		88.51	147.51	0.00	0.00
45.00		502.09	827.90	0.00	0.00
50.00		561.18	956.67	0.00	0.00
55.00		562.74	937.94	0.00	0.00
60.00		563.15	919.20	0.00	0.00
65.00		562.56	900.46	0.00	0.00
70.00	(2) attachments	726.84	1599.28	0.00	0.00
71.00		112.92	306.36	0.00	0.00
75.00		450.46	696.49	0.00	0.00
80.00		561.23	853.75	0.00	0.00
85.00		557.68	835.01	0.00	0.00
90.00		553.55	816.27	0.00	0.00
95.00	(50) attachments	6836.14	3758.09	0.00	0.00
100.00		479.25	714.90	0.00	0.00
105.00	(2) attachments	736.05	754.67	0.00	717.05
110.00		456.53	676.71	0.00	0.00
115.00		451.09	1067.95	0.00	0.00
120.00		438.63	549.03	0.00	0.00
123.00	(27) attachments	7089.76	2394.21	0.00	942.08
125.00		168.30	177.91	0.00	0.00
130.00		412.48	434.28	0.00	0.00
133.00	(7) attachments	2192.44	1406.27	0.00	0.00
135.00		157.50	143.45	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:		35,022.89	35,453.94	0.00	1,659.14

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

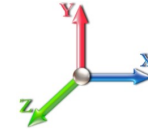


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**Load Case:** 0.9D + 1.6W 93 mph Wind

**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	0.091	0.000	17.879	0.00	1.23
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.091	0.000	17.879	0.00	56.16
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.091	0.000	17.879	0.00	0.54
5.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.091	0.000	17.879	0.00	7.20
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.093	0.000	17.879	0.00	1.23
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.093	0.000	17.879	0.00	56.16
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.093	0.000	17.879	0.00	0.54
10.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.093	0.000	17.879	0.00	7.20
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.095	0.000	17.879	0.00	1.23
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.095	0.000	17.879	0.00	56.16
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.095	0.000	17.879	0.00	0.54
15.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.095	0.000	17.879	0.00	7.20
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.097	0.000	18.971	0.00	1.23
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.097	0.000	18.971	0.00	56.16
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.097	0.000	18.971	0.00	0.54
20.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.097	0.000	18.971	0.00	7.20
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.098	0.000	19.166	0.00	0.25
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.098	0.000	19.166	0.00	11.23
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.098	0.000	19.166	0.00	0.11
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.098	0.000	19.166	0.00	1.44
25.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.103	1.010	19.883	0.00	0.98
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.103	1.010	19.883	0.00	44.93
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.103	1.010	19.883	0.00	0.43
25.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.103	1.010	19.883	0.00	5.76
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.103	1.010	19.883	0.00	0.00
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.124	1.071	20.325	0.00	0.68
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	0.91	0.00	0.124	1.071	20.325	0.00	30.89
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.09	0.00	0.124	1.071	20.325	0.00	0.30
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.17	0.00	0.124	1.071	20.325	0.00	3.96
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.29	0.00	0.124	1.071	20.325	0.00	0.00
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.01	0.00	0.125	1.074	20.363	0.00	0.06
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.125	1.074	20.363	0.00	2.81
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.01	0.00	0.125	1.074	20.363	0.00	0.03
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.02	0.00	0.125	1.074	20.363	0.00	0.36
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.03	0.00	0.125	1.074	20.363	0.00	0.00
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.124	1.071	20.661	0.00	0.49
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.124	1.071	20.661	0.00	22.46
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.124	1.071	20.661	0.00	0.22
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.124	1.071	20.661	0.00	2.88
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.124	1.071	20.661	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.126	1.077	21.343	0.00	1.23
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.126	1.077	21.343	0.00	56.16
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.126	1.077	21.343	0.00	0.54
35.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.126	1.077	21.343	0.00	7.20
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.126	1.077	21.343	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.129	1.086	21.951	0.00	1.23
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.129	1.086	21.951	0.00	56.16

## Linear Appurtenance Segment Forces (Factored)

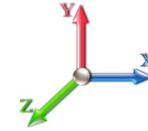
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.129	1.086	21.951	0.00	0.54
40.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.129	1.086	21.951	0.00	7.20
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.129	1.086	21.951	0.00	0.00
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.02	0.00	0.131	1.092	22.037	0.00	0.18
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.25	0.00	0.131	1.092	22.037	0.00	8.42
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.02	0.00	0.131	1.092	22.037	0.00	0.08
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.05	0.00	0.131	1.092	22.037	0.00	1.08
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.131	1.092	22.037	0.00	0.00
45.00	Safety Cable	Yes	4.25	0.000	0.38	0.13	0.00	0.128	1.084	22.502	0.00	1.04
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	1.40	0.00	0.128	1.084	22.502	0.00	47.74
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	0.13	0.00	0.128	1.084	22.502	0.00	0.46
45.00	3/4" DC	Yes	4.25	0.000	0.75	0.27	0.00	0.128	1.084	22.502	0.00	6.12
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	0.36	0.00	0.128	1.084	22.502	0.00	0.00
50.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.030	23.007	0.00	1.23
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.110	1.030	23.007	0.00	56.16
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.030	23.007	0.00	0.54
50.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.110	1.030	23.007	0.00	7.20
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.113	1.039	23.473	0.00	1.23
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.113	1.039	23.473	0.00	56.16
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.113	1.039	23.473	0.00	0.54
55.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.113	1.039	23.473	0.00	7.20
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.116	1.048	23.907	0.00	1.23
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.116	1.048	23.907	0.00	56.16
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.116	1.048	23.907	0.00	0.54
60.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.116	1.048	23.907	0.00	7.20
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.119	1.058	24.313	0.00	1.23
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.119	1.058	24.313	0.00	56.16
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.119	1.058	24.313	0.00	0.54
65.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.119	1.058	24.313	0.00	7.20
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.123	1.068	24.696	0.00	1.23
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.123	1.068	24.696	0.00	56.16
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.123	1.068	24.696	0.00	0.54
70.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.123	1.068	24.696	0.00	7.20
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.125	1.074	24.770	0.00	0.25
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.125	1.074	24.770	0.00	11.23
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.125	1.074	24.770	0.00	0.11
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.125	1.074	24.770	0.00	1.44
75.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.125	1.074	25.057	0.00	0.98
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.125	1.074	25.057	0.00	44.93
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.125	1.074	25.057	0.00	0.43
75.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.125	1.074	25.057	0.00	5.76
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.128	1.084	25.400	0.00	1.23
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.128	1.084	25.400	0.00	56.16
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.128	1.084	25.400	0.00	0.54
80.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.128	1.084	25.400	0.00	7.20
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.132	1.095	25.726	0.00	1.23
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.132	1.095	25.726	0.00	56.16

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

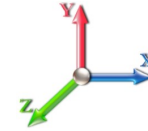


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**Load Case:** 0.9D + 1.6W 93 mph Wind

**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)
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.132	1.095	25.726	0.00	0.54
85.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.132	1.095	25.726	0.00	7.20
90.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.136	1.107	26.037	0.00	1.23
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.136	1.107	26.037	0.00	56.16
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.136	1.107	26.037	0.00	0.54
90.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.136	1.107	26.037	0.00	7.20
95.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.140	1.121	26.336	0.00	1.23
95.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.140	1.121	26.336	0.00	56.16
95.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.140	1.121	26.336	0.00	0.54
95.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.140	1.121	26.336	0.00	7.20
100.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.010	0.000	26.621	0.00	1.23
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
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
133.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.013	0.000	28.269	0.00	0.74
135.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.013	0.000	28.358	0.00	0.49
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
<b>Totals:</b>											<b>0.0</b>	<b>1,251.7</b>

## Calculated Forces

**Structure:** CT01499-S-SBA  
**Site Name:** Torrington  
**Height:** 153.00 (ft)  
**Base Elev:** 0.000 (ft)  
**Gh:** 1.1

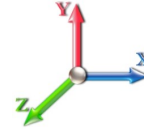
**Code:** EIA/TIA-222-G  
**Exposure:** C  
**Crest Height:** 0.00  
**Site Class:** B - Competent Rock  
**Struct Class:** II

2/2/2017  
  
  
  
  
  
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**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	-35.40	-35.07	0.00	-3584.1	0.00	3584.15	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.662
5.00	-34.02	-34.65	0.00	-3408.7	0.00	3408.79	4413.36	2206.68	10604.1	5309.95	0.08	-0.156	0.000	0.650
10.00	-32.65	-34.23	0.00	-3235.5	0.00	3235.55	4361.89	2180.94	10257.6	5136.44	0.33	-0.314	0.000	0.638
15.00	-31.31	-33.82	0.00	-3064.3	0.00	3064.39	4308.61	2154.31	9912.23	4963.48	0.75	-0.473	0.000	0.625
20.00	-30.03	-33.35	0.00	-2895.3	0.00	2895.30	4253.53	2126.77	9568.22	4791.22	1.33	-0.635	0.000	0.612
21.00	-29.74	-33.28	0.00	-2861.9	0.00	2861.96	4242.30	2121.15	9499.61	4756.87	1.47	-0.668	0.000	0.609
25.00	-28.06	-32.89	0.00	-2728.8	0.00	2728.82	4196.65	2098.33	9225.87	4619.79	2.08	-0.799	0.000	0.598
27.75	-26.94	-32.58	0.00	-2638.3	0.00	2638.38	4164.60	2082.30	9038.39	4525.91	2.57	-0.890	0.000	0.389
28.00	-26.82	-32.56	0.00	-2630.2	0.00	2630.23	4213.57	1606.78	7065.87	3538.19	2.62	-0.896	0.000	0.429
30.00	-26.37	-32.37	0.00	-2565.1	0.00	2565.10	3199.34	1599.67	6969.21	3489.78	3.00	-0.940	0.000	0.464
35.00	-25.30	-31.82	0.00	-2403.2	0.00	2403.27	3162.51	1581.26	6727.41	3368.71	4.05	-1.059	0.000	0.446
40.00	-24.28	-31.23	0.00	-2244.2	0.00	2244.20	3123.88	1561.94	6485.64	3247.64	5.23	-1.177	0.000	0.428
40.75	-24.11	-31.17	0.00	-2220.7	0.00	2220.77	3117.93	1558.96	6449.39	3229.49	5.41	-1.195	0.000	0.425
40.75	-24.11	-31.17	0.00	-2220.7	0.00	2220.77	3117.93	1558.96	6449.39	3229.49	5.41	-1.195	0.000	0.425
45.00	-23.21	-30.71	0.00	-2088.3	0.00	2088.32	3083.44	1541.72	6244.17	3126.72	6.52	-1.295	0.000	0.676
50.00	-22.17	-30.20	0.00	-1934.7	0.00	1934.79	3041.20	1520.60	6003.26	3006.09	7.98	-1.487	0.000	0.651
55.00	-21.15	-29.68	0.00	-1783.8	0.00	1783.82	2997.16	1498.58	5763.21	2885.89	9.64	-1.678	0.000	0.626
60.00	-20.15	-29.15	0.00	-1635.4	0.00	1635.43	2951.32	1475.66	5524.28	2766.24	11.50	-1.868	0.000	0.598
65.00	-19.17	-28.62	0.00	-1489.6	0.00	1489.67	2903.67	1451.83	5286.75	2647.30	13.56	-2.056	0.000	0.570
70.00	-17.55	-27.87	0.00	-1346.5	0.00	1346.56	2854.22	1427.11	5050.90	2529.20	15.82	-2.241	0.000	0.539
71.00	-17.20	-27.77	0.00	-1318.6	0.00	1318.69	2869.57	1434.79	5123.02	2565.32	16.29	-2.279	0.000	0.520
75.00	-16.45	-27.34	0.00	-1207.6	0.00	1207.60	2829.16	1414.58	4935.24	2471.29	18.26	-2.426	0.000	0.495
80.00	-15.54	-26.79	0.00	-1070.9	0.00	1070.90	2777.01	1388.51	4702.41	2354.70	20.90	-2.595	0.000	0.461
85.00	-14.66	-26.23	0.00	-936.97	0.00	936.97	2723.06	1361.53	4471.94	2239.29	23.70	-2.758	0.000	0.424
90.00	-13.81	-25.67	0.00	-805.82	0.00	805.82	2667.31	1333.66	4244.12	2125.22	26.68	-2.913	0.000	0.385
95.00	-10.37	-18.68	0.00	-677.44	0.00	677.44	2609.76	1304.88	4019.22	2012.60	29.81	-3.058	0.000	0.341
100.00	-9.64	-18.18	0.00	-584.06	0.00	584.06	2550.40	1275.20	3797.52	1901.58	33.08	-3.194	0.000	0.311
105.00	-8.89	-17.42	0.00	-492.43	0.00	492.43	2489.24	1244.62	3579.29	1792.30	36.49	-3.322	0.000	0.279
110.00	-8.21	-16.94	0.00	-405.32	0.00	405.32	2426.28	1213.14	3364.80	1684.90	40.04	-3.440	0.000	0.244
115.00	-7.14	-16.44	0.00	-320.60	0.00	320.60	1783.00	891.50	2427.68	1215.65	43.70	-3.547	0.000	0.268
120.00	-6.60	-15.98	0.00	-238.40	0.00	238.40	1739.91	869.95	2280.12	1141.75	47.46	-3.639	0.000	0.213
123.00	-4.66	-8.75	0.00	-189.53	0.00	189.53	1713.19	856.59	2192.59	1097.92	49.77	-3.695	0.000	0.175
125.00	-4.48	-8.58	0.00	-172.02	0.00	172.02	1695.01	847.51	2134.69	1068.93	51.32	-3.729	0.000	0.164
130.00	-4.07	-8.14	0.00	-129.14	0.00	129.14	1648.31	824.16	1991.67	997.31	55.27	-3.803	0.000	0.132
133.00	-2.81	-5.86	0.00	-104.71	0.00	104.71	1619.42	809.71	1907.13	954.98	57.67	-3.843	0.000	0.111
135.00	-2.67	-5.70	0.00	-92.99	0.00	92.99	1599.81	799.90	1851.33	927.04	59.28	-3.866	0.000	0.102
140.00	-2.35	-5.29	0.00	-64.51	0.00	64.51	1549.50	774.75	1713.96	858.25	63.36	-3.916	0.000	0.077
145.00	-2.04	-4.90	0.00	-38.06	0.00	38.06	1497.39	748.69	1579.82	791.09	67.48	-3.953	0.000	0.050
150.00	-1.74	-4.52	0.00	-13.57	0.00	13.57	1443.48	721.74	1449.20	725.68	71.63	-3.975	0.000	0.020
150.00	-1.74	-4.52	0.00	-13.57	0.00	13.57	1443.48	721.74	1449.20	725.68	71.63	-3.975	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	74.12	-3.979	0.000	0.000

## Wind Loading - Shaft

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

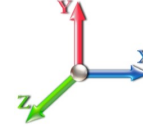


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**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Iterations** 21

**Dead Load Factor** 1.20  
**Wind Load Factor** 1.00



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	1.200	1.656	5.00	26.505	31.81	115.7	626.8	2060.7
10.00		1.00	0.85	3.308	3.64	0.00	1.200	1.775	5.00	26.082	31.30	113.9	659.4	2063.3
15.00		1.00	0.85	3.308	3.64	0.00	1.200	1.848	5.00	25.621	30.75	111.9	673.2	2047.1
20.00		1.00	0.90	3.509	3.86	0.00	1.200	1.902	5.00	25.144	30.17	116.5	678.8	2022.7
21.00	Bot - Section 2	1.00	0.91	3.546	3.90	0.00	1.200	1.912	1.00	4.968	5.96	23.3	135.8	401.0
25.00		1.00	0.95	3.678	4.05	0.00	1.212 *	1.945	4.00	19.896	24.12	97.6	549.7	2483.7
27.75	RB1	1.00	0.97	3.760	4.14	0.00	1.285 *	1.966	2.75	13.494	17.35	71.7	377.5	1686.6
28.00	Top - Section 1	1.00	0.97	3.767	4.14	0.00	1.288 *	1.967	0.25	1.219	1.57	6.5	34.3	152.5
30.00		1.00	0.98	3.822	4.20	0.00	1.286 *	1.981	2.00	9.709	12.48	52.5	274.0	704.6
35.00		1.00	1.01	3.948	4.34	0.00	1.293 *	2.012	5.00	23.934	30.94	134.4	680.4	1739.4
40.00		1.00	1.04	4.061	4.47	0.00	1.304 *	2.039	5.00	23.434	30.55	136.5	674.1	1708.1
40.75	RT1	1.00	1.05	4.077	4.48	0.00	1.310 *	2.043	0.75	3.471	4.55	20.4	101.0	253.9
45.00		1.00	1.07	4.163	4.58	0.00	1.300 *	2.063	4.25	19.459	25.31	115.9	566.5	1422.6
50.00		1.00	1.09	4.256	4.68	0.00	1.237 *	2.085	5.00	22.429	27.73	129.8	657.7	1641.7
55.00		1.00	1.12	4.342	4.78	0.00	1.247 *	2.105	5.00	21.924	27.33	130.6	648.0	1607.0
60.00		1.00	1.14	4.423	4.86	0.00	1.258 *	2.123	5.00	21.417	26.93	131.0	637.5	1571.5
65.00	Bot - Section 3	1.00	1.16	4.498	4.95	0.00	1.269 *	2.140	5.00	20.909	26.53	131.3	626.3	1535.4
70.00	Appurtenance(s)	1.00	1.17	4.569	5.03	0.00	1.281 *	2.156	5.00	20.665	26.47	133.0	622.9	2403.8
71.00	Top - Section 2	1.00	1.18	4.582	5.04	0.00	1.289 *	2.159	1.00	4.071	5.25	26.4	124.1	474.3
75.00		1.00	1.19	4.635	5.10	0.00	1.289 *	2.171	4.00	16.083	20.72	105.7	488.5	1183.9
80.00		1.00	1.21	4.699	5.17	0.00	1.300 *	2.185	5.00	19.645	25.55	132.0	597.9	1444.7
85.00		1.00	1.22	4.759	5.24	0.00	1.314 *	2.198	5.00	19.134	25.15	131.6	584.7	1406.5
90.00		1.00	1.24	4.817	5.30	0.00	1.329 *	2.211	5.00	18.623	24.75	131.1	571.2	1368.0
95.00	Appurtenance(s)	1.00	1.25	4.872	5.36	0.00	1.345 *	2.223	5.00	18.111	24.35	130.5	557.2	1329.1
100.00		1.00	1.27	4.925	5.42	0.00	1.200	2.234	5.00	17.598	21.12	114.4	543.0	1289.8
105.00	Appurtenance(s)	1.00	1.28	4.976	5.47	0.00	1.200	2.245	5.00	17.086	20.50	112.2	528.4	1250.3
110.00	Bot - Section 4	1.00	1.29	5.025	5.53	0.00	1.200	2.256	5.00	16.572	19.89	109.9	513.6	1210.5
115.00	Top - Section 3	1.00	1.30	5.072	5.58	0.00	1.200	2.266	5.00	16.270	19.52	108.9	505.6	1724.2
120.00		1.00	1.32	5.117	5.63	0.00	1.200	2.276	5.00	15.756	18.91	106.4	490.3	1017.0
123.00	Appurtenance(s)	1.00	1.32	5.144	5.66	0.00	1.200	2.281	3.00	9.206	11.05	62.5	288.6	595.0
125.00		1.00	1.33	5.162	5.68	0.00	1.200	2.285	2.00	6.034	7.24	41.1	189.9	390.2
130.00		1.00	1.34	5.204	5.72	0.00	1.200	2.294	5.00	14.728	17.67	101.2	459.0	945.7
133.00	Appurtenance(s)	1.00	1.34	5.230	5.75	0.00	1.200	2.299	3.00	8.589	10.31	59.3	269.7	552.1
135.00		1.00	1.35	5.246	5.77	0.00	1.200	2.303	2.00	5.623	6.75	38.9	177.2	361.5
140.00		1.00	1.36	5.286	5.81	0.00	1.200	2.311	5.00	13.698	16.44	95.6	427.0	873.7
145.00		1.00	1.37	5.325	5.86	0.00	1.200	2.319	5.00	13.183	15.82	92.7	410.7	837.4
150.00	Top - Section 4	1.00	1.38	5.364	5.90	0.00	1.200	2.327	5.00	12.668	15.20	89.7	394.2	800.9
153.00	Appurtenance(s)	1.00	1.38	5.386	5.92	0.00	1.200	2.332	3.00	7.352	8.82	52.3	230.5	465.0
								<b>Totals:</b>	<b>153.00</b>			<b>3,614.9</b>	<b>47,025.3</b>	

\* Cf Adjusted by Linear Load Ra Effect

## Discrete Appurtenance Forces

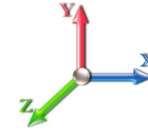
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)	CaAa 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	800 MHz RRUs	3	5.386	5.925	0.83	0.90	9.98	423.93	0.000	0.000	59.13	0.00	0.00			
2	153.00	APXVTM14-C-I20	3	5.386	5.925	0.71	0.90	16.76	888.83	0.000	0.000	99.32	0.00	0.00			
3	153.00	APXVSPP18-C-A20	3	5.386	5.925	0.75	0.90	26.34	749.48	0.000	0.000	156.04	0.00	0.00			
4	153.00	1900 MHz RRUs	3	5.386	5.925	0.79	0.90	13.44	502.32	0.000	0.000	79.63	0.00	0.00			
5	153.00	Lightning Rod	1	5.386	5.925	1.00	1.00	2.83	27.98	0.000	0.000	16.78	0.00	0.00			
6	153.00	ACU-A20-N	4	5.386	5.925	0.81	0.90	1.74	22.56	0.000	0.000	10.30	0.00	0.00			
7	153.00	TD-RRH8x20-25	3	5.386	5.925	0.62	0.90	9.62	726.39	0.000	0.000	57.00	0.00	0.00			
8	153.00	Low Profile Platform	1	5.386	5.925	1.00	1.00	52.98	2538.94	0.000	0.000	313.88	0.00	0.00			
9	153.00	800 MHz Filters	3	5.386	5.925	0.62	0.90	3.06	87.39	0.000	0.000	18.15	0.00	0.00			
10	133.00	Low Profile Platform	1	5.230	5.752	1.00	1.00	52.59	2519.48	0.000	0.000	302.52	0.00	0.00			
11	133.00	RR90-17-02DP	6	5.230	5.752	0.54	0.80	18.60	951.53	0.000	0.000	107.00	0.00	0.00			
12	123.00	LPA-80063/6CF	6	5.144	5.659	0.75	0.80	51.44	2555.35	0.000	0.000	291.08	0.00	0.00			
13	123.00	B66 4X45 AWS	3	5.144	5.659	0.64	0.80	6.80	583.31	0.000	0.000	38.50	0.00	0.00			
14	123.00	SBNHH-1D65B	9	5.144	5.659	0.66	0.80	58.59	2951.53	0.000	0.000	331.55	0.00	0.00			
15	123.00	Low Profile Platform	1	5.144	5.659	1.00	1.00	52.37	2508.74	0.000	0.000	296.37	0.00	0.00			
16	123.00	RRH2X60-PCS	3	5.144	5.659	0.71	0.80	6.53	553.93	0.000	0.000	36.93	0.00	0.00			
17	123.00	RRH2x60-700	3	5.170	5.687	0.61	0.80	8.27	497.99	0.000	3.000	47.01	0.00	141.03			
18	123.00	DB-T1-6Z-8AB-0Z	2	5.144	5.659	0.72	0.80	8.59	442.04	0.000	0.000	48.61	0.00	0.00			
19	105.00	Standoff	1	4.976	5.473	1.00	1.00	10.31	128.29	0.000	0.000	56.42	0.00	0.00			
20	105.00	10' Omni	1	5.025	5.527	1.00	1.00	7.64	106.16	0.000	5.000	42.23	0.00	211.13			
21	95.00	HPA-65R-BUU-H6	4	4.872	5.359	0.72	0.80	32.91	1566.08	0.000	0.000	176.39	0.00	0.00			
22	95.00	7770	3	4.872	5.359	0.58	0.80	12.06	675.16	0.000	0.000	64.61	0.00	0.00			
23	95.00	SBNH-1D65A	2	4.872	5.359	0.72	0.80	11.38	342.58	0.000	0.000	61.01	0.00	0.00			
24	95.00	OPA-65R-LCUU-H6	3	4.872	5.359	0.63	0.80	21.67	1215.85	0.000	0.000	116.12	0.00	0.00			
25	95.00	LGP21401	6	4.872	5.359	0.54	0.80	7.57	250.00	0.000	0.000	40.58	0.00	0.00			
26	95.00	LGP21903	6	4.872	5.359	0.67	0.80	3.13	89.61	0.000	0.000	16.78	0.00	0.00			
27	95.00	RRUS-11	6	4.872	5.359	0.54	0.80	20.66	929.34	0.000	0.000	110.73	0.00	0.00			
28	95.00	RRUS-12	3	4.872	5.359	0.54	0.80	7.64	436.35	0.000	0.000	40.93	0.00	0.00			
29	95.00	RRUS-A2	3	4.872	5.359	0.50	0.80	4.61	183.71	0.000	0.000	24.72	0.00	0.00			
30	95.00	RRUS-32	3	4.872	5.359	0.70	0.80	9.07	736.33	0.000	0.000	48.60	0.00	0.00			
31	95.00	RRUS-E2	3	4.872	5.359	0.56	0.80	6.21	560.74	0.000	0.000	33.27	0.00	0.00			
32	95.00	1000860	3	4.872	5.359	1.00	1.00	0.98	15.17	0.000	0.000	5.25	0.00	0.00			
33	95.00	Raycap/Squid	2	4.872	5.359	0.72	0.80	3.40	198.42	0.000	0.000	18.22	0.00	0.00			
34	95.00	Sector Frame	3	4.872	5.359	0.56	0.75	59.47	3867.67	0.000	0.000	318.69	0.00	0.00			
35	70.00	Standoff	1	4.569	5.025	1.00	1.00	10.00	124.19	0.000	0.000	50.27	0.00	0.00			
36	70.00	GPS	1	4.569	5.025	1.00	1.00	1.88	40.22	0.000	0.000	9.45	0.00	0.00			
<b>Totals:</b>									<b>30,997.59</b>						<b>3,544.07</b>		



## Total Applied Force Summary

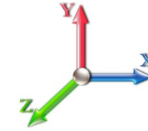
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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		115.72	2619.67	0.00	0.00
10.00		113.87	2645.12	0.00	0.00
15.00		111.86	2643.44	0.00	0.00
20.00		116.48	2629.84	0.00	0.00
21.00		23.25	522.84	0.00	0.00
25.00		97.59	2984.32	0.00	0.00
27.75		71.74	2057.42	0.00	0.00
28.00		6.51	186.23	0.00	0.00
30.00		52.48	975.72	0.00	0.00
35.00		134.39	2424.83	0.00	0.00
40.00		136.48	2400.25	0.00	0.00
40.75		20.39	357.86	0.00	0.00
45.00		115.87	2007.27	0.00	0.00
50.00		129.84	2286.40	0.00	0.00
55.00		130.57	2255.92	0.00	0.00
60.00		131.03	2224.32	0.00	0.00
65.00		131.28	2191.77	0.00	0.00
70.00	(2) attachments	192.76	3227.97	0.00	0.00
71.00		26.44	606.37	0.00	0.00
75.00		105.66	1714.35	0.00	0.00
80.00		132.03	2110.72	0.00	0.00
85.00		131.64	2075.42	0.00	0.00
90.00		131.13	2039.60	0.00	0.00
95.00	(50) attachments	1206.42	13070.31	0.00	0.00
100.00		114.40	1530.01	0.00	0.00
105.00	(2) attachments	210.87	1725.24	0.00	211.13
110.00		109.92	1450.32	0.00	0.00
115.00		108.93	1964.28	0.00	0.00
120.00		106.44	1257.37	0.00	0.00
123.00	(27) attachments	1152.56	10832.26	0.00	141.03
125.00		41.11	441.24	0.00	0.00
130.00		101.18	1073.63	0.00	0.00
133.00	(7) attachments	468.80	4099.96	0.00	0.00
135.00		38.93	382.83	0.00	0.00
140.00		95.58	927.21	0.00	0.00
145.00		92.67	891.16	0.00	0.00
150.00		89.69	854.92	0.00	0.00
153.00	(24) attachments	862.50	6465.28	0.00	0.00
Totals:		7,159.01	92,153.69	0.00	352.16

## Linear Appurtenance Segment Forces (Factored)

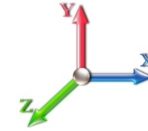
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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	1.54	0.00	0.091	0.000	3.308	0.00	20.86
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.03	0.00	0.091	0.000	3.308	0.00	264.28
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.54	0.00	0.091	0.000	3.308	0.00	22.49
5.00	3/4" DC	Yes	5.00	0.000	0.75	1.69	0.00	0.091	0.000	3.308	0.00	46.61
10.00	Safety Cable	Yes	5.00	0.000	0.38	1.64	0.00	0.093	0.000	3.308	0.00	23.53
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.13	0.00	0.093	0.000	3.308	0.00	277.76
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.64	0.00	0.093	0.000	3.308	0.00	25.33
10.00	3/4" DC	Yes	5.00	0.000	0.75	1.79	0.00	0.093	0.000	3.308	0.00	50.49
15.00	Safety Cable	Yes	5.00	0.000	0.38	1.70	0.00	0.095	0.000	3.308	0.00	25.26
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.19	0.00	0.095	0.000	3.308	0.00	286.17
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.70	0.00	0.095	0.000	3.308	0.00	27.17
15.00	3/4" DC	Yes	5.00	0.000	0.75	1.85	0.00	0.095	0.000	3.308	0.00	52.97
20.00	Safety Cable	Yes	5.00	0.000	0.38	1.74	0.00	0.097	0.000	3.509	0.00	26.58
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.24	0.00	0.097	0.000	3.509	0.00	292.39
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.74	0.00	0.097	0.000	3.509	0.00	28.57
20.00	3/4" DC	Yes	5.00	0.000	0.75	1.90	0.00	0.097	0.000	3.509	0.00	54.84
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.35	0.00	0.098	0.000	3.546	0.00	5.36
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.65	0.00	0.098	0.000	3.546	0.00	58.69
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.35	0.00	0.098	0.000	3.546	0.00	5.76
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.38	0.00	0.098	0.000	3.546	0.00	11.03
25.00	Safety Cable	Yes	4.00	0.000	0.38	1.42	0.00	0.103	1.010	3.678	0.00	22.12
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	2.62	0.00	0.103	1.010	3.678	0.00	237.89
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	1.42	0.00	0.103	1.010	3.678	0.00	23.76
25.00	3/4" DC	Yes	4.00	0.000	0.75	1.55	0.00	0.103	1.010	3.678	0.00	45.08
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.32	0.00	0.103	1.010	3.678	0.00	8.02
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.99	0.00	0.124	1.071	3.760	0.00	15.49
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	1.81	0.00	0.124	1.071	3.760	0.00	164.86
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.99	0.00	0.124	1.071	3.760	0.00	16.64
27.75	3/4" DC	Yes	2.75	0.000	0.75	1.07	0.00	0.124	1.071	3.760	0.00	31.39
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	1.19	0.00	0.124	1.071	3.760	0.00	29.82
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.09	0.00	0.125	1.074	3.767	0.00	1.41
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.16	0.00	0.125	1.074	3.767	0.00	15.00
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.09	0.00	0.125	1.074	3.767	0.00	1.52
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.10	0.00	0.125	1.074	3.767	0.00	2.86
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.11	0.00	0.125	1.074	3.767	0.00	2.71
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.72	0.00	0.124	1.071	3.822	0.00	11.42
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	1.32	0.00	0.124	1.071	3.822	0.00	120.61
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.72	0.00	0.124	1.071	3.822	0.00	12.27
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.79	0.00	0.124	1.071	3.822	0.00	23.05
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.87	0.00	0.124	1.071	3.822	0.00	21.93
35.00	Safety Cable	Yes	5.00	0.000	0.38	1.83	0.00	0.126	1.077	3.948	0.00	29.35
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.33	0.00	0.126	1.077	3.948	0.00	305.13
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.83	0.00	0.126	1.077	3.948	0.00	31.51
35.00	3/4" DC	Yes	5.00	0.000	0.75	1.99	0.00	0.126	1.077	3.948	0.00	58.73
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.20	0.00	0.126	1.077	3.948	0.00	56.02
40.00	Safety Cable	Yes	5.00	0.000	0.38	1.86	0.00	0.129	1.086	4.061	0.00	30.06
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.35	0.00	0.129	1.086	4.061	0.00	308.29

## Linear Appurtenance Segment Forces (Factored)

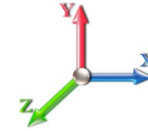
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.86	0.00	0.129	1.086	4.061	0.00	32.26
40.00	3/4" DC	Yes	5.00	0.000	0.75	2.01	0.00	0.129	1.086	4.061	0.00	59.72
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.22	0.00	0.129	1.086	4.061	0.00	57.08
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.28	0.00	0.131	1.092	4.077	0.00	4.52
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.50	0.00	0.131	1.092	4.077	0.00	46.31
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.28	0.00	0.131	1.092	4.077	0.00	4.85
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.30	0.00	0.131	1.092	4.077	0.00	8.98
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.33	0.00	0.131	1.092	4.077	0.00	8.58
45.00	Safety Cable	Yes	4.25	0.000	0.38	1.60	0.00	0.128	1.084	4.163	0.00	26.10
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	2.86	0.00	0.128	1.084	4.163	0.00	264.46
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	1.60	0.00	0.128	1.084	4.163	0.00	28.00
45.00	3/4" DC	Yes	4.25	0.000	0.75	1.73	0.00	0.128	1.084	4.163	0.00	51.51
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	1.57	0.00	0.128	1.084	4.163	0.00	40.63
50.00	Safety Cable	Yes	5.00	0.000	0.38	1.90	0.00	0.110	1.030	4.256	0.00	31.29
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.39	0.00	0.110	1.030	4.256	0.00	313.70
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.90	0.00	0.110	1.030	4.256	0.00	33.55
50.00	3/4" DC	Yes	5.00	0.000	0.75	2.05	0.00	0.110	1.030	4.256	0.00	61.41
55.00	Safety Cable	Yes	5.00	0.000	0.38	1.91	0.00	0.113	1.039	4.342	0.00	31.83
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.40	0.00	0.113	1.039	4.342	0.00	316.06
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.91	0.00	0.113	1.039	4.342	0.00	34.12
55.00	3/4" DC	Yes	5.00	0.000	0.75	2.07	0.00	0.113	1.039	4.342	0.00	62.16
60.00	Safety Cable	Yes	5.00	0.000	0.38	1.93	0.00	0.116	1.048	4.423	0.00	32.33
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.42	0.00	0.116	1.048	4.423	0.00	318.23
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.93	0.00	0.116	1.048	4.423	0.00	34.65
60.00	3/4" DC	Yes	5.00	0.000	0.75	2.08	0.00	0.116	1.048	4.423	0.00	62.85
65.00	Safety Cable	Yes	5.00	0.000	0.38	1.94	0.00	0.119	1.058	4.498	0.00	32.80
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.43	0.00	0.119	1.058	4.498	0.00	320.25
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.94	0.00	0.119	1.058	4.498	0.00	35.15
65.00	3/4" DC	Yes	5.00	0.000	0.75	2.10	0.00	0.119	1.058	4.498	0.00	63.49
70.00	Safety Cable	Yes	5.00	0.000	0.38	1.96	0.00	0.123	1.068	4.569	0.00	33.24
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.45	0.00	0.123	1.068	4.569	0.00	322.14
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.96	0.00	0.123	1.068	4.569	0.00	35.61
70.00	3/4" DC	Yes	5.00	0.000	0.75	2.11	0.00	0.123	1.068	4.569	0.00	64.09
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.39	0.00	0.125	1.074	4.582	0.00	6.67
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.69	0.00	0.125	1.074	4.582	0.00	64.50
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.39	0.00	0.125	1.074	4.582	0.00	7.14
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.42	0.00	0.125	1.074	4.582	0.00	12.84
75.00	Safety Cable	Yes	4.00	0.000	0.38	1.57	0.00	0.125	1.074	4.635	0.00	26.93
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	2.77	0.00	0.125	1.074	4.635	0.00	259.13
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	1.57	0.00	0.125	1.074	4.635	0.00	28.84
75.00	3/4" DC	Yes	4.00	0.000	0.75	1.70	0.00	0.125	1.074	4.635	0.00	51.73
80.00	Safety Cable	Yes	5.00	0.000	0.38	1.98	0.00	0.128	1.084	4.699	0.00	34.05
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.47	0.00	0.128	1.084	4.699	0.00	325.59
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.98	0.00	0.128	1.084	4.699	0.00	36.47
80.00	3/4" DC	Yes	5.00	0.000	0.75	2.13	0.00	0.128	1.084	4.699	0.00	65.20
85.00	Safety Cable	Yes	5.00	0.000	0.38	1.99	0.00	0.132	1.095	4.759	0.00	34.43
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.48	0.00	0.132	1.095	4.759	0.00	327.17

## Linear Appurtenance Segment Forces (Factored)

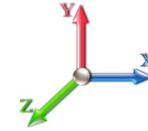
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	1.99	0.00	0.132	1.095	4.759	0.00	36.86
85.00	3/4" DC	Yes	5.00	0.000	0.75	2.14	0.00	0.132	1.095	4.759	0.00	65.71
90.00	Safety Cable	Yes	5.00	0.000	0.38	2.00	0.00	0.136	1.107	4.817	0.00	34.79
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.49	0.00	0.136	1.107	4.817	0.00	328.68
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	2.00	0.00	0.136	1.107	4.817	0.00	37.24
90.00	3/4" DC	Yes	5.00	0.000	0.75	2.16	0.00	0.136	1.107	4.817	0.00	66.20
95.00	Safety Cable	Yes	5.00	0.000	0.38	2.01	0.00	0.140	1.121	4.872	0.00	35.13
95.00	1 5/8" Coax	Yes	5.00	0.000	3.96	3.50	0.00	0.140	1.121	4.872	0.00	330.11
95.00	1/2" Fiber	Yes	5.00	0.000	0.38	2.01	0.00	0.140	1.121	4.872	0.00	37.60
95.00	3/4" DC	Yes	5.00	0.000	0.75	2.17	0.00	0.140	1.121	4.872	0.00	66.66
100.00	Safety Cable	Yes	5.00	0.000	0.38	2.02	0.00	0.010	0.000	4.925	0.00	35.46
105.00	Safety Cable	Yes	5.00	0.000	0.38	2.03	0.00	0.010	0.000	4.976	0.00	35.77
110.00	Safety Cable	Yes	5.00	0.000	0.38	2.04	0.00	0.011	0.000	5.025	0.00	36.07
115.00	Safety Cable	Yes	5.00	0.000	0.38	2.05	0.00	0.011	0.000	5.072	0.00	36.37
120.00	Safety Cable	Yes	5.00	0.000	0.38	2.05	0.00	0.011	0.000	5.117	0.00	36.65
123.00	Safety Cable	Yes	3.00	0.000	0.38	1.24	0.00	0.012	0.000	5.144	0.00	22.09
125.00	Safety Cable	Yes	2.00	0.000	0.38	0.82	0.00	0.012	0.000	5.162	0.00	14.77
130.00	Safety Cable	Yes	5.00	0.000	0.38	2.07	0.00	0.012	0.000	5.204	0.00	37.19
133.00	Safety Cable	Yes	3.00	0.000	0.38	1.24	0.00	0.013	0.000	5.230	0.00	22.40
135.00	Safety Cable	Yes	2.00	0.000	0.38	0.83	0.00	0.013	0.000	5.246	0.00	14.98
140.00	Safety Cable	Yes	5.00	0.000	0.38	2.08	0.00	0.013	0.000	5.286	0.00	37.69
145.00	Safety Cable	Yes	5.00	0.000	0.38	2.09	0.00	0.014	0.000	5.325	0.00	37.93
150.00	Safety Cable	Yes	5.00	0.000	0.38	2.10	0.00	0.015	0.000	5.364	0.00	38.17
153.00	Safety Cable	Yes	3.00	0.000	0.38	1.26	0.00	0.015	0.000	5.386	0.00	22.98
<b>Totals:</b>											<b>0.0</b>	<b>8,853.3</b>

## Calculated Forces

**Structure:** CT01499-S-SBA

**Code:** EIA/TIA-222-G

2/2/2017

**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

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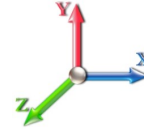


**Load Case:** 1.2D + 1.0Di + 1.0Wi 40 mph Wind

**Iterations** 21

**Dead Load Factor** 1.20

**Wind Load 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	-92.15	-7.19	0.00	-747.43	0.00	747.43	4463.02	2231.51	10951.4	5483.88	0.00	0.000	0.000	0.157
5.00	-89.53	-7.12	0.00	-711.50	0.00	711.50	4413.36	2206.68	10604.1	5309.95	0.02	-0.033	0.000	0.154
10.00	-86.88	-7.05	0.00	-675.90	0.00	675.90	4361.89	2180.94	10257.6	5136.44	0.07	-0.066	0.000	0.152
15.00	-84.23	-6.99	0.00	-640.63	0.00	640.63	4308.61	2154.31	9912.23	4963.48	0.16	-0.099	0.000	0.149
20.00	-81.60	-6.89	0.00	-605.70	0.00	605.70	4253.53	2126.77	9568.22	4791.22	0.28	-0.133	0.000	0.146
21.00	-81.07	-6.89	0.00	-598.80	0.00	598.80	4242.30	2121.15	9499.61	4756.87	0.31	-0.140	0.000	0.145
25.00	-78.09	-6.82	0.00	-571.23	0.00	571.23	4196.65	2098.33	9225.87	4619.79	0.44	-0.167	0.000	0.142
27.75	-76.03	-6.76	0.00	-552.47	0.00	552.47	4164.60	2082.30	9038.39	4525.91	0.54	-0.186	0.000	0.093
28.00	-75.84	-6.76	0.00	-550.78	0.00	550.78	3213.57	1606.78	7065.87	3538.19	0.55	-0.187	0.000	0.102
30.00	-74.86	-6.72	0.00	-537.27	0.00	537.27	3199.34	1599.67	6969.21	3489.78	0.63	-0.197	0.000	0.111
35.00	-72.44	-6.61	0.00	-503.66	0.00	503.66	3162.51	1581.26	6727.41	3368.71	0.85	-0.221	0.000	0.107
40.00	-70.04	-6.48	0.00	-470.61	0.00	470.61	3123.88	1561.94	6485.64	3247.64	1.09	-0.246	0.000	0.103
40.75	-69.68	-6.47	0.00	-465.75	0.00	465.75	3117.93	1558.96	6449.39	3229.49	1.13	-0.250	0.000	0.102
40.75	-69.68	-6.47	0.00	-465.75	0.00	465.75	3117.93	1558.96	6449.39	3229.49	1.13	-0.250	0.000	0.102
45.00	-67.67	-6.39	0.00	-438.23	0.00	438.23	3083.44	1541.72	6244.17	3126.72	1.36	-0.271	0.000	0.162
50.00	-65.38	-6.29	0.00	-406.30	0.00	406.30	3041.20	1520.60	6003.26	3006.09	1.67	-0.311	0.000	0.157
55.00	-63.12	-6.19	0.00	-374.85	0.00	374.85	2997.16	1498.58	5763.21	2885.89	2.02	-0.351	0.000	0.151
60.00	-60.89	-6.09	0.00	-343.89	0.00	343.89	2951.32	1475.66	5524.28	2766.24	2.41	-0.391	0.000	0.145
65.00	-58.70	-5.98	0.00	-313.45	0.00	313.45	2903.67	1451.83	5286.75	2647.30	2.84	-0.431	0.000	0.139
70.00	-55.47	-5.79	0.00	-283.55	0.00	283.55	2854.22	1427.11	5050.90	2529.20	3.31	-0.470	0.000	0.132
71.00	-54.86	-5.77	0.00	-277.76	0.00	277.76	2869.57	1434.79	5123.02	2565.32	3.41	-0.478	0.000	0.127
75.00	-53.14	-5.68	0.00	-254.67	0.00	254.67	2829.16	1414.58	4935.24	2471.29	3.82	-0.509	0.000	0.122
80.00	-51.03	-5.56	0.00	-226.26	0.00	226.26	2777.01	1388.51	4702.41	2354.70	4.38	-0.544	0.000	0.114
85.00	-48.95	-5.44	0.00	-198.44	0.00	198.44	2723.06	1361.53	4471.94	2239.29	4.96	-0.579	0.000	0.107
90.00	-46.91	-5.31	0.00	-171.24	0.00	171.24	2667.31	1333.66	4244.12	2125.22	5.59	-0.612	0.000	0.098
95.00	-33.85	-3.98	0.00	-144.67	0.00	144.67	2609.76	1304.88	4019.22	2012.60	6.25	-0.643	0.000	0.085
100.00	-32.32	-3.87	0.00	-124.76	0.00	124.76	2550.40	1275.20	3797.52	1901.58	6.94	-0.672	0.000	0.078
105.00	-30.60	-3.65	0.00	-105.22	0.00	105.22	2489.24	1244.62	3579.29	1792.30	7.65	-0.699	0.000	0.071
110.00	-29.15	-3.53	0.00	-86.98	0.00	86.98	2426.28	1213.14	3364.80	1684.90	8.40	-0.724	0.000	0.064
115.00	-27.18	-3.41	0.00	-69.32	0.00	69.32	1783.00	891.50	2427.68	1215.65	9.17	-0.747	0.000	0.072
120.00	-25.93	-3.29	0.00	-52.27	0.00	52.27	1739.91	869.95	2280.12	1141.75	9.97	-0.767	0.000	0.061
123.00	-15.11	-2.00	0.00	-42.25	0.00	42.25	1713.19	856.59	2192.59	1097.92	10.45	-0.780	0.000	0.047
125.00	-14.67	-1.95	0.00	-38.26	0.00	38.26	1695.01	847.51	2134.69	1068.93	10.78	-0.787	0.000	0.044
130.00	-13.60	-1.84	0.00	-28.49	0.00	28.49	1648.31	824.16	1991.67	997.31	11.61	-0.804	0.000	0.037
133.00	-9.50	-1.31	0.00	-22.97	0.00	22.97	1619.42	809.71	1907.13	954.98	12.12	-0.812	0.000	0.030
135.00	-9.12	-1.27	0.00	-20.34	0.00	20.34	1599.81	799.90	1851.33	927.04	12.46	-0.818	0.000	0.028
140.00	-8.20	-1.16	0.00	-13.99	0.00	13.99	1549.50	774.75	1713.96	858.25	13.33	-0.828	0.000	0.022
145.00	-7.31	-1.06	0.00	-8.17	0.00	8.17	1497.39	748.69	1579.82	791.09	14.20	-0.836	0.000	0.015
150.00	-6.45	-0.96	0.00	-2.87	0.00	2.87	1443.48	721.74	1449.20	725.68	15.08	-0.841	0.000	0.008
150.00	-6.45	-0.96	0.00	-2.87	0.00	2.87	1443.48	721.74	1449.20	725.68	15.08	-0.841	0.000	0.008
153.00	0.00	-0.86	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	15.61	-0.842	0.000	0.000

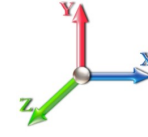
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 1.2D + 1.0E</b>					<b>Iterations</b> 19
<b>Gust Response Factor</b>	1.10			<b>Sds</b> 0.12	<b>Ss</b> 0.18
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b> 0.04	<b>S1</b> 0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.43	<b>SA</b> 0.02	<b>Seismic Importance Factor</b> 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	15.55	
10.00		1169.9	0.01	0.05	0.03	21.63	
15.00		1144.9	0.02	0.06	0.04	24.19	
20.00		1119.9	0.03	0.07	0.04	25.16	
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	25.72	
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	21.52	
40.75	RT1	127.45	0.13	0.07	0.03	3.19	
45.00		713.37	0.16	0.07	0.03	18.17	
50.00		820.00	0.20	0.06	0.02	21.01	
55.00		799.19	0.24	0.06	0.02	20.03	
60.00		778.37	0.29	0.05	0.01	18.11	
65.00	Bot - Section 3	757.55	0.34	0.04	0.01	14.85	
70.00	Appurtenance(s)	1534.0	0.40	0.02	0.01	20.80	
71.00	Top - Section 2	291.81	0.41	0.02	0.01	3.52	
75.00		579.50	0.45	0.00	0.01	2.96	
80.00		705.64	0.52	-0.02	0.01	-3.40	
85.00		684.82	0.58	-0.05	0.01	-9.89	
90.00		664.01	0.65	-0.07	0.02	-14.60	
95.00	Appurtenance(s)	3932.6	0.73	-0.10	0.04	-104.03	
100.00		622.37	0.81	-0.11	0.06	-17.14	
105.00	Appurtenance(s)	666.55	0.89	-0.12	0.08	-16.88	
110.00	Bot - Section 4	580.73	0.98	-0.11	0.12	-11.59	
115.00	Top - Section 3	1015.4	1.07	-0.09	0.17	-11.73	
120.00		438.87	1.16	-0.03	0.23	-0.06	
123.00	Appurtenance(s)	2557.5	1.22	0.03	0.27	20.84	
125.00		166.89	1.26	0.07	0.30	2.38	
130.00		405.56	1.36	0.22	0.40	12.88	
133.00	Appurtenance(s)	1516.3	1.43	0.34	0.46	66.31	
135.00		153.57	1.47	0.43	0.51	8.04	
140.00		372.25	1.58	0.73	0.65	28.34	
145.00		355.60	1.70	1.11	0.81	36.69	
150.00	Top - Section 4	338.95	1.82	1.62	1.01	45.27	
153.00	Appurtenance(s)	2270.7	1.89	1.98	1.14	348.44	
<b>Totals:</b>		<b>33,604.6</b>				<b>711.1</b>	<b>Total Wind: 35,022.9</b>

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

## Calculated Forces

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case: 1.2D + 1.0E</b>							<b>Iterations</b> 19
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.12	<b>Ss</b>	0.18
<b>Dead Load Factor</b>	1.20	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.04	<b>S1</b>	0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.43	<b>SA</b>	0.02	<b>Seismic Importance Factor</b>	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	-47.27	-0.90	0.00	-98.70	0.00	98.70	4463.02	2231.51	10951.4	5483.88	0.00	0.00	0.00	0.029
5.00	-45.55	-0.89	0.00	-94.19	0.00	94.19	4413.36	2206.68	10604.1	5309.95	0.00	0.00	0.00	0.028
10.00	-43.85	-0.87	0.00	-89.75	0.00	89.75	4361.89	2180.94	10257.6	5136.44	0.01	-0.01	0.00	0.028
15.00	-42.19	-0.85	0.00	-85.40	0.00	85.40	4308.61	2154.31	9912.23	4963.48	0.02	-0.01	0.00	0.027
20.00	-40.55	-0.83	0.00	-81.15	0.00	81.15	4253.53	2126.77	9568.22	4791.22	0.04	-0.02	0.00	0.026
21.00	-40.23	-0.82	0.00	-80.32	0.00	80.32	4242.30	2121.15	9499.61	4756.87	0.04	-0.02	0.00	0.026
25.00	-38.06	-0.79	0.00	-77.04	0.00	77.04	4196.65	2098.33	9225.87	4619.79	0.06	-0.02	0.00	0.026
27.75	-36.59	-0.76	0.00	-74.87	0.00	74.87	4164.60	2082.30	9038.39	4525.91	0.07	-0.02	0.00	0.017
28.00	-36.46	-0.76	0.00	-74.68	0.00	74.68	3213.57	1606.78	7065.87	3538.19	0.07	-0.02	0.00	0.019
30.00	-35.91	-0.75	0.00	-73.17	0.00	73.17	3199.34	1599.67	6969.21	3489.78	0.08	-0.03	0.00	0.020
35.00	-34.56	-0.73	0.00	-69.41	0.00	69.41	3162.51	1581.26	6727.41	3368.71	0.11	-0.03	0.00	0.020
40.00	-33.23	-0.71	0.00	-65.75	0.00	65.75	3123.88	1561.94	6485.64	3247.64	0.15	-0.03	0.00	0.019
40.75	-33.04	-0.71	0.00	-65.22	0.00	65.22	3117.93	1558.96	6449.39	3229.49	0.15	-0.03	0.00	0.019
40.75	-33.04	-0.71	0.00	-65.22	0.00	65.22	3117.93	1558.96	6449.39	3229.49	0.15	-0.03	0.00	0.019
45.00	-31.93	-0.69	0.00	-62.21	0.00	62.21	3083.44	1541.72	6244.17	3126.72	0.18	-0.04	0.00	0.030
50.00	-30.66	-0.67	0.00	-58.76	0.00	58.76	3041.20	1520.60	6003.26	3006.09	0.22	-0.04	0.00	0.030
55.00	-29.41	-0.65	0.00	-55.39	0.00	55.39	2997.16	1498.58	5763.21	2885.89	0.27	-0.05	0.00	0.029
60.00	-28.18	-0.64	0.00	-52.12	0.00	52.12	2951.32	1475.66	5524.28	2766.24	0.32	-0.05	0.00	0.028
65.00	-26.98	-0.63	0.00	-48.93	0.00	48.93	2903.67	1451.83	5286.75	2647.30	0.38	-0.06	0.00	0.028
70.00	-24.85	-0.60	0.00	-45.80	0.00	45.80	2854.22	1427.11	5050.90	2529.20	0.45	-0.07	0.00	0.027
71.00	-24.44	-0.60	0.00	-45.20	0.00	45.20	2869.57	1434.79	5123.02	2565.32	0.47	-0.07	0.00	0.026
75.00	-23.51	-0.60	0.00	-42.79	0.00	42.79	2829.16	1414.58	4935.24	2471.29	0.52	-0.07	0.00	0.026
80.00	-22.37	-0.60	0.00	-39.80	0.00	39.80	2777.01	1388.51	4702.41	2354.70	0.60	-0.08	0.00	0.025
85.00	-21.26	-0.60	0.00	-36.80	0.00	36.80	2723.06	1361.53	4471.94	2239.29	0.69	-0.09	0.00	0.024
90.00	-20.17	-0.60	0.00	-33.79	0.00	33.79	2667.31	1333.66	4244.12	2125.22	0.78	-0.09	0.00	0.023
95.00	-15.16	-0.60	0.00	-30.78	0.00	30.78	2609.76	1304.88	4019.22	2012.60	0.88	-0.10	0.00	0.021
100.00	-14.21	-0.59	0.00	-27.81	0.00	27.81	2550.40	1275.20	3797.52	1901.58	0.99	-0.10	0.00	0.020
105.00	-13.20	-0.59	0.00	-24.83	0.00	24.83	2489.24	1244.62	3579.29	1792.30	1.10	-0.11	0.00	0.019
110.00	-12.30	-0.59	0.00	-21.86	0.00	21.86	2426.28	1213.14	3364.80	1684.90	1.22	-0.12	0.00	0.018
115.00	-10.87	-0.59	0.00	-18.89	0.00	18.89	1783.00	891.50	2427.68	1215.65	1.34	-0.12	0.00	0.022
120.00	-10.14	-0.59	0.00	-15.93	0.00	15.93	1739.91	869.95	2280.12	1141.75	1.48	-0.13	0.00	0.020
123.00	-6.95	-0.56	0.00	-14.15	0.00	14.15	1713.19	856.59	2192.59	1097.92	1.56	-0.13	0.00	0.017
125.00	-6.71	-0.56	0.00	-13.03	0.00	13.03	1695.01	847.51	2134.69	1068.93	1.61	-0.13	0.00	0.016
130.00	-6.13	-0.55	0.00	-10.22	0.00	10.22	1648.31	824.16	1991.67	997.31	1.76	-0.14	0.00	0.014
133.00	-4.26	-0.48	0.00	-8.57	0.00	8.57	1619.42	809.71	1907.13	954.98	1.85	-0.14	0.00	0.012
135.00	-4.07	-0.47	0.00	-7.62	0.00	7.62	1599.81	799.90	1851.33	927.04	1.91	-0.15	0.00	0.011
140.00	-3.60	-0.44	0.00	-5.28	0.00	5.28	1549.50	774.75	1713.96	858.25	2.06	-0.15	0.00	0.008
145.00	-3.16	-0.40	0.00	-3.08	0.00	3.08	1497.39	748.69	1579.82	791.09	2.22	-0.15	0.00	0.006
150.00	-2.73	-0.36	0.00	-1.07	0.00	1.07	1443.48	721.74	1449.20	725.68	2.38	-0.15	0.00	0.003
150.00	-2.73	-0.36	0.00	-1.07	0.00	1.07	1443.48	721.74	1449.20	725.68	2.38	-0.15	0.00	0.003
153.00	0.00	-0.35	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	2.48	-0.15	0.00	0.000

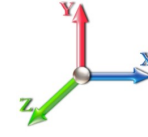
## Seismic Segment Forces (Factored)

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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<b>Load Case:</b> 0.9D + 1.0E				<b>Iterations</b> 19
<b>Gust Response Factor</b>	1.10	<b>Sds</b>	0.12	<b>Ss</b> 0.18
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>S1</b> 0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.43	<b>SA</b> 0.02
				<b>Seismic Importance Factor</b> 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	15.55	
10.00		1169.9	0.01	0.05	0.03	21.63	
15.00		1144.9	0.02	0.06	0.04	24.19	
20.00		1119.9	0.03	0.07	0.04	25.16	
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	25.72	
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	21.52	
40.75	RT1	127.45	0.13	0.07	0.03	3.19	
45.00		713.37	0.16	0.07	0.03	18.17	
50.00		820.00	0.20	0.06	0.02	21.01	
55.00		799.19	0.24	0.06	0.02	20.03	
60.00		778.37	0.29	0.05	0.01	18.11	
65.00	Bot - Section 3	757.55	0.34	0.04	0.01	14.85	
70.00	Appurtenance(s)	1534.0	0.40	0.02	0.01	20.80	
71.00	Top - Section 2	291.81	0.41	0.02	0.01	3.52	
75.00		579.50	0.45	0.00	0.01	2.96	
80.00		705.64	0.52	-0.02	0.01	-3.40	
85.00		684.82	0.58	-0.05	0.01	-9.89	
90.00		664.01	0.65	-0.07	0.02	-14.60	
95.00	Appurtenance(s)	3932.6	0.73	-0.10	0.04	-104.03	
100.00		622.37	0.81	-0.11	0.06	-17.14	
105.00	Appurtenance(s)	666.55	0.89	-0.12	0.08	-16.88	
110.00	Bot - Section 4	580.73	0.98	-0.11	0.12	-11.59	
115.00	Top - Section 3	1015.4	1.07	-0.09	0.17	-11.73	
120.00		438.87	1.16	-0.03	0.23	-0.06	
123.00	Appurtenance(s)	2557.5	1.22	0.03	0.27	20.84	
125.00		166.89	1.26	0.07	0.30	2.38	
130.00		405.56	1.36	0.22	0.40	12.88	
133.00	Appurtenance(s)	1516.3	1.43	0.34	0.46	66.31	
135.00		153.57	1.47	0.43	0.51	8.04	
140.00		372.25	1.58	0.73	0.65	28.34	
145.00		355.60	1.70	1.11	0.81	36.69	
150.00	Top - Section 4	338.95	1.82	1.62	1.01	45.27	
153.00	Appurtenance(s)	2270.7	1.89	1.98	1.14	348.44	

<b>Totals:</b>	<b>33,604.6</b>	<b>711.1</b>	<b>Total Wind:</b>	<b>35,022.9</b>
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Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

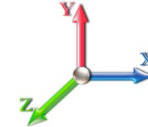


## Calculated Forces

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



<b>Load Case:</b> 0.9D + 1.0E						<b>Iterations</b> 19
<b>Gust Response Factor</b>	1.10			<b>Sds</b>	0.12	<b>Ss</b> 0.18
<b>Dead Load Factor</b>	0.90	<b>Seismic Load Factor</b>	1.00	<b>Sd1</b>	0.04	<b>S1</b> 0.07
<b>Wind Load Factor</b>	0.00	<b>Structure Frequency</b>	0.43	<b>SA</b>	0.02	<b>Seismic Importance Factor</b> 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	-35.45	-0.90	0.00	-97.91	0.00	97.91	4463.02	2231.51	10951.4	5483.88	0.00	0.00	0.00	0.026
5.00	-34.16	-0.89	0.00	-93.41	0.00	93.41	4413.36	2206.68	10604.1	5309.95	0.00	0.00	0.00	0.025
10.00	-32.89	-0.87	0.00	-88.97	0.00	88.97	4361.89	2180.94	10257.6	5136.44	0.01	-0.01	0.00	0.025
15.00	-31.64	-0.85	0.00	-84.63	0.00	84.63	4308.61	2154.31	9912.23	4963.48	0.02	-0.01	0.00	0.024
20.00	-30.41	-0.82	0.00	-80.40	0.00	80.40	4253.53	2126.77	9568.22	4791.22	0.04	-0.02	0.00	0.024
21.00	-30.17	-0.82	0.00	-79.58	0.00	79.58	4242.30	2121.15	9499.61	4756.87	0.04	-0.02	0.00	0.024
25.00	-28.54	-0.78	0.00	-76.30	0.00	76.30	4196.65	2098.33	9225.87	4619.79	0.06	-0.02	0.00	0.023
27.75	-27.44	-0.76	0.00	-74.15	0.00	74.15	4164.60	2082.30	9038.39	4525.91	0.07	-0.02	0.00	0.015
28.00	-27.34	-0.75	0.00	-73.96	0.00	73.96	3213.57	1606.78	7065.87	3538.19	0.07	-0.02	0.00	0.017
30.00	-26.93	-0.75	0.00	-72.45	0.00	72.45	3199.34	1599.67	6969.21	3489.78	0.08	-0.03	0.00	0.018
35.00	-25.92	-0.73	0.00	-68.72	0.00	68.72	3162.51	1581.26	6727.41	3368.71	0.11	-0.03	0.00	0.018
40.00	-24.92	-0.71	0.00	-65.09	0.00	65.09	3123.88	1561.94	6485.64	3247.64	0.14	-0.03	0.00	0.017
40.75	-24.78	-0.70	0.00	-64.56	0.00	64.56	3117.93	1558.96	6449.39	3229.49	0.15	-0.03	0.00	0.017
40.75	-24.78	-0.70	0.00	-64.56	0.00	64.56	3117.93	1558.96	6449.39	3229.49	0.15	-0.03	0.00	0.017
45.00	-23.95	-0.69	0.00	-61.57	0.00	61.57	3083.44	1541.72	6244.17	3126.72	0.18	-0.04	0.00	0.027
50.00	-22.99	-0.67	0.00	-58.14	0.00	58.14	3041.20	1520.60	6003.26	3006.09	0.22	-0.04	0.00	0.027
55.00	-22.05	-0.65	0.00	-54.81	0.00	54.81	2997.16	1498.58	5763.21	2885.89	0.27	-0.05	0.00	0.026
60.00	-21.14	-0.63	0.00	-51.57	0.00	51.57	2951.32	1475.66	5524.28	2766.24	0.32	-0.05	0.00	0.026
65.00	-20.23	-0.62	0.00	-48.42	0.00	48.42	2903.67	1451.83	5286.75	2647.30	0.38	-0.06	0.00	0.025
70.00	-18.64	-0.60	0.00	-45.33	0.00	45.33	2854.22	1427.11	5050.90	2529.20	0.45	-0.07	0.00	0.024
71.00	-18.33	-0.59	0.00	-44.73	0.00	44.73	2869.57	1434.79	5123.02	2565.32	0.46	-0.07	0.00	0.024
75.00	-17.63	-0.59	0.00	-42.36	0.00	42.36	2829.16	1414.58	4935.24	2471.29	0.52	-0.07	0.00	0.023
80.00	-16.78	-0.59	0.00	-39.40	0.00	39.40	2777.01	1388.51	4702.41	2354.70	0.60	-0.08	0.00	0.023
85.00	-15.94	-0.59	0.00	-36.44	0.00	36.44	2723.06	1361.53	4471.94	2239.29	0.68	-0.08	0.00	0.022
90.00	-15.13	-0.59	0.00	-33.48	0.00	33.48	2667.31	1333.66	4244.12	2125.22	0.77	-0.09	0.00	0.021
95.00	-11.37	-0.59	0.00	-30.51	0.00	30.51	2609.76	1304.88	4019.22	2012.60	0.87	-0.10	0.00	0.020
100.00	-10.65	-0.59	0.00	-27.57	0.00	27.57	2550.40	1275.20	3797.52	1901.58	0.98	-0.10	0.00	0.019
105.00	-9.90	-0.59	0.00	-24.63	0.00	24.63	2489.24	1244.62	3579.29	1792.30	1.09	-0.11	0.00	0.018
110.00	-9.22	-0.59	0.00	-21.69	0.00	21.69	2426.28	1213.14	3364.80	1684.90	1.21	-0.12	0.00	0.017
115.00	-8.15	-0.59	0.00	-18.75	0.00	18.75	1783.00	891.50	2427.68	1215.65	1.33	-0.12	0.00	0.020
120.00	-7.61	-0.59	0.00	-15.82	0.00	15.82	1739.91	869.95	2280.12	1141.75	1.46	-0.13	0.00	0.018
123.00	-5.21	-0.56	0.00	-14.07	0.00	14.07	1713.19	856.59	2192.59	1097.92	1.54	-0.13	0.00	0.016
125.00	-5.03	-0.56	0.00	-12.95	0.00	12.95	1695.01	847.51	2134.69	1068.93	1.60	-0.13	0.00	0.015
130.00	-4.60	-0.54	0.00	-10.16	0.00	10.16	1648.31	824.16	1991.67	997.31	1.74	-0.14	0.00	0.013
133.00	-3.19	-0.47	0.00	-8.53	0.00	8.53	1619.42	809.71	1907.13	954.98	1.83	-0.14	0.00	0.011
135.00	-3.05	-0.47	0.00	-7.58	0.00	7.58	1599.81	799.90	1851.33	927.04	1.89	-0.14	0.00	0.010
140.00	-2.70	-0.44	0.00	-5.25	0.00	5.25	1549.50	774.75	1713.96	858.25	2.04	-0.15	0.00	0.008
145.00	-2.37	-0.40	0.00	-3.06	0.00	3.06	1497.39	748.69	1579.82	791.09	2.20	-0.15	0.00	0.005
150.00	-2.05	-0.35	0.00	-1.06	0.00	1.06	1443.48	721.74	1449.20	725.68	2.36	-0.15	0.00	0.003
150.00	-2.05	-0.35	0.00	-1.06	0.00	1.06	1443.48	721.74	1449.20	725.68	2.36	-0.15	0.00	0.003
153.00	0.00	-0.35	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38	2.46	-0.15	0.00	0.000

## Wind Loading - Shaft

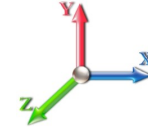
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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	0.650	0.000	5.00	25.125	16.33	133.7	0.0	1194.9
10.00		1.00	0.85	7.442	8.19	269.30	0.650	0.000	5.00	24.603	15.99	130.9	0.0	1169.9
15.00		1.00	0.85	7.442	8.19	263.53	0.650	0.000	5.00	24.081	15.65	128.1	0.0	1145.0
20.00		1.00	0.90	7.896	8.69	265.50	0.650	0.000	5.00	23.559	15.31	133.0	0.0	1120.0
21.00	Bot - Section 2	1.00	0.91	7.978	8.78	265.68	0.650	0.000	1.00	4.649	3.02	26.5	0.0	221.0
25.00		1.00	0.95	8.276	9.10	265.73	0.657 *	0.000	4.00	18.599	12.21	111.2	0.0	1611.6
27.75	RB1	1.00	0.97	8.460	9.31	265.27	0.696 *	0.000	2.75	12.593	8.77	81.6	0.0	1091.0
28.00	Top - Section 1	1.00	0.97	8.476	9.32	265.22	0.698 *	0.000	0.25	1.137	0.79	7.4	0.0	98.5
30.00		1.00	0.98	8.600	9.46	267.81	0.696 *	0.000	2.00	9.049	6.30	59.6	0.0	358.8
35.00		1.00	1.01	8.883	9.77	265.88	0.700 *	0.000	5.00	22.257	15.59	152.3	0.0	882.5
40.00		1.00	1.04	9.137	10.05	263.25	0.706 *	0.000	5.00	21.735	15.35	154.3	0.0	861.6
40.75	RT1	1.00	1.05	9.173	10.09	262.80	0.710 *	0.000	0.75	3.215	2.28	23.0	0.0	127.5
45.00		1.00	1.07	9.366	10.30	260.05	0.704 *	0.000	4.25	17.998	12.68	130.6	0.0	713.4
50.00		1.00	1.09	9.576	10.53	256.40	0.670 *	0.000	5.00	20.692	13.86	146.0	0.0	820.0
55.00		1.00	1.12	9.770	10.75	252.37	0.675 *	0.000	5.00	20.170	13.62	146.4	0.0	799.2
60.00		1.00	1.14	9.951	10.95	248.02	0.681 *	0.000	5.00	19.648	13.38	146.5	0.0	778.4
65.00	Bot - Section 3	1.00	1.16	10.120	11.13	243.38	0.687 *	0.000	5.00	19.126	13.15	146.3	0.0	757.6
70.00	Appurtenance(s)	1.00	1.17	10.279	11.31	238.50	0.694 *	0.000	5.00	18.868	13.09	148.0	0.0	1484.0
71.00	Top - Section 2	1.00	1.18	10.310	11.34	237.50	0.698 *	0.000	1.00	3.711	2.59	29.4	0.0	291.8
75.00		1.00	1.19	10.430	11.47	236.87	0.698 *	0.000	4.00	14.635	10.21	117.2	0.0	579.5
80.00		1.00	1.21	10.572	11.63	231.60	0.704 *	0.000	5.00	17.824	12.55	146.0	0.0	705.6
85.00		1.00	1.22	10.708	11.78	226.15	0.712 *	0.000	5.00	17.302	12.32	145.1	0.0	684.8
90.00		1.00	1.24	10.838	11.92	220.55	0.720 *	0.000	5.00	16.780	12.08	144.0	0.0	664.0
95.00	Appurtenance(s)	1.00	1.25	10.962	12.06	214.80	0.728 *	0.000	5.00	16.258	11.84	142.8	0.0	643.2
100.00		1.00	1.27	11.081	12.19	208.92	0.650	0.000	5.00	15.736	10.23	124.7	0.0	622.4
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
133.00	Appurtenance(s)	1.00	1.34	11.766	12.94	170.30	0.650	0.000	3.00	7.439	4.84	62.6	0.0	235.3
135.00		1.00	1.35	11.803	12.98	167.66	0.650	0.000	2.00	4.855	3.16	41.0	0.0	153.6
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
<b>Totals:</b>									<b>153.00</b>			<b>3,990.7</b>		<b>24,541.5</b>

\* Cf Adjusted by Linear Load Ra Effect

## Discrete Appurtenance Forces

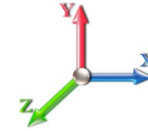
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)	CaAa 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	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	
2	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	
3	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	
4	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	
5	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	
6	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	
7	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	
8	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	
9	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	
10	133.00	Low Profile Platform	1	11.766	12.943	1.00	1.00	25.00	1200.00	0.000	0.000	323.58	0.00	0.00	
11	133.00	RR90-17-02DP	6	11.766	12.943	0.54	0.80	14.23	81.00	0.000	0.000	184.19	0.00	0.00	
12	123.00	LPA-80063/6CF	6	11.574	12.732	0.75	0.80	43.32	162.00	0.000	0.000	551.48	0.00	0.00	
13	123.00	B66 4X45 AWS	3	11.574	12.732	0.64	0.80	4.99	192.00	0.000	0.000	63.56	0.00	0.00	
14	123.00	SBNHH-1D65B	9	11.574	12.732	0.66	0.80	48.29	365.40	0.000	0.000	614.77	0.00	0.00	
15	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	
16	123.00	RRH2X60-PCS	3	11.574	12.732	0.71	0.80	4.70	165.00	0.000	0.000	59.83	0.00	0.00	
17	123.00	RRH2x60-700	3	11.633	12.797	0.61	0.80	6.38	180.00	0.000	3.000	81.69	0.00	245.08	
18	123.00	DB-T1-6Z-8AB-0Z	2	11.574	12.732	0.72	0.80	6.91	37.80	0.000	0.000	88.00	0.00	0.00	
19	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	
20	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	
21	95.00	HPA-65R-BUU-H6	4	10.962	12.058	0.72	0.80	27.82	204.00	0.000	0.000	335.46	0.00	0.00	
22	95.00	7770	3	10.962	12.058	0.58	0.80	9.64	105.00	0.000	0.000	116.19	0.00	0.00	
23	95.00	SBNH-1D65A	2	10.962	12.058	0.72	0.80	7.75	76.80	0.000	0.000	93.42	0.00	0.00	
24	95.00	OPA-65R-LCUU-H6	3	10.962	12.058	0.63	0.80	18.32	240.00	0.000	0.000	220.84	0.00	0.00	
25	95.00	LGP21401	6	10.962	12.058	0.54	0.80	4.15	84.60	0.000	0.000	50.02	0.00	0.00	
26	95.00	LGP21903	6	10.962	12.058	0.67	0.80	1.09	33.00	0.000	0.000	13.13	0.00	0.00	
27	95.00	RRUS-11	6	10.962	12.058	0.54	0.80	14.43	330.00	0.000	0.000	173.96	0.00	0.00	
28	95.00	RRUS-12	3	10.962	12.058	0.54	0.80	5.07	180.00	0.000	0.000	61.08	0.00	0.00	
29	95.00	RRUS-A2	3	10.962	12.058	0.50	0.80	2.77	63.60	0.000	0.000	33.37	0.00	0.00	
30	95.00	RRUS-32	3	10.962	12.058	0.70	0.80	8.08	231.00	0.000	0.000	97.43	0.00	0.00	
31	95.00	RRUS-E2	3	10.962	12.058	0.56	0.80	4.72	171.90	0.000	0.000	56.92	0.00	0.00	
32	95.00	1000860	3	10.962	12.058	1.00	1.00	0.18	6.00	0.000	0.000	2.17	0.00	0.00	
33	95.00	Raycap/Squid	2	10.962	12.058	0.72	0.80	2.12	63.60	0.000	0.000	25.52	0.00	0.00	
34	95.00	Sector Frame	3	10.962	12.058	0.56	0.75	29.53	1500.00	0.000	0.000	356.09	0.00	0.00	
35	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	
36	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	
<b>Totals:</b>									<b>9,063.10</b>						<b>5,120.32</b>

## Total Applied Force Summary

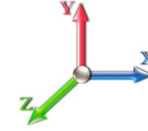
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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		133.69	1437.88	0.00	0.00
10.00		130.91	1412.90	0.00	0.00
15.00		128.13	1387.92	0.00	0.00
20.00		133.01	1362.94	0.00	0.00
21.00		26.52	269.59	0.00	0.00
25.00		111.18	1805.98	0.00	0.00
27.75		81.59	1224.61	0.00	0.00
28.00		7.40	110.64	0.00	0.00
30.00		59.61	456.00	0.00	0.00
35.00		152.31	1125.42	0.00	0.00
40.00		154.27	1104.61	0.00	0.00
40.75		23.02	163.90	0.00	0.00
45.00		130.62	919.89	0.00	0.00
50.00		145.99	1062.97	0.00	0.00
55.00		146.40	1042.15	0.00	0.00
60.00		146.50	1021.33	0.00	0.00
65.00		146.35	1000.52	0.00	0.00
70.00	(2) attachments	189.08	1776.98	0.00	0.00
71.00		29.38	340.40	0.00	0.00
75.00		117.19	773.88	0.00	0.00
80.00		146.00	948.61	0.00	0.00
85.00		145.08	927.79	0.00	0.00
90.00		144.00	906.97	0.00	0.00
95.00	(50) attachments	1778.39	4175.65	0.00	0.00
100.00		124.68	794.34	0.00	0.00
105.00	(2) attachments	191.48	838.52	0.00	186.54
110.00		118.76	751.90	0.00	0.00
115.00		117.35	1186.61	0.00	0.00
120.00		114.11	610.04	0.00	0.00
123.00	(27) attachments	1844.37	2660.23	0.00	245.08
125.00		43.78	197.67	0.00	0.00
130.00		107.31	482.53	0.00	0.00
133.00	(7) attachments	570.35	1562.52	0.00	0.00
135.00		40.97	159.39	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
<b>Totals:</b>		<b>9,111.05</b>	<b>39,393.27</b>	<b>0.00</b>	<b>431.62</b>

## Linear Appurtenance Segment Forces (Factored)

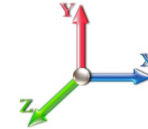
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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	0.091	0.000	7.442	0.00	1.37
5.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.091	0.000	7.442	0.00	62.40
5.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.091	0.000	7.442	0.00	0.60
5.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.091	0.000	7.442	0.00	8.00
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.093	0.000	7.442	0.00	1.37
10.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.093	0.000	7.442	0.00	62.40
10.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.093	0.000	7.442	0.00	0.60
10.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.093	0.000	7.442	0.00	8.00
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.095	0.000	7.442	0.00	1.37
15.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.095	0.000	7.442	0.00	62.40
15.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.095	0.000	7.442	0.00	0.60
15.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.095	0.000	7.442	0.00	8.00
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.097	0.000	7.896	0.00	1.37
20.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.097	0.000	7.896	0.00	62.40
20.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.097	0.000	7.896	0.00	0.60
20.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.097	0.000	7.896	0.00	8.00
21.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.098	0.000	7.978	0.00	0.27
21.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.098	0.000	7.978	0.00	12.48
21.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.098	0.000	7.978	0.00	0.12
21.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.098	0.000	7.978	0.00	1.60
25.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.103	1.010	8.276	0.00	1.09
25.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.103	1.010	8.276	0.00	49.92
25.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.103	1.010	8.276	0.00	0.48
25.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.103	1.010	8.276	0.00	6.40
25.00	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.103	1.010	8.276	0.00	0.00
27.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.124	1.071	8.460	0.00	0.75
27.75	1 5/8" Coax	Yes	2.75	0.000	3.96	0.91	0.00	0.124	1.071	8.460	0.00	34.32
27.75	1/2" Fiber	Yes	2.75	0.000	0.38	0.09	0.00	0.124	1.071	8.460	0.00	0.33
27.75	3/4" DC	Yes	2.75	0.000	0.75	0.17	0.00	0.124	1.071	8.460	0.00	4.40
27.75	1.25" Reinforcing	Yes	2.75	0.000	1.25	0.29	0.00	0.124	1.071	8.460	0.00	0.00
28.00	Safety Cable	Yes	0.25	0.000	0.38	0.01	0.00	0.125	1.074	8.476	0.00	0.07
28.00	1 5/8" Coax	Yes	0.25	0.000	3.96	0.08	0.00	0.125	1.074	8.476	0.00	3.12
28.00	1/2" Fiber	Yes	0.25	0.000	0.38	0.01	0.00	0.125	1.074	8.476	0.00	0.03
28.00	3/4" DC	Yes	0.25	0.000	0.75	0.02	0.00	0.125	1.074	8.476	0.00	0.40
28.00	1.25" Reinforcing	Yes	0.25	0.000	1.25	0.03	0.00	0.125	1.074	8.476	0.00	0.00
30.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.124	1.071	8.600	0.00	0.55
30.00	1 5/8" Coax	Yes	2.00	0.000	3.96	0.66	0.00	0.124	1.071	8.600	0.00	24.96
30.00	1/2" Fiber	Yes	2.00	0.000	0.38	0.06	0.00	0.124	1.071	8.600	0.00	0.24
30.00	3/4" DC	Yes	2.00	0.000	0.75	0.13	0.00	0.124	1.071	8.600	0.00	3.20
30.00	1.25" Reinforcing	Yes	2.00	0.000	1.25	0.21	0.00	0.124	1.071	8.600	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.126	1.077	8.883	0.00	1.37
35.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.126	1.077	8.883	0.00	62.40
35.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.126	1.077	8.883	0.00	0.60
35.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.126	1.077	8.883	0.00	8.00
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.126	1.077	8.883	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.129	1.086	9.137	0.00	1.37
40.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.129	1.086	9.137	0.00	62.40

## Linear Appurtenance Segment Forces (Factored)

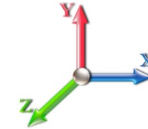
<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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**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)
40.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.129	1.086	9.137	0.00	0.60
40.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.129	1.086	9.137	0.00	8.00
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.129	1.086	9.137	0.00	0.00
40.75	Safety Cable	Yes	0.75	0.000	0.38	0.02	0.00	0.131	1.092	9.173	0.00	0.20
40.75	1 5/8" Coax	Yes	0.75	0.000	3.96	0.25	0.00	0.131	1.092	9.173	0.00	9.36
40.75	1/2" Fiber	Yes	0.75	0.000	0.38	0.02	0.00	0.131	1.092	9.173	0.00	0.09
40.75	3/4" DC	Yes	0.75	0.000	0.75	0.05	0.00	0.131	1.092	9.173	0.00	1.20
40.75	1.25" Reinforcing	Yes	0.75	0.000	1.25	0.08	0.00	0.131	1.092	9.173	0.00	0.00
45.00	Safety Cable	Yes	4.25	0.000	0.38	0.13	0.00	0.128	1.084	9.366	0.00	1.16
45.00	1 5/8" Coax	Yes	4.25	0.000	3.96	1.40	0.00	0.128	1.084	9.366	0.00	53.04
45.00	1/2" Fiber	Yes	4.25	0.000	0.38	0.13	0.00	0.128	1.084	9.366	0.00	0.51
45.00	3/4" DC	Yes	4.25	0.000	0.75	0.27	0.00	0.128	1.084	9.366	0.00	6.80
45.00	1.25" Reinforcing	Yes	3.50	0.000	1.25	0.36	0.00	0.128	1.084	9.366	0.00	0.00
50.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.030	9.576	0.00	1.37
50.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.110	1.030	9.576	0.00	62.40
50.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.110	1.030	9.576	0.00	0.60
50.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.110	1.030	9.576	0.00	8.00
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.113	1.039	9.770	0.00	1.37
55.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.113	1.039	9.770	0.00	62.40
55.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.113	1.039	9.770	0.00	0.60
55.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.113	1.039	9.770	0.00	8.00
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.116	1.048	9.951	0.00	1.37
60.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.116	1.048	9.951	0.00	62.40
60.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.116	1.048	9.951	0.00	0.60
60.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.116	1.048	9.951	0.00	8.00
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.119	1.058	10.120	0.00	1.37
65.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.119	1.058	10.120	0.00	62.40
65.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.119	1.058	10.120	0.00	0.60
65.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.119	1.058	10.120	0.00	8.00
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.123	1.068	10.279	0.00	1.37
70.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.123	1.068	10.279	0.00	62.40
70.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.123	1.068	10.279	0.00	0.60
70.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.123	1.068	10.279	0.00	8.00
71.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.125	1.074	10.310	0.00	0.27
71.00	1 5/8" Coax	Yes	1.00	0.000	3.96	0.33	0.00	0.125	1.074	10.310	0.00	12.48
71.00	1/2" Fiber	Yes	1.00	0.000	0.38	0.03	0.00	0.125	1.074	10.310	0.00	0.12
71.00	3/4" DC	Yes	1.00	0.000	0.75	0.06	0.00	0.125	1.074	10.310	0.00	1.60
75.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.125	1.074	10.430	0.00	1.09
75.00	1 5/8" Coax	Yes	4.00	0.000	3.96	1.32	0.00	0.125	1.074	10.430	0.00	49.92
75.00	1/2" Fiber	Yes	4.00	0.000	0.38	0.13	0.00	0.125	1.074	10.430	0.00	0.48
75.00	3/4" DC	Yes	4.00	0.000	0.75	0.25	0.00	0.125	1.074	10.430	0.00	6.40
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.128	1.084	10.572	0.00	1.37
80.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.128	1.084	10.572	0.00	62.40
80.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.128	1.084	10.572	0.00	0.60
80.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.128	1.084	10.572	0.00	8.00
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.132	1.095	10.708	0.00	1.37
85.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.132	1.095	10.708	0.00	62.40

## Linear Appurtenance Segment Forces (Factored)

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II

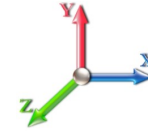


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**Load Case:** 1.0D + 1.0W 60 mph Wind

**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)
85.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.132	1.095	10.708	0.00	0.60
85.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.132	1.095	10.708	0.00	8.00
90.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.136	1.107	10.838	0.00	1.37
90.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.136	1.107	10.838	0.00	62.40
90.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.136	1.107	10.838	0.00	0.60
90.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.136	1.107	10.838	0.00	8.00
95.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.140	1.121	10.962	0.00	1.37
95.00	1 5/8" Coax	Yes	5.00	0.000	3.96	1.65	0.00	0.140	1.121	10.962	0.00	62.40
95.00	1/2" Fiber	Yes	5.00	0.000	0.38	0.16	0.00	0.140	1.121	10.962	0.00	0.60
95.00	3/4" DC	Yes	5.00	0.000	0.75	0.31	0.00	0.140	1.121	10.962	0.00	8.00
100.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.010	0.000	11.081	0.00	1.37
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
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
133.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.013	0.000	11.766	0.00	0.82
135.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.013	0.000	11.803	0.00	0.55
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
<b>Totals:</b>											<b>0.0</b>	<b>1,390.8</b>





## Final Analysis Summary

<b>Structure:</b> CT01499-S-SBA	<b>Code:</b> EIA/TIA-222-G	2/2/2017
<b>Site Name:</b> Torrington	<b>Exposure:</b> C	
<b>Height:</b> 153.00 (ft)	<b>Crest Height:</b> 0.00	
<b>Base Elev:</b> 0.000 (ft)	<b>Site Class:</b> B - Competent Rock	
<b>Gh:</b> 1.1	<b>Topography:</b> 1	<b>Struct Class:</b> II



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### 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	35.1	0.00	47.22	0.00	0.00	3609.80
0.9D + 1.6W 93 mph Wind	35.1	0.00	35.40	0.00	0.00	3584.15
1.2D + 1.0Di + 1.0Wi 40 mph Wind	7.2	0.00	92.15	0.00	0.00	747.43
1.2D + 1.0E	0.9	0.00	47.27	0.00	0.00	98.70
0.9D + 1.0E	0.9	0.00	35.45	0.00	0.00	97.91
1.0D + 1.0W 60 mph Wind	9.1	0.00	39.39	0.00	0.00	935.17

### 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	-31.18	-30.91	0.00	-2108.7	0.00	-2108.7	3083.44	1541.7	6244.17	3126.72	45.00	0.685
0.9D + 1.6W 93 mph Wind	-23.21	-30.71	0.00	-2088.3	0.00	-2088.3	3083.44	1541.7	6244.17	3126.72	45.00	0.676
1.2D + 1.0Di + 1.0Wi 40 mph Wind	-67.67	-6.39	0.00	-438.23	0.00	-438.23	3083.44	1541.7	6244.17	3126.72	45.00	0.162
1.2D + 1.0E	-31.93	-0.69	0.00	-62.21	0.00	-62.21	3083.44	1541.7	6244.17	3126.72	45.00	0.030
0.9D + 1.0E	-23.95	-0.69	0.00	-61.57	0.00	-61.57	3083.44	1541.7	6244.17	3126.72	45.00	0.027
1.0D + 1.0W 60 mph Wind	-26.56	-8.01	0.00	-545.57	0.00	-545.57	3083.44	1541.7	6244.17	3126.72	45.00	0.183

### Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors			Lower Termination				Upper Termination				Max 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)	311.7	5.61	37.1	262.0	37.1	7	14	267.5	37.1	7	14	284.13	551.4	506.25	0.561



# Monopole Mat Foundation Design

Date

2/2/2017

<b>Customer Name:</b>	AT&T	<b>EIA/TIA Standard:</b>	EIA-222-G
<b>Site Name:</b>		<b>Structure Height (Ft.):</b>	153
<b>Site Number:</b>	CT01499-S-SBA	<b>Engineer Name:</b>	J. Chen
<b>Engr. Number:</b>	30154	<b>Engineer Login ID:</b>	

**Foundation Info Obtained from:**

Drawings/Calculations

**Structure Type:**

Monopole

**Analysis or Design?**

Analysis

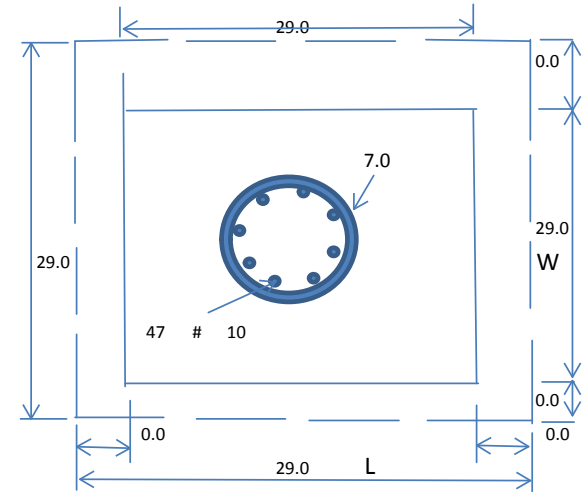
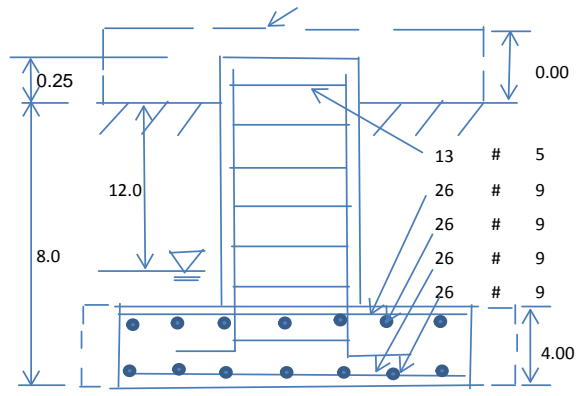
**Base Reactions (Factored):**

Axial Load (Kips):	92.2	Shear Force (Kips):	35.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3609.8

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
Control Value for Cell D18:	0	Control Value for Cell F18:	0



**Material Properties and Rebar Info:**

Concrete Strength (psi):	3000	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):	110.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	12.0	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	8000	Ultimate Skin Friction:	0	Psf
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No	
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00	
		Angle from Top of Pad:	30	
		Angle from Bottm of Pad:	25	
		Angle from Bottm of Pad:	25	

**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):	353.11
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	353.11	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):	974.44

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	1998	<	Allowable Factored Soil Bearing (psf):	6000	0.33	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	12850.1	>	Design Factored Momont (kips-ft):	3899	0.30	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	3.30					OK!

Load/  
Capacity  
Ratio

**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 compression):	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):	9234.8	> Design Factored Moment (Mu, Kips-Ft)	3759.0	0.41	OK!
Calculated Shear Capacity (Kips):	767.8	> Design Factored Shear (Kips):	35.1	0.05	OK!
Calculated Tension Capacity (Tn, Kips):	3223.3	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7269.2	> Design Factored Axial Load (Pu Kips):	92.2	0.01	OK!
Moment & Axial Strength Combination:	0.41	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):	1270.5	> One-Way Factored Shear (L-D. Kips):	271.4	0.21	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1270.5	> One-Way Factored Shear (W-D., Kips)	271.4	0.21	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1490.1	> One-Way Factored Shear (C-C, Kips):	438.2	0.29	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0017	OK! Lower Steel Pad Reinf. Ratio (W-Direct	0.0017		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5096.3	> Moment at Bottom ( L-Direct. K-Ft):	990.3	0.19	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5096.3	> Moment at Bottom ( W-Direct. K-Ft):	990.3	0.19	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	7177.4	> Moment at Bottom ( C-C Dir. K-Ft):	1400.5	0.20	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0017	OK! Upper Steel Reinf. Ratio (W-Direct. ):	0.0017		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	5096.3	> Moment at the top (L-Dir Kips-Ft):	607.7	0.12	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	5096.3	> Moment at the top (W-Dir Kips-Ft):	607.7	0.12	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	7177.4	> Moment at the top (C-C Direc. K-Ft):	517.4	0.07	OK!