Filed by:
G. Scott Shepherd, Sr. Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - GShepherd@sbasite.com

October 15, 2020

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

Notice of Exempt Modification
175 Dickenson Road, Glastonbury, CT 06073
41.655897 N
-72.523255 W
T-Mobile #: CT11366A_L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 177-foot level of the existing 176-foot Monopole Tower at 175 Dickenson Road, Glastonbury, CT. The tower is owned by SBA Properties, LLC. The property is owned by Karrie-Lynne Bronzie and Randall Chapman. T-Mobile now intends remove three (3) antennas and replace with (3) new 600/700/1900/2100 MHz antennas. The new antennas would be installed at the 177-foot level of the tower.

Please note: Per the Connecticut Siting Council Website: CSC COVID 19 Guidelines. *In order to prevent the spread of Coronavirus and protect the health and safety of our members and staff, as of March 18, 2020, the Connecticut Siting Council shall convert to full remote operations until March 30, 2020. Please be advised that during this time period, all hard copy filing requirements will be waived in lieu of an electronic filing. Please also be advised that the March 26, 2020 regular meeting shall be held via teleconference. The Council's website is not equipped with an on-line filing fee receipt service. Therefore, filing fees and/or direct cost charges associated with matters received electronically during the above-mentioned time period will be directly invoiced at a later date.*

Planned Modifications:

TOWER

Remove:

- (6) Allen FE15501P77/75-MHA

Remove and Replace:

- (3) T-Arms (Remove) – (1) Low profile platform w/HRK & reinforcement kit Sitepro RMQP-4096-HK (Replace)
- (3) EMS RR90-17-02DP antennas (Remove) - (3) RFS APXVAARR24_43_U-NA20 antennas L600/L700/1900/L2100 MHz (Replace)

Install New:

- (3) Ericsson KRY 112 144/1
- (3) Ericsson KRY 112 489/2
- (3) Ericsson Radio 4449 B71+B12
- (1) 1-5/8" line

Existing Equipment to Remain:

- (3) EMS RR90-17-02DP antennas
- (6) Allen FE15501P77/75-MHA
- (8) 1-5/8" coax

Entitlements:

- (4) 1-5/8" coax

GROUND

Install New:

- Equipment inside existing 6201 cabinet
- (3) Ericsson 4415 RRH mounted to proposed H-Frame

Remove and Replace:

- (1) 60A breaker (Remove) – (1) 100A breaker (Replace)

This facility was approved by the Town of Glastonbury's Zoning Board of Appeals on August 9, 2000 under Special Exception. Approval was given to construct a 180' monopole tower for antennas and associated equipment for wireless communication systems. Power and telco utilities were to be installed underground. Initial approval was for no more than twelve antennas per carrier at each platform level. There were no further post construction stipulations set. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Glastonbury's Town Manager, Richard J. Johnson, and Zoning Enforcement Officer, Peter R. Carey, as well as the property owners. (Separate notice need not be sent to the tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading with certain modifications.

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

Sincerely,

G. Scott Shepherd
Sr. Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3804 + T
508.366.2610 + F
508.868.6000 + C
GShepherd@sbasite.com

Attachments
cc: Richard J. Johnson, Town Manager / with attachments
Glastonbury Town Hall, 2155 Main Street, Glastonbury, CT 06033
Peter R. Carey, Zoning Enforcement Officer / with attachments
Glastonbury Town Hall, 2155 Main Street, Glastonbury, CT 06033
Randall Chapman and Karrie-Lyne Bronzi / with attachments
PO Box 7, Troy, ME 04987 (town address on file)
Karrie-Lyne Bronzi / with attachments
8 Post Lane, Palm Coast FL 32164

Exhibit List

Exhibit 1	Check Copy	X To be invoiced at a later date per COVID guidelines.
Exhibit 2	Notification Receipts	
Exhibit 3	Property Card	X
Exhibit 4	Property Map	X
Exhibit 5	Original Zoning Approval	X Town of Glastonbury, CT 8/15/2000
Exhibit 6	Construction Drawings	Chappell Engineering 9/13/19
Exhibit 7	Structural Analysis	TES 6/19/19
Exhibit 8	Mount Analysis	GeoStructural 8/5/19
Exhibit 9	EME Report	Transcom 5/30/19

EXHIBIT 1

Normally, Exhibit 1 would contain the copy of the check for the filing fee.

EXHIBIT 2

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

EXHIBIT 3

Town of Glastonbury GIS Parcel Report

Report Generated 6/17/2019 10:56:16 AM

Owner of Record

GIS ID: 18600175
Owner: CHAPMAN RANDALL S+
Co-Owner: BRONZI KARRIE-LYNNE
Address: PO BOX 7
City, State ZIP: TROY, ME 04987-0007

Account Number: 18600175
Property Address: 175 DICKINSON RD

Property highlighted in blue

Parcel Information

Map/Street/Lot J12 / 1860 / N0003 **Property ID:** 1492
Developer Lot ID: **Water:** Well
Parcel Acreage: 30.35 **Sewer:** Septic
Zoning Code: RR **Census:** 5205.02

Valuation Summary

Item	Appraised Value	Assessed Value
Buildings	0	0
Land	1155200	808700
Appurtenances	0	0
Total	**1155200**	**808700**

Building Picture Not Applicable

Owner of Record	Deed / Page	Sale Date	Sale Price
CHAPMAN RANDALL S+	3456/0161	11/07/2017	0
CHAPMAN RANDALL S+	3379/0090	10/20/2016	0
CHAPMAN RANDALL S+	3057/0041	01/11/2013	0
CHAPMAN RANDALL S+	3057/0039	01/11/2013	0
CHAPMAN RANDALL S+	2684/0333	08/03/2009	0
CHAPMAN RANDALL S+	2295/0261	02/02/2006	0
CHAPMAN DONALD A (LU)+ RANDALL S+	1582/0249	05/08/2002	0
CHAPMAN DONALD A+BRONZI	0442/0018	08/25/1988	0

Building Information

Building ID 0

Year Constructed :
Building Type :
Style :
Occupany :
Stories :
Building Zone :
Roof Type :
Roof Material :
Est. Gross S.F. :
Est. Living S.F. :

Number of Rooms :
Number of Bedrooms :
Number of Bathrooms :
Number of Half-Baths :
Exterior Wall :
Interior Wall :
Interior Floor :
Interior Floor #2 :
Air Conditioning Type :
Heat Type :
Fuel Type :

Building Sketch Not Applicable

Subarea Type	Est. Gross S.F.	Est. Living S.F.

Outbuilding Type	Est. Gross S.F.	Comments

EXHIBIT 4

Town of Glastonbury

Town of Glastonbury GIS

841 0 420 841 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

This map is a user generated static output from an Internet mapping site and is for reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

EXHIBIT 5

5086

Town of Glastonbury

2155 MAIN STREET • P.O. BOX 6523 • GLASTONBURY, CONNECTICUT 06033-6523

DATE: August 15, 2000
RE: Assessors Lot N3 Dickenson Road
OWNER: Donald Chapman, Ronald Bronzi and Beverly Bronzi
ZONE: RR

SBA, Inc., and Sprint PCS
80 Eastern Boulevard
Glastonbury, CT 06033

Dear Applicant(s):

Following a Public Hearing of your application on August 9, 2000, the following resolution was passed by the Zoning Board of Appeals:

The Board granted a special exception as provided for in Section 4.2.1 to construct a 180' monopole tower and the installation and operation of antennas and associated equipment for wireless communication system at assessors Lot N3 Dickenson Road as it meets all the requirements of Section 13.9.

The approval will become effective when it is recorded by the property owner in the Town Clerk's Office but to satisfy the provisions of Section 13.10 of the Glastonbury Building Zone Regulations concerning expiration, this approval shall become null and void two years from August 10, 2000, unless substantial construction on a building or structure or use is established on a lot.

This decision is based upon and subject to the representations made and evidence produced by the applicant(s) at the Public Hearing.

Glastonbury Zoning Board of Appeals
For the Secretary
Edward P. Pietrycha
Building Official and Zoning Enforcement Officer

dml

cc: Wendell G. Davis, Jr., Cranmore, FitzGerald & Meaney, 49 Wethersfield Avenue, Hartford, CT.

TOWN OF GLASTONBURY
ZONING BOARD OF APPEALS
APPLICATION FOR SPECIAL EXCEPTION

Applicant: SBA, Inc.
80 Eastern Boulevard
Glastonbury, CT 06033

Sprint PCS
9 Barnes Industrial Road
Wallingford, CT 06492

Omnipoint Communications
100 Filley Street
Bloomfield, CT 06002

Contact: Wendell Davis, Jr.
Cranmore, FitzGerald & Meaney
(860)522-9100

Project: Wireless Telecommunications Facility
Redwood Lane
Map 133, Lot E6

SBA, Inc/ Sprint PCS/ Omnipoint Communications' Application for a Special Exception (Wireless Telecommunication Facility)

Introduction:

SBA, Inc., Sprint PCS, and Omnipoint Communications hereby petition the Zoning Board of Appeals of the Town of Glastonbury for a special exception to construct a wireless telecommunications facility at Redwood Lane, Glastonbury (Map 133, Lot E6). The Redwood Lane site is located in a Rural Residence Zone as permitted under Section 5 and Section 4.2.1 of the Glastonbury Zoning Regulations.

The details of SBA, Inc., Sprint PCS, and Omnipoint Communications' request are fully set forth in the application, attachments and drawings submitted to the Zoning Board of Appeals. This information provides you with background information on SBA, Inc., Sprint PCS, and Omnipoint Communications, PCS (Personal Communications Services), and the proposed use and necessity for the Redwood Lane site.

Background:

SBA, Inc.:

SBA Communications Corporation began in 1989 and has grown to become the premier wireless antenna site development services provider for the Wireless Telecommunications Industry. Since its beginning, SBA has worked in partnership with the leading wireless carriers to build out networks across the country and around the globe. The compilation of our Build-to-Suit program, Site Development Services, and Construction Services provides for the best solutions to the many challenges faced today in the industry. We offer our clients the freedom to choose how to best meet their antenna site build-out objectives. Our strong financial stability, capital resources and industry leadership serve to support the needs of our clients and the Wireless Telecommunications Industry.

Sprint PCS:

Based out of Kansas City, Missouri, Sprint PCS is comprised of four major corporations: Sprint Corporation, Tele-Communications Incorporated (TCI), Cox Communications, and Comcast Corporation. This strong alliance provides Sprint PCS with the financial resources to create a nationwide telecommunications company that will provide customers with a variety of telecommunications services.

Sprint is a participant in the Personal Communications Service (PCS) market. In early 1995, the Federal Communications Commission (FCC) auctioned licenses in fifty-one Metropolitan Trading Areas (MTA's). With these licences and agreements with other providers, Sprint will be able to offer seamless Personal Communications Services virtually anywhere in the country.

Omnipoint Communications:

Founded in 1987, Omnipoint is a leader in wireless technology development and PCS provision. The company was started by Douglas G. Smith to develop commercial uses for a military wireless technology based on spread spectrum modulation. The company's success in developing its technology for the first digital PCS system at 190 MHz during 1991 and 1992 was instrumental in the FCC awarding the company one of the three Pioneer's Preference licenses issued for broadban PCS, specifically the "A - band" license for New York. Omnipoint holds licences covering more than 96.5 million people or "pops". The company has continuous license coverage throughout the Northeastern United States from Maine to Virginia, including Boston, New York, Philadelphia, Portland, Providence, Washington, D.C., and Norfolk. Omnipoint also has won licenses that cover areas in Michigan, Kansas, Texas, and South Florida.

PCS (Personal Communications Services):

PCS is a family of products offering services such as portable phones, pagers, and fax transmission. PCS was made available by the FCC with the allocation of 140 MHz of radio spectrum in the frequency range of 1850-1990 MHz which will allow for new wireless communications services. There are three main advantages of PCS over traditional cellular: Clarity, Privacy and All-In-One Communications.

Specific PCS services include:

Wireless PBX - A service that simply works as a wireless phone. Wireless PBX will provide the same features that desktop business telephones currently provide such as voice mail and three-way teleconferencing.

Telepoint - A service that can provide either one or two-way voice and data communications through hand-held phones and electronic notebooks.

Paging - A service that provides primarily one way voice and data communications such as a voice or electronic message, or data transfer to a pager, electronic notebook, or laptop computer with a built-in pager.

Site Necessity:

The goal of a wireless service provider's radio frequency engineering group is to maximize the area which their communications system will service while minimizing the number of sites required. The goal of SBA is to develop facilities which will accommodate the engineering needs of a number of wireless communications providers in one given site. This partnership benefits all. The carriers benefit from less capital cost, SBA benefits with long terms site ownership and management, and the community benefits from the variety of wireless services provided in their area as well as the reduction in the number of towers in their neighborhoods.

Once the need for a new site in a particular geographic area has been established, system engineers identify a target area in which to locate the facility. The need for a new site is dictated by capacity and coverage requirements for a particular geographic area. Within the general target area, the selection of a specific site location is determined by local topographic and geographic factors, mitigation of the antenna mounting structure's visual impact, compatibility with existing land use and the ability to negotiate a mutually beneficial lease with a landlord.

To accomplish this goal, the site must be placed at specific locations. Because these sites function as a network, the location of one site effects the service area of all the surrounding sites. In order to use mobile communications services, a user must be "handed-off" from one site to the next as they travel.

The proposed facility will be an essential part of Sprint and Omnipoint's network. There is currently a large gap in service for Sprint and Omnipoint in the southern portion of Glastonbury, most especially along Route 2. The proposed facility will allow Sprint and Omnipoint to provide continuous coverage in this area and specifically along Route 2 as it approaches the Town of Marlborough.

Co-Location

The tower has been designed to accommodate the typical antenna array of five cellular/PCS providers. Also, two additional ports have been designed to accommodate the needs of paging, two-way radio, and the emergency communications needs of the Town of Glastonbury. (See tower design drawings for further details).

Site Information

This particular site will be located within a 70' x 70' fenced compound on a 25.13 acre parcel owned by Donald A. Chapman. The property address is Redwood Lane (Map 133, Lot E6). The site will be accessed off of Redwood Lane via an existing 20' right-of-way which extends from Redwood Lane to the parcel.

This parcel is an undeveloped wooded lot. The woods provide a natural screening around the compound area. The State of Connecticut owns a significant portion of the property located to the east and south of the property and this property consists of primarily dense forest.

The project consists of the construction of a 180' monopole and the installation and operation of antennas and associated equipment as part of Sprint and Omnipoint's PCS system. The proposed compound area is 70' x 70'. This area will contain the tower and the Base Transceiver Stations for each carrier. The compound area will be enclosed by a chain link fence measuring 6' in height with 3 strands of barbed wire on top of the fence. This application also includes mounting of no more than 12 antennas per carrier at each platform level (please see site plan and equipment specification sheets and the attached Antenna Specification Sheet).

The power and telco utilities needed for the operation of this facility will be installed underground to the compound area. No water or sewer services are required. Access will be gained by upgrading the existing logging road on the property to the site location.

EXHIBIT 6

RT-2/GLASTONBURY/SBA

175 DICKINSON ROAD
GLASTONBURY, CT 06073
HARTFORD COUNTY

SITE NO.: CT11336A

SITE TYPE: 176'± MONOPOLE

RF DESIGN GUIDELINE: CUSTOM

APPROVALS

PROJECT MANAGER:	DATE:	ZONING/SITE ACQ.:	DATE:
CONSTRUCTION:	DATE:	OPERATIONS:	DATE:
RF ENGINEERING:	DATE:	TOWER OWNER:	DATE:

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS BY CERTIFIED CLIMBER
SECTOR B:	ACCESS BY CERTIFIED CLIMBER
SECTOR C:	ACCESS BY CERTIFIED CLIMBER
SECTOR D:	ACCESS BY CERTIFIED CLIMBER
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

SITE NOTES

1. THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
   - ADA COMPLIANCE NOT REQUIRED.
   - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - BUILDING CODE: 2018 CONNECTICUT STATE BUILDING CODE
   - ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
   - STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

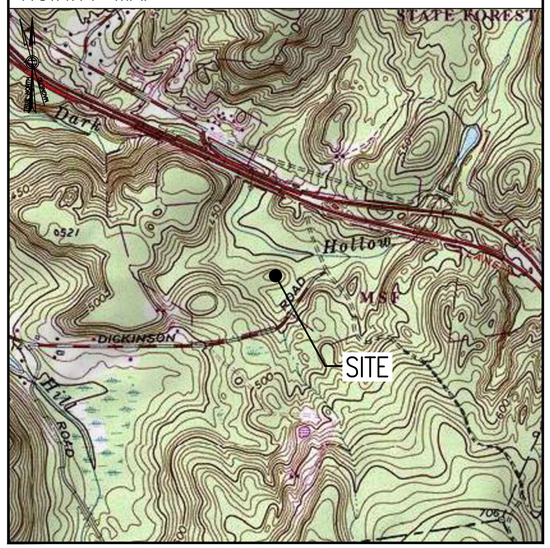
GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE OMNIPOINT REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
15. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK.

AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811

VICINITY MAP

SCALE: 1" = 1000'-0"



DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SHEET INDEX

SHEET NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	COMPOUND & EQUIPMENT PLAN	2
A-2	TOWER ELEVATIONS & ANTENNA PLAN	2
A-3	SITE DETAILS	2
E-1	ELECTRIC & GROUNDING DETAILS	2

SPECIAL ZONING NOTE:
BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW, AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, OR ADMINISTRATIVE REVIEW).

PROJECT SUMMARY

SITE NUMBER:	CT11336A
SBA SITE NUMBER:	CT02216-S
SBA SITE NAME:	GLASTONBURY
SITE ADDRESS:	175 DICKINSON ROAD GLASTONBURY, CT 06073
PROPERTY OWNER:	CHAPMAN RANDALL S. & BRONZI KARRIE-LYNN PO BOX 7 TROY, ME 04987
TOWER OWNER:	SBA PROPERTIES, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
COUNTY:	HARTFORD COUNTY
ZONING DISTRICT:	RURAL RESIDENTIAL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	176'±
APPLICANT:	T-MOBILE NORTHEAST LLC 15 COMMERCE WAY, SUITE B NORTON, MA 02766
SBA RSM:	STEPHEN ROTH PHONE: 860-539-4920 EMAIL: SRoth@sbasite.com
ARCHITECT:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
STRUCTURAL ENGINEER:	CHAPPELL ENGINEERING ASSOCIATES, LLC. 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752
SITE CONTROL POINT:	LATITUDE: N.41.6559° N41°39'21.24" LONGITUDE W.72.5233° W72°31'23.88"

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

STATE OF CONNECTICUT
CLEMENT J. SAMEK
No. 26876
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/113/19	ISSUED FOR CONSTRUCTION	CMC
1	07/03/19	ISSUED FOR REVIEW	JRV
0	06/07/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CT11336A

SITE ADDRESS:
175 DICKINSON ROAD
GLASTONBURY, CT 06073

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

1815.073

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR – T–MOBILE
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T–MOBILE
   OEM – ORIGINAL EQUIPMENT MANUFACTURER

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

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

4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL, STATE AND FEDERAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

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

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

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR.

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

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

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION AND RETURN DISTURBED AREAS TO ORIGINAL CONDITIONS.

13. THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

14. SUBCONTRACTOR SHALL NOTIFY CHAPPELL ENGINEERING ASSOCIATES, LLC 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS AND POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEERING REVIEW.

15. CONSTRUCTION SHALL COMPLY WITH ALL T–MOBILE STANDARDS AND SPECIFICATIONS.

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

17. THE EXISTING CELL SITES ARE IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. IF THE EXISTING CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.

3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.

6. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

7. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

8. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEERING, OWNER AND/OR LOCAL UTILITIES.

9. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE AND STABILIZED TO PREVENT EROSION AS SPECIFIED IN THE PROJECT SPECIFICATIONS.

10. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

11. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T–MOBILE SPECIFICATION FOR SITE SIGNAGE.

CONCRETE AND REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST–IN–PLACE CONCRETE.

2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000PSI) MAY BE USED. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 381 CODE REQUIREMENTS

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER .....2 IN.
   #5 AND SMALLER & WWF .....1½ IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER
   OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....¾ IN.
   BEAMS AND COLUMNS .....1½ IN.

5. A CHAMFER ¾" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHORS SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO THE MANUFACTURERS RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY SIMPSON OR APPROVED EQUAL.

7. CONCRETE CYLINDER TIES ARE NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TEST PERFORMED AT THE SUPPLIERS PLANT.
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.

8. AS AN ALTERNATIVE TO ITEM 7. TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.

9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND T–MOBILE SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM–A–36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".

2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 9TH EDITION. PAINTED SURFACES SHALL BE TOUCHED UP.

3. BOLTED CONNECTIONS SHALL USE BEARING TYPE ASTM A325 BOLTS (¾"ø) AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE GALVANIZED OR STAINLESS STEEL.

4. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE ⅝" DIA. ASTM A 307 BOLTS (GALV) UNLESS NOTED OTHERWISE.

5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL

6. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION AND TOPSOIL TO EXPOSE NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.

2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.

3. AS AN ALTERNATE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.

4. COMPACTED SUBBASE SHALL BE UNIFORM AND LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING #1 SIEVE.

5. AS AN ALTERNATE TO ITEMS 2 AND 3, THE SUBGRADE SOILS WITH 5 PASSES OR A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND–OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). AND SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL–GRADED GRANULAR FILL AND COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUN, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
SUBCONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T–MOBILE ANTENNA PLATFORM LOCATION AND UTILITY TRENCHWORK.

2. COORDINATION OF WORK:
SUBCONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH CONTRACTOR.

3. CABLE LADDER RACK:
SUBCONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY AND/OR ICE BRIDGE, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. WIRING, RACEWAY, AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.

2. SUBCONTRACTOR SHALL MODIFY OR INSTALL CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. SUBCONTRACTOR SHALL SUBMIT MODIFICATIONS TO CONTRACTOR FOR APPROVAL.

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

4. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.

5. EACH END OF EVERY POWER, GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA, AND MATCH INSTALLATION REQUIREMENTS.

6. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR–CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, ½ INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC AND OSHA.

7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).

8. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.

9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.

10. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.

12. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.

13. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#34 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.

14. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY HARGER (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).

15. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

16. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

17. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

18. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.

19. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.

20. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.

21. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

22. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.

23. CABINETS, BOXES AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.

24. CABINETS, BOXES AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.

25. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

26. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY–COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.

27. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY–COATED, OR NON–CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

28. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.

29. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

30. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

31. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.

32. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.

T-MOBILE
NORTHEAST LLC

15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286–2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251–0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying

R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481–7400
www.chappellengineering.com

STATE OF CONNECTICUT
CLEMENT J. SAMI
No. 26876
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/113/19	ISSUED FOR CONSTRUCTION	CMC
1	07/03/19	ISSUED FOR REVIEW	JRV
0	06/07/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CT11336A

SITE ADDRESS:
175 DICKINSON ROAD
GLASTONBURY, CT 06073

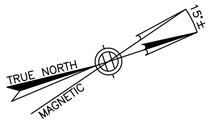
SHEET TITLE
GENERAL NOTES

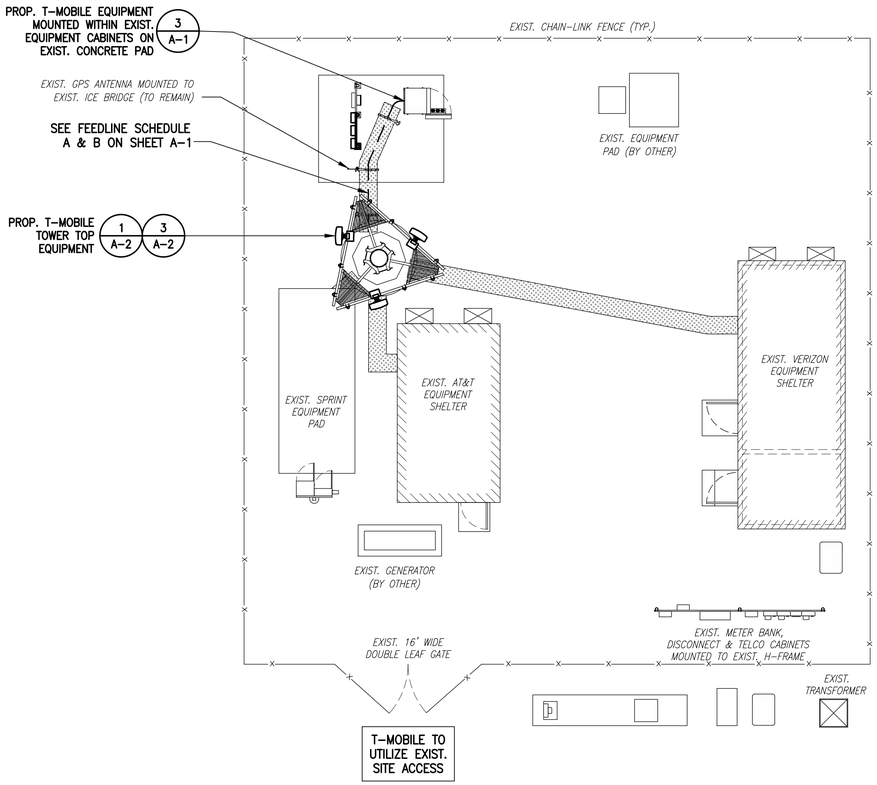
SHEET NUMBER
GN-1

1815.073

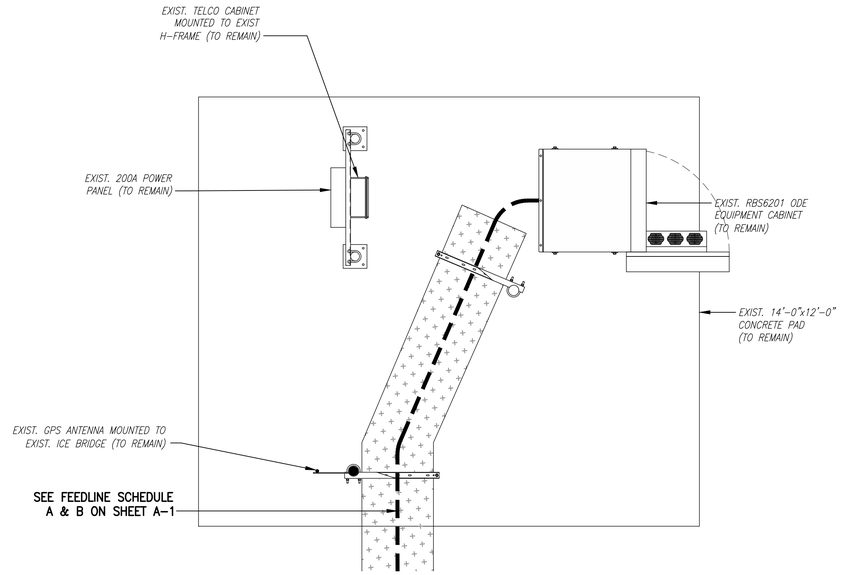
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

FEEDLINE SCHEDULE	FEEDLINES	LOCATION
A	*EXISTING TO REMAIN:* *(4) 1-5/8" COAX CABLES*	ROUTED PER TOWER STRUCTURAL ANALYSIS
B	PROPOSED: (8) 1-5/8" COAX CABLES (1) 1-5/8" HCS FIBER CABLE	
NOTE: EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.		

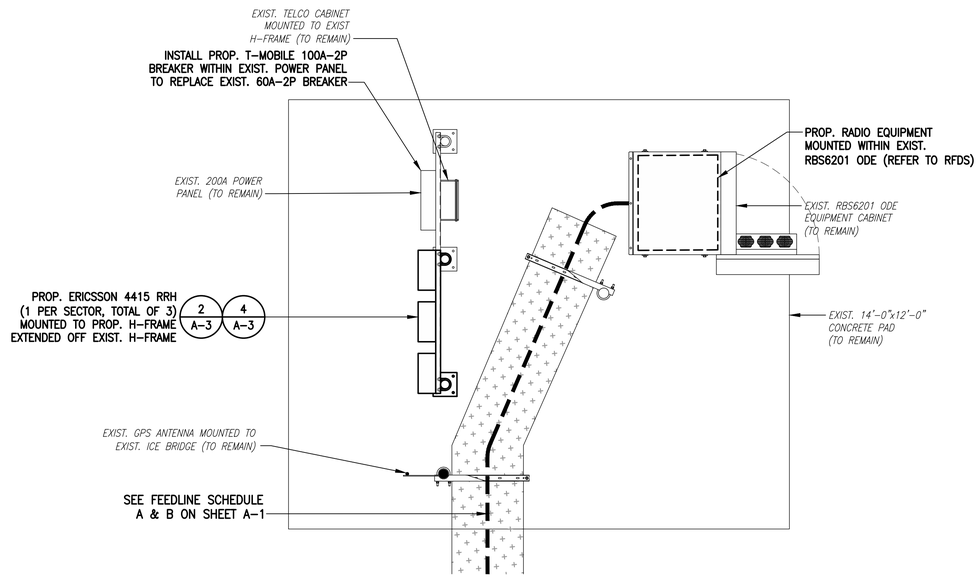




COMPOUND PLAN
SCALE: 1" = 8'-0"
1 A-1
0 8'-0" 16'-0" 24'-0"



EXISTING EQUIPMENT PLAN
SCALE: 1/2" = 1'-0"
2 A-1
0 2'-0" 4'-0" 6'-0"

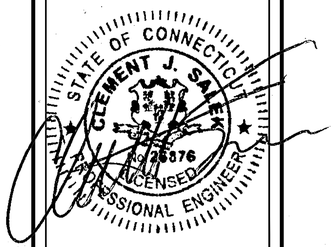


PROPOSED EQUIPMENT PLAN
SCALE: 1/2" = 1'-0"
3 A-1
0 2'-0" 4'-0" 6'-0"

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com



CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/113/19	ISSUED FOR CONSTRUCTION	CMC
1	07/03/19	ISSUED FOR REVIEW	JRV
0	06/07/19	ISSUED FOR REVIEW	JRV

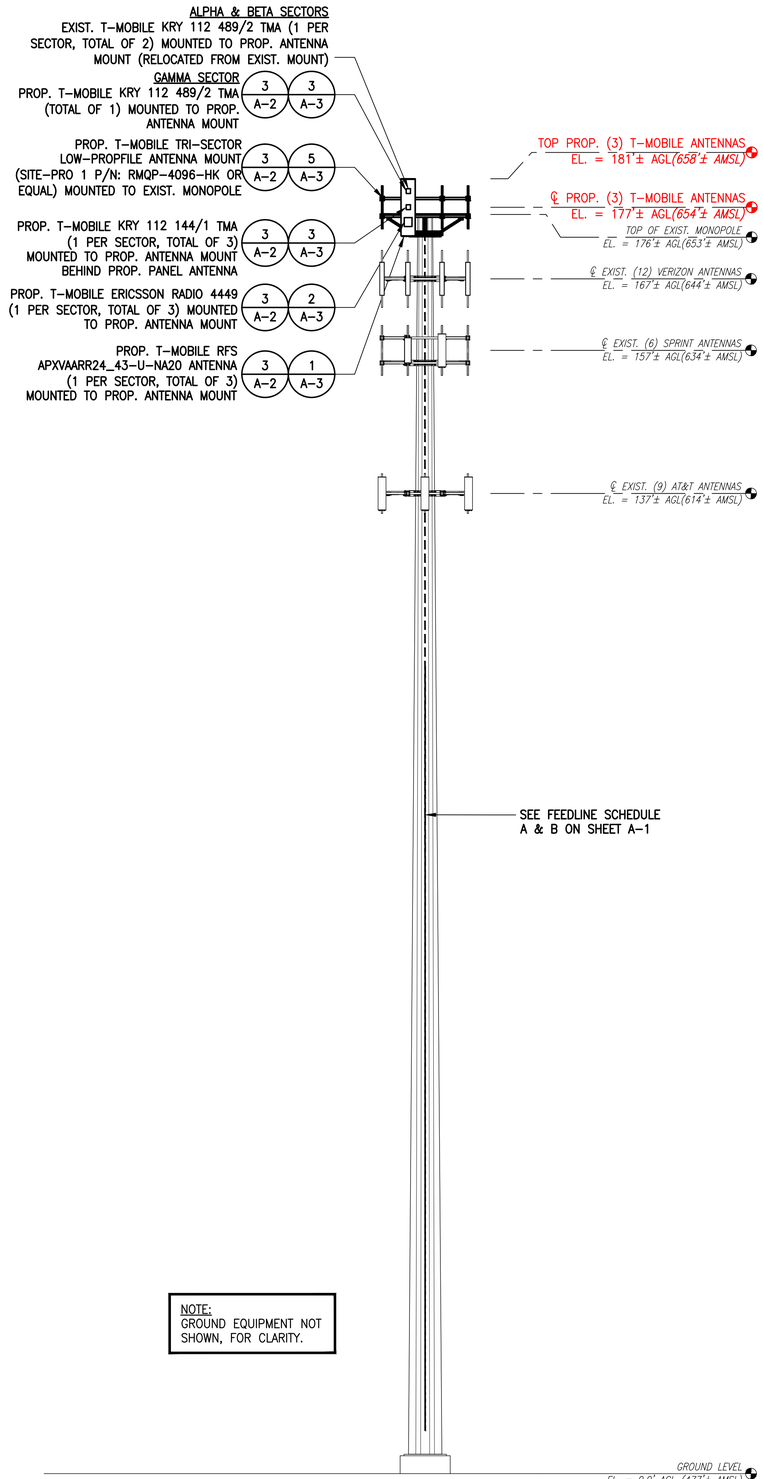
SITE NUMBER:
CT11336A

SITE ADDRESS:
175 DICKINSON ROAD
GLASTONBURY, CT 06073

SHEET TITLE
COMPOUND & EQUIPMENT PLAN

SHEET NUMBER
A-1

1815.073



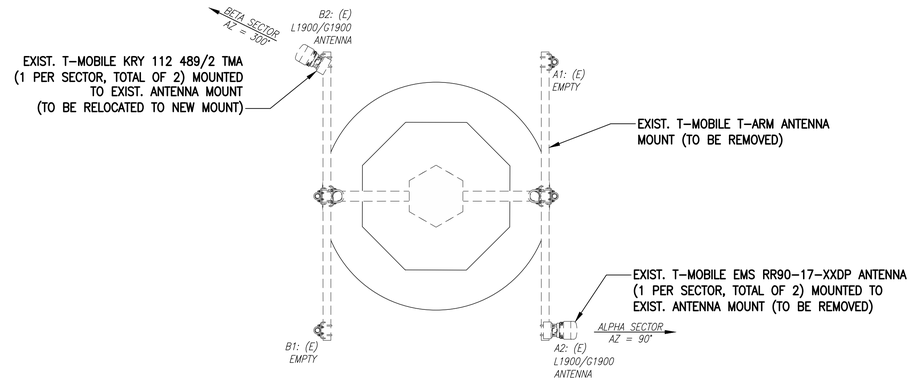
TOWER ELEVATION 1/A-2
SCALE: 1" = 10'
0 5' 10' 20' 30'

NOTE:
GROUND EQUIPMENT NOT SHOWN, FOR CLARITY.

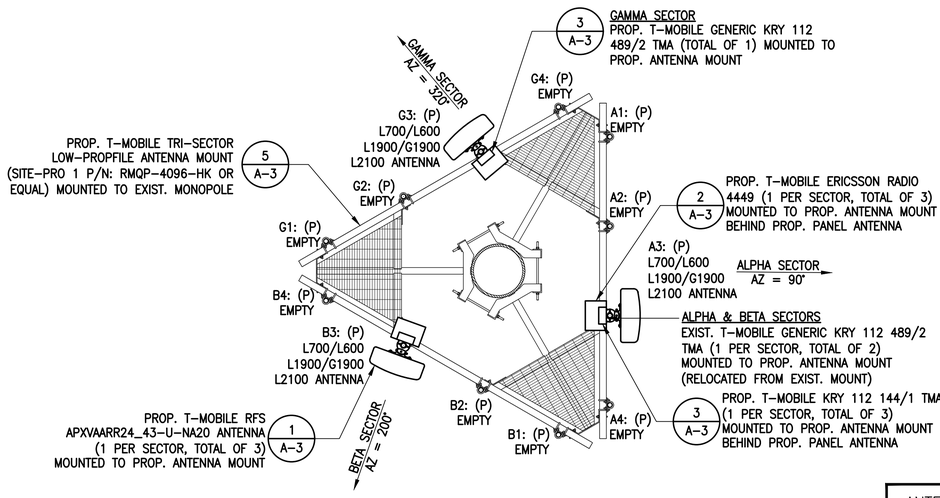
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS):
GENERAL CONTRACTOR SHALL ORIENT PROPOSED PLATFORM REINFORCEMENT KIT RING-MOUNTS SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH EXISTING OR PROPOOSED RING-MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.

RAD CENTER NOTE:
T-MOBILE RAD CENTER SHOWN IN RED TEXT BASED ON SBA-PROVIDED CO-LOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA-PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE T-MOBILE RFDS.



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



PROPOSED ANTENNA PLAN 3/A-2
SCALE: N.T.S.

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.

ANTENNA STATUS LEGEND:

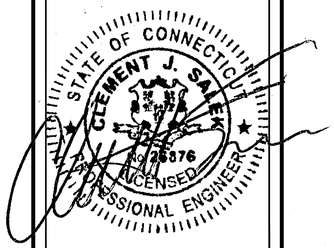
EMPTY – EMPTY PIPE

(E) – EXISTING
(P) – INSTALL
(F) – FUTURE

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com



CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/113/19	ISSUED FOR CONSTRUCTION	CMC
1	07/03/19	ISSUED FOR REVIEW	JRV
0	06/07/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CT11336A

SITE ADDRESS:
175 DICKINSON ROAD
GLASTONBURY, CT 06073

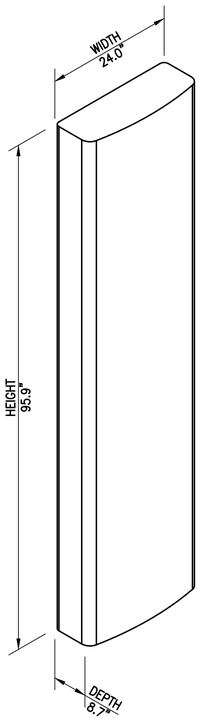
SHEET TITLE
TOWER ELEVATIONS & ANTENNA PLAN

SHEET NUMBER
A-2

1815.073

FINAL ANTENNA CONFIGURATION

SECTOR	ANTENNA	RAD CENTER	AZIMUTH (TRUE NORTH)	MECHANICAL DOWNTILT	ELECTRICAL DOWNTILT	BAND	RADIOS/TMAS	CABLES
ALPHA	RFS APXVAARR24_43-U-NA20	177'± AGL	90°	0°	2°	L600/L700	RADIO 4449 B71+B12	(1) (P) 6x12 (1-5/8") HCS CABLE (SHARED)
						L1900/G1900	*KRY 112 489/2*	*(2) (E) 1-5/8"ø COAX CABLE*
						L2100	RADIO 4415 B66A (AT CABINET) KRY 112 144/1	(2) (P) 1-5/8"ø COAX CABLE
BETA	RFS APXVAARR24_43-U-NA20	177'± AGL	200°	0°	2°	L600/L700	RADIO 4449 B71+B12	(1) (P) 6x12 (1-5/8") HCS CABLE (SHARED)
						L1900/G1900	*KRY 112 489/2*	*(2) (E) 1-5/8"ø COAX CABLE*
						L2100	RADIO 4415 B66A (AT CABINET) KRY 112 144/1	(2) (P) 1-5/8"ø COAX CABLE
GAMMA	RFS APXVAARR24_43-U-NA20	177'± AGL	320°	0°	2°	L600/L700	RADIO 4449 B71+B12	(1) (P) 6x12 (1-5/8") HCS CABLE (SHARED)
						L1900/G1900	*KRY 112 489/2*	*(2) (E) 1-5/8"ø COAX CABLE*
						L2100	RADIO 4415 B66A (AT CABINET) KRY 112 144/1	(2) (P) 1-5/8"ø COAX CABLE



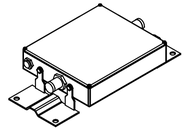
RFS APXVAARR24_43-NA20 PANEL ANTENNA
DIMENSIONS: 95.9"H x 24.0"W x 8.7"D
WEIGHT: 128.0 LBS
1 PER SECTOR, TOTAL OF 3

ANTENNA DETAILS (1 / A-3)
SCALE: N.T.S.

ERICSSON RRUS 4415 B66A
DIMENSIONS: 16.5"H x 13.4"W x 5.9"D
WEIGHT: 46 LBS
(1 PER SECTOR, TOTAL OF 3)

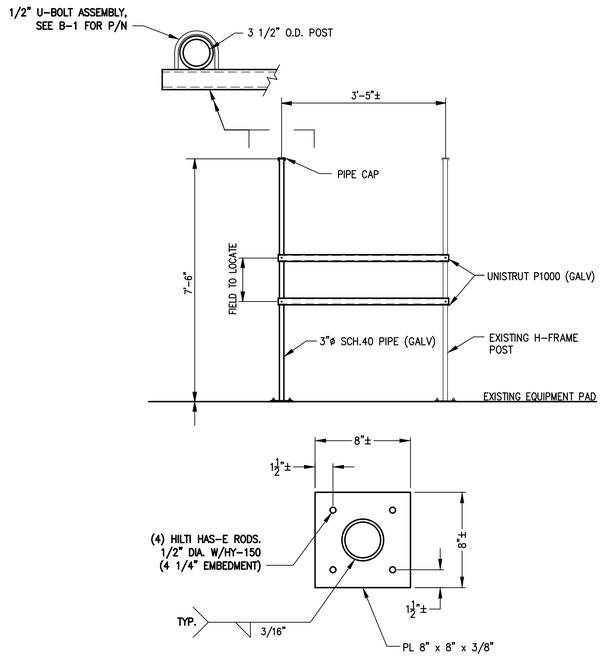
ERICSSON RADIO 4449 B12+B71
DIMENSIONS: 14.9"H x 13.2"W x 9.3"D
WEIGHT: 74.0 LBS
1 PER SECTOR, TOTAL OF 3

RRUS DETAILS (2 / A-3)
SCALE: N.T.S.

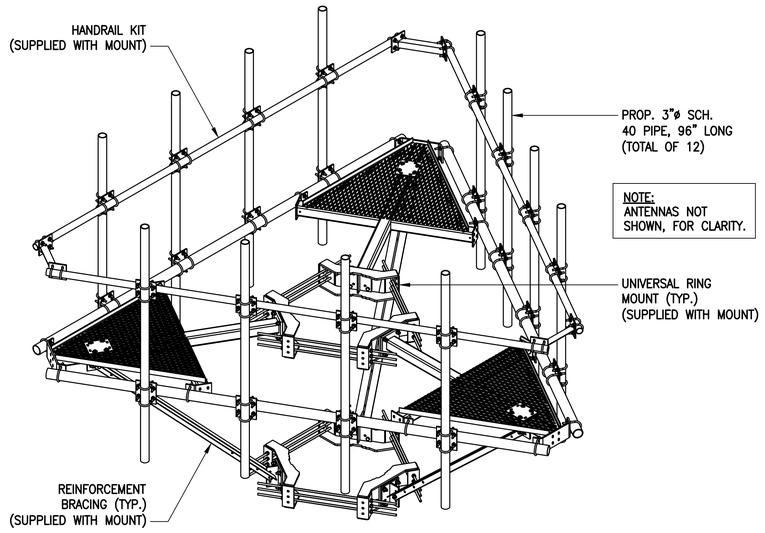


KRY 112 144/1 @ 177'
DIMENSIONS: 6.93"H x 6.1"W x 2.8"D
WEIGHT: 11.02 LBS
2 PER SECTOR, TOTAL OF 6

TMA DETAIL (3 / A-3)
SCALE: N.T.S.



H-FRAME DETAILS (4 / A-3)
SCALE: NOT TO SCALE



SITE-PRO 1 12'-6" LOW-PROFILE CO-LOCATION PLATFORM W/HANDRAIL KIT
PART NUMBERS: RMQP-4096-HK
(TOTAL OF 1 REQUIRED)

TYPICAL SITE PRO 1 12'-6" PLATFORM MOUNT (5 / A-3)
SCALE: N.T.S.

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

STATE OF CONNECTICUT
CLEMENT J. SAMEK
No. 26876
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/113/19	ISSUED FOR CONSTRUCTION	CMC
1	07/03/19	ISSUED FOR REVIEW	JRV
0	06/07/19	ISSUED FOR REVIEW	JRV

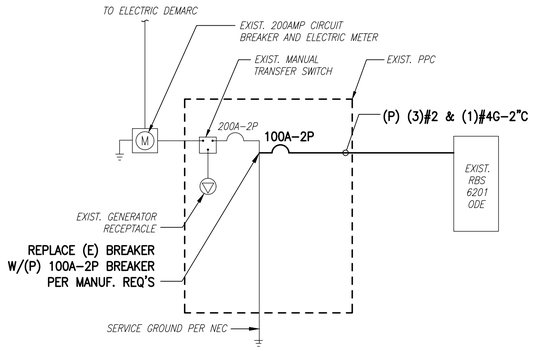
SITE NUMBER:
CT11336A

SITE ADDRESS:
175 DICKINSON ROAD
GLASTONBURY, CT 06073

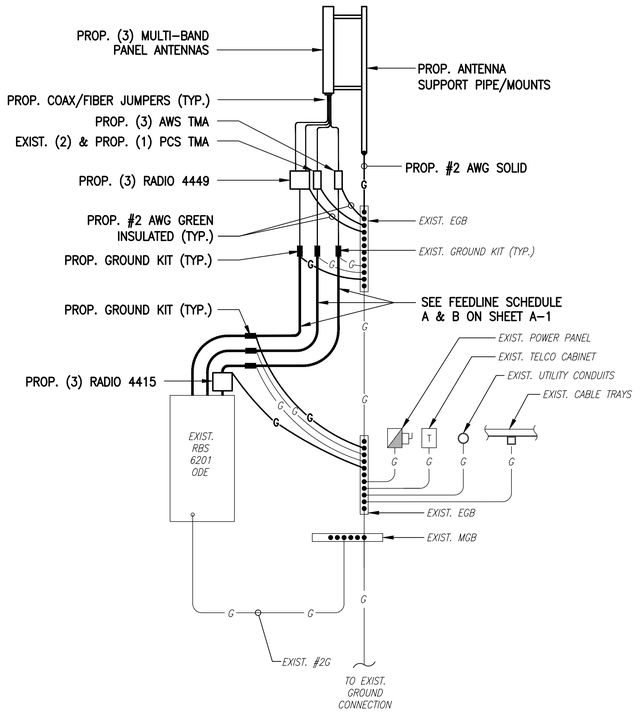
SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-3

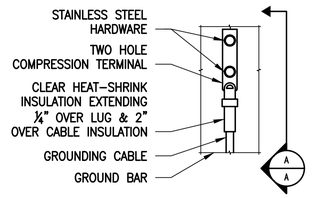
1815.073



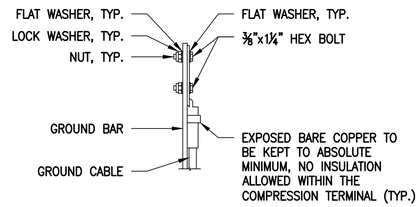
ONE LINE DIAGRAM
SCALE: NOT TO SCALE
1 E-1



GROUNDING RISER DIAGRAM
SCALE: NOT TO SCALE
2 E-1



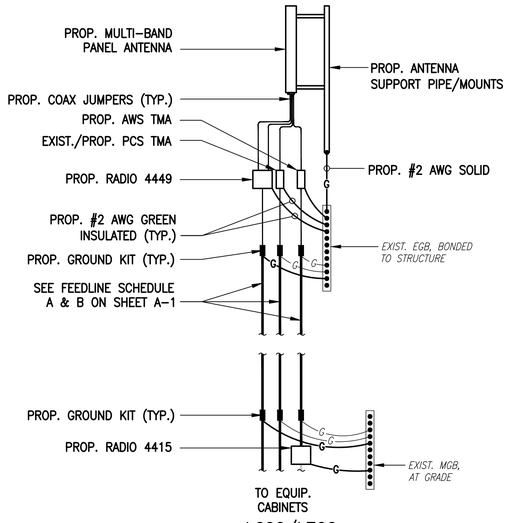
ELEVATION



SECTION A-A

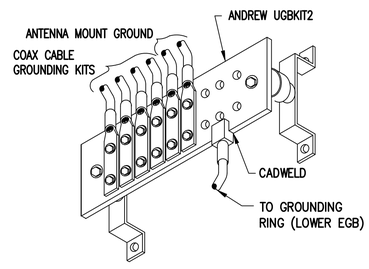
NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELL DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

TYPICAL GROUND BAR CONNECTIONS DETAIL
SCALE: NOT TO SCALE
3 E-1



L600/L700

COAX CABLE CONNECTION AND GROUNDING DETAIL
SCALE: NOT TO SCALE
4 E-1



GROUND BAR (EGB)
SCALE: NOT TO SCALE
5 E-1

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHNINSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
11. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
12. PPC SUPPLIED BY PROJECT OWNER.
13. GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE DONE IN ACCORDANCE WITH "T-MOBILE BTS SITE GROUNDING STANDARDS".
14. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
15. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
16. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
17. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
18. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
19. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
20. CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXIST. TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
21. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMNS MINIMUM RESISTANCE REQUIRED.
22. CONTRACTOR SHALL CONDUCT ANTENNA, COAX, AND LNA RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.

T-MOBILE NORTHEAST LLC
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
(508) 286-2700

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
(508) 251-0720

CHAPPELL ENGINEERING ASSOCIATES, LLC
Civil ·Structural ·Land Surveying
R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com

STATE OF CONNECTICUT
CLEMENT J. SAMEK
No. 26876
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/113/19	ISSUED FOR CONSTRUCTION	CMC
1	07/03/19	ISSUED FOR REVIEW	JRV
0	06/07/19	ISSUED FOR REVIEW	JRV

SITE NUMBER:
CT11336A

SITE ADDRESS:
175 DICKINSON ROAD
GLASTONBURY, CT 06073

SHEET TITLE
ELECTRIC & GROUNDING DETAILS

SHEET NUMBER
E-1

1815.073

EXHIBIT 7

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

Structural Analysis Report

Existing 176 ft SUMMIT Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT02216-S

Customer Site Name: Glastonbury

Carrier Name: T-Mobile (App#: 117010, V1)

Carrier Site ID / Name: CT11336A / Glastonbury

Site Location: 175 Dickenson Road

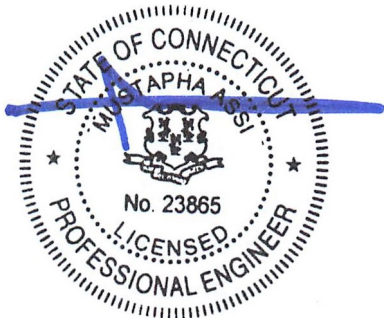
Glastonbury, Connecticut

Hartford County

Latitude: 41.655897

Longitude: -72.523255

Exp.01/31/2020



06/19/2019

Analysis Result:

Max Structural Usage: 81.0% [Pass]

Max Foundation Usage: 63.0% [Pass]

Additional Usage Caused by New Mount: +6.0%

Report Prepared By : Dipika Dhungana

Introduction

The purpose of this report is to summarize the analysis results on the 176 ft SUMMIT Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Paul J. Ford and Company, Job #29200-887 dated June 19, 2000
Foundation Drawing	Paul J. Ford and Company, Job #29200-887 dated June 19, 2000
Geotechnical Report	FDH Engineering, Project #1204838EG1 dated August 13, 2012
Modification Drawings	N/A

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.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} =125.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 97.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.179, S_1 = 0.063

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
-	177.0	6	EMS RR90-17-02DP - Panel	(3) T-Arms	(12) 1 5/8"	T-Mobile
-		12	Allen FE15501P77/75 - MHA			
7	167.0	6	Andrew SBNHH-1D65B - Panel	(1) LP Platform	(6) 1 5/8" (2) 1 5/8" Hybrid	Verizon
8		2	RFS APL868013 - Panel			
9		4	Antel LPA-80063-4CF-EDIN-5 - Panel			
10		3	ALU RRH2X60-700			
11		3	ALU RRH2X60-AWS			
12		1	RFS DB-T16Z-8AB-0Z			
13	157.0	3	RFS APXVTM14-C-I20 - Panel	Low Profile Platform w/ Mount Reinforcement kit: (1) Sitepro PRK-1245L (1) Sitepro HRK14-U (1) Sitepro PRK-SFS-H-L	(4) 1-1/4" Fiber	Sprint Nextel
14		3	Commscope NNVV-65B-R4 - Panel			
15		3	ALU 1900 Mhz			
16		6	ALU 800 Mhz			
17		3	ALU TD-RRH8x20-25			
18	137.0	6	Powerwave 7770.00 - Panel	(1) LP Platform	(12) 1 5/8" (2) 3/4" DC (1) 1/2" (1) 3" conduit	AT&T
19		3	CCI HPA-65R-BUU-H6 - Panel			
20		6	Powerwave LGP21401 - TMA			
21		12	Powerwave 7020.00 RET			
22		3	Ericsson RRUS-11 - RRU			
23		3	Ericsson RRUS 32-B2 - RRU			
24		6	Powerwave LGP21903 - DP			
25		1	Raycap DC6-48-60-18-8F - SP			
26		3	Powerwave 1001940 Smart Bias T			

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
1	177.0	3	EMS RR90-17-02DP	Low profile platform w/HRK & reinforcement kit Sitepro RMQP-4096-HK	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	RFS APXVAARR24_43-U-NA20			
3		6	Allen Telecom FE15501P77/75			
4		3	Ericsson KRY 112 144/1			
5		3	Ericsson KRY 112 489/2			
6		3	Ericsson Radio 4449 B71+B12			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**72.8%**	**62.0%**	**81.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	5166.3	39.08	105.9

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 1.8328 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/EIA 222-G Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

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

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

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

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

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

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

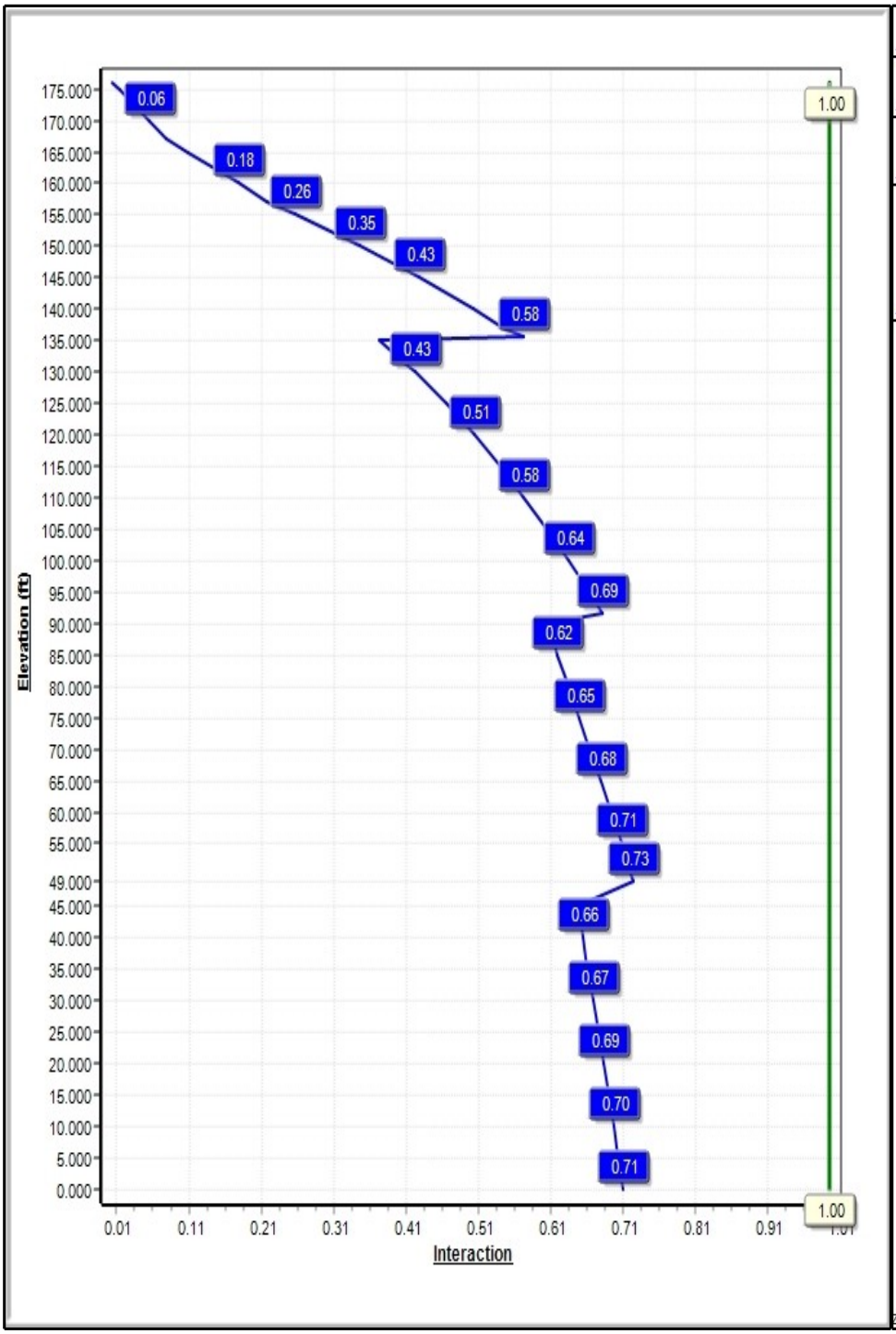
Usage Diagram - Max Ratio 72.82% at 49.0ft

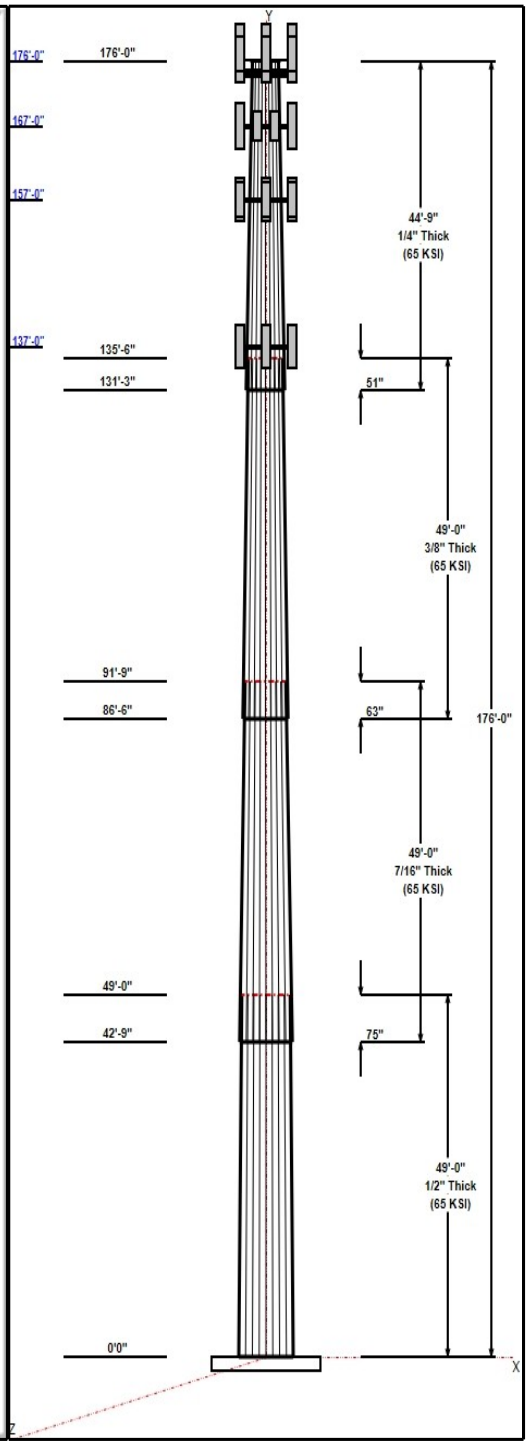
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.1		
Base Elev:	0.000 (ft)			Page: 1	

Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	26
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 97 mph Wind





Structure: CT02216-S-SBA

Type: Tapered
Site Name: Glastonbury
Height: 176.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.19702

6/19/2019

Tower Engineering Solutions

Shaft Properties

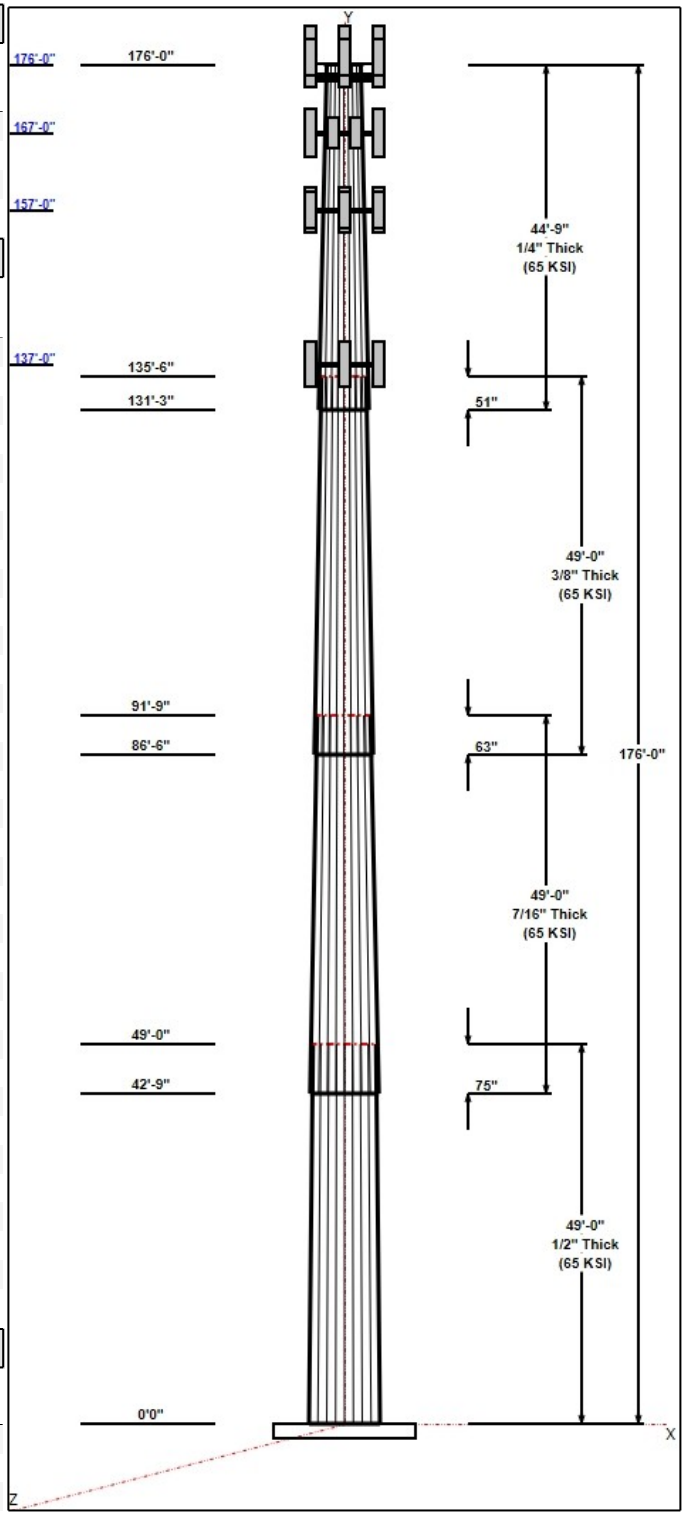
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	49.00	46.90	56.55	0.500		0.19702	65
2	49.00	39.35	49.00	0.438	Slip	0.19702	65
3	49.00	31.48	41.13	0.375	Slip	0.19702	65
4	44.75	24.00	32.82	0.250	Slip	0.19702	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
176.00	177.00	3	RR90-17-02DP	T-Mobile
176.00	177.00	6	MHA FE15501P77/75	T-Mobile
176.00	179.50	1	Lightning Rod	
176.00	177.00	3	APXVAARR24_43-U-NA20	T-Mobile
176.00	177.00	1	RMQP-496-HK	T-Mobile
176.00	177.00	3	KRY 112 489/2	T-Mobile
176.00	177.00	3	KRY 112 89/4	T-Mobile
176.00	177.00	3	4449	T-Mobile
167.00	167.00	1	Low Profile	Verizon
167.00	167.00	3	RRH2X60-AWS	Verizon
167.00	167.00	3	RRH2X60-700	Verizon
167.00	167.00	6	SBNHH-1D65B	Verizon
167.00	167.00	4	LPA-80063-4CF-EDIN-5	Verizon
167.00	167.00	2	APL868013	Verizon
167.00	167.00	1	DB-T16Z-8AB-0Z	Verizon
157.00	157.00	1	Low Profile Platform	Sprint Nextel
157.00	157.00	3	RFS APXVTM14-C-I20	Sprint Nextel
157.00	157.00	3	Commscope	Sprint Nextel
157.00	157.00	1	Sitepro PRK-1245L	Sprint Nextel
157.00	157.00	1	Sitepro HRK14-U	Sprint Nextel
157.00	157.00	1	Sitepro PRK-SFS-H-L	Sprint Nextel
157.00	157.00	3	ALU 1900 Mhz	Sprint Nextel
157.00	157.00	6	ALU 800 Mhz	Sprint Nextel
157.00	157.00	3	ALU TD-RRH8x20-25	Sprint Nextel
137.00	137.00	1	LP Platform-Round	AT&T
137.00	137.00	1	DC6-48-60-18-8F	AT&T
137.00	137.00	3	RRUS-11	AT&T
137.00	137.00	6	7770.00	AT&T
137.00	137.00	6	LGP21401	AT&T
137.00	137.00	6	LGP21903	AT&T
137.00	137.00	3	HPA-65R-BUU-H6	AT&T
137.00	137.00	12	7020	AT&T
137.00	137.00	3	RRUS 32-B2	AT&T
137.00	137.00	3	Smart Bias T 1001940	AT&T

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	176.00	Inside	1 5/8" Coax	T-Mobile
0.00	176.00	Inside	1 5/8" Fiber	T-Mobile
0.00	176.00	Outside	Safety Cable	
0.00	176.00	Outside	Step bolts (ladder)	
0.00	167.00	Inside	1 5/8" Coax	Verizon
0.00	167.00	Inside	1 5/8" Hybrid	Verizon
0.00	157.00	Inside	1 1/4" Fiber	Sprint Nextel
0.00	137.00	Inside	1 5/8" Coax	AT&T



0.00	137.00	Inside	1/2" Coax	AT&T
0.00	137.00	Inside	3" conduit	AT&T
0.00	137.00	Inside	3/4" DC	AT&T

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
24	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	66.0	50.0	Clipped

Reactions

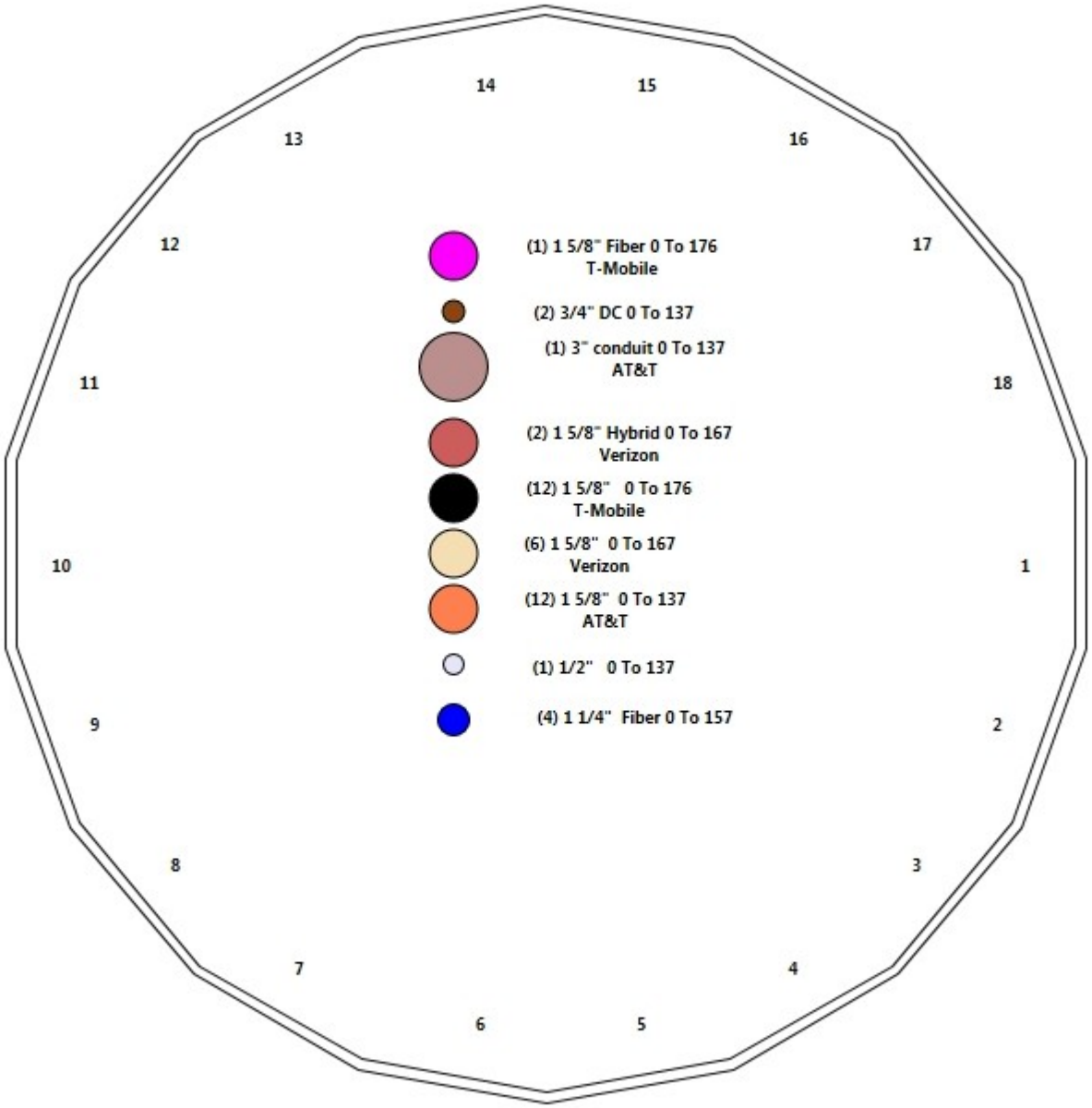
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	5166.3	39.1	62.6
0.9D + 1.6W 97 mph Wind	5092.1	39.0	46.9
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1619.7	11.8	105.9
1.2D + 1.0E	352.1	2.5	62.7
0.9D + 1.0E	346.5	2.5	47.0
1.0D + 1.0W 60 mph Wind	1226.4	9.3	52.2

Structure: CT02216-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Glastonbury
Height: 176.00 (ft)

6/19/2019

Tower Engineering Solutions



Shaft Properties

Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	49.000	0.5000	65		0.00	13,554
2	18	49.000	0.4375	65	Slip	75.00	10,126
3	18	49.000	0.3750	65	Slip	63.00	7,131
4	18	44.750	0.2500	65	Slip	51.00	3,402
					Total Shaft Weight:		**34,213**

	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	56.55	0.00	88.95	35305.41	18.53	113.10	46.90	49.00	73.63	20024.4	15.13	93.79	0.197017
2	49.00	42.75	67.44	20095.24	18.34	112.01	39.35	91.75	54.03	10335.8	14.45	89.94	0.197017
3	41.13	86.50	48.51	10181.58	17.93	109.69	31.48	135.50	37.02	4525.14	13.39	83.94	0.197017
4	32.82	131.2	25.84	3462.57	21.74	131.27	24.00	176.00	18.84	1343.00	15.52	96.00	0.197017

Load Summary

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	176.00	RR90-17-02DP	3	13.50	4.36	0.68	161.46	5.741	0.68	0.00	1.00
2	176.00	MHA FE15501P77/75	6	11.00	0.93	0.65	37.10	1.886	0.65	0.00	1.00
3	176.00	Lightning Rod	1	35.00	1.05	1.00	77.56	4.266	1.00	0.00	3.50
4	176.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	720.02	22.848	0.70	0.00	1.00
5	176.00	RMQP-496-HK	1	2449.00	46.00	1.00	5923.32	89.506	1.00	0.00	1.00
6	176.00	KRY 112 489/2	3	15.40	0.65	0.67	39.27	1.479	0.67	0.00	1.00
7	176.00	KRY 112 89/4	3	15.40	0.65	0.67	39.27	1.479	0.67	0.00	1.00
8	176.00	4449	3	70.00	1.65	0.67	171.14	2.407	0.67	0.00	1.00
9	167.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	3264.05	45.803	1.00	0.00	0.00
10	167.00	RRH2X60-AWS	3	60.00	3.50	0.76	177.64	4.564	0.76	0.00	0.00
11	167.00	RRH2X60-700	3	60.00	3.50	0.76	177.64	4.564	0.76	0.00	0.00
12	167.00	SBNHH-1D65B	6	40.00	8.16	0.83	332.23	9.954	0.83	0.00	0.00
13	167.00	LPA-80063-4CF-EDIN-5	4	20.00	6.15	0.93	266.55	8.702	0.93	0.00	0.00
14	167.00	APL868013	2	6.30	2.86	0.93	163.90	4.061	0.93	0.00	0.00
15	167.00	DB-T16Z-8AB-0Z	1	18.90	4.80	1.00	224.85	6.005	1.00	0.00	0.00
16	157.00	Low Profile Platform	1	1500.00	22.00	1.00	3253.19	45.656	1.00	0.00	0.00
17	157.00	RFS APXVTM14-C-I20	3	56.20	6.34	0.77	286.02	7.864	0.77	0.00	0.00
18	157.00	Commscope NNVV-65B-R4	3	77.40	12.27	0.75	459.89	14.220	0.75	0.00	0.00
19	157.00	Sitepro PRK-1245L	1	464.91	9.50	1.00	899.62	22.824	1.00	0.00	0.00
20	157.00	Sitepro HRK14-U	1	302.36	8.13	1.00	782.98	18.773	1.00	0.00	0.00
21	157.00	Sitepro PRK-SFS-H-L	1	230.00	6.70	1.00	660.12	16.097	1.00	0.00	0.00
22	157.00	ALU 1900 Mhz	3	60.00	2.77	0.67	171.76	4.469	0.67	0.00	0.00
23	157.00	ALU 800 Mhz	6	53.00	2.49	0.67	152.06	4.022	0.67	0.00	0.00
24	157.00	ALU TD-RRH8x20-25	3	70.00	4.05	0.67	228.65	5.168	0.67	0.00	0.00
25	137.00	LP Platform-Round	1	1500.00	22.00	1.00	3229.47	45.336	1.00	0.00	0.00
26	137.00	DC6-48-60-18-8F	1	32.80	1.47	1.00	117.06	2.395	1.00	0.00	0.00
27	137.00	RRUS-11	3	55.00	4.42	0.68	173.86	6.401	0.68	0.00	0.00
28	137.00	7770.00	6	35.00	5.50	0.73	226.86	6.937	0.73	0.00	0.00
29	137.00	LGP21401	6	19.00	1.29	0.67	63.51	2.394	0.67	0.00	0.00
30	137.00	LGP21903	6	5.00	0.27	0.84	15.12	0.795	0.84	3.00	0.00
31	137.00	HPA-65R-BUU-H6	3	51.00	9.66	0.85	396.24	11.499	0.85	0.00	0.00
32	137.00	7020	12	2.20	0.40	0.50	15.71	1.040	0.50	0.00	0.00
33	137.00	RRUS 32-B2	3	53.00	2.74	0.67	202.22	4.026	0.67	0.00	0.00
34	137.00	Smart Bias T 1001940	3	2.00	0.09	0.67	4.64	0.400	0.67	5.70	0.00
		Totals:	**109**	**11,490.67**			**35,205.34**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	176.00	(12) 1 5/8" Coax	0.00	Inside
0.00	176.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	176.00	(1) Safety Cable	0.38	Outside
0.00	176.00	(1) Step bolts (ladder)	0.63	Outside
0.00	167.00	(6) 1 5/8" Coax	0.00	Inside
0.00	167.00	(2) 1 5/8" Hybrid	0.00	Inside
0.00	157.00	(4) 1 1/4" Fiber	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	137.00	(12) 1 5/8" Coax			0.00	Inside					
0.00	137.00	(1) 1/2" Coax			0.00	Inside					
0.00	137.00	(1) 3" conduit			0.00	Inside					
0.00	137.00	(2) 3/4" DC			0.00	Inside					

Shaft Section Properties

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.5000	56.550	88.948	35305.4	18.53	113.10	79.6	1229.	0.0
5.00		0.5000	55.565	87.385	33476.4	18.18	111.13	80.0	1186.	1500.1
10.00		0.5000	54.580	85.822	31711.8	17.84	109.16	80.4	1144.	1473.5
15.00		0.5000	53.595	84.258	30010.2	17.49	107.19	80.8	1102.	1446.9
20.00		0.5000	52.610	82.695	28370.6	17.14	105.22	81.2	1062.	1420.3
25.00		0.5000	51.625	81.132	26791.9	16.79	103.25	81.6	1022.	1393.7
30.00		0.5000	50.639	79.569	25272.8	16.45	101.28	82.1	983.0	1367.1
35.00		0.5000	49.654	78.005	23812.3	16.10	99.31	82.5	944.6	1340.5
40.00		0.5000	48.669	76.442	22409.2	15.75	97.34	82.5	906.9	1313.9
42.75	Bot - Section 2	0.5000	48.128	75.582	21661.5	15.56	96.26	82.5	886.5	711.3
45.00		0.5000	47.684	74.879	21062.3	15.41	95.37	82.5	870.0	1089.9
49.00	Top - Section 1	0.4375	47.771	65.726	18605.1	17.84	109.19	0.0	0.0	1912.7
50.00		0.4375	47.574	65.453	18373.8	17.76	108.74	80.5	760.7	223.2
55.00		0.4375	46.589	64.085	17245.7	17.37	106.49	81.0	729.1	1102.0
60.00		0.4375	45.604	62.717	16164.8	16.97	104.24	81.4	698.2	1078.7
65.00		0.4375	44.619	61.349	15130.1	16.57	101.99	81.9	667.9	1055.4
70.00		0.4375	43.634	59.981	14140.4	16.18	99.73	82.4	638.3	1032.2
75.00		0.4375	42.649	58.613	13194.9	15.78	97.48	82.5	609.4	1008.9
80.00		0.4375	41.664	57.246	12292.5	15.38	95.23	82.5	581.1	985.6
85.00		0.4375	40.679	55.878	11432.2	14.98	92.98	82.5	553.5	962.3
86.50	Bot - Section 3	0.4375	40.383	55.467	11182.2	14.87	92.30	82.5	545.4	284.2
90.00		0.4375	39.693	54.510	10613.0	14.59	90.73	82.5	526.6	1227.8
91.75	Top - Section 2	0.3750	40.099	47.279	9425.9	17.44	106.93	0.0	0.0	605.9
95.00		0.3750	39.458	46.517	8977.4	17.14	105.22	81.2	448.1	518.7
100.00		0.3750	38.473	45.345	8315.6	16.68	102.60	81.8	425.7	781.5
105.00		0.3750	37.488	44.172	7687.1	16.22	99.97	82.3	403.9	761.5
110.00		0.3750	36.503	43.000	7091.1	15.75	97.34	82.5	382.6	741.6
115.00		0.3750	35.518	41.827	6526.7	15.29	94.71	82.5	361.9	721.6
120.00		0.3750	34.533	40.655	5993.1	14.83	92.09	82.5	341.8	701.7
125.00		0.3750	33.548	39.483	5489.4	14.36	89.46	82.5	322.3	681.7
130.00		0.3750	32.563	38.310	5014.7	13.90	86.83	82.5	303.3	661.8
131.25	Bot - Section 4	0.3750	32.317	38.017	4900.5	13.78	86.18	82.5	298.7	162.3
135.00		0.3750	31.578	37.138	4568.3	13.44	84.21	82.5	284.9	805.5
135.50	Top - Section 3	0.2500	31.979	25.176	3202.3	21.14	127.92	0.0	0.0	106.0
137.00		0.2500	31.684	24.942	3113.6	20.94	126.73	76.8	193.6	127.9
140.00		0.2500	31.093	24.473	2941.3	20.52	124.37	77.3	186.3	252.2
145.00		0.2500	30.108	23.691	2668.4	19.82	120.43	78.1	174.6	409.7
150.00		0.2500	29.122	22.909	2412.9	19.13	116.49	78.9	163.2	396.4
155.00		0.2500	28.137	22.128	2174.2	18.43	112.55	79.7	152.2	383.1
157.00		0.2500	27.743	21.815	2083.4	18.16	110.97	80.0	147.9	149.5
160.00		0.2500	27.152	21.346	1951.9	17.74	108.61	80.5	141.6	220.3
165.00		0.2500	26.167	20.565	1745.2	17.05	104.67	81.4	131.4	356.5
167.00		0.2500	25.773	20.252	1666.8	16.77	103.09	81.7	127.4	138.9
170.00		0.2500	25.182	19.783	1553.7	16.35	100.73	82.2	121.5	204.3
175.00		0.2500	24.197	19.001	1376.7	15.66	96.79	82.5	112.1	329.9
176.00		0.2500	24.000	18.845	1343.0	15.52	96.00	82.5	110.2	64.4
										34212.9

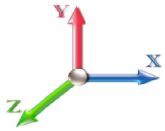
Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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	19.450	21.40	427.94	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	420.48	0.650	0.000	5.00	23.718	15.42	527.7	0.0	1800.1
10.00		1.00	0.85	19.450	21.40	413.03	0.650	0.000	5.00	23.301	15.15	518.5	0.0	1768.1
15.00		1.00	0.85	19.450	21.40	405.57	0.650	0.000	5.00	22.884	14.87	509.2	0.0	1736.2
20.00		1.00	0.90	20.638	22.70	410.09	0.650	0.000	5.00	22.467	14.60	530.4	0.0	1704.3
25.00		1.00	0.95	21.630	23.79	411.98	0.650	0.000	5.00	22.050	14.33	545.6	0.0	1672.4
30.00		1.00	0.98	22.477	24.72	411.95	0.650	0.000	5.00	21.634	14.06	556.3	0.0	1640.5
35.00		1.00	1.01	23.218	25.54	410.54	0.650	0.000	5.00	21.217	13.79	563.5	0.0	1608.6
40.00		1.00	1.04	23.880	26.27	408.09	0.650	0.000	5.00	20.800	13.52	568.2	0.0	1576.6
42.75	Bot - Section 2	1.00	1.06	24.217	26.64	406.38	0.650	0.000	2.75	11.262	7.32	312.0	0.0	853.6
45.00		1.00	1.07	24.479	26.93	404.82	0.650	0.000	2.25	9.288	6.04	260.1	0.0	1307.9
49.00	Top - Section 1	1.00	1.09	24.922	27.41	401.71	0.650	0.000	4.00	16.303	10.60	464.8	0.0	2295.3
50.00		1.00	1.09	25.029	27.53	408.39	0.650	0.000	1.00	4.034	2.62	115.5	0.0	267.8
55.00		1.00	1.12	25.536	28.09	403.97	0.650	0.000	5.00	19.920	12.95	581.9	0.0	1322.4
60.00		1.00	1.14	26.008	28.61	399.06	0.650	0.000	5.00	19.503	12.68	580.3	0.0	1294.4
65.00		1.00	1.16	26.450	29.09	393.75	0.650	0.000	5.00	19.086	12.41	577.5	0.0	1266.5
70.00		1.00	1.17	26.866	29.55	388.07	0.650	0.000	5.00	18.670	12.14	573.8	0.0	1238.6
75.00		1.00	1.19	27.259	29.98	382.07	0.650	0.000	5.00	18.253	11.86	569.2	0.0	1210.7
80.00		1.00	1.21	27.632	30.39	375.79	0.650	0.000	5.00	17.836	11.59	563.8	0.0	1182.7
85.00		1.00	1.22	27.987	30.79	369.25	0.650	0.000	5.00	17.419	11.32	557.7	0.0	1154.8
86.50	Bot - Section 3	1.00	1.23	28.090	30.90	367.25	0.650	0.000	1.50	5.145	3.34	165.3	0.0	341.0
90.00		1.00	1.24	28.325	31.16	362.49	0.650	0.000	3.50	12.080	7.85	391.4	0.0	1473.3
91.75	Top - Section 2	1.00	1.24	28.441	31.28	360.07	0.650	0.000	1.75	5.963	3.88	194.0	0.0	727.1
95.00		1.00	1.25	28.650	31.51	362.40	0.650	0.000	3.25	10.940	7.11	358.5	0.0	622.4
100.00		1.00	1.27	28.961	31.86	355.26	0.650	0.000	5.00	16.486	10.72	546.2	0.0	937.8
105.00		1.00	1.28	29.260	32.19	347.95	0.650	0.000	5.00	16.069	10.45	537.9	0.0	913.8
110.00		1.00	1.29	29.548	32.50	340.47	0.650	0.000	5.00	15.653	10.17	529.1	0.0	889.9
115.00		1.00	1.30	29.826	32.81	332.83	0.650	0.000	5.00	15.236	9.90	519.9	0.0	865.9
120.00		1.00	1.32	30.094	33.10	325.06	0.650	0.000	5.00	14.819	9.63	510.2	0.0	842.0
125.00		1.00	1.33	30.354	33.39	317.14	0.650	0.000	5.00	14.402	9.36	500.1	0.0	818.1
130.00		1.00	1.34	30.605	33.67	309.11	0.650	0.000	5.00	13.986	9.09	489.7	0.0	794.1
131.25	Bot - Section 4	1.00	1.34	30.667	33.73	307.08	0.650	0.000	1.25	3.431	2.23	120.4	0.0	194.8
135.00		1.00	1.35	30.850	33.93	300.95	0.650	0.000	3.75	10.296	6.69	363.4	0.0	966.6
135.50	Top - Section 3	1.00	1.35	30.874	33.96	300.13	0.650	0.000	0.50	1.355	0.88	47.9	0.0	127.2
137.00	Appurtenance(s)	1.00	1.35	30.945	34.04	302.42	0.650	0.000	1.50	4.040	2.63	143.0	0.0	153.5
140.00		1.00	1.36	31.087	34.20	297.46	0.650	0.000	3.00	7.968	5.18	283.4	0.0	302.7
145.00		1.00	1.37	31.317	34.45	289.10	0.650	0.000	5.00	12.947	8.42	463.8	0.0	491.7
150.00		1.00	1.38	31.541	34.70	280.64	0.650	0.000	5.00	12.530	8.14	452.1	0.0	475.7
155.00		1.00	1.39	31.760	34.94	272.09	0.650	0.000	5.00	12.113	7.87	440.1	0.0	459.8
157.00	Appurtenance(s)	1.00	1.39	31.846	35.03	268.64	0.650	0.000	2.00	4.729	3.07	172.3	0.0	179.4
160.00		1.00	1.40	31.973	35.17	263.44	0.650	0.000	3.00	6.968	4.53	254.9	0.0	264.4
165.00		1.00	1.41	32.181	35.40	254.71	0.650	0.000	5.00	11.280	7.33	415.3	0.0	427.8
167.00	Appurtenance(s)	1.00	1.41	32.262	35.49	251.19	0.650	0.000	2.00	4.395	2.86	162.2	0.0	166.7
170.00		1.00	1.42	32.384	35.62	245.89	0.650	0.000	3.00	6.468	4.20	239.6	0.0	245.2
175.00		1.00	1.42	32.582	35.84	236.99	0.650	0.000	5.00	10.446	6.79	389.4	0.0	395.9
176.00	Appurtenance(s)	1.00	1.43	32.621	35.88	235.20	0.650	0.000	1.00	2.039	1.33	76.1	0.0	77.3

Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Totals:	**176.00**	**18,242.3**	**41,055.5**

Discrete Appurtenance Forces

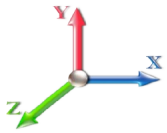
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	176.00	KRY 112 89/4	3	32.660	35.926	0.50	0.75	0.98	55.44	0.000	1.000	56.32	0.00	56.32
2	176.00	KRY 112 489/2	3	32.660	35.926	0.50	0.75	0.98	55.44	0.000	1.000	56.32	0.00	56.32
3	176.00	RMQP-496-HK	1	32.660	35.926	1.00	1.00	46.00	2938.80	0.000	1.000	2644.15	0.00	2644.15
4	176.00	APXVAARR24_43-U-NA2	3	32.660	35.926	0.52	0.75	31.88	460.80	0.000	1.000	1832.39	0.00	1832.39
5	176.00	Lightning Rod	1	32.756	36.032	1.00	1.00	1.05	42.00	0.000	3.500	60.53	0.00	211.87
6	176.00	MHA FE15501P77/75	6	32.660	35.926	0.49	0.75	2.72	79.20	0.000	1.000	156.36	0.00	156.36
7	176.00	RR90-17-02DP	3	32.660	35.926	0.51	0.75	6.67	48.60	0.000	1.000	383.45	0.00	383.45
8	176.00	4449	3	32.660	35.926	0.50	0.75	2.49	252.00	0.000	1.000	142.98	0.00	142.98
9	167.00	RRH2X60-AWS	3	32.262	35.489	0.61	0.80	6.38	216.00	0.000	0.000	362.50	0.00	0.00
10	167.00	RRH2X60-700	3	32.262	35.489	0.61	0.80	6.38	216.00	0.000	0.000	362.50	0.00	0.00
11	167.00	Low Profile	1	32.262	35.489	1.00	1.00	22.00	1800.00	0.000	0.000	1249.20	0.00	0.00
12	167.00	DB-T16Z-8AB-0Z	1	32.262	35.489	1.00	1.00	4.80	22.68	0.000	0.000	272.55	0.00	0.00
13	167.00	SBNHH-1D65B	6	32.262	35.489	0.66	0.80	32.51	288.00	0.000	0.000	1845.95	0.00	0.00
14	167.00	LPA-80063-4CF-EDIN-5	4	32.262	35.489	0.74	0.80	18.30	96.00	0.000	0.000	1039.25	0.00	0.00
15	167.00	APL868013	2	32.262	35.489	0.84	0.90	4.79	15.12	0.000	0.000	271.85	0.00	0.00
16	157.00	Low Profile Platform	1	31.846	35.030	1.00	1.00	22.00	1800.00	0.000	0.000	1233.07	0.00	0.00
17	157.00	ALU TD-RRH8x20-25	3	31.846	35.030	0.54	0.80	6.51	252.00	0.000	0.000	365.01	0.00	0.00
18	157.00	ALU 800 Mhz	6	31.846	35.030	0.54	0.80	8.01	381.60	0.000	0.000	448.83	0.00	0.00
19	157.00	Sitepro PRK-SFS-H-L	1	31.846	35.030	1.00	1.00	6.70	276.00	0.000	0.000	375.53	0.00	0.00
20	157.00	Sitepro HRK14-U	1	31.846	35.030	1.00	1.00	8.13	362.83	0.000	0.000	455.67	0.00	0.00
21	157.00	Sitepro PRK-1245L	1	31.846	35.030	1.00	1.00	9.50	557.89	0.000	0.000	532.46	0.00	0.00
22	157.00	Commscope	3	31.846	35.030	0.60	0.80	22.09	278.64	0.000	0.000	1237.89	0.00	0.00
23	157.00	RFS APXVTM14-C-I20	3	31.846	35.030	0.62	0.80	11.72	202.32	0.000	0.000	656.68	0.00	0.00
24	157.00	ALU 1900 Mhz	3	31.846	35.030	0.54	0.80	4.45	216.00	0.000	0.000	249.65	0.00	0.00
25	137.00	7770.00	6	30.945	34.040	0.58	0.80	19.27	252.00	0.000	0.000	1049.62	0.00	0.00
26	137.00	LGP21401	6	30.945	34.040	0.54	0.80	4.15	136.80	0.000	0.000	225.95	0.00	0.00
27	137.00	LGP21903	6	30.945	34.040	0.67	0.80	1.09	36.00	4.341	0.000	59.29	160.85	0.00
28	137.00	RRUS-11	3	30.945	34.040	0.54	0.80	7.21	198.00	0.000	0.000	392.87	0.00	0.00
29	137.00	DC6-48-60-18-8F	1	30.945	34.040	1.00	1.00	1.47	39.36	0.000	0.000	80.06	0.00	0.00
30	137.00	RRUS 32-B2	3	30.945	34.040	0.54	0.80	4.41	190.80	0.000	0.000	239.96	0.00	0.00
31	137.00	LP Platform-Round	1	30.945	34.040	1.00	1.00	22.00	1800.00	0.000	0.000	1198.20	0.00	0.00
32	137.00	HPA-65R-BUU-H6	3	30.945	34.040	0.68	0.80	19.71	183.60	0.000	0.000	1073.28	0.00	0.00
33	137.00	7020	12	30.945	34.040	0.40	0.80	1.92	31.68	0.000	0.000	104.57	0.00	0.00
34	137.00	Smart Bias T 1001940	3	30.945	34.040	0.54	0.80	0.14	7.20	7.041	0.000	7.88	34.68	0.00
							Totals:		**13,788.80**			**20,722.78**		

Total Applied Force Summary

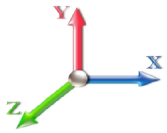
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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		527.74	2047.22	0.00	0.00
10.00		518.47	2015.31	0.00	0.00
15.00		509.20	1983.39	0.00	0.00
20.00		530.44	1951.47	0.00	0.00
25.00		545.64	1919.56	0.00	0.00
30.00		556.27	1887.64	0.00	0.00
35.00		563.55	1855.72	0.00	0.00
40.00		568.23	1823.81	0.00	0.00
42.75		312.01	989.49	0.00	0.00
45.00		260.09	1419.14	0.00	0.00
49.00		464.81	2493.00	0.00	0.00
50.00		115.50	317.26	0.00	0.00
55.00		581.92	1569.52	0.00	0.00
60.00		580.28	1541.59	0.00	0.00
65.00		577.53	1513.67	0.00	0.00
70.00		573.80	1485.74	0.00	0.00
75.00		569.20	1457.81	0.00	0.00
80.00		563.81	1429.89	0.00	0.00
85.00		557.71	1401.96	0.00	0.00
86.50		165.32	415.14	0.00	0.00
90.00		391.45	1646.32	0.00	0.00
91.75		194.03	813.63	0.00	0.00
95.00		358.55	783.03	0.00	0.00
100.00		546.21	1184.92	0.00	0.00
105.00		537.90	1160.98	0.00	0.00
110.00		529.10	1137.04	0.00	0.00
115.00		519.85	1113.10	0.00	0.00
120.00		510.18	1089.17	0.00	0.00
125.00		500.12	1065.23	0.00	0.00
130.00		489.67	1041.29	0.00	0.00
131.25		120.38	256.58	0.00	0.00
135.00		363.37	1151.97	0.00	0.00
135.50		47.86	151.90	0.00	0.00
137.00	(44) attachments	4574.72	3103.07	195.53	0.00
140.00		283.37	396.17	0.00	0.00
145.00		463.84	647.51	0.00	0.00
150.00		452.12	631.55	0.00	0.00
155.00		440.11	615.59	0.00	0.00
157.00	(22) attachments	5727.06	4569.05	0.00	0.00
160.00		254.86	348.36	0.00	0.00
165.00		415.26	567.84	0.00	0.00
167.00	(20) attachments	5566.01	2876.47	0.00	0.00
170.00		239.61	298.83	0.00	0.00
175.00		389.36	485.28	0.00	0.00
176.00	(23) attachments	5408.61	4027.42	0.00	5483.85

Total Applied Force Summary

Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

Totals:	**38,965.10**	**62,680.64**	**195.53**	**5,483.85**

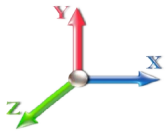
Linear Appurtenance Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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	0.018	0.000	19.450	0.00	1.64
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	19.450	0.00	6.24
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.018	0.000	19.450	0.00	1.64
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	19.450	0.00	6.24
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.018	0.000	19.450	0.00	1.64
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	19.450	0.00	6.24
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	20.638	0.00	1.64
20.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	20.638	0.00	6.24
25.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	21.630	0.00	1.64
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	21.630	0.00	6.24
30.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	22.477	0.00	1.64
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	22.477	0.00	6.24
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.020	0.000	23.218	0.00	1.64
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.020	0.000	23.218	0.00	6.24
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.020	0.000	23.880	0.00	1.64
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.020	0.000	23.880	0.00	6.24
42.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.021	0.000	24.217	0.00	0.90
42.75	Step bolts (ladder)	Yes	2.75	0.000	0.63	0.14	0.00	0.021	0.000	24.217	0.00	3.43
45.00	Safety Cable	Yes	2.25	0.000	0.38	0.07	0.00	0.021	0.000	24.479	0.00	0.74
45.00	Step bolts (ladder)	Yes	2.25	0.000	0.63	0.12	0.00	0.021	0.000	24.479	0.00	2.81
49.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.021	0.000	24.922	0.00	1.31
49.00	Step bolts (ladder)	Yes	4.00	0.000	0.63	0.21	0.00	0.021	0.000	24.922	0.00	4.99
50.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.021	0.000	25.029	0.00	0.33
50.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.05	0.00	0.021	0.000	25.029	0.00	1.25
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.021	0.000	25.536	0.00	1.64
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.021	0.000	25.536	0.00	6.24
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.022	0.000	26.008	0.00	1.64
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.022	0.000	26.008	0.00	6.24
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.022	0.000	26.450	0.00	1.64
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.022	0.000	26.450	0.00	6.24
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.023	0.000	26.866	0.00	1.64
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.023	0.000	26.866	0.00	6.24
75.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.023	0.000	27.259	0.00	1.64
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.023	0.000	27.259	0.00	6.24
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.024	0.000	27.632	0.00	1.64
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.024	0.000	27.632	0.00	6.24
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.024	0.000	27.987	0.00	1.64
85.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.024	0.000	27.987	0.00	6.24
86.50	Safety Cable	Yes	1.50	0.000	0.38	0.05	0.00	0.025	0.000	28.090	0.00	0.49
86.50	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.08	0.00	0.025	0.000	28.090	0.00	1.87
90.00	Safety Cable	Yes	3.50	0.000	0.38	0.11	0.00	0.025	0.000	28.325	0.00	1.15
90.00	Step bolts (ladder)	Yes	3.50	0.000	0.63	0.18	0.00	0.025	0.000	28.325	0.00	4.37
91.75	Safety Cable	Yes	1.75	0.000	0.38	0.06	0.00	0.025	0.000	28.441	0.00	0.57
91.75	Step bolts (ladder)	Yes	1.75	0.000	0.63	0.09	0.00	0.025	0.000	28.441	0.00	2.18
95.00	Safety Cable	Yes	3.25	0.000	0.38	0.10	0.00	0.025	0.000	28.650	0.00	1.06
95.00	Step bolts (ladder)	Yes	3.25	0.000	0.63	0.17	0.00	0.025	0.000	28.650	0.00	4.06
100.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.026	0.000	28.961	0.00	1.64

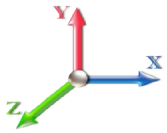
Linear Appurtenance Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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)
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.026	0.000	28.961	0.00	6.24
105.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.026	0.000	29.260	0.00	1.64
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.026	0.000	29.260	0.00	6.24
110.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.027	0.000	29.548	0.00	1.64
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.027	0.000	29.548	0.00	6.24
115.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.028	0.000	29.826	0.00	1.64
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.028	0.000	29.826	0.00	6.24
120.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.028	0.000	30.094	0.00	1.64
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.028	0.000	30.094	0.00	6.24
125.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.029	0.000	30.354	0.00	1.64
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.029	0.000	30.354	0.00	6.24
130.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.030	0.000	30.605	0.00	1.64
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.030	0.000	30.605	0.00	6.24
131.25	Safety Cable	Yes	1.25	0.000	0.38	0.04	0.00	0.031	0.000	30.667	0.00	0.41
131.25	Step bolts (ladder)	Yes	1.25	0.000	0.63	0.07	0.00	0.031	0.000	30.667	0.00	1.56
135.00	Safety Cable	Yes	3.75	0.000	0.38	0.12	0.00	0.031	0.000	30.850	0.00	1.23
135.00	Step bolts (ladder)	Yes	3.75	0.000	0.63	0.20	0.00	0.031	0.000	30.850	0.00	4.68
135.50	Safety Cable	Yes	0.50	0.000	0.38	0.02	0.00	0.032	0.000	30.874	0.00	0.16
135.50	Step bolts (ladder)	Yes	0.50	0.000	0.63	0.03	0.00	0.032	0.000	30.874	0.00	0.62
137.00	Safety Cable	Yes	1.50	0.000	0.38	0.05	0.00	0.031	0.000	30.945	0.00	0.49
137.00	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.08	0.00	0.031	0.000	30.945	0.00	1.87
140.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.032	0.000	31.087	0.00	0.98
140.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.032	0.000	31.087	0.00	3.74
145.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.033	0.000	31.317	0.00	1.64
145.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.033	0.000	31.317	0.00	6.24
150.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.034	0.000	31.541	0.00	1.64
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.034	0.000	31.541	0.00	6.24
155.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.035	0.000	31.760	0.00	1.64
155.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.035	0.000	31.760	0.00	6.24
157.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.036	0.000	31.846	0.00	0.66
157.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.10	0.00	0.036	0.000	31.846	0.00	2.50
160.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.036	0.000	31.973	0.00	0.98
160.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.036	0.000	31.973	0.00	3.74
165.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.037	0.000	32.181	0.00	1.64
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.037	0.000	32.181	0.00	6.24
167.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.038	0.000	32.262	0.00	0.66
167.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.10	0.00	0.038	0.000	32.262	0.00	2.50
170.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.039	0.000	32.384	0.00	0.98
170.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.039	0.000	32.384	0.00	3.74
175.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.040	0.000	32.582	0.00	1.64
175.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.040	0.000	32.582	0.00	6.24
176.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.041	0.000	32.621	0.00	0.33
176.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.05	0.00	0.041	0.000	32.621	0.00	1.25
										Totals:	**0.0**	**277.3**

Calculated Forces

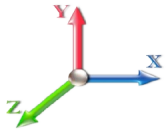
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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	-62.61	-39.08	-0.19	-5166.3	0.00	5166.30	6372.54	3186.27	14661.2	7341.49	0.00	0.000	0.000	0.714
5.00	-60.42	-38.76	-0.19	-4970.9	0.00	4970.91	6292.68	3146.34	14220.7	7120.95	0.11	-0.204	0.000	0.708
10.00	-58.27	-38.45	-0.19	-4777.0	0.00	4777.09	6211.66	3105.83	13784.2	6902.39	0.43	-0.411	0.000	0.702
15.00	-56.15	-38.13	-0.19	-4584.8	0.00	4584.86	6129.50	3064.75	13351.9	6685.89	0.98	-0.621	0.000	0.695
20.00	-54.07	-37.77	-0.19	-4394.2	0.00	4394.22	6046.18	3023.09	12923.8	6471.51	1.74	-0.834	0.000	0.688
25.00	-52.02	-37.40	-0.19	-4205.3	0.00	4205.35	5961.72	2980.86	12500.0	6259.33	2.73	-1.050	0.000	0.681
30.00	-50.00	-36.99	-0.19	-4018.3	0.00	4018.38	5876.11	2938.05	12080.8	6049.42	3.95	-1.268	0.000	0.673
35.00	-48.02	-36.57	-0.19	-3833.4	-0.01	3833.42	5789.35	2894.67	11666.3	5841.84	5.39	-1.489	0.000	0.665
40.00	-46.10	-36.09	-0.19	-3650.5	-0.01	3650.57	5679.25	2839.63	11212.8	5614.75	7.07	-1.713	0.000	0.658
42.75	-45.05	-35.84	-0.19	-3551.3	-0.01	3551.32	5615.38	2807.69	10960.7	5488.51	8.10	-1.838	0.000	0.655
45.00	-43.55	-35.64	-0.19	-3470.6	-0.01	3470.68	5563.11	2781.56	10756.6	5386.29	8.99	-1.942	0.000	0.652
49.00	-41.00	-35.17	-0.19	-3328.1	-0.01	3328.11	4756.80	2378.40	9239.06	4626.40	10.69	-2.126	0.000	0.728
50.00	-40.60	-35.15	-0.19	-3292.9	-0.01	3292.94	4742.51	2371.25	9172.60	4593.12	11.14	-2.173	0.000	0.726
55.00	-38.90	-34.68	-0.19	-3117.1	-0.01	3117.19	4670.33	2335.16	8842.49	4427.82	13.55	-2.421	0.000	0.713
60.00	-37.24	-34.19	-0.19	-2943.8	-0.01	2943.82	4597.00	2298.50	8516.13	4264.39	16.22	-2.671	0.000	0.699
65.00	-35.61	-33.70	-0.19	-2772.8	-0.01	2772.87	4522.52	2261.26	8193.68	4102.93	19.15	-2.922	0.000	0.684
70.00	-34.01	-33.20	-0.19	-2604.3	-0.01	2604.39	4446.89	2223.45	7875.26	3943.48	22.35	-3.175	0.000	0.668
75.00	-32.44	-32.69	-0.19	-2438.4	-0.01	2438.42	4354.69	2177.34	7534.33	3772.77	25.81	-3.429	0.000	0.654
80.00	-30.91	-32.17	-0.19	-2274.9	-0.01	2274.99	4253.06	2126.53	7185.02	3597.85	29.53	-3.683	0.000	0.640
85.00	-29.46	-31.61	-0.19	-2114.1	-0.01	2114.13	4151.43	2075.72	6843.99	3427.08	33.52	-3.937	0.000	0.624
86.50	-28.98	-31.48	-0.19	-2066.7	-0.01	2066.72	4120.95	2060.47	6743.30	3376.66	34.77	-4.015	0.000	0.619
90.00	-27.30	-31.04	-0.19	-1956.5	-0.01	1956.54	4049.81	2024.90	6511.26	3260.47	37.78	-4.194	0.000	0.607
91.75	-26.43	-30.84	-0.19	-1902.2	-0.01	1902.23	3441.70	1720.85	5608.94	2808.64	39.33	-4.285	0.000	0.685
95.00	-25.56	-30.52	-0.19	-1801.9	-0.01	1801.99	3401.05	1700.53	5452.51	2730.31	42.30	-4.450	0.000	0.668
100.00	-24.28	-30.00	-0.19	-1649.3	-0.01	1649.38	3337.56	1668.78	5214.58	2611.16	47.11	-4.724	0.000	0.639
105.00	-23.03	-29.47	-0.19	-1499.3	-0.01	1499.39	3272.92	1636.46	4980.08	2493.74	52.19	-4.993	0.000	0.609
110.00	-21.81	-28.94	-0.19	-1352.0	-0.01	1352.03	3194.68	1597.34	4730.71	2368.87	57.56	-5.257	0.000	0.578
115.00	-20.63	-28.41	-0.19	-1207.3	-0.01	1207.32	3107.57	1553.79	4474.96	2240.81	63.19	-5.514	0.000	0.546
120.00	-19.48	-27.88	-0.19	-1065.2	-0.01	1065.26	3020.47	1510.23	4226.32	2116.30	69.09	-5.761	0.000	0.510
125.00	-18.36	-27.35	-0.19	-925.87	-0.01	925.87	2933.36	1466.68	3984.78	1995.35	75.24	-5.997	-0.001	0.471
130.00	-17.31	-26.79	-0.19	-789.13	-0.01	789.13	2846.25	1423.13	3750.35	1877.96	81.64	-6.220	-0.001	0.427
131.25	-17.02	-26.67	-0.19	-755.65	-0.02	755.65	2824.47	1412.24	3692.86	1849.17	83.27	-6.274	-0.001	0.415
135.00	-15.88	-26.21	-0.20	-655.62	-0.02	655.62	2759.14	1379.57	3523.03	1764.13	88.25	-6.428	-0.001	0.378
135.50	-15.72	-26.16	-0.20	-642.52	-0.02	642.52	1734.08	867.04	2260.78	1132.07	88.92	-6.448	-0.001	0.578
137.00	-13.11	-21.28	0.00	-603.28	0.01	603.28	1723.43	861.72	2225.81	1114.56	90.95	-6.507	-0.001	0.549
140.00	-12.67	-21.00	0.00	-539.43	0.01	539.43	1701.83	850.91	2156.25	1079.73	95.09	-6.664	-0.001	0.508
145.00	-12.01	-20.51	0.00	-434.42	0.00	434.42	1664.90	832.45	2041.54	1022.29	102.18	-6.899	-0.001	0.433
150.00	-11.37	-20.02	0.00	-331.87	0.00	331.87	1626.81	813.41	1928.48	965.67	109.50	-7.103	-0.001	0.351
155.00	-10.78	-19.53	0.00	-231.76	0.00	231.76	1587.58	793.79	1817.22	909.96	117.02	-7.270	-0.001	0.262
157.00	-6.96	-13.28	0.00	-192.70	0.00	192.70	1571.57	785.79	1773.24	887.94	120.07	-7.325	-0.001	0.222
160.00	-6.63	-12.99	0.00	-152.88	0.00	152.88	1547.20	773.60	1707.88	855.21	124.68	-7.396	-0.001	0.183
165.00	-6.11	-12.51	0.00	-87.94	0.00	87.94	1505.67	752.84	1600.62	801.50	132.46	-7.484	-0.001	0.114
167.00	-3.98	-6.62	0.00	-62.92	0.00	62.92	1488.74	744.37	1558.33	780.32	135.59	-7.508	-0.001	0.083
170.00	-3.71	-6.34	0.00	-43.08	0.00	43.08	1462.99	731.50	1495.57	748.90	140.30	-7.535	-0.001	0.060
175.00	-3.28	-5.89	0.00	-11.38	0.00	11.38	1411.70	705.85	1385.55	693.80	148.19	-7.560	-0.001	0.019
176.00	0.00	-5.41	0.00	-5.48	0.00	5.48	1400.09	700.04	1362.73	682.38	149.77	-7.562	-0.001	0.008

Wind Loading - Shaft

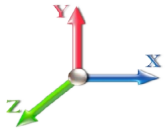
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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	19.450	21.40	427.94	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	420.48	0.650	0.000	5.00	23.718	15.42	527.7	0.0	1350.0
10.00		1.00	0.85	19.450	21.40	413.03	0.650	0.000	5.00	23.301	15.15	518.5	0.0	1326.1
15.00		1.00	0.85	19.450	21.40	405.57	0.650	0.000	5.00	22.884	14.87	509.2	0.0	1302.2
20.00		1.00	0.90	20.638	22.70	410.09	0.650	0.000	5.00	22.467	14.60	530.4	0.0	1278.2
25.00		1.00	0.95	21.630	23.79	411.98	0.650	0.000	5.00	22.050	14.33	545.6	0.0	1254.3
30.00		1.00	0.98	22.477	24.72	411.95	0.650	0.000	5.00	21.634	14.06	556.3	0.0	1230.4
35.00		1.00	1.01	23.218	25.54	410.54	0.650	0.000	5.00	21.217	13.79	563.5	0.0	1206.4
40.00		1.00	1.04	23.880	26.27	408.09	0.650	0.000	5.00	20.800	13.52	568.2	0.0	1182.5
42.75	Bot - Section 2	1.00	1.06	24.217	26.64	406.38	0.650	0.000	2.75	11.262	7.32	312.0	0.0	640.2
45.00		1.00	1.07	24.479	26.93	404.82	0.650	0.000	2.25	9.288	6.04	260.1	0.0	980.9
49.00	Top - Section 1	1.00	1.09	24.922	27.41	401.71	0.650	0.000	4.00	16.303	10.60	464.8	0.0	1721.5
50.00		1.00	1.09	25.029	27.53	408.39	0.650	0.000	1.00	4.034	2.62	115.5	0.0	200.9
55.00		1.00	1.12	25.536	28.09	403.97	0.650	0.000	5.00	19.920	12.95	581.9	0.0	991.8
60.00		1.00	1.14	26.008	28.61	399.06	0.650	0.000	5.00	19.503	12.68	580.3	0.0	970.8
65.00		1.00	1.16	26.450	29.09	393.75	0.650	0.000	5.00	19.086	12.41	577.5	0.0	949.9
70.00		1.00	1.17	26.866	29.55	388.07	0.650	0.000	5.00	18.670	12.14	573.8	0.0	928.9
75.00		1.00	1.19	27.259	29.98	382.07	0.650	0.000	5.00	18.253	11.86	569.2	0.0	908.0
80.00		1.00	1.21	27.632	30.39	375.79	0.650	0.000	5.00	17.836	11.59	563.8	0.0	887.0
85.00		1.00	1.22	27.987	30.79	369.25	0.650	0.000	5.00	17.419	11.32	557.7	0.0	866.1
86.50	Bot - Section 3	1.00	1.23	28.090	30.90	367.25	0.650	0.000	1.50	5.145	3.34	165.3	0.0	255.7
90.00		1.00	1.24	28.325	31.16	362.49	0.650	0.000	3.50	12.080	7.85	391.4	0.0	1105.0
91.75	Top - Section 2	1.00	1.24	28.441	31.28	360.07	0.650	0.000	1.75	5.963	3.88	194.0	0.0	545.3
95.00		1.00	1.25	28.650	31.51	362.40	0.650	0.000	3.25	10.940	7.11	358.5	0.0	466.8
100.00		1.00	1.27	28.961	31.86	355.26	0.650	0.000	5.00	16.486	10.72	546.2	0.0	703.3
105.00		1.00	1.28	29.260	32.19	347.95	0.650	0.000	5.00	16.069	10.45	537.9	0.0	685.4
110.00		1.00	1.29	29.548	32.50	340.47	0.650	0.000	5.00	15.653	10.17	529.1	0.0	667.4
115.00		1.00	1.30	29.826	32.81	332.83	0.650	0.000	5.00	15.236	9.90	519.9	0.0	649.5
120.00		1.00	1.32	30.094	33.10	325.06	0.650	0.000	5.00	14.819	9.63	510.2	0.0	631.5
125.00		1.00	1.33	30.354	33.39	317.14	0.650	0.000	5.00	14.402	9.36	500.1	0.0	613.6
130.00		1.00	1.34	30.605	33.67	309.11	0.650	0.000	5.00	13.986	9.09	489.7	0.0	595.6
131.25	Bot - Section 4	1.00	1.34	30.667	33.73	307.08	0.650	0.000	1.25	3.431	2.23	120.4	0.0	146.1
135.00		1.00	1.35	30.850	33.93	300.95	0.650	0.000	3.75	10.296	6.69	363.4	0.0	724.9
135.50	Top - Section 3	1.00	1.35	30.874	33.96	300.13	0.650	0.000	0.50	1.355	0.88	47.9	0.0	95.4
137.00	Appurtenance(s)	1.00	1.35	30.945	34.04	302.42	0.650	0.000	1.50	4.040	2.63	143.0	0.0	115.1
140.00		1.00	1.36	31.087	34.20	297.46	0.650	0.000	3.00	7.968	5.18	283.4	0.0	227.0
145.00		1.00	1.37	31.317	34.45	289.10	0.650	0.000	5.00	12.947	8.42	463.8	0.0	368.8
150.00		1.00	1.38	31.541	34.70	280.64	0.650	0.000	5.00	12.530	8.14	452.1	0.0	356.8
155.00		1.00	1.39	31.760	34.94	272.09	0.650	0.000	5.00	12.113	7.87	440.1	0.0	344.8
157.00	Appurtenance(s)	1.00	1.39	31.846	35.03	268.64	0.650	0.000	2.00	4.729	3.07	172.3	0.0	134.6
160.00		1.00	1.40	31.973	35.17	263.44	0.650	0.000	3.00	6.968	4.53	254.9	0.0	198.3
165.00		1.00	1.41	32.181	35.40	254.71	0.650	0.000	5.00	11.280	7.33	415.3	0.0	320.9
167.00	Appurtenance(s)	1.00	1.41	32.262	35.49	251.19	0.650	0.000	2.00	4.395	2.86	162.2	0.0	125.0
170.00		1.00	1.42	32.384	35.62	245.89	0.650	0.000	3.00	6.468	4.20	239.6	0.0	183.9
175.00		1.00	1.42	32.582	35.84	236.99	0.650	0.000	5.00	10.446	6.79	389.4	0.0	296.9
176.00	Appurtenance(s)	1.00	1.43	32.621	35.88	235.20	0.650	0.000	1.00	2.039	1.33	76.1	0.0	58.0

Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Totals:	**176.00**	**18,242.3**	**30,791.6**

Discrete Appurtenance Forces

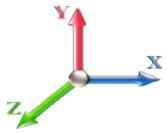
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	176.00	KRY 112 89/4	3	32.660	35.926	0.50	0.75	0.98	41.58	0.000	1.000	56.32	0.00	56.32
2	176.00	KRY 112 489/2	3	32.660	35.926	0.50	0.75	0.98	41.58	0.000	1.000	56.32	0.00	56.32
3	176.00	RMQP-496-HK	1	32.660	35.926	1.00	1.00	46.00	2204.10	0.000	1.000	2644.15	0.00	2644.15
4	176.00	APXVAARR24_43-U-NA2	3	32.660	35.926	0.52	0.75	31.88	345.60	0.000	1.000	1832.39	0.00	1832.39
5	176.00	Lightning Rod	1	32.756	36.032	1.00	1.00	1.05	31.50	0.000	3.500	60.53	0.00	211.87
6	176.00	MHA FE15501P77/75	6	32.660	35.926	0.49	0.75	2.72	59.40	0.000	1.000	156.36	0.00	156.36
7	176.00	RR90-17-02DP	3	32.660	35.926	0.51	0.75	6.67	36.45	0.000	1.000	383.45	0.00	383.45
8	176.00	4449	3	32.660	35.926	0.50	0.75	2.49	189.00	0.000	1.000	142.98	0.00	142.98
9	167.00	RRH2X60-AWS	3	32.262	35.489	0.61	0.80	6.38	162.00	0.000	0.000	362.50	0.00	0.00
10	167.00	RRH2X60-700	3	32.262	35.489	0.61	0.80	6.38	162.00	0.000	0.000	362.50	0.00	0.00
11	167.00	Low Profile	1	32.262	35.489	1.00	1.00	22.00	1350.00	0.000	0.000	1249.20	0.00	0.00
12	167.00	DB-T16Z-8AB-0Z	1	32.262	35.489	1.00	1.00	4.80	17.01	0.000	0.000	272.55	0.00	0.00
13	167.00	SBNHH-1D65B	6	32.262	35.489	0.66	0.80	32.51	216.00	0.000	0.000	1845.95	0.00	0.00
14	167.00	LPA-80063-4CF-EDIN-5	4	32.262	35.489	0.74	0.80	18.30	72.00	0.000	0.000	1039.25	0.00	0.00
15	167.00	APL868013	2	32.262	35.489	0.84	0.90	4.79	11.34	0.000	0.000	271.85	0.00	0.00
16	157.00	Low Profile Platform	1	31.846	35.030	1.00	1.00	22.00	1350.00	0.000	0.000	1233.07	0.00	0.00
17	157.00	ALU TD-RRH8x20-25	3	31.846	35.030	0.54	0.80	6.51	189.00	0.000	0.000	365.01	0.00	0.00
18	157.00	ALU 800 Mhz	6	31.846	35.030	0.54	0.80	8.01	286.20	0.000	0.000	448.83	0.00	0.00
19	157.00	Sitepro PRK-SFS-H-L	1	31.846	35.030	1.00	1.00	6.70	207.00	0.000	0.000	375.53	0.00	0.00
20	157.00	Sitepro HRK14-U	1	31.846	35.030	1.00	1.00	8.13	272.12	0.000	0.000	455.67	0.00	0.00
21	157.00	Sitepro PRK-1245L	1	31.846	35.030	1.00	1.00	9.50	418.42	0.000	0.000	532.46	0.00	0.00
22	157.00	Commscope	3	31.846	35.030	0.60	0.80	22.09	208.98	0.000	0.000	1237.89	0.00	0.00
23	157.00	RFS APXVTM14-C-I20	3	31.846	35.030	0.62	0.80	11.72	151.74	0.000	0.000	656.68	0.00	0.00
24	157.00	ALU 1900 Mhz	3	31.846	35.030	0.54	0.80	4.45	162.00	0.000	0.000	249.65	0.00	0.00
25	137.00	7770.00	6	30.945	34.040	0.58	0.80	19.27	189.00	0.000	0.000	1049.62	0.00	0.00
26	137.00	LGP21401	6	30.945	34.040	0.54	0.80	4.15	102.60	0.000	0.000	225.95	0.00	0.00
27	137.00	LGP21903	6	30.945	34.040	0.67	0.80	1.09	27.00	4.341	0.000	59.29	160.85	0.00
28	137.00	RRUS-11	3	30.945	34.040	0.54	0.80	7.21	148.50	0.000	0.000	392.87	0.00	0.00
29	137.00	DC6-48-60-18-8F	1	30.945	34.040	1.00	1.00	1.47	29.52	0.000	0.000	80.06	0.00	0.00
30	137.00	RRUS 32-B2	3	30.945	34.040	0.54	0.80	4.41	143.10	0.000	0.000	239.96	0.00	0.00
31	137.00	LP Platform-Round	1	30.945	34.040	1.00	1.00	22.00	1350.00	0.000	0.000	1198.20	0.00	0.00
32	137.00	HPA-65R-BUU-H6	3	30.945	34.040	0.68	0.80	19.71	137.70	0.000	0.000	1073.28	0.00	0.00
33	137.00	7020	12	30.945	34.040	0.40	0.80	1.92	23.76	0.000	0.000	104.57	0.00	0.00
34	137.00	Smart Bias T 1001940	3	30.945	34.040	0.54	0.80	0.14	5.40	7.041	0.000	7.88	34.68	0.00
							Totals:		**10,341.60**			**20,722.78**		

Total Applied Force Summary

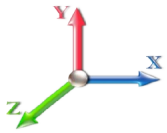
Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 20

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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		527.74	1535.42	0.00	0.00
10.00		518.47	1511.48	0.00	0.00
15.00		509.20	1487.54	0.00	0.00
20.00		530.44	1463.61	0.00	0.00
25.00		545.64	1439.67	0.00	0.00
30.00		556.27	1415.73	0.00	0.00
35.00		563.55	1391.79	0.00	0.00
40.00		568.23	1367.85	0.00	0.00
42.75		312.01	742.12	0.00	0.00
45.00		260.09	1064.36	0.00	0.00
49.00		464.81	1869.75	0.00	0.00
50.00		115.50	237.94	0.00	0.00
55.00		581.92	1177.14	0.00	0.00
60.00		580.28	1156.20	0.00	0.00
65.00		577.53	1135.25	0.00	0.00
70.00		573.80	1114.31	0.00	0.00
75.00		569.20	1093.36	0.00	0.00
80.00		563.81	1072.41	0.00	0.00
85.00		557.71	1051.47	0.00	0.00
86.50		165.32	311.36	0.00	0.00
90.00		391.45	1234.74	0.00	0.00
91.75		194.03	610.22	0.00	0.00
95.00		358.55	587.27	0.00	0.00
100.00		546.21	888.69	0.00	0.00
105.00		537.90	870.74	0.00	0.00
110.00		529.10	852.78	0.00	0.00
115.00		519.85	834.83	0.00	0.00
120.00		510.18	816.88	0.00	0.00
125.00		500.12	798.92	0.00	0.00
130.00		489.67	780.97	0.00	0.00
131.25		120.38	192.44	0.00	0.00
135.00		363.37	863.98	0.00	0.00
135.50		47.86	113.93	0.00	0.00
137.00	(44) attachments	4574.72	2327.31	195.53	0.00
140.00		283.37	297.12	0.00	0.00
145.00		463.84	485.63	0.00	0.00
150.00		452.12	473.66	0.00	0.00
155.00		440.11	461.70	0.00	0.00
157.00	(22) attachments	5727.06	3426.79	0.00	0.00
160.00		254.86	261.27	0.00	0.00
165.00		415.26	425.88	0.00	0.00
167.00	(20) attachments	5566.01	2157.35	0.00	0.00
170.00		239.61	224.12	0.00	0.00
175.00		389.36	363.96	0.00	0.00
176.00	(23) attachments	5408.61	3020.57	0.00	5483.85

Total Applied Force Summary

Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21

Tower Engineering Solutions

Totals:	**38,965.10**	**47,010.48**	**195.53**	**5,483.85**

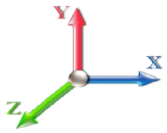
Linear Appurtenance Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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	0.018	0.000	19.450	0.00	1.23
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	19.450	0.00	4.68
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.018	0.000	19.450	0.00	1.23
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	19.450	0.00	4.68
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.018	0.000	19.450	0.00	1.23
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	19.450	0.00	4.68
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	20.638	0.00	1.23
20.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	20.638	0.00	4.68
25.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	21.630	0.00	1.23
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	21.630	0.00	4.68
30.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	22.477	0.00	1.23
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	22.477	0.00	4.68
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.020	0.000	23.218	0.00	1.23
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.020	0.000	23.218	0.00	4.68
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.020	0.000	23.880	0.00	1.23
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.020	0.000	23.880	0.00	4.68
42.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.021	0.000	24.217	0.00	0.68
42.75	Step bolts (ladder)	Yes	2.75	0.000	0.63	0.14	0.00	0.021	0.000	24.217	0.00	2.57
45.00	Safety Cable	Yes	2.25	0.000	0.38	0.07	0.00	0.021	0.000	24.479	0.00	0.55
45.00	Step bolts (ladder)	Yes	2.25	0.000	0.63	0.12	0.00	0.021	0.000	24.479	0.00	2.11
49.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.021	0.000	24.922	0.00	0.98
49.00	Step bolts (ladder)	Yes	4.00	0.000	0.63	0.21	0.00	0.021	0.000	24.922	0.00	3.74
50.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.021	0.000	25.029	0.00	0.25
50.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.05	0.00	0.021	0.000	25.029	0.00	0.94
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.021	0.000	25.536	0.00	1.23
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.021	0.000	25.536	0.00	4.68
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.022	0.000	26.008	0.00	1.23
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.022	0.000	26.008	0.00	4.68
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.022	0.000	26.450	0.00	1.23
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.022	0.000	26.450	0.00	4.68
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.023	0.000	26.866	0.00	1.23
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.023	0.000	26.866	0.00	4.68
75.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.023	0.000	27.259	0.00	1.23
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.023	0.000	27.259	0.00	4.68
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.024	0.000	27.632	0.00	1.23
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.024	0.000	27.632	0.00	4.68
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.024	0.000	27.987	0.00	1.23
85.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.024	0.000	27.987	0.00	4.68
86.50	Safety Cable	Yes	1.50	0.000	0.38	0.05	0.00	0.025	0.000	28.090	0.00	0.37
86.50	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.08	0.00	0.025	0.000	28.090	0.00	1.40
90.00	Safety Cable	Yes	3.50	0.000	0.38	0.11	0.00	0.025	0.000	28.325	0.00	0.86
90.00	Step bolts (ladder)	Yes	3.50	0.000	0.63	0.18	0.00	0.025	0.000	28.325	0.00	3.28
91.75	Safety Cable	Yes	1.75	0.000	0.38	0.06	0.00	0.025	0.000	28.441	0.00	0.43
91.75	Step bolts (ladder)	Yes	1.75	0.000	0.63	0.09	0.00	0.025	0.000	28.441	0.00	1.64
95.00	Safety Cable	Yes	3.25	0.000	0.38	0.10	0.00	0.025	0.000	28.650	0.00	0.80
95.00	Step bolts (ladder)	Yes	3.25	0.000	0.63	0.17	0.00	0.025	0.000	28.650	0.00	3.04
100.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.026	0.000	28.961	0.00	1.23

Linear Appurtenance Segment Forces (Factored)

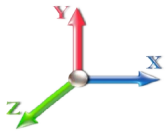
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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)
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.026	0.000	28.961	0.00	4.68
105.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.026	0.000	29.260	0.00	1.23
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.026	0.000	29.260	0.00	4.68
110.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.027	0.000	29.548	0.00	1.23
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.027	0.000	29.548	0.00	4.68
115.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.028	0.000	29.826	0.00	1.23
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.028	0.000	29.826	0.00	4.68
120.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.028	0.000	30.094	0.00	1.23
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.028	0.000	30.094	0.00	4.68
125.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.029	0.000	30.354	0.00	1.23
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.029	0.000	30.354	0.00	4.68
130.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.030	0.000	30.605	0.00	1.23
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.030	0.000	30.605	0.00	4.68
131.25	Safety Cable	Yes	1.25	0.000	0.38	0.04	0.00	0.031	0.000	30.667	0.00	0.31
131.25	Step bolts (ladder)	Yes	1.25	0.000	0.63	0.07	0.00	0.031	0.000	30.667	0.00	1.17
135.00	Safety Cable	Yes	3.75	0.000	0.38	0.12	0.00	0.031	0.000	30.850	0.00	0.92
135.00	Step bolts (ladder)	Yes	3.75	0.000	0.63	0.20	0.00	0.031	0.000	30.850	0.00	3.51
135.50	Safety Cable	Yes	0.50	0.000	0.38	0.02	0.00	0.032	0.000	30.874	0.00	0.12
135.50	Step bolts (ladder)	Yes	0.50	0.000	0.63	0.03	0.00	0.032	0.000	30.874	0.00	0.47
137.00	Safety Cable	Yes	1.50	0.000	0.38	0.05	0.00	0.031	0.000	30.945	0.00	0.37
137.00	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.08	0.00	0.031	0.000	30.945	0.00	1.40
140.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.032	0.000	31.087	0.00	0.74
140.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.032	0.000	31.087	0.00	2.81
145.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.033	0.000	31.317	0.00	1.23
145.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.033	0.000	31.317	0.00	4.68
150.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.034	0.000	31.541	0.00	1.23
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.034	0.000	31.541	0.00	4.68
155.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.035	0.000	31.760	0.00	1.23
155.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.035	0.000	31.760	0.00	4.68
157.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.036	0.000	31.846	0.00	0.49
157.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.10	0.00	0.036	0.000	31.846	0.00	1.87
160.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.036	0.000	31.973	0.00	0.74
160.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.036	0.000	31.973	0.00	2.81
165.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.037	0.000	32.181	0.00	1.23
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.037	0.000	32.181	0.00	4.68
167.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.038	0.000	32.262	0.00	0.49
167.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.10	0.00	0.038	0.000	32.262	0.00	1.87
170.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.039	0.000	32.384	0.00	0.74
170.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.039	0.000	32.384	0.00	2.81
175.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.040	0.000	32.582	0.00	1.23
175.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.040	0.000	32.582	0.00	4.68
176.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.041	0.000	32.621	0.00	0.25
176.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.05	0.00	0.041	0.000	32.621	0.00	0.94
										Totals:	**0.0**	**208.0**

Calculated Forces

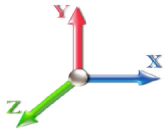
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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	-46.94	-39.05	-0.19	-5092.0	0.00	5092.07	6372.54	3186.27	14661.2	7341.49	0.00	0.000	0.000	0.701
5.00	-45.27	-38.68	-0.19	-4896.8	0.00	4896.83	6292.68	3146.34	14220.7	7120.95	0.11	-0.201	0.000	0.695
10.00	-43.62	-38.31	-0.19	-4703.4	0.00	4703.44	6211.66	3105.83	13784.2	6902.39	0.43	-0.405	0.000	0.689
15.00	-42.00	-37.94	-0.19	-4511.9	0.00	4511.90	6129.50	3064.75	13351.9	6685.89	0.96	-0.612	0.000	0.682
20.00	-40.41	-37.54	-0.19	-4322.2	0.00	4322.21	6046.18	3023.09	12923.8	6471.51	1.72	-0.821	0.000	0.675
25.00	-38.84	-37.12	-0.19	-4134.5	0.00	4134.51	5961.72	2980.86	12500.0	6259.33	2.69	-1.033	0.000	0.667
30.00	-37.30	-36.67	-0.19	-3948.9	0.00	3948.94	5876.11	2938.05	12080.8	6049.42	3.89	-1.248	0.000	0.659
35.00	-35.78	-36.21	-0.19	-3765.5	0.00	3765.58	5789.35	2894.67	11666.3	5841.84	5.31	-1.465	0.000	0.651
40.00	-34.32	-35.71	-0.19	-3584.5	0.00	3584.53	5679.25	2839.63	11212.8	5614.75	6.96	-1.685	0.000	0.645
42.75	-33.52	-35.44	-0.19	-3486.3	0.00	3486.33	5615.38	2807.69	10960.7	5488.51	7.97	-1.808	0.000	0.641
45.00	-32.38	-35.23	-0.19	-3406.5	0.00	3406.59	5563.11	2781.56	10756.6	5386.29	8.85	-1.910	0.000	0.638
49.00	-30.46	-34.76	-0.19	-3265.6	0.00	3265.69	4756.80	2378.40	9239.06	4626.40	10.52	-2.090	0.000	0.712
50.00	-30.14	-34.71	-0.19	-3230.9	0.00	3230.93	4742.51	2371.25	9172.60	4593.12	10.97	-2.136	0.000	0.710
55.00	-28.84	-34.20	-0.19	-3057.3	0.00	3057.39	4670.33	2335.16	8842.49	4427.82	13.33	-2.380	0.000	0.697
60.00	-27.56	-33.69	-0.19	-2886.3	-0.01	2886.38	4597.00	2298.50	8516.13	4264.39	15.96	-2.625	0.000	0.683
65.00	-26.32	-33.17	-0.19	-2717.9	-0.01	2717.92	4522.52	2261.26	8193.68	4102.93	18.84	-2.871	0.000	0.668
70.00	-25.09	-32.65	-0.19	-2552.0	-0.01	2552.04	4446.89	2223.45	7875.26	3943.48	21.97	-3.119	0.000	0.653
75.00	-23.89	-32.13	-0.19	-2388.7	-0.01	2388.78	4354.69	2177.34	7534.33	3772.77	25.37	-3.368	0.000	0.639
80.00	-22.72	-31.60	-0.19	-2228.1	-0.01	2228.15	4253.06	2126.53	7185.02	3597.85	29.03	-3.617	0.000	0.625
85.00	-21.62	-31.03	-0.19	-2070.1	-0.01	2070.17	4151.43	2075.72	6843.99	3427.08	32.95	-3.865	0.000	0.609
86.50	-21.25	-30.89	-0.19	-2023.6	-0.01	2023.62	4120.95	2060.47	6743.30	3376.66	34.18	-3.942	0.000	0.605
90.00	-19.98	-30.46	-0.19	-1915.4	-0.01	1915.49	4049.81	2024.90	6511.26	3260.47	37.13	-4.117	0.000	0.593
91.75	-19.32	-30.27	-0.19	-1862.1	-0.01	1862.18	3441.70	1720.85	5608.94	2808.64	38.65	-4.206	0.000	0.669
95.00	-18.65	-29.94	-0.19	-1763.8	-0.01	1763.82	3401.05	1700.53	5452.51	2730.31	41.57	-4.368	0.000	0.652
100.00	-17.67	-29.40	-0.19	-1614.1	-0.01	1614.14	3337.56	1668.78	5214.58	2611.16	46.28	-4.635	0.000	0.624
105.00	-16.71	-28.87	-0.19	-1467.1	-0.01	1467.12	3272.92	1636.46	4980.08	2493.74	51.28	-4.899	0.000	0.594
110.00	-15.78	-28.34	-0.19	-1322.7	-0.01	1322.76	3194.68	1597.34	4730.71	2368.87	56.54	-5.157	0.000	0.564
115.00	-14.88	-27.81	-0.19	-1181.0	-0.01	1181.05	3107.57	1553.79	4474.96	2240.81	62.07	-5.408	0.000	0.532
120.00	-14.00	-27.28	-0.19	-1042.0	-0.01	1042.00	3020.47	1510.23	4226.32	2116.30	67.86	-5.651	0.000	0.497
125.00	-13.15	-26.76	-0.19	-905.59	-0.01	905.59	2933.36	1466.68	3984.78	1995.35	73.89	-5.882	-0.001	0.459
130.00	-12.37	-26.22	-0.19	-771.81	-0.01	771.81	2846.25	1423.13	3750.35	1877.96	80.16	-6.099	-0.001	0.416
131.25	-12.14	-26.10	-0.20	-739.04	-0.01	739.04	2824.47	1412.24	3692.86	1849.17	81.76	-6.153	-0.001	0.404
135.00	-11.29	-25.66	-0.20	-641.17	-0.02	641.17	2759.14	1379.57	3523.03	1764.13	86.64	-6.303	-0.001	0.368
135.50	-11.16	-25.61	-0.20	-628.35	-0.02	628.35	1734.08	867.04	2260.78	1132.07	87.30	-6.323	-0.001	0.562
137.00	-9.31	-20.82	0.00	-589.94	0.01	589.94	1723.43	861.72	2225.81	1114.56	89.29	-6.380	-0.001	0.535
140.00	-8.98	-20.54	0.00	-527.47	0.01	527.47	1701.83	850.91	2156.25	1079.73	93.35	-6.533	-0.001	0.494
145.00	-8.48	-20.05	0.00	-424.80	0.00	424.80	1664.90	832.45	2041.54	1022.29	100.30	-6.763	-0.001	0.421
150.00	-8.00	-19.57	0.00	-324.54	0.00	324.54	1626.81	813.41	1928.48	965.67	107.48	-6.963	-0.001	0.342
155.00	-7.56	-19.09	0.00	-226.69	0.00	226.69	1587.58	793.79	1817.22	909.96	114.84	-7.126	-0.001	0.254
157.00	-4.86	-12.99	0.00	-188.51	0.00	188.51	1571.57	785.79	1773.24	887.94	117.84	-7.180	-0.001	0.216
160.00	-4.61	-12.71	0.00	-149.55	0.00	149.55	1547.20	773.60	1707.88	855.21	122.36	-7.249	-0.001	0.178
165.00	-4.23	-12.25	0.00	-86.01	0.00	86.01	1505.67	752.84	1600.62	801.50	129.98	-7.335	-0.001	0.110
167.00	-2.80	-6.45	0.00	-61.52	0.00	61.52	1488.74	744.37	1558.33	780.32	133.05	-7.359	-0.001	0.081
170.00	-2.61	-6.19	0.00	-42.16	0.00	42.16	1462.99	731.50	1495.57	748.90	137.67	-7.386	-0.001	0.058
175.00	-2.30	-5.75	0.00	-11.24	0.00	11.24	1411.70	705.85	1385.55	693.80	145.40	-7.410	-0.001	0.018
176.00	0.00	-5.41	0.00	-5.48	0.00	5.48	1400.09	700.04	1362.73	682.38	146.95	-7.412	-0.001	0.008

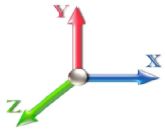
Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.656	5.00	25.098	30.12	171.2	593.6	2393.6
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.775	5.00	24.780	29.74	169.0	626.5	2394.7
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.848	5.00	24.424	29.31	166.6	641.9	2378.1
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.902	5.00	24.053	28.86	174.1	649.5	2353.8
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.945	5.00	23.671	28.41	179.6	652.7	2325.1
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.981	5.00	23.285	27.94	183.6	652.9	2293.4
35.00		1.00	1.01	6.169	6.79	0.00	1.200	2.012	5.00	22.893	27.47	186.4	651.0	2259.5
40.00		1.00	1.04	6.345	6.98	0.00	1.200	2.039	5.00	22.499	27.00	188.4	647.5	2224.1
42.75	Bot - Section 2	1.00	1.06	6.434	7.08	0.00	1.200	2.052	2.75	12.203	14.64	103.6	354.8	1208.3
45.00		1.00	1.07	6.504	7.15	0.00	1.200	2.063	2.25	10.061	12.07	86.4	294.3	1602.2
49.00	Top - Section 1	1.00	1.09	6.622	7.28	0.00	1.200	2.081	4.00	17.690	21.23	154.6	519.7	2814.9
50.00		1.00	1.09	6.650	7.32	0.00	1.200	2.085	1.00	4.381	5.26	38.5	129.7	397.5
55.00		1.00	1.12	6.785	7.46	0.00	1.200	2.105	5.00	21.674	26.01	194.1	641.9	1964.2
60.00		1.00	1.14	6.910	7.60	0.00	1.200	2.123	5.00	21.273	25.53	194.0	634.6	1929.0
65.00		1.00	1.16	7.028	7.73	0.00	1.200	2.140	5.00	20.870	25.04	193.6	626.7	1893.2
70.00		1.00	1.17	7.138	7.85	0.00	1.200	2.156	5.00	20.466	24.56	192.8	618.3	1856.9
75.00		1.00	1.19	7.243	7.97	0.00	1.200	2.171	5.00	20.062	24.07	191.8	609.4	1820.0
80.00		1.00	1.21	7.342	8.08	0.00	1.200	2.185	5.00	19.657	23.59	190.5	600.0	1782.7
85.00		1.00	1.22	7.436	8.18	0.00	1.200	2.198	5.00	19.251	23.10	189.0	590.3	1745.1
86.50	Bot - Section 3	1.00	1.23	7.464	8.21	0.00	1.200	2.202	1.50	5.695	6.83	56.1	176.2	517.2
90.00		1.00	1.24	7.526	8.28	0.00	1.200	2.211	3.50	13.370	16.04	132.8	413.4	1886.7
91.75	Top - Section 2	1.00	1.24	7.557	8.31	0.00	1.200	2.215	1.75	6.610	7.93	65.9	205.4	932.6
95.00		1.00	1.25	7.612	8.37	0.00	1.200	2.223	3.25	12.144	14.57	122.0	377.1	999.5
100.00		1.00	1.27	7.695	8.46	0.00	1.200	2.234	5.00	18.348	22.02	186.4	569.5	1507.3
105.00		1.00	1.28	7.774	8.55	0.00	1.200	2.245	5.00	17.941	21.53	184.1	558.6	1472.4
110.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	5.00	17.533	21.04	181.7	547.4	1437.3
115.00		1.00	1.30	7.925	8.72	0.00	1.200	2.266	5.00	17.124	20.55	179.1	536.0	1402.0
120.00		1.00	1.32	7.996	8.80	0.00	1.200	2.276	5.00	16.715	20.06	176.4	524.4	1366.4
125.00		1.00	1.33	8.065	8.87	0.00	1.200	2.285	5.00	16.306	19.57	173.6	512.6	1330.7
130.00		1.00	1.34	8.132	8.95	0.00	1.200	2.294	5.00	15.897	19.08	170.6	500.6	1294.7
131.25	Bot - Section 4	1.00	1.34	8.148	8.96	0.00	1.200	2.296	1.25	3.910	4.69	42.1	124.4	319.2
135.00		1.00	1.35	8.197	9.02	0.00	1.200	2.303	3.75	11.735	14.08	127.0	371.7	1338.3
135.50	Top - Section 3	1.00	1.35	8.203	9.02	0.00	1.200	2.303	0.50	1.547	1.86	16.8	49.4	176.6
137.00	Appurtenance(s)	1.00	1.35	8.222	9.04	0.00	1.200	2.306	1.50	4.617	5.54	50.1	147.2	300.7
140.00		1.00	1.36	8.260	9.09	0.00	1.200	2.311	3.00	9.124	10.95	99.5	289.9	592.6
145.00		1.00	1.37	8.321	9.15	0.00	1.200	2.319	5.00	14.879	17.86	163.4	470.7	962.4
150.00		1.00	1.38	8.381	9.22	0.00	1.200	2.327	5.00	14.469	17.36	160.1	458.1	933.8
155.00		1.00	1.39	8.439	9.28	0.00	1.200	2.335	5.00	14.059	16.87	156.6	445.3	905.0
157.00	Appurtenance(s)	1.00	1.39	8.462	9.31	0.00	1.200	2.338	2.00	5.508	6.61	61.5	176.1	355.5
160.00		1.00	1.40	8.495	9.34	0.00	1.200	2.342	3.00	8.139	9.77	91.3	259.4	523.8
165.00		1.00	1.41	8.551	9.41	0.00	1.200	2.349	5.00	13.237	15.88	149.4	419.3	847.1
167.00	Appurtenance(s)	1.00	1.41	8.572	9.43	0.00	1.200	2.352	2.00	5.179	6.21	58.6	165.6	332.3
170.00		1.00	1.42	8.604	9.46	0.00	1.200	2.356	3.00	7.646	9.17	86.8	243.7	488.9
175.00		1.00	1.42	8.657	9.52	0.00	1.200	2.363	5.00	12.415	14.90	141.9	392.8	788.7
176.00	Appurtenance(s)	1.00	1.43	8.667	9.53	0.00	1.200	2.364	1.00	2.433	2.92	27.8	78.0	155.3

Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Totals:	**176.00**	**6,209.6**	**60,803.4**

Discrete Appurtenance Forces

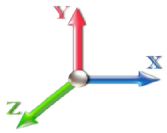
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	176.00	KRY 112 89/4	3	8.678	9.546	0.50	0.75	2.23	112.06	0.000	1.000	21.29	0.00	21.29
2	176.00	KRY 112 489/2	3	8.678	9.546	0.50	0.75	2.23	112.06	0.000	1.000	21.29	0.00	21.29
3	176.00	RMQP-496-HK	1	8.678	9.546	1.00	1.00	89.51	5623.12	0.000	1.000	854.39	0.00	854.39
4	176.00	APXVAARR24_43-U-NA2	3	8.678	9.546	0.52	0.75	35.99	2236.86	0.000	1.000	343.51	0.00	343.51
5	176.00	Lightning Rod	1	8.703	9.574	1.00	1.00	4.27	75.56	0.000	3.500	40.84	0.00	142.94
6	176.00	MHA FE15501P77/75	6	8.678	9.546	0.49	0.75	5.52	202.82	0.000	1.000	52.66	0.00	52.66
7	176.00	RR90-17-02DP	3	8.678	9.546	0.51	0.75	8.78	492.47	0.000	1.000	83.85	0.00	83.85
8	176.00	4449	3	8.678	9.546	0.50	0.75	3.63	555.42	0.000	1.000	34.64	0.00	34.64
9	167.00	RRH2X60-AWS	3	8.572	9.429	0.61	0.80	8.32	508.62	0.000	0.000	78.49	0.00	0.00
10	167.00	RRH2X60-700	3	8.572	9.429	0.61	0.80	8.32	508.62	0.000	0.000	78.49	0.00	0.00
11	167.00	Low Profile	1	8.572	9.429	1.00	1.00	45.80	3264.05	0.000	0.000	431.90	0.00	0.00
12	167.00	DB-T16Z-8AB-0Z	1	8.572	9.429	1.00	1.00	6.01	228.63	0.000	0.000	56.63	0.00	0.00
13	167.00	SBNHH-1D65B	6	8.572	9.429	0.66	0.80	39.66	2041.39	0.000	0.000	373.93	0.00	0.00
14	167.00	LPA-80063-4CF-EDIN-5	4	8.572	9.429	0.74	0.80	25.90	872.61	0.000	0.000	244.19	0.00	0.00
15	167.00	APL868013	2	8.572	9.429	0.84	0.90	6.80	330.32	0.000	0.000	64.10	0.00	0.00
16	157.00	Low Profile Platform	1	8.462	9.308	1.00	1.00	45.66	3253.19	0.000	0.000	424.96	0.00	0.00
17	157.00	ALU TD-RRH8x20-25	3	8.462	9.308	0.54	0.80	8.31	727.95	0.000	0.000	77.34	0.00	0.00
18	157.00	ALU 800 Mhz	6	8.462	9.308	0.54	0.80	12.93	849.39	0.000	0.000	120.39	0.00	0.00
19	157.00	Sitepro PRK-SFS-H-L	1	8.462	9.308	1.00	1.00	16.10	605.12	0.000	0.000	149.83	0.00	0.00
20	157.00	Sitepro HRK14-U	1	8.462	9.308	1.00	1.00	18.77	1145.81	0.000	0.000	174.73	0.00	0.00
21	157.00	Sitepro PRK-1245L	1	8.462	9.308	1.00	1.00	22.82	897.51	0.000	0.000	212.44	0.00	0.00
22	157.00	Commscope	3	8.462	9.308	0.60	0.80	25.60	1228.70	0.000	0.000	238.25	0.00	0.00
23	157.00	RFS APXVTM14-C-I20	3	8.462	9.308	0.62	0.80	14.53	891.79	0.000	0.000	135.26	0.00	0.00
24	157.00	ALU 1900 Mhz	3	8.462	9.308	0.54	0.80	7.19	479.57	0.000	0.000	66.89	0.00	0.00
25	137.00	7770.00	6	8.222	9.044	0.58	0.80	24.31	1403.18	0.000	0.000	219.85	0.00	0.00
26	137.00	LGP21401	6	8.222	9.044	0.54	0.80	7.70	390.68	0.000	0.000	69.64	0.00	0.00
27	137.00	LGP21903	6	8.222	9.044	0.67	0.80	3.21	79.34	4.341	0.000	29.01	125.91	0.00
28	137.00	RRUS-11	3	8.222	9.044	0.54	0.80	10.45	477.49	0.000	0.000	94.49	0.00	0.00
29	137.00	DC6-48-60-18-8F	1	8.222	9.044	1.00	1.00	2.39	106.92	0.000	0.000	21.66	0.00	0.00
30	137.00	RRUS 32-B2	3	8.222	9.044	0.54	0.80	6.47	638.45	0.000	0.000	58.55	0.00	0.00
31	137.00	LP Platform-Round	1	8.222	9.044	1.00	1.00	45.34	3229.47	0.000	0.000	410.04	0.00	0.00
32	137.00	HPA-65R-BUU-H6	3	8.222	9.044	0.68	0.80	23.46	1219.31	0.000	0.000	212.17	0.00	0.00
33	137.00	7020	12	8.222	9.044	0.40	0.80	4.99	159.06	0.000	0.000	45.14	0.00	0.00
34	137.00	Smart Bias T 1001940	3	8.222	9.044	0.54	0.80	0.64	8.22	7.041	0.000	5.81	40.94	0.00
							Totals:		**34,955.75**			**5,546.63**		

Total Applied Force Summary

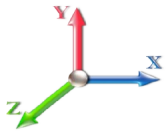
Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 28

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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		171.21	2680.97	0.00	0.00
10.00		169.04	2687.44	0.00	0.00
15.00		166.62	2674.42	0.00	0.00
20.00		174.10	2652.80	0.00	0.00
25.00		179.58	2626.24	0.00	0.00
30.00		183.56	2596.39	0.00	0.00
35.00		186.43	2564.20	0.00	0.00
40.00		188.44	2530.23	0.00	0.00
42.75		103.65	1377.06	0.00	0.00
45.00		86.38	1740.57	0.00	0.00
49.00		154.63	3061.63	0.00	0.00
50.00		38.46	459.22	0.00	0.00
55.00		194.11	2273.91	0.00	0.00
60.00		194.04	2239.75	0.00	0.00
65.00		193.60	2204.89	0.00	0.00
70.00		192.85	2169.43	0.00	0.00
75.00		191.80	2133.42	0.00	0.00
80.00		190.50	2096.94	0.00	0.00
85.00		188.97	2060.04	0.00	0.00
86.50		56.11	611.73	0.00	0.00
90.00		132.82	2107.69	0.00	0.00
91.75		65.93	1043.15	0.00	0.00
95.00		122.02	1205.17	0.00	0.00
100.00		186.37	1824.38	0.00	0.00
105.00		184.11	1790.15	0.00	0.00
110.00		181.69	1755.66	0.00	0.00
115.00		179.13	1720.91	0.00	0.00
120.00		176.43	1685.92	0.00	0.00
125.00		173.60	1650.70	0.00	0.00
130.00		170.64	1615.29	0.00	0.00
131.25		42.05	399.36	0.00	0.00
135.00		126.97	1579.12	0.00	0.00
135.50		16.75	208.74	0.00	0.00
137.00	(44) attachments	1216.47	8109.19	166.85	0.00
140.00		99.47	730.78	0.00	0.00
145.00		163.43	1193.20	0.00	0.00
150.00		160.06	1165.06	0.00	0.00
155.00		156.60	1136.77	0.00	0.00
157.00	(22) attachments	1661.60	10527.27	0.00	0.00
160.00		91.27	653.58	0.00	0.00
165.00		149.41	1063.91	0.00	0.00
167.00	(20) attachments	1386.33	8173.32	0.00	0.00
170.00		86.84	588.82	0.00	0.00
175.00		141.87	955.71	0.00	0.00
176.00	(23) attachments	1480.30	9599.06	0.00	1554.56

Total Applied Force Summary

Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Totals:	**11,756.24**	**105,924.18**	**166.85**	**1,554.56**

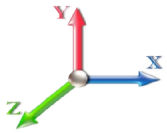
Linear Appurtenance Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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	0.018	0.000	5.168	0.00	20.86
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.64	0.00	0.018	0.000	5.168	0.00	27.18
10.00	Safety Cable	Yes	5.00	0.000	0.38	1.64	0.00	0.018	0.000	5.168	0.00	23.53
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.74	0.00	0.018	0.000	5.168	0.00	29.96
15.00	Safety Cable	Yes	5.00	0.000	0.38	1.70	0.00	0.018	0.000	5.168	0.00	25.26
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.80	0.00	0.018	0.000	5.168	0.00	31.77
20.00	Safety Cable	Yes	5.00	0.000	0.38	1.74	0.00	0.019	0.000	5.483	0.00	26.58
20.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.85	0.00	0.019	0.000	5.483	0.00	33.13
25.00	Safety Cable	Yes	5.00	0.000	0.38	1.78	0.00	0.019	0.000	5.747	0.00	27.65
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.88	0.00	0.019	0.000	5.747	0.00	34.25
30.00	Safety Cable	Yes	5.00	0.000	0.38	1.81	0.00	0.019	0.000	5.972	0.00	28.56
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.91	0.00	0.019	0.000	5.972	0.00	35.19
35.00	Safety Cable	Yes	5.00	0.000	0.38	1.83	0.00	0.020	0.000	6.169	0.00	29.35
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.94	0.00	0.020	0.000	6.169	0.00	36.02
40.00	Safety Cable	Yes	5.00	0.000	0.38	1.86	0.00	0.020	0.000	6.345	0.00	30.06
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	1.96	0.00	0.020	0.000	6.345	0.00	36.75
42.75	Safety Cable	Yes	2.75	0.000	0.38	1.03	0.00	0.021	0.000	6.434	0.00	16.73
42.75	Step bolts (ladder)	Yes	2.75	0.000	0.63	1.09	0.00	0.021	0.000	6.434	0.00	20.42
45.00	Safety Cable	Yes	2.25	0.000	0.38	0.84	0.00	0.021	0.000	6.504	0.00	13.82
45.00	Step bolts (ladder)	Yes	2.25	0.000	0.63	0.89	0.00	0.021	0.000	6.504	0.00	16.84
49.00	Safety Cable	Yes	4.00	0.000	0.38	1.51	0.00	0.021	0.000	6.622	0.00	24.94
49.00	Step bolts (ladder)	Yes	4.00	0.000	0.63	1.60	0.00	0.021	0.000	6.622	0.00	30.32
50.00	Safety Cable	Yes	1.00	0.000	0.38	0.38	0.00	0.021	0.000	6.650	0.00	6.26
50.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.40	0.00	0.021	0.000	6.650	0.00	7.60
55.00	Safety Cable	Yes	5.00	0.000	0.38	1.91	0.00	0.021	0.000	6.785	0.00	31.83
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.02	0.00	0.021	0.000	6.785	0.00	38.58
60.00	Safety Cable	Yes	5.00	0.000	0.38	1.93	0.00	0.022	0.000	6.910	0.00	32.33
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.03	0.00	0.022	0.000	6.910	0.00	39.10
65.00	Safety Cable	Yes	5.00	0.000	0.38	1.94	0.00	0.022	0.000	7.028	0.00	32.80
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.05	0.00	0.022	0.000	7.028	0.00	39.59
70.00	Safety Cable	Yes	5.00	0.000	0.38	1.96	0.00	0.023	0.000	7.138	0.00	33.24
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.06	0.00	0.023	0.000	7.138	0.00	40.04
75.00	Safety Cable	Yes	5.00	0.000	0.38	1.97	0.00	0.023	0.000	7.243	0.00	33.66
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.07	0.00	0.023	0.000	7.243	0.00	40.47
80.00	Safety Cable	Yes	5.00	0.000	0.38	1.98	0.00	0.024	0.000	7.342	0.00	34.05
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.08	0.00	0.024	0.000	7.342	0.00	40.88
85.00	Safety Cable	Yes	5.00	0.000	0.38	1.99	0.00	0.024	0.000	7.436	0.00	34.43
85.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.09	0.00	0.024	0.000	7.436	0.00	41.27
86.50	Safety Cable	Yes	1.50	0.000	0.38	0.60	0.00	0.025	0.000	7.464	0.00	10.36
86.50	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.63	0.00	0.025	0.000	7.464	0.00	12.42
90.00	Safety Cable	Yes	3.50	0.000	0.38	1.40	0.00	0.025	0.000	7.526	0.00	24.35
90.00	Step bolts (ladder)	Yes	3.50	0.000	0.63	1.47	0.00	0.025	0.000	7.526	0.00	29.15
91.75	Safety Cable	Yes	1.75	0.000	0.38	0.70	0.00	0.025	0.000	7.557	0.00	12.22
91.75	Step bolts (ladder)	Yes	1.75	0.000	0.63	0.74	0.00	0.025	0.000	7.557	0.00	14.62
95.00	Safety Cable	Yes	3.25	0.000	0.38	1.31	0.00	0.025	0.000	7.612	0.00	22.83
95.00	Step bolts (ladder)	Yes	3.25	0.000	0.63	1.37	0.00	0.025	0.000	7.612	0.00	27.30
100.00	Safety Cable	Yes	5.00	0.000	0.38	2.02	0.00	0.026	0.000	7.695	0.00	35.46

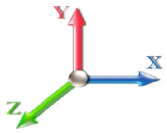
Linear Appurtenance Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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)
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.12	0.00	0.026	0.000	7.695	0.00	42.33
105.00	Safety Cable	Yes	5.00	0.000	0.38	2.03	0.00	0.026	0.000	7.774	0.00	35.77
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.13	0.00	0.026	0.000	7.774	0.00	42.66
110.00	Safety Cable	Yes	5.00	0.000	0.38	2.04	0.00	0.027	0.000	7.851	0.00	36.07
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.14	0.00	0.027	0.000	7.851	0.00	42.97
115.00	Safety Cable	Yes	5.00	0.000	0.38	2.05	0.00	0.028	0.000	7.925	0.00	36.37
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.15	0.00	0.028	0.000	7.925	0.00	43.28
120.00	Safety Cable	Yes	5.00	0.000	0.38	2.05	0.00	0.028	0.000	7.996	0.00	36.65
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.16	0.00	0.028	0.000	7.996	0.00	43.57
125.00	Safety Cable	Yes	5.00	0.000	0.38	2.06	0.00	0.029	0.000	8.065	0.00	36.92
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.17	0.00	0.029	0.000	8.065	0.00	43.85
130.00	Safety Cable	Yes	5.00	0.000	0.38	2.07	0.00	0.030	0.000	8.132	0.00	37.19
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.17	0.00	0.030	0.000	8.132	0.00	44.12
131.25	Safety Cable	Yes	1.25	0.000	0.38	0.52	0.00	0.031	0.000	8.148	0.00	9.31
131.25	Step bolts (ladder)	Yes	1.25	0.000	0.63	0.54	0.00	0.031	0.000	8.148	0.00	11.05
135.00	Safety Cable	Yes	3.75	0.000	0.38	1.56	0.00	0.031	0.000	8.197	0.00	28.08
135.00	Step bolts (ladder)	Yes	3.75	0.000	0.63	1.64	0.00	0.031	0.000	8.197	0.00	33.29
135.50	Safety Cable	Yes	0.50	0.000	0.38	0.21	0.00	0.032	0.000	8.203	0.00	3.75
135.50	Step bolts (ladder)	Yes	0.50	0.000	0.63	0.22	0.00	0.032	0.000	8.203	0.00	4.44
137.00	Safety Cable	Yes	1.50	0.000	0.38	0.62	0.00	0.031	0.000	8.222	0.00	11.26
137.00	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.66	0.00	0.031	0.000	8.222	0.00	13.35
140.00	Safety Cable	Yes	3.00	0.000	0.38	1.25	0.00	0.032	0.000	8.260	0.00	22.61
140.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	1.31	0.00	0.032	0.000	8.260	0.00	26.79
145.00	Safety Cable	Yes	5.00	0.000	0.38	2.09	0.00	0.033	0.000	8.321	0.00	37.93
145.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.20	0.00	0.033	0.000	8.321	0.00	44.89
150.00	Safety Cable	Yes	5.00	0.000	0.38	2.10	0.00	0.034	0.000	8.381	0.00	38.17
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.20	0.00	0.034	0.000	8.381	0.00	45.14
155.00	Safety Cable	Yes	5.00	0.000	0.38	2.10	0.00	0.035	0.000	8.439	0.00	38.40
155.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.21	0.00	0.035	0.000	8.439	0.00	45.37
157.00	Safety Cable	Yes	2.00	0.000	0.38	0.84	0.00	0.036	0.000	8.462	0.00	15.39
157.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.88	0.00	0.036	0.000	8.462	0.00	18.19
160.00	Safety Cable	Yes	3.00	0.000	0.38	1.27	0.00	0.036	0.000	8.495	0.00	23.17
160.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	1.33	0.00	0.036	0.000	8.495	0.00	27.36
165.00	Safety Cable	Yes	5.00	0.000	0.38	2.12	0.00	0.037	0.000	8.551	0.00	38.84
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.22	0.00	0.037	0.000	8.551	0.00	45.83
167.00	Safety Cable	Yes	2.00	0.000	0.38	0.85	0.00	0.038	0.000	8.572	0.00	15.57
167.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.89	0.00	0.038	0.000	8.572	0.00	18.37
170.00	Safety Cable	Yes	3.00	0.000	0.38	1.27	0.00	0.039	0.000	8.604	0.00	23.43
170.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	1.34	0.00	0.039	0.000	8.604	0.00	27.63
175.00	Safety Cable	Yes	5.00	0.000	0.38	2.13	0.00	0.040	0.000	8.657	0.00	39.26
175.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	2.23	0.00	0.040	0.000	8.657	0.00	46.26
176.00	Safety Cable	Yes	1.00	0.000	0.38	0.43	0.00	0.041	0.000	8.667	0.00	7.86
176.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.45	0.00	0.041	0.000	8.667	0.00	9.26
									Totals:		**0.0**	**2,606.0**

Calculated Forces

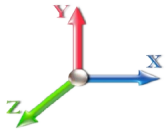
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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	-105.9	-11.82	-0.17	-1619.6	0.00	1619.68	6372.54	3186.27	14661.2	7341.49	0.00	0.000	0.000	0.237
5.00	-103.2	-11.76	-0.17	-1560.6	0.00	1560.60	6292.68	3146.34	14220.7	7120.95	0.03	-0.064	0.000	0.236
10.00	-100.5	-11.70	-0.17	-1501.8	0.00	1501.80	6211.66	3105.83	13784.2	6902.39	0.14	-0.129	0.000	0.234
15.00	-97.84	-11.64	-0.17	-1443.2	0.00	1443.29	6129.50	3064.75	13351.9	6685.89	0.31	-0.195	0.000	0.232
20.00	-95.17	-11.57	-0.17	-1385.0	0.00	1385.09	6046.18	3023.09	12923.8	6471.51	0.55	-0.262	0.000	0.230
25.00	-92.53	-11.49	-0.17	-1327.2	0.00	1327.25	5961.72	2980.86	12500.0	6259.33	0.86	-0.330	0.000	0.228
30.00	-89.92	-11.39	-0.17	-1269.8	0.00	1269.83	5876.11	2938.05	12080.8	6049.42	1.24	-0.399	0.000	0.225
35.00	-87.35	-11.30	-0.17	-1212.8	0.00	1212.85	5789.35	2894.67	11666.3	5841.84	1.70	-0.469	0.000	0.223
40.00	-84.81	-11.17	-0.17	-1156.3	0.00	1156.38	5679.25	2839.63	11212.8	5614.75	2.23	-0.540	0.000	0.221
42.75	-83.42	-11.10	-0.17	-1125.6	0.00	1125.67	5615.38	2807.69	10960.7	5488.51	2.55	-0.580	0.000	0.220
45.00	-81.67	-11.06	-0.17	-1100.6	0.00	1100.69	5563.11	2781.56	10756.6	5386.29	2.83	-0.613	0.000	0.219
49.00	-78.61	-10.92	-0.17	-1056.4	0.00	1056.44	4756.80	2378.40	9239.06	4626.40	3.37	-0.671	0.000	0.245
50.00	-78.14	-10.95	-0.17	-1045.5	0.00	1045.51	4742.51	2371.25	9172.60	4593.12	3.51	-0.686	0.000	0.244
55.00	-75.85	-10.83	-0.17	-990.79	0.00	990.79	4670.33	2335.16	8842.49	4427.82	4.27	-0.765	0.000	0.240
60.00	-73.60	-10.70	-0.17	-936.66	0.00	936.66	4597.00	2298.50	8516.13	4264.39	5.11	-0.844	0.000	0.236
65.00	-71.39	-10.58	-0.17	-883.14	0.00	883.14	4522.52	2261.26	8193.68	4102.93	6.04	-0.924	0.000	0.231
70.00	-69.21	-10.44	-0.17	-830.26	0.00	830.26	4446.89	2223.45	7875.26	3943.48	7.05	-1.005	0.000	0.226
75.00	-67.06	-10.31	-0.17	-778.04	0.00	778.04	4354.69	2177.34	7534.33	3772.77	8.15	-1.086	0.000	0.222
80.00	-64.95	-10.17	-0.17	-726.50	0.00	726.50	4253.06	2126.53	7185.02	3597.85	9.33	-1.167	0.000	0.217
85.00	-62.89	-9.99	-0.17	-675.65	0.00	675.65	4151.43	2075.72	6843.99	3427.08	10.59	-1.248	0.000	0.212
86.50	-62.27	-9.97	-0.17	-660.66	0.00	660.66	4120.95	2060.47	6743.30	3376.66	10.99	-1.273	0.000	0.211
90.00	-60.16	-9.83	-0.17	-625.77	0.00	625.77	4049.81	2024.90	6511.26	3260.47	11.94	-1.330	0.000	0.207
91.75	-59.11	-9.79	-0.17	-608.56	0.00	608.56	3441.70	1720.85	5608.94	2808.64	12.44	-1.359	0.000	0.234
95.00	-57.90	-9.71	-0.17	-576.76	0.00	576.76	3401.05	1700.53	5452.51	2730.31	13.38	-1.412	0.000	0.228
100.00	-56.07	-9.56	-0.17	-528.22	0.00	528.22	3337.56	1668.78	5214.58	2611.16	14.91	-1.500	0.000	0.219
105.00	-54.27	-9.41	-0.17	-480.43	0.00	480.43	3272.92	1636.46	4980.08	2493.74	16.52	-1.586	0.000	0.209
110.00	-52.50	-9.25	-0.17	-433.39	0.00	433.39	3194.68	1597.34	4730.71	2368.87	18.23	-1.670	0.000	0.199
115.00	-50.78	-9.09	-0.17	-387.13	0.00	387.13	3107.57	1553.79	4474.96	2240.81	20.02	-1.753	0.000	0.189
120.00	-49.08	-8.93	-0.17	-341.67	0.00	341.67	3020.47	1510.23	4226.32	2116.30	21.90	-1.832	0.000	0.178
125.00	-47.43	-8.76	-0.17	-297.01	0.00	297.01	2933.36	1466.68	3984.78	1995.35	23.86	-1.908	0.000	0.165
130.00	-45.81	-8.57	-0.17	-253.19	0.00	253.19	2846.25	1423.13	3750.35	1877.96	25.90	-1.979	0.000	0.151
131.25	-45.41	-8.55	-0.17	-242.47	0.00	242.47	2824.47	1412.24	3692.86	1849.17	26.42	-1.997	0.000	0.147
135.00	-43.83	-8.38	-0.17	-210.43	0.00	210.43	2759.14	1379.57	3523.03	1764.13	28.01	-2.046	-0.001	0.135
135.50	-43.62	-8.37	-0.17	-206.23	0.00	206.23	1734.08	867.04	2260.78	1132.07	28.22	-2.053	-0.001	0.207
137.00	-35.56	-6.88	0.00	-193.68	0.00	193.68	1723.43	861.72	2225.81	1114.56	28.87	-2.071	-0.001	0.194
140.00	-34.83	-6.80	0.00	-173.03	0.00	173.03	1701.83	850.91	2156.25	1079.73	30.19	-2.122	-0.001	0.181
145.00	-33.63	-6.63	0.00	-139.05	0.00	139.05	1664.90	832.45	2041.54	1022.29	32.45	-2.197	-0.001	0.156
150.00	-32.47	-6.46	0.00	-105.91	0.00	105.91	1626.81	813.41	1928.48	965.67	34.79	-2.262	-0.001	0.130
155.00	-31.33	-6.27	0.00	-73.62	0.00	73.62	1587.58	793.79	1817.22	909.96	37.19	-2.315	-0.001	0.101
157.00	-20.88	-4.19	0.00	-61.08	0.00	61.08	1571.57	785.79	1773.24	887.94	38.16	-2.333	-0.001	0.082
160.00	-20.23	-4.09	0.00	-48.49	0.00	48.49	1547.20	773.60	1707.88	855.21	39.63	-2.355	-0.001	0.070
165.00	-19.17	-3.90	0.00	-28.07	0.00	28.07	1505.67	752.84	1600.62	801.50	42.12	-2.383	-0.001	0.048
167.00	-11.06	-2.17	0.00	-20.27	0.00	20.27	1488.74	744.37	1558.33	780.32	43.12	-2.391	-0.001	0.033
170.00	-10.48	-2.06	0.00	-13.75	0.00	13.75	1462.99	731.50	1495.57	748.90	44.62	-2.400	-0.001	0.026
175.00	-9.53	-1.88	0.00	-3.44	0.00	3.44	1411.70	705.85	1385.55	693.80	47.14	-2.408	-0.001	0.012
176.00	0.00	-1.48	0.00	-1.55	0.00	1.55	1400.09	700.04	1362.73	682.38	47.64	-2.408	-0.001	0.002

Seismic Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	24
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.29		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1500.0	0.00	0.03	0.02	27.71	
10.00		1473.4	0.01	0.05	0.03	39.80	
15.00		1446.8	0.01	0.06	0.03	45.57	
20.00		1420.2	0.02	0.07	0.04	48.20	
25.00		1393.6	0.04	0.07	0.04	49.26	
30.00		1367.0	0.05	0.07	0.04	49.60	
35.00		1340.4	0.07	0.07	0.04	49.67	
40.00		1313.8	0.10	0.07	0.04	49.70	
42.75	Bot - Section 2	711.29	0.11	0.07	0.04	27.21	
45.00		1089.9	0.12	0.07	0.03	42.09	
49.00	Top - Section 1	1912.7	0.15	0.07	0.03	74.98	
50.00		223.19	0.15	0.07	0.03	8.78	
55.00		1101.9	0.18	0.06	0.03	43.81	
60.00		1078.7	0.22	0.06	0.02	42.67	
65.00		1055.4	0.26	0.05	0.02	40.41	
70.00		1032.1	0.30	0.05	0.01	36.49	
75.00		1008.8	0.34	0.03	0.01	30.39	
80.00		985.61	0.39	0.02	0.01	21.78	
85.00		962.33	0.44	0.00	0.01	10.78	
86.50	Bot - Section 3	284.16	0.46	0.00	0.01	2.12	
90.00		1227.7	0.49	-0.01	0.01	-2.20	
91.75	Top - Section 2	605.94	0.51	-0.02	0.01	-3.97	
95.00		518.65	0.55	-0.03	0.01	-7.91	
100.00		781.47	0.61	-0.06	0.02	-21.27	
105.00		761.52	0.67	-0.08	0.02	-27.55	
110.00		741.57	0.74	-0.10	0.04	-30.68	
115.00		721.62	0.81	-0.11	0.06	-30.75	
120.00		701.67	0.88	-0.12	0.08	-28.04	
125.00		681.73	0.95	-0.12	0.11	-22.89	
130.00		661.78	1.03	-0.10	0.15	-15.61	
131.25	Bot - Section 4	162.33	1.05	-0.09	0.16	-3.33	
135.00		805.50	1.11	-0.06	0.19	-8.10	
135.50	Top - Section 3	105.99	1.12	-0.06	0.20	-0.90	
137.00	Appurtenance(s)	2524.1	1.15	-0.04	0.22	-9.21	
140.00		252.22	1.20	0.00	0.25	1.77	
145.00		409.73	1.28	0.10	0.32	11.33	
150.00		396.43	1.37	0.23	0.40	20.57	
155.00		383.13	1.47	0.42	0.50	30.57	
157.00	Appurtenance(s)	3755.6	1.50	0.51	0.55	345.53	
160.00		220.30	1.56	0.67	0.62	24.55	
165.00		356.53	1.66	0.98	0.76	52.39	
167.00	Appurtenance(s)	2350.3	1.70	1.13	0.82	381.28	
170.00		204.34	1.76	1.38	0.92	38.08	
175.00		329.93	1.87	1.87	1.10	75.79	
176.00	Appurtenance(s)	3341.2	1.89	1.98	1.14	798.20	

Seismic Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Totals:	**45,703.6**	**2,308.7**	**Total Wind:**	**38,965.1**

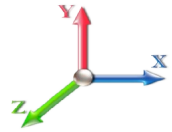
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.29	**SA**	0.03	**Seismic Importance Factor**			1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-62.68	-2.53	0.00	-352.07	0.00	352.07	6372.54	3186.27	14661.2	7341.49		0.00	0.00	0.058
5.00	-60.63	-2.52	0.00	-339.43	0.00	339.43	6292.68	3146.34	14220.7	7120.95		0.01	-0.01	0.057
10.00	-58.62	-2.49	0.00	-326.85	0.00	326.85	6211.66	3105.83	13784.2	6902.39		0.03	-0.03	0.057
15.00	-56.63	-2.46	0.00	-314.41	0.00	314.41	6129.50	3064.75	13351.9	6685.89		0.07	-0.04	0.056
20.00	-54.68	-2.42	0.00	-302.12	0.00	302.12	6046.18	3023.09	12923.8	6471.51		0.12	-0.06	0.056
25.00	-52.76	-2.38	0.00	-290.02	0.00	290.02	5961.72	2980.86	12500.0	6259.33		0.19	-0.07	0.055
30.00	-50.87	-2.34	0.00	-278.10	0.00	278.10	5876.11	2938.05	12080.8	6049.42		0.27	-0.09	0.055
35.00	-49.02	-2.31	0.00	-266.38	0.00	266.38	5789.35	2894.67	11666.3	5841.84		0.37	-0.10	0.054
40.00	-47.19	-2.26	0.00	-254.85	0.00	254.85	5679.25	2839.63	11212.8	5614.75		0.48	-0.12	0.054
42.75	-46.20	-2.24	0.00	-248.63	0.00	248.63	5615.38	2807.69	10960.7	5488.51		0.56	-0.13	0.054
45.00	-44.78	-2.20	0.00	-243.60	0.00	243.60	5563.11	2781.56	10756.6	5386.29		0.62	-0.13	0.053
49.00	-42.29	-2.13	0.00	-234.79	0.00	234.79	4756.80	2378.40	9239.06	4626.40		0.73	-0.15	0.060
50.00	-41.97	-2.12	0.00	-232.66	0.00	232.66	4742.51	2371.25	9172.60	4593.12		0.77	-0.15	0.060
55.00	-40.40	-2.09	0.00	-222.04	0.00	222.04	4670.33	2335.16	8842.49	4427.82		0.93	-0.17	0.059
60.00	-38.86	-2.05	0.00	-211.60	0.00	211.60	4597.00	2298.50	8516.13	4264.39		1.12	-0.19	0.058
65.00	-37.35	-2.02	0.00	-201.33	0.00	201.33	4522.52	2261.26	8193.68	4102.93		1.32	-0.20	0.057
70.00	-35.86	-1.99	0.00	-191.23	0.00	191.23	4446.89	2223.45	7875.26	3943.48		1.55	-0.22	0.057
75.00	-34.40	-1.96	0.00	-181.28	0.00	181.28	4354.69	2177.34	7534.33	3772.77		1.79	-0.24	0.056
80.00	-32.97	-1.95	0.00	-171.45	0.00	171.45	4253.06	2126.53	7185.02	3597.85		2.05	-0.26	0.055
85.00	-31.57	-1.94	0.00	-161.71	0.00	161.71	4151.43	2075.72	6843.99	3427.08		2.33	-0.28	0.055
86.50	-31.15	-1.94	0.00	-158.81	0.00	158.81	4120.95	2060.47	6743.30	3376.66		2.42	-0.29	0.055
90.00	-29.51	-1.94	0.00	-152.02	0.00	152.02	4049.81	2024.90	6511.26	3260.47		2.64	-0.30	0.054
91.75	-28.69	-1.94	0.00	-148.64	0.00	148.64	3441.70	1720.85	5608.94	2808.64		2.75	-0.31	0.061
95.00	-27.91	-1.94	0.00	-142.34	0.00	142.34	3401.05	1700.53	5452.51	2730.31		2.96	-0.32	0.060
100.00	-26.72	-1.94	0.00	-132.64	0.00	132.64	3337.56	1668.78	5214.58	2611.16		3.31	-0.34	0.059
105.00	-25.56	-1.95	0.00	-122.92	0.00	122.92	3272.92	1636.46	4980.08	2493.74		3.68	-0.36	0.057
110.00	-24.42	-1.95	0.00	-113.19	0.00	113.19	3194.68	1597.34	4730.71	2368.87		4.07	-0.38	0.055
115.00	-23.31	-1.95	0.00	-103.45	0.00	103.45	3107.57	1553.79	4474.96	2240.81		4.48	-0.41	0.054
120.00	-22.22	-1.95	0.00	-93.70	0.00	93.70	3020.47	1510.23	4226.32	2116.30		4.92	-0.43	0.052
125.00	-21.15	-1.95	0.00	-83.95	0.00	83.95	2933.36	1466.68	3984.78	1995.35		5.38	-0.45	0.049
130.00	-20.11	-1.95	0.00	-74.20	0.00	74.20	2846.25	1423.13	3750.35	1877.96		5.86	-0.47	0.047
131.25	-19.86	-1.95	0.00	-71.77	0.00	71.77	2824.47	1412.24	3692.86	1849.17		5.98	-0.47	0.046
135.00	-18.70	-1.94	0.00	-64.47	0.00	64.47	2759.14	1379.57	3523.03	1764.13		6.36	-0.49	0.043
135.50	-18.55	-1.94	0.00	-63.50	0.00	63.50	1734.08	867.04	2260.78	1132.07		6.41	-0.49	0.067
137.00	-15.45	-1.92	0.00	-60.59	0.00	60.59	1723.43	861.72	2225.81	1114.56		6.57	-0.50	0.063
140.00	-15.05	-1.92	0.00	-54.84	0.00	54.84	1701.83	850.91	2156.25	1079.73		6.89	-0.51	0.060
145.00	-14.40	-1.90	0.00	-45.26	0.00	45.26	1664.90	832.45	2041.54	1022.29		7.44	-0.54	0.053
150.00	-13.77	-1.88	0.00	-35.74	0.00	35.74	1626.81	813.41	1928.48	965.67		8.01	-0.56	0.045
155.00	-13.16	-1.85	0.00	-26.32	0.00	26.32	1587.58	793.79	1817.22	909.96		8.61	-0.58	0.037
157.00	-8.59	-1.46	0.00	-22.62	0.00	22.62	1571.57	785.79	1773.24	887.94		8.85	-0.58	0.031
160.00	-8.24	-1.43	0.00	-18.25	0.00	18.25	1547.20	773.60	1707.88	855.21		9.22	-0.59	0.027
165.00	-7.67	-1.37	0.00	-11.09	0.00	11.09	1505.67	752.84	1600.62	801.50		9.85	-0.60	0.019
167.00	-4.80	-0.96	0.00	-8.34	0.00	8.34	1488.74	744.37	1558.33	780.32		10.10	-0.61	0.014
170.00	-4.50	-0.92	0.00	-5.45	0.00	5.45	1462.99	731.50	1495.57	748.90		10.48	-0.61	0.010
175.00	-4.02	-0.84	0.00	-0.84	0.00	0.84	1411.70	705.85	1385.55	693.80		11.12	-0.61	0.004
176.00	0.00	-0.80	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38		11.25	-0.61	0.000

Calculated Forces

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

Seismic Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E					**Iterations**	23
Gust Response Factor	1.10			**Sds**	0.19	**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.29	**SA**	0.03	**Seismic Importance Factor**	1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1500.0	0.00	0.03	0.02	27.71	
10.00		1473.4	0.01	0.05	0.03	39.80	
15.00		1446.8	0.01	0.06	0.03	45.57	
20.00		1420.2	0.02	0.07	0.04	48.20	
25.00		1393.6	0.04	0.07	0.04	49.26	
30.00		1367.0	0.05	0.07	0.04	49.60	
35.00		1340.4	0.07	0.07	0.04	49.67	
40.00		1313.8	0.10	0.07	0.04	49.70	
42.75	Bot - Section 2	711.29	0.11	0.07	0.04	27.21	
45.00		1089.9	0.12	0.07	0.03	42.09	
49.00	Top - Section 1	1912.7	0.15	0.07	0.03	74.98	
50.00		223.19	0.15	0.07	0.03	8.78	
55.00		1101.9	0.18	0.06	0.03	43.81	
60.00		1078.7	0.22	0.06	0.02	42.67	
65.00		1055.4	0.26	0.05	0.02	40.41	
70.00		1032.1	0.30	0.05	0.01	36.49	
75.00		1008.8	0.34	0.03	0.01	30.39	
80.00		985.61	0.39	0.02	0.01	21.78	
85.00		962.33	0.44	0.00	0.01	10.78	
86.50	Bot - Section 3	284.16	0.46	0.00	0.01	2.12	
90.00		1227.7	0.49	-0.01	0.01	-2.20	
91.75	Top - Section 2	605.94	0.51	-0.02	0.01	-3.97	
95.00		518.65	0.55	-0.03	0.01	-7.91	
100.00		781.47	0.61	-0.06	0.02	-21.27	
105.00		761.52	0.67	-0.08	0.02	-27.55	
110.00		741.57	0.74	-0.10	0.04	-30.68	
115.00		721.62	0.81	-0.11	0.06	-30.75	
120.00		701.67	0.88	-0.12	0.08	-28.04	
125.00		681.73	0.95	-0.12	0.11	-22.89	
130.00		661.78	1.03	-0.10	0.15	-15.61	
131.25	Bot - Section 4	162.33	1.05	-0.09	0.16	-3.33	
135.00		805.50	1.11	-0.06	0.19	-8.10	
135.50	Top - Section 3	105.99	1.12	-0.06	0.20	-0.90	
137.00	Appurtenance(s)	2524.1	1.15	-0.04	0.22	-9.21	
140.00		252.22	1.20	0.00	0.25	1.77	
145.00		409.73	1.28	0.10	0.32	11.33	
150.00		396.43	1.37	0.23	0.40	20.57	
155.00		383.13	1.47	0.42	0.50	30.57	
157.00	Appurtenance(s)	3755.6	1.50	0.51	0.55	345.53	
160.00		220.30	1.56	0.67	0.62	24.55	
165.00		356.53	1.66	0.98	0.76	52.39	
167.00	Appurtenance(s)	2350.3	1.70	1.13	0.82	381.28	
170.00		204.34	1.76	1.38	0.92	38.08	
175.00		329.93	1.87	1.87	1.10	75.79	
176.00	Appurtenance(s)	3341.2	1.89	1.98	1.14	798.20	

Seismic Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 38	

Totals:	**45,703.6**	**2,308.7**	**Total Wind:**	**38,965.1**

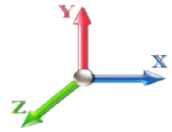
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19			**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.29	**SA**	0.03			**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-47.01	-2.53	0.00	-346.49	0.00	346.49	6372.54	3186.27	14661.2	7341.49		0.00	0.00	0.055
5.00	-45.47	-2.51	0.00	-333.86	0.00	333.86	6292.68	3146.34	14220.7	7120.95		0.01	-0.01	0.054
10.00	-43.96	-2.48	0.00	-321.32	0.00	321.32	6211.66	3105.83	13784.2	6902.39		0.03	-0.03	0.054
15.00	-42.47	-2.44	0.00	-308.93	0.00	308.93	6129.50	3064.75	13351.9	6685.89		0.07	-0.04	0.053
20.00	-41.01	-2.40	0.00	-296.71	0.00	296.71	6046.18	3023.09	12923.8	6471.51		0.12	-0.06	0.053
25.00	-39.57	-2.36	0.00	-284.69	0.00	284.69	5961.72	2980.86	12500.0	6259.33		0.18	-0.07	0.052
30.00	-38.15	-2.32	0.00	-272.88	0.00	272.88	5876.11	2938.05	12080.8	6049.42		0.27	-0.09	0.052
35.00	-36.76	-2.28	0.00	-261.27	0.00	261.27	5789.35	2894.67	11666.3	5841.84		0.36	-0.10	0.051
40.00	-35.39	-2.23	0.00	-249.87	0.00	249.87	5679.25	2839.63	11212.8	5614.75		0.48	-0.12	0.051
42.75	-34.65	-2.21	0.00	-243.73	0.00	243.73	5615.38	2807.69	10960.7	5488.51		0.55	-0.12	0.051
45.00	-33.59	-2.17	0.00	-238.76	0.00	238.76	5563.11	2781.56	10756.6	5386.29		0.61	-0.13	0.050
49.00	-31.72	-2.10	0.00	-230.07	0.00	230.07	4756.80	2378.40	9239.06	4626.40		0.72	-0.14	0.056
50.00	-31.48	-2.09	0.00	-227.97	0.00	227.97	4742.51	2371.25	9172.60	4593.12		0.75	-0.15	0.056
55.00	-30.30	-2.06	0.00	-217.51	0.00	217.51	4670.33	2335.16	8842.49	4427.82		0.92	-0.16	0.056
60.00	-29.14	-2.02	0.00	-207.23	0.00	207.23	4597.00	2298.50	8516.13	4264.39		1.10	-0.18	0.055
65.00	-28.01	-1.98	0.00	-197.14	0.00	197.14	4522.52	2261.26	8193.68	4102.93		1.30	-0.20	0.054
70.00	-26.89	-1.95	0.00	-187.23	0.00	187.23	4446.89	2223.45	7875.26	3943.48		1.52	-0.22	0.054
75.00	-25.80	-1.92	0.00	-177.48	0.00	177.48	4354.69	2177.34	7534.33	3772.77		1.76	-0.24	0.053
80.00	-24.73	-1.91	0.00	-167.86	0.00	167.86	4253.06	2126.53	7185.02	3597.85		2.01	-0.26	0.052
85.00	-23.67	-1.90	0.00	-158.33	0.00	158.33	4151.43	2075.72	6843.99	3427.08		2.29	-0.27	0.052
86.50	-23.36	-1.90	0.00	-155.48	0.00	155.48	4120.95	2060.47	6743.30	3376.66		2.38	-0.28	0.052
90.00	-22.13	-1.89	0.00	-148.85	0.00	148.85	4049.81	2024.90	6511.26	3260.47		2.59	-0.29	0.051
91.75	-21.52	-1.89	0.00	-145.53	0.00	145.53	3441.70	1720.85	5608.94	2808.64		2.70	-0.30	0.058
95.00	-20.93	-1.90	0.00	-139.38	0.00	139.38	3401.05	1700.53	5452.51	2730.31		2.91	-0.31	0.057
100.00	-20.04	-1.90	0.00	-129.89	0.00	129.89	3337.56	1668.78	5214.58	2611.16		3.24	-0.33	0.056
105.00	-19.17	-1.90	0.00	-120.39	0.00	120.39	3272.92	1636.46	4980.08	2493.74		3.61	-0.36	0.054
110.00	-18.31	-1.90	0.00	-110.89	0.00	110.89	3194.68	1597.34	4730.71	2368.87		3.99	-0.38	0.053
115.00	-17.48	-1.90	0.00	-101.37	0.00	101.37	3107.57	1553.79	4474.96	2240.81		4.40	-0.40	0.051
120.00	-16.66	-1.90	0.00	-91.85	0.00	91.85	3020.47	1510.23	4226.32	2116.30		4.83	-0.42	0.049
125.00	-15.86	-1.90	0.00	-82.33	0.00	82.33	2933.36	1466.68	3984.78	1995.35		5.28	-0.44	0.047
130.00	-15.08	-1.90	0.00	-72.81	0.00	72.81	2846.25	1423.13	3750.35	1877.96		5.75	-0.46	0.044
131.25	-14.89	-1.90	0.00	-70.44	0.00	70.44	2824.47	1412.24	3692.86	1849.17		5.87	-0.47	0.043
135.00	-14.02	-1.90	0.00	-63.30	0.00	63.30	2759.14	1379.57	3523.03	1764.13		6.24	-0.48	0.041
135.50	-13.91	-1.90	0.00	-62.35	0.00	62.35	1734.08	867.04	2260.78	1132.07		6.29	-0.48	0.063
137.00	-11.58	-1.88	0.00	-59.51	0.00	59.51	1723.43	861.72	2225.81	1114.56		6.44	-0.49	0.060
140.00	-11.28	-1.88	0.00	-53.87	0.00	53.87	1701.83	850.91	2156.25	1079.73		6.75	-0.50	0.057
145.00	-10.80	-1.87	0.00	-44.47	0.00	44.47	1664.90	832.45	2041.54	1022.29		7.29	-0.53	0.050
150.00	-10.32	-1.85	0.00	-35.14	0.00	35.14	1626.81	813.41	1928.48	965.67		7.86	-0.55	0.043
155.00	-9.86	-1.81	0.00	-25.90	0.00	25.90	1587.58	793.79	1817.22	909.96		8.44	-0.57	0.035
157.00	-6.44	-1.43	0.00	-22.28	0.00	22.28	1571.57	785.79	1773.24	887.94		8.68	-0.57	0.029
160.00	-6.18	-1.41	0.00	-17.97	0.00	17.97	1547.20	773.60	1707.88	855.21		9.04	-0.58	0.025
165.00	-5.75	-1.35	0.00	-10.93	0.00	10.93	1505.67	752.84	1600.62	801.50		9.66	-0.59	0.017
167.00	-3.60	-0.95	0.00	-8.22	0.00	8.22	1488.74	744.37	1558.33	780.32		9.91	-0.59	0.013
170.00	-3.38	-0.91	0.00	-5.38	0.00	5.38	1462.99	731.50	1495.57	748.90		10.28	-0.60	0.009
175.00	-3.01	-0.83	0.00	-0.83	0.00	0.83	1411.70	705.85	1385.55	693.80		10.91	-0.60	0.003
176.00	0.00	-0.80	0.00	0.00	0.00	0.00	1400.09	700.04	1362.73	682.38		11.03	-0.60	0.000

Calculated Forces

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

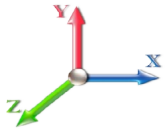
Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 41	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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	264.70	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	260.09	0.650	0.000	5.00	23.718	15.42	126.2	0.0	1500.1
10.00		1.00	0.85	7.442	8.19	255.48	0.650	0.000	5.00	23.301	15.15	124.0	0.0	1473.5
15.00		1.00	0.85	7.442	8.19	250.87	0.650	0.000	5.00	22.884	14.87	121.8	0.0	1446.9
20.00		1.00	0.90	7.896	8.69	253.66	0.650	0.000	5.00	22.467	14.60	126.8	0.0	1420.3
25.00		1.00	0.95	8.276	9.10	254.83	0.650	0.000	5.00	22.050	14.33	130.5	0.0	1393.7
30.00		1.00	0.98	8.600	9.46	254.81	0.650	0.000	5.00	21.634	14.06	133.0	0.0	1367.1
35.00		1.00	1.01	8.883	9.77	253.94	0.650	0.000	5.00	21.217	13.79	134.8	0.0	1340.5
40.00		1.00	1.04	9.137	10.05	252.43	0.650	0.000	5.00	20.800	13.52	135.9	0.0	1313.9
42.75	Bot - Section 2	1.00	1.06	9.266	10.19	251.37	0.650	0.000	2.75	11.262	7.32	74.6	0.0	711.3
45.00		1.00	1.07	9.366	10.30	250.40	0.650	0.000	2.25	9.288	6.04	62.2	0.0	1089.9
49.00	Top - Section 1	1.00	1.09	9.536	10.49	248.48	0.650	0.000	4.00	16.303	10.60	111.2	0.0	1912.7
50.00		1.00	1.09	9.576	10.53	252.61	0.650	0.000	1.00	4.034	2.62	27.6	0.0	223.2
55.00		1.00	1.12	9.770	10.75	249.88	0.650	0.000	5.00	19.920	12.95	139.2	0.0	1102.0
60.00		1.00	1.14	9.951	10.95	246.84	0.650	0.000	5.00	19.503	12.68	138.8	0.0	1078.7
65.00		1.00	1.16	10.120	11.13	243.55	0.650	0.000	5.00	19.086	12.41	138.1	0.0	1055.4
70.00		1.00	1.17	10.279	11.31	240.04	0.650	0.000	5.00	18.670	12.14	137.2	0.0	1032.2
75.00		1.00	1.19	10.430	11.47	236.33	0.650	0.000	5.00	18.253	11.86	136.1	0.0	1008.9
80.00		1.00	1.21	10.572	11.63	232.45	0.650	0.000	5.00	17.836	11.59	134.8	0.0	985.6
85.00		1.00	1.22	10.708	11.78	228.41	0.650	0.000	5.00	17.419	11.32	133.4	0.0	962.3
86.50	Bot - Section 3	1.00	1.23	10.748	11.82	227.16	0.650	0.000	1.50	5.145	3.34	39.5	0.0	284.2
90.00		1.00	1.24	10.838	11.92	224.22	0.650	0.000	3.50	12.080	7.85	93.6	0.0	1227.8
91.75	Top - Section 2	1.00	1.24	10.882	11.97	222.72	0.650	0.000	1.75	5.963	3.88	46.4	0.0	605.9
95.00		1.00	1.25	10.962	12.06	224.16	0.650	0.000	3.25	10.940	7.11	85.7	0.0	518.7
100.00		1.00	1.27	11.081	12.19	219.75	0.650	0.000	5.00	16.486	10.72	130.6	0.0	781.5
105.00		1.00	1.28	11.195	12.31	215.23	0.650	0.000	5.00	16.069	10.45	128.6	0.0	761.5
110.00		1.00	1.29	11.305	12.44	210.60	0.650	0.000	5.00	15.653	10.17	126.5	0.0	741.6
115.00		1.00	1.30	11.412	12.55	205.88	0.650	0.000	5.00	15.236	9.90	124.3	0.0	721.6
120.00		1.00	1.32	11.514	12.67	201.07	0.650	0.000	5.00	14.819	9.63	122.0	0.0	701.7
125.00		1.00	1.33	11.614	12.78	196.17	0.650	0.000	5.00	14.402	9.36	119.6	0.0	681.7
130.00		1.00	1.34	11.710	12.88	191.20	0.650	0.000	5.00	13.986	9.09	117.1	0.0	661.8
131.25	Bot - Section 4	1.00	1.34	11.734	12.91	189.94	0.650	0.000	1.25	3.431	2.23	28.8	0.0	162.3
135.00		1.00	1.35	11.803	12.98	186.15	0.650	0.000	3.75	10.296	6.69	86.9	0.0	805.5
135.50	Top - Section 3	1.00	1.35	11.813	12.99	185.64	0.650	0.000	0.50	1.355	0.88	11.4	0.0	106.0
137.00	Appurtenance(s)	1.00	1.35	11.840	13.02	187.07	0.650	0.000	1.50	4.040	2.63	34.2	0.0	127.9
140.00		1.00	1.36	11.894	13.08	184.00	0.650	0.000	3.00	7.968	5.18	67.8	0.0	252.2
145.00		1.00	1.37	11.982	13.18	178.83	0.650	0.000	5.00	12.947	8.42	110.9	0.0	409.7
150.00		1.00	1.38	12.068	13.27	173.59	0.650	0.000	5.00	12.530	8.14	108.1	0.0	396.4
155.00		1.00	1.39	12.152	13.37	168.30	0.650	0.000	5.00	12.113	7.87	105.2	0.0	383.1
157.00	Appurtenance(s)	1.00	1.39	12.185	13.40	166.17	0.650	0.000	2.00	4.729	3.07	41.2	0.0	149.5
160.00		1.00	1.40	12.233	13.46	162.95	0.650	0.000	3.00	6.968	4.53	60.9	0.0	220.3
165.00		1.00	1.41	12.313	13.54	157.55	0.650	0.000	5.00	11.280	7.33	99.3	0.0	356.5
167.00	Appurtenance(s)	1.00	1.41	12.344	13.58	155.38	0.650	0.000	2.00	4.395	2.86	38.8	0.0	138.9
170.00		1.00	1.42	12.390	13.63	152.10	0.650	0.000	3.00	6.468	4.20	57.3	0.0	204.3
175.00		1.00	1.42	12.466	13.71	146.59	0.650	0.000	5.00	10.446	6.79	93.1	0.0	329.9
176.00	Appurtenance(s)	1.00	1.43	12.481	13.73	145.49	0.650	0.000	1.00	2.039	1.33	18.2	0.0	64.4

Wind Loading - Shaft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 42	

Totals:	**176.00**	**4,362.3**	**34,212.9**

Discrete Appurtenance Forces

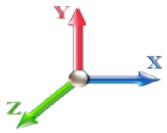
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 43	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	176.00	KRY 112 89/4	3	12.496	13.746	0.50	0.75	0.98	46.20	0.000	1.000	13.47	0.00	13.47
2	176.00	KRY 112 489/2	3	12.496	13.746	0.50	0.75	0.98	46.20	0.000	1.000	13.47	0.00	13.47
3	176.00	RMQP-496-HK	1	12.496	13.746	1.00	1.00	46.00	2449.00	0.000	1.000	632.30	0.00	632.30
4	176.00	APXVAARR24_43-U-NA2	3	12.496	13.746	0.52	0.75	31.88	384.00	0.000	1.000	438.19	0.00	438.19
5	176.00	Lightning Rod	1	12.533	13.786	1.00	1.00	1.05	35.00	0.000	3.500	14.48	0.00	50.66
6	176.00	MHA FE15501P77/75	6	12.496	13.746	0.49	0.75	2.72	66.00	0.000	1.000	37.39	0.00	37.39
7	176.00	RR90-17-02DP	3	12.496	13.746	0.51	0.75	6.67	40.50	0.000	1.000	91.69	0.00	91.69
8	176.00	4449	3	12.496	13.746	0.50	0.75	2.49	210.00	0.000	1.000	34.19	0.00	34.19
9	167.00	RRH2X60-AWS	3	12.344	13.578	0.61	0.80	6.38	180.00	0.000	0.000	86.68	0.00	0.00
10	167.00	RRH2X60-700	3	12.344	13.578	0.61	0.80	6.38	180.00	0.000	0.000	86.68	0.00	0.00
11	167.00	Low Profile	1	12.344	13.578	1.00	1.00	22.00	1500.00	0.000	0.000	298.73	0.00	0.00
12	167.00	DB-T16Z-8AB-0Z	1	12.344	13.578	1.00	1.00	4.80	18.90	0.000	0.000	65.18	0.00	0.00
13	167.00	SBNHH-1D65B	6	12.344	13.578	0.66	0.80	32.51	240.00	0.000	0.000	441.43	0.00	0.00
14	167.00	LPA-80063-4CF-EDIN-5	4	12.344	13.578	0.74	0.80	18.30	80.00	0.000	0.000	248.52	0.00	0.00
15	167.00	APL868013	2	12.344	13.578	0.84	0.90	4.79	12.60	0.000	0.000	65.01	0.00	0.00
16	157.00	Low Profile Platform	1	12.185	13.403	1.00	1.00	22.00	1500.00	0.000	0.000	294.87	0.00	0.00
17	157.00	ALU TD-RRH8x20-25	3	12.185	13.403	0.54	0.80	6.51	210.00	0.000	0.000	87.29	0.00	0.00
18	157.00	ALU 800 Mhz	6	12.185	13.403	0.54	0.80	8.01	318.00	0.000	0.000	107.33	0.00	0.00
19	157.00	Sitepro PRK-SFS-H-L	1	12.185	13.403	1.00	1.00	6.70	230.00	0.000	0.000	89.80	0.00	0.00
20	157.00	Sitepro HRK14-U	1	12.185	13.403	1.00	1.00	8.13	302.36	0.000	0.000	108.97	0.00	0.00
21	157.00	Sitepro PRK-1245L	1	12.185	13.403	1.00	1.00	9.50	464.91	0.000	0.000	127.33	0.00	0.00
22	157.00	Commscope	3	12.185	13.403	0.60	0.80	22.09	232.20	0.000	0.000	296.02	0.00	0.00
23	157.00	RFS APXVTM14-C-I20	3	12.185	13.403	0.62	0.80	11.72	168.60	0.000	0.000	157.03	0.00	0.00
24	157.00	ALU 1900 Mhz	3	12.185	13.403	0.54	0.80	4.45	180.00	0.000	0.000	59.70	0.00	0.00
25	137.00	7770.00	6	11.840	13.024	0.58	0.80	19.27	210.00	0.000	0.000	251.00	0.00	0.00
26	137.00	LGP21401	6	11.840	13.024	0.54	0.80	4.15	114.00	0.000	0.000	54.03	0.00	0.00
27	137.00	LGP21903	6	11.840	13.024	0.67	0.80	1.09	30.00	4.341	0.000	14.18	61.54	0.00
28	137.00	RRUS-11	3	11.840	13.024	0.54	0.80	7.21	165.00	0.000	0.000	93.95	0.00	0.00
29	137.00	DC6-48-60-18-8F	1	11.840	13.024	1.00	1.00	1.47	32.80	0.000	0.000	19.15	0.00	0.00
30	137.00	RRUS 32-B2	3	11.840	13.024	0.54	0.80	4.41	159.00	0.000	0.000	57.38	0.00	0.00
31	137.00	LP Platform-Round	1	11.840	13.024	1.00	1.00	22.00	1500.00	0.000	0.000	286.53	0.00	0.00
32	137.00	HPA-65R-BUU-H6	3	11.840	13.024	0.68	0.80	19.71	153.00	0.000	0.000	256.66	0.00	0.00
33	137.00	7020	12	11.840	13.024	0.40	0.80	1.92	26.40	0.000	0.000	25.01	0.00	0.00
34	137.00	Smart Bias T 1001940	3	11.840	13.024	0.54	0.80	0.14	6.00	7.041	0.000	1.88	13.27	0.00
							Totals:		**11,490.67**			**4,955.50**		

Total Applied Force Summary

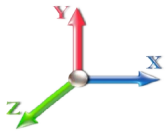
Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 44

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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		126.20	1706.02	0.00	0.00
10.00		123.98	1679.42	0.00	0.00
15.00		121.77	1652.83	0.00	0.00
20.00		126.84	1626.23	0.00	0.00
25.00		130.48	1599.63	0.00	0.00
30.00		133.02	1573.03	0.00	0.00
35.00		134.76	1546.44	0.00	0.00
40.00		135.88	1519.84	0.00	0.00
42.75		74.61	824.57	0.00	0.00
45.00		62.20	1182.62	0.00	0.00
49.00		111.15	2077.50	0.00	0.00
50.00		27.62	264.38	0.00	0.00
55.00		139.16	1307.93	0.00	0.00
60.00		138.76	1284.66	0.00	0.00
65.00		138.11	1261.39	0.00	0.00
70.00		137.21	1238.12	0.00	0.00
75.00		136.11	1214.84	0.00	0.00
80.00		134.83	1191.57	0.00	0.00
85.00		133.37	1168.30	0.00	0.00
86.50		39.53	345.95	0.00	0.00
90.00		93.61	1371.93	0.00	0.00
91.75		46.40	678.03	0.00	0.00
95.00		85.74	652.53	0.00	0.00
100.00		130.62	987.43	0.00	0.00
105.00		128.63	967.48	0.00	0.00
110.00		126.53	947.54	0.00	0.00
115.00		124.31	927.59	0.00	0.00
120.00		122.00	907.64	0.00	0.00
125.00		119.59	887.69	0.00	0.00
130.00		117.10	867.74	0.00	0.00
131.25		28.79	213.82	0.00	0.00
135.00		86.89	959.97	0.00	0.00
135.50		11.45	126.58	0.00	0.00
137.00	(44) attachments	1093.96	2585.89	74.81	0.00
140.00		67.76	330.14	0.00	0.00
145.00		110.92	539.59	0.00	0.00
150.00		108.12	526.29	0.00	0.00
155.00		105.25	512.99	0.00	0.00
157.00	(22) attachments	1369.53	3807.54	0.00	0.00
160.00		60.95	290.30	0.00	0.00
165.00		99.30	473.20	0.00	0.00
167.00	(20) attachments	1331.02	2397.06	0.00	0.00
170.00		57.30	249.02	0.00	0.00
175.00		93.11	404.40	0.00	0.00
176.00	(23) attachments	1293.38	3356.18	0.00	1311.37

Total Applied Force Summary

Structure:	CT02216-S-SBA		**Code:**	EIA/TIA-222-G	6/19/2019
Site Name:	Glastonbury		**Exposure:**	C	
Height:	176.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 45

Tower Engineering Solutions

Totals:	**9,317.83**	**52,233.87**	**74.81**	**1,311.37**

Linear Appurtenance Segment Forces (Factored)

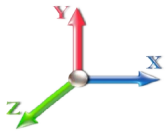
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 46	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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	0.018	0.000	7.442	0.00	1.37
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	7.442	0.00	5.20
10.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.018	0.000	7.442	0.00	1.37
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	7.442	0.00	5.20
15.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.018	0.000	7.442	0.00	1.37
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.018	0.000	7.442	0.00	5.20
20.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	7.896	0.00	1.37
20.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	7.896	0.00	5.20
25.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	8.276	0.00	1.37
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	8.276	0.00	5.20
30.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.019	0.000	8.600	0.00	1.37
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.019	0.000	8.600	0.00	5.20
35.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.020	0.000	8.883	0.00	1.37
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.020	0.000	8.883	0.00	5.20
40.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.020	0.000	9.137	0.00	1.37
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.020	0.000	9.137	0.00	5.20
42.75	Safety Cable	Yes	2.75	0.000	0.38	0.09	0.00	0.021	0.000	9.266	0.00	0.75
42.75	Step bolts (ladder)	Yes	2.75	0.000	0.63	0.14	0.00	0.021	0.000	9.266	0.00	2.86
45.00	Safety Cable	Yes	2.25	0.000	0.38	0.07	0.00	0.021	0.000	9.366	0.00	0.61
45.00	Step bolts (ladder)	Yes	2.25	0.000	0.63	0.12	0.00	0.021	0.000	9.366	0.00	2.34
49.00	Safety Cable	Yes	4.00	0.000	0.38	0.13	0.00	0.021	0.000	9.536	0.00	1.09
49.00	Step bolts (ladder)	Yes	4.00	0.000	0.63	0.21	0.00	0.021	0.000	9.536	0.00	4.16
50.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.021	0.000	9.576	0.00	0.27
50.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.05	0.00	0.021	0.000	9.576	0.00	1.04
55.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.021	0.000	9.770	0.00	1.37
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.021	0.000	9.770	0.00	5.20
60.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.022	0.000	9.951	0.00	1.37
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.022	0.000	9.951	0.00	5.20
65.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.022	0.000	10.120	0.00	1.37
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.022	0.000	10.120	0.00	5.20
70.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.023	0.000	10.279	0.00	1.37
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.023	0.000	10.279	0.00	5.20
75.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.023	0.000	10.430	0.00	1.37
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.023	0.000	10.430	0.00	5.20
80.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.024	0.000	10.572	0.00	1.37
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.024	0.000	10.572	0.00	5.20
85.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.024	0.000	10.708	0.00	1.37
85.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.024	0.000	10.708	0.00	5.20
86.50	Safety Cable	Yes	1.50	0.000	0.38	0.05	0.00	0.025	0.000	10.748	0.00	0.41
86.50	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.08	0.00	0.025	0.000	10.748	0.00	1.56
90.00	Safety Cable	Yes	3.50	0.000	0.38	0.11	0.00	0.025	0.000	10.838	0.00	0.96
90.00	Step bolts (ladder)	Yes	3.50	0.000	0.63	0.18	0.00	0.025	0.000	10.838	0.00	3.64
91.75	Safety Cable	Yes	1.75	0.000	0.38	0.06	0.00	0.025	0.000	10.882	0.00	0.48
91.75	Step bolts (ladder)	Yes	1.75	0.000	0.63	0.09	0.00	0.025	0.000	10.882	0.00	1.82
95.00	Safety Cable	Yes	3.25	0.000	0.38	0.10	0.00	0.025	0.000	10.962	0.00	0.89
95.00	Step bolts (ladder)	Yes	3.25	0.000	0.63	0.17	0.00	0.025	0.000	10.962	0.00	3.38
100.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.026	0.000	11.081	0.00	1.37

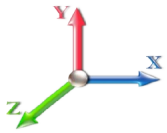
Linear Appurtenance Segment Forces (Factored)

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 47	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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)
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.026	0.000	11.081	0.00	5.20
105.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.026	0.000	11.195	0.00	1.37
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.026	0.000	11.195	0.00	5.20
110.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.027	0.000	11.305	0.00	1.37
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.027	0.000	11.305	0.00	5.20
115.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.028	0.000	11.412	0.00	1.37
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.028	0.000	11.412	0.00	5.20
120.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.028	0.000	11.514	0.00	1.37
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.028	0.000	11.514	0.00	5.20
125.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.029	0.000	11.614	0.00	1.37
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.029	0.000	11.614	0.00	5.20
130.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.030	0.000	11.710	0.00	1.37
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.030	0.000	11.710	0.00	5.20
131.25	Safety Cable	Yes	1.25	0.000	0.38	0.04	0.00	0.031	0.000	11.734	0.00	0.34
131.25	Step bolts (ladder)	Yes	1.25	0.000	0.63	0.07	0.00	0.031	0.000	11.734	0.00	1.30
135.00	Safety Cable	Yes	3.75	0.000	0.38	0.12	0.00	0.031	0.000	11.803	0.00	1.02
135.00	Step bolts (ladder)	Yes	3.75	0.000	0.63	0.20	0.00	0.031	0.000	11.803	0.00	3.90
135.50	Safety Cable	Yes	0.50	0.000	0.38	0.02	0.00	0.032	0.000	11.813	0.00	0.14
135.50	Step bolts (ladder)	Yes	0.50	0.000	0.63	0.03	0.00	0.032	0.000	11.813	0.00	0.52
137.00	Safety Cable	Yes	1.50	0.000	0.38	0.05	0.00	0.031	0.000	11.840	0.00	0.41
137.00	Step bolts (ladder)	Yes	1.50	0.000	0.63	0.08	0.00	0.031	0.000	11.840	0.00	1.56
140.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.032	0.000	11.894	0.00	0.82
140.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.032	0.000	11.894	0.00	3.12
145.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.033	0.000	11.982	0.00	1.37
145.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.033	0.000	11.982	0.00	5.20
150.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.034	0.000	12.068	0.00	1.37
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.034	0.000	12.068	0.00	5.20
155.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.035	0.000	12.152	0.00	1.37
155.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.035	0.000	12.152	0.00	5.20
157.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.036	0.000	12.185	0.00	0.55
157.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.10	0.00	0.036	0.000	12.185	0.00	2.08
160.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.036	0.000	12.233	0.00	0.82
160.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.036	0.000	12.233	0.00	3.12
165.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.037	0.000	12.313	0.00	1.37
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.037	0.000	12.313	0.00	5.20
167.00	Safety Cable	Yes	2.00	0.000	0.38	0.06	0.00	0.038	0.000	12.344	0.00	0.55
167.00	Step bolts (ladder)	Yes	2.00	0.000	0.63	0.10	0.00	0.038	0.000	12.344	0.00	2.08
170.00	Safety Cable	Yes	3.00	0.000	0.38	0.10	0.00	0.039	0.000	12.390	0.00	0.82
170.00	Step bolts (ladder)	Yes	3.00	0.000	0.63	0.16	0.00	0.039	0.000	12.390	0.00	3.12
175.00	Safety Cable	Yes	5.00	0.000	0.38	0.16	0.00	0.040	0.000	12.466	0.00	1.37
175.00	Step bolts (ladder)	Yes	5.00	0.000	0.63	0.26	0.00	0.040	0.000	12.466	0.00	5.20
176.00	Safety Cable	Yes	1.00	0.000	0.38	0.03	0.00	0.041	0.000	12.481	0.00	0.27
176.00	Step bolts (ladder)	Yes	1.00	0.000	0.63	0.05	0.00	0.041	0.000	12.481	0.00	1.04
									Totals:		**0.0**	**231.1**

Calculated Forces

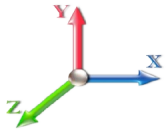
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 48	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

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	-52.23	-9.34	-0.07	-1226.4	0.00	1226.44	6372.54	3186.27	14661.2	7341.49	0.00	0.000	0.000	0.175
5.00	-50.52	-9.26	-0.07	-1179.7	0.00	1179.74	6292.68	3146.34	14220.7	7120.95	0.03	-0.048	0.000	0.174
10.00	-48.83	-9.17	-0.07	-1133.4	0.00	1133.46	6211.66	3105.83	13784.2	6902.39	0.10	-0.098	0.000	0.172
15.00	-47.17	-9.09	-0.07	-1087.6	0.00	1087.60	6129.50	3064.75	13351.9	6685.89	0.23	-0.147	0.000	0.170
20.00	-45.53	-9.00	-0.07	-1042.1	0.00	1042.16	6046.18	3023.09	12923.8	6471.51	0.41	-0.198	0.000	0.169
25.00	-43.93	-8.90	-0.07	-997.18	0.00	997.18	5961.72	2980.86	12500.0	6259.33	0.65	-0.249	0.000	0.167
30.00	-42.35	-8.80	-0.07	-952.68	0.00	952.68	5876.11	2938.05	12080.8	6049.42	0.94	-0.301	0.000	0.165
35.00	-40.79	-8.69	-0.07	-908.70	0.00	908.70	5789.35	2894.67	11666.3	5841.84	1.28	-0.353	0.000	0.163
40.00	-39.27	-8.57	-0.07	-865.24	0.00	865.24	5679.25	2839.63	11212.8	5614.75	1.68	-0.406	0.000	0.161
42.75	-38.44	-8.51	-0.07	-841.66	0.00	841.66	5615.38	2807.69	10960.7	5488.51	1.92	-0.436	0.000	0.160
45.00	-37.25	-8.46	-0.07	-822.51	0.00	822.51	5563.11	2781.56	10756.6	5386.29	2.13	-0.461	0.000	0.159
49.00	-35.17	-8.35	-0.07	-788.67	0.00	788.67	4756.80	2378.40	9239.06	4626.40	2.54	-0.504	0.000	0.178
50.00	-34.90	-8.34	-0.07	-780.32	0.00	780.32	4742.51	2371.25	9172.60	4593.12	2.64	-0.515	0.000	0.177
55.00	-33.59	-8.22	-0.07	-738.61	0.00	738.61	4670.33	2335.16	8842.49	4427.82	3.21	-0.574	0.000	0.174
60.00	-32.30	-8.11	-0.07	-697.49	0.00	697.49	4597.00	2298.50	8516.13	4264.39	3.85	-0.633	0.000	0.171
65.00	-31.03	-7.99	-0.07	-656.96	0.00	656.96	4522.52	2261.26	8193.68	4102.93	4.54	-0.693	0.000	0.167
70.00	-29.78	-7.86	-0.07	-617.03	0.00	617.03	4446.89	2223.45	7875.26	3943.48	5.30	-0.753	0.000	0.163
75.00	-28.56	-7.74	-0.07	-577.72	0.00	577.72	4354.69	2177.34	7534.33	3772.77	6.12	-0.813	0.000	0.160
80.00	-27.37	-7.62	-0.07	-539.01	0.00	539.01	4253.06	2126.53	7185.02	3597.85	7.00	-0.873	0.000	0.156
85.00	-26.19	-7.48	-0.07	-500.92	0.00	500.92	4151.43	2075.72	6843.99	3427.08	7.95	-0.933	0.000	0.152
86.50	-25.85	-7.45	-0.07	-489.70	0.00	489.70	4120.95	2060.47	6743.30	3376.66	8.25	-0.952	0.000	0.151
90.00	-24.47	-7.35	-0.07	-463.62	0.00	463.62	4049.81	2024.90	6511.26	3260.47	8.96	-0.994	0.000	0.148
91.75	-23.79	-7.30	-0.07	-450.76	0.00	450.76	3441.70	1720.85	5608.94	2808.64	9.33	-1.016	0.000	0.167
95.00	-23.13	-7.23	-0.07	-427.02	0.00	427.02	3401.05	1700.53	5452.51	2730.31	10.04	-1.055	0.000	0.163
100.00	-22.14	-7.10	-0.07	-390.89	0.00	390.89	3337.56	1668.78	5214.58	2611.16	11.17	-1.120	0.000	0.156
105.00	-21.17	-6.98	-0.07	-355.38	0.00	355.38	3272.92	1636.46	4980.08	2493.74	12.38	-1.183	0.000	0.149
110.00	-20.22	-6.85	-0.07	-320.49	0.00	320.49	3194.68	1597.34	4730.71	2368.87	13.65	-1.246	0.000	0.142
115.00	-19.28	-6.73	-0.07	-286.23	0.00	286.23	3107.57	1553.79	4474.96	2240.81	14.99	-1.307	0.000	0.134
120.00	-18.37	-6.60	-0.07	-252.59	0.00	252.59	3020.47	1510.23	4226.32	2116.30	16.39	-1.366	0.000	0.125
125.00	-17.48	-6.48	-0.07	-219.57	0.00	219.57	2933.36	1466.68	3984.78	1995.35	17.85	-1.422	0.000	0.116
130.00	-16.61	-6.35	-0.07	-187.18	0.00	187.18	2846.25	1423.13	3750.35	1877.96	19.37	-1.474	0.000	0.106
131.25	-16.40	-6.32	-0.07	-179.24	0.00	179.24	2824.47	1412.24	3692.86	1849.17	19.76	-1.487	0.000	0.103
135.00	-15.44	-6.22	-0.07	-155.54	0.00	155.54	2759.14	1379.57	3523.03	1764.13	20.94	-1.524	0.000	0.094
135.50	-15.31	-6.20	-0.07	-152.43	0.00	152.43	1734.08	867.04	2260.78	1132.07	21.10	-1.529	0.000	0.144
137.00	-12.75	-5.05	0.00	-143.12	0.00	143.12	1723.43	861.72	2225.81	1114.56	21.58	-1.543	0.000	0.136
140.00	-12.42	-4.98	0.00	-127.99	0.00	127.99	1701.83	850.91	2156.25	1079.73	22.57	-1.580	0.000	0.126
145.00	-11.88	-4.86	0.00	-103.09	0.00	103.09	1664.90	832.45	2041.54	1022.29	24.25	-1.636	0.000	0.108
150.00	-11.35	-4.75	0.00	-78.77	0.00	78.77	1626.81	813.41	1928.48	965.67	25.99	-1.684	0.000	0.089
155.00	-10.84	-4.63	0.00	-55.02	0.00	55.02	1587.58	793.79	1817.22	909.96	27.78	-1.723	0.000	0.067
157.00	-7.08	-3.15	0.00	-45.75	0.00	45.75	1571.57	785.79	1773.24	887.94	28.50	-1.737	0.000	0.056
160.00	-6.79	-3.08	0.00	-36.30	0.00	36.30	1547.20	773.60	1707.88	855.21	29.60	-1.753	0.000	0.047
165.00	-6.32	-2.97	0.00	-20.87	0.00	20.87	1505.67	752.84	1600.62	801.50	31.45	-1.774	0.000	0.030
167.00	-3.96	-1.57	0.00	-14.93	0.00	14.93	1488.74	744.37	1558.33	780.32	32.19	-1.780	0.000	0.022
170.00	-3.72	-1.50	0.00	-10.23	0.00	10.23	1462.99	731.50	1495.57	748.90	33.31	-1.787	0.000	0.016
175.00	-3.31	-1.40	0.00	-2.71	0.00	2.71	1411.70	705.85	1385.55	693.80	35.19	-1.792	0.000	0.006
176.00	0.00	-1.29	0.00	-1.31	0.00	1.31	1400.09	700.04	1362.73	682.38	35.56	-1.793	0.000	0.002

Final Analysis Summary

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 49	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 97 mph Wind	39.1	0.00	62.61	0.00	0.19	5166.30
0.9D + 1.6W 97 mph Wind	39.0	0.00	46.94	0.00	0.19	5092.07
1.2D + 1.0Di + 1.0Wi 50 mph Wind	11.8	0.00	105.92	0.00	0.17	1619.68
1.2D + 1.0E	2.5	0.00	62.68	0.00	0.00	352.07
0.9D + 1.0E	2.5	0.00	47.01	0.00	0.00	346.49
1.0D + 1.0W 60 mph Wind	9.3	0.00	52.23	0.00	0.07	1226.44

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 97 mph Wind	-41.00	-35.17	-0.19	-3328.1	-0.01	-3328.1	4756.80	2378.4	9239.06	4626.40	49.00	0.728
0.9D + 1.6W 97 mph Wind	-30.46	-34.76	-0.19	-3265.6	0.00	-3265.6	4756.80	2378.4	9239.06	4626.40	49.00	0.712
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-78.61	-10.92	-0.17	-1056.4	0.00	-1056.4	4756.80	2378.4	9239.06	4626.40	49.00	0.245
1.2D + 1.0E	-18.55	-1.94	0.00	-63.50	0.00	-63.50	1734.08	867.04	2260.78	1132.07	135.50	0.067
0.9D + 1.0E	-13.91	-1.90	0.00	-62.35	0.00	-62.35	1734.08	867.04	2260.78	1132.07	135.50	0.063
1.0D + 1.0W 60 mph Wind	-35.17	-8.35	-0.07	-788.67	0.00	-788.67	4756.80	2378.4	9239.06	4626.40	49.00	0.178

Base Plate Summary

Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 50	

Tower Engineering Solutions

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	50.00	**Bolt Circle:**	64.00
Moment (kip-ft):	5100.00	**Width (in):**	66.00	**Number Bolts:**	24.00
Axial (kip):	47.00	**Style:**	Clipped	**Bolt Type:**	2.25" 18J
Shear (kip):	38.00	**Polygon Sides:**	0.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	16.00	**Yield (ksi):**	75.00
Moment (kip-ft):	5166.30	**Effective Len (in):**	7.55	**Ultimate (ksi):**	100.00
Axial (kip):	105.92	**Moment (kip-in):**	617.83	**Arrangement:**	Clustered
Shear (kip):	39.08	**Allow Stress (ksi):**	67.50	**Cluster Dist (in):**	6.00
		Applied Stress (ksi):	0.00	**Start Angle (deg):**	45.00
Moment Design %:	101.30	**Stress Ratio:**	0.81	Compression	
				Force (kip):	165.86
				Allowable (kip):	260.00
				Ratio:	0.65
				Tension	
				Force (kip):	157.03
				Allowable (kip):	260.00
				Ratio:	0.62

Pier Foundation Design For Monopole

				Date
				6/19/2019
	Customer Name:	**T-Mobile**	**EIA/TIA Standard:**	EIA-222-G
	Site Name:		**Structure Height (Ft.):**	176
	Site Number:	CT02216-S-SBA	**Engineer Name:**	J. Chen
	Engr. Number:	78646	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

Analysis or Design? Analysis

Acceptable overstress (5.0%

Base Reactions (Factored):

Axial Load (Kips):	105.9	Shear Force (Kips):	39.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5166.3

Foundation Geometries:

Diameter of Pier (ft.):	8.0	Depth of Base B. G. S. :	28.0	ft.
Pier Height A. G. (ft.):	0.50			

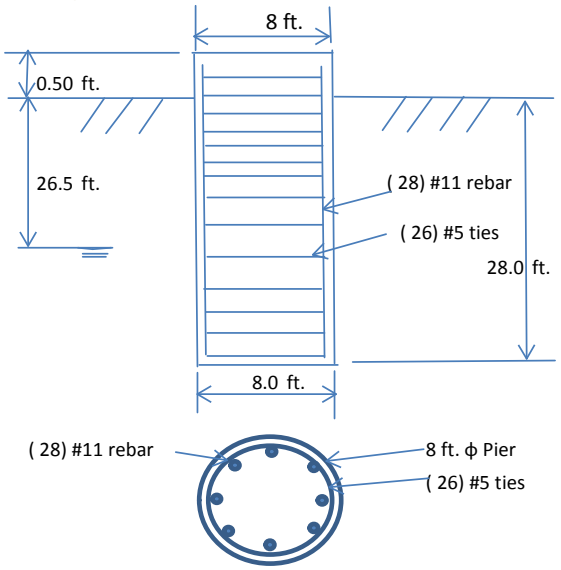
Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	40	ksi
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	28	Tie Spacing:	18.0	in.
Concrete Cover (in.):	4	Concrete unit weight:	150.0	pcf

Soil Design Parameters:

Water Table B.G.S. (ft):	26.5	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	30	(°)

Skin Frictions are to be obtained from: Soil Report



Monopole Pier Foundation

Depth of Layers (ft) Top	Bottom	γ_{soil} (pcf)	ϕ (°)	Cohesion (psf)	Ultimate Skin Friction (psf)	Ultimate Bearing (psf)	Soil Types
0.0	4.0	100	0	0		0	Sand
4.0	9.0	120	33	0		0	Sand
9.0	19.0	120	34	0		0	Sand
19.0	26.5	125	36	0		0	Sand
26.5	29.0	125	36	0		19800	Sand
29.0	34.0						

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75	
Total Dry Soil Volume from Conical Failure (cu. Ft.):	13308	Dry Soil Weight from Conical Failure:	1576	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	18	Buoyant Soil Weight from Conical Failure (Ki	0	Kips
Total Dry Concrete Volume (cu. Ft.):	1357	Total Dry Concrete Weight:	203.6	Kips
Total Buoyant Concrete Volume (cu. Ft.):	75.4	Total Buoyant Concrete Weight:	6.60	Kips
Total Effective Concrete Weight (Kips):	210.2	Total Effective Soil Weight:	1575.4	Kips
Total Effective Vertical Load on Base (Kips):	159.5			

Check Soil Capacities:

					Usage	
Allowable Foundation Overturning Resistance (kips-ft.):	12888.8	>	Design Factored Momont (kips-ft):	5951	0.46	OK!
Factor of Safety of Passive Soil Resistance against Moment:	2.17	OK!				

Check the capacities of Reinforceing Concrete:

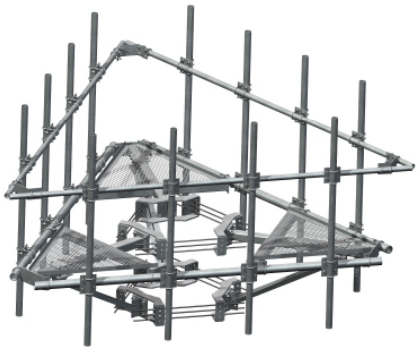
Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00

Reinforcing Concrete Pier:

					Usage	
Vertical Steel Rebar Area (sq. in./each):	1.56		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	8441.6	>	Design Factored Moment (Mu, K-Ft):	5358.9	0.63	OK!
Calculated Shear Capacity (Kips):	1471.3	>	Design Factored Shear (Kips):	445.0	0.30	OK!
Calculated Tension Capacity (Tn, Kips):	2358.7	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	12720	>	Design Factored Axial Load (Pu Kips):	105.9	0.01	OK!
Moment & Axial Strength Combination:	0.63	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI				

EXHIBIT 8

Antenna Mount Structural Analysis



Source: Sitepro1 Date: 08.01.2019

SBA Site:	CT02216-S Glastonbury
T-Mobile Site Number:	CT11336A
Project:	L600 Project
Prepared For:	T-Mobile
Mount Description:	(1) Platform w/ Handrail and Kicker Sitepro1 RMQP-4096-HK
Site Location:	175 Dickinson Road, Glastonbury, CT Hartford County 41.655833°, -72.523286°
Design Codes:	ANSI/TIA-222-G IBC 2015 w/ 2018 CT Building Code
Analysis Load Case:	T-Mobile Final Configuration
Analysis Result:	**Adequate @ 58%** - Once Replaced See Conclusion

Revision 0
August 5, 2019

GeoStructural ▪ P.O. Box 2621, Boise, ID 83701 ▪ Office: (530) 539-4787
Professional Engineers | Tower Technicians | Climbers | sUAS Mapping

1.0 Introduction

An antenna mount structural analysis has been performed on T-Mobile's replacement mount assembly located at the CT02216-S Glastonbury communications site in Hartford County, CT considering the final equipment loading configuration listed in Section 3.0.

2.0 Analysis Criteria

An elastic three-dimensional model of the mount structure has been analyzed pursuant to the following criteria considering wind forces in 30° increments:

- 2018 Connecticut State Building Code.
- IBC 2015 – International Building Code.
- ANSI/TIA-222-G – Structural Standard for Antenna Supporting Structures and Antennas.
- AISC – Steel Construction Manual.
- ANSI/AWS D1.1 – Structural Welding Code.

Wind w/o ice = 125 mph (3-sec gust Ultimate Wind Speed) Wind w/o ice = 97 mph (3-sec gust Basic Wind Speed) Wind w/ ice = 50 mph (3-sec gust Basic) with 1" Design Ice, Escalated with Height
Topographic Category 1; Exposure Category C; Structure Class (Risk Category) II Gust Effect Factor = 1.0; Directionality Factor = 0.95 Site Class D "Stiff Soil"; F_a = 1.6; F_v = 2.4; S_{DS} = 0.191
Maintenance Loads**: Lm = 500 lb @ Worst Case Mount Pipe (Concurrent with 30 mph Wind Speed) Lv = 250 lb @ Worst Case Member Location (Center Span or Cantilever) ** *The mount face horizontal boom rails of T-Arm mount assemblies are not rated for rigging, hoisting or maintenance loading.*

The following documents were provided:

- Colo Application
  SBA 600 MHz, App # 117010 v1.
- RFDS
  T-Mobile L600 Project, V1.1, CT11336A, 5/14/19.

The results of the analysis are illustrated in Section 4.0. If any of the existing or proposed conditions reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

3.0 Appurtenance Information

Table 3.1 – T-Mobile Final Configuration[1,2]

COR	(Quantity) Appurtenance Make/Model	Mount Description
177.0'±	(3) EMS RR90-17-02DP	*(1) Platform w/ Handrail and Kicker* • *Sitepro1 RMQP-4096-HK*
	(3) RFS APXVAARR24_43-U-NA20	
	(3) ERICSSON 4449 B71+B12 RRH	
	(6) ALLEN FR15501P77/75 TMA	
	(3) ERICSSON KRY 112 144/1 TMA	
	(3) ERICSSON KRY 112 489/2 TMA	

1. *Refer to antenna installation Construction Drawings (by others, when applicable) for additional information regarding final antenna and equipment orientations.*
2. *Panel antennas and RRH/TMA units to be installed as directed in approved RFDS.*

4.0 Analysis Results

Table 4.1 – Replacement Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final T-Mobile Configuration	Standoff	27%	**Adequate Once Replaced[3]**
	Bottom Rail	13%	
	Bracing	31%	
	Pipe2.5STD Mount Pipe	35%	
	PRK Double Angles	46%	
	Handrail	58%	
	Connection Plates	45%	

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.2. 105% is an acceptable allowable stress percentage for mount components.*
3. *Refer to Conclusion & Recommendations Section for more information regarding mount replacement.*

Table 4.2 – Structural Component Material Strengths

Structural Component	Nominal Strength/Material[1]
Pipe	F_y = 35 ksi (A53, Gr. B)
Tube	F_y = 46 ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate / Bar	F_y = 36 ksi (A36)
Uni-Strut	F_y = 33 ksi (A570, Gr. 33)
Connection Bolts	A325
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 F_y = 74 ksi (Yield) & F_u = 29 ksi (Tension)
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) F_y = 57 ksi (Yield) & F_u = 74 ksi (Tension)
Welds	E70XX Electrodes

1. *Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.*

5.0 Conclusion & Recommendations

Based on T-Mobile's final equipment loading configuration, the replacement mount assembly has sufficient capacity to support the loading considered in this analysis pursuant to the listed standards.

- Install Replacement Platform Assembly; attach to monopole shaft per manufacturer's specifications.
    - Sitepro1 RMQP-4096-HK, (1) total.
        - Sitepro1 RMQP + PRK1245 + HRK12.
        - 12'-6" Low Pro-Platform with Twelve 2-7/8" Antenna Mounting Pipes and Handrail.
        - Replacement mount to be installed in accordance with manufacturer's specifications and applicable Construction Drawings.

Installation Requirements:

- Antennas and equipment shall be installed centered vertically between the mount front face rails (limit vertical installation eccentricity) with a maximum vertical eccentricity of 12" for panels and 20" for RRHs. If this assumption is incorrect, the results of this analysis will be inaccurate and not valid. This analysis accounts for vertical eccentricities necessary to install all panel antennas at the same relative top tip elevation.
- Panel antennas and RRH/TMA units to be installed as directed in approved RFDS.

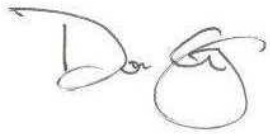
All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study, nor have they been provided a mount mapping to verify existing conditions and the results of this analysis are based solely on the information provided.

This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If any of the existing or proposed conditions (appurtenance loading, member sizes, etc.) reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

Prepared by:

Jesse Drennen, PE, MLE
208.761.7986
jesse.drennen@geostructural.com

Reviewed and Approved by:



Don George, PE, SE, MLSE
208.602.6569
don.george@geostructural.com

6.0 Standard Conditions

- All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided. It has been assumed that the tower, antenna support structure and foundation have been constructed according to the provided existing drawings, previous structural analysis reports, mapping documents, etc.

- The default Structure Classification is Class II in accordance with ANSI/TIA-222-G §A.2.2 & §A.15.3 and has been assumed for this analysis. The owner shall verify this classification conforms with original or desired reliability criteria.

- This analysis assumes that the structure has been properly installed and maintained in accordance with ANSI/TIA-222-G §15.5 and that no physical deterioration has occurred in any of the components of the structure. Damaged, missing, or rusted members were not considered.

- This analysis verifies the adequacy of the main components of the structure. Not all connections, welds, bolts, plates, etc. were individually detailed and analyzed. Where not specifically analyzed, the existing connection plates, welds, bolts, etc. were assumed adequate to develop the full capacity of the main structural members.

- No consideration has been made for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding or other similar conditions.

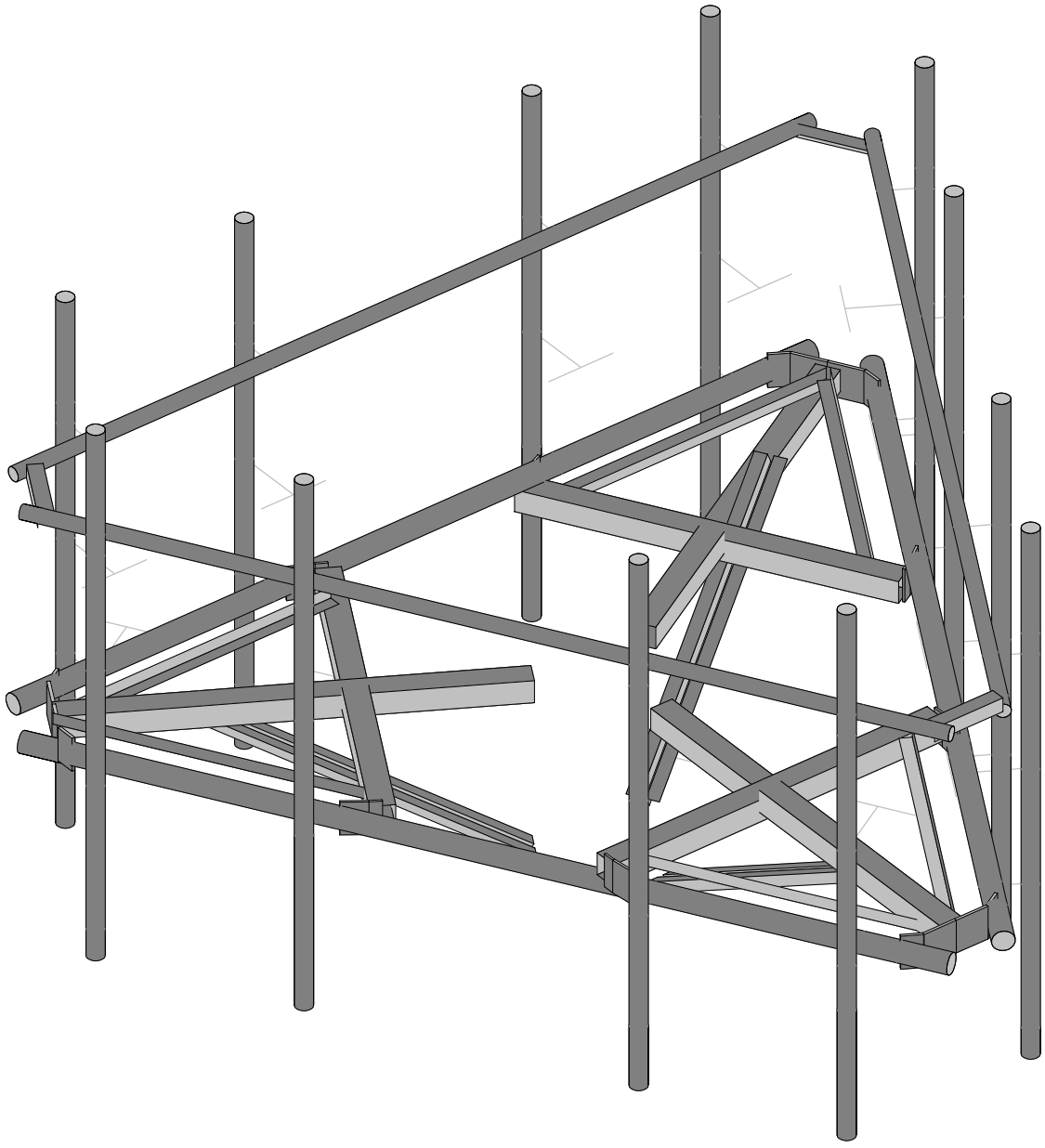
- It is the owner's responsibility to determine the appropriate design wind speed and amount of ice accumulation beyond code minimum values that should be considered in the analysis.

- This analysis report does not constitute a maintenance and condition assessment. No certifications regarding maintenance and condition are expressed or implied. If desired, GeoStructural can provide these services under a subsequent contract.

- This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If desired, GeoStructural can provide these services under a subsequent contract.

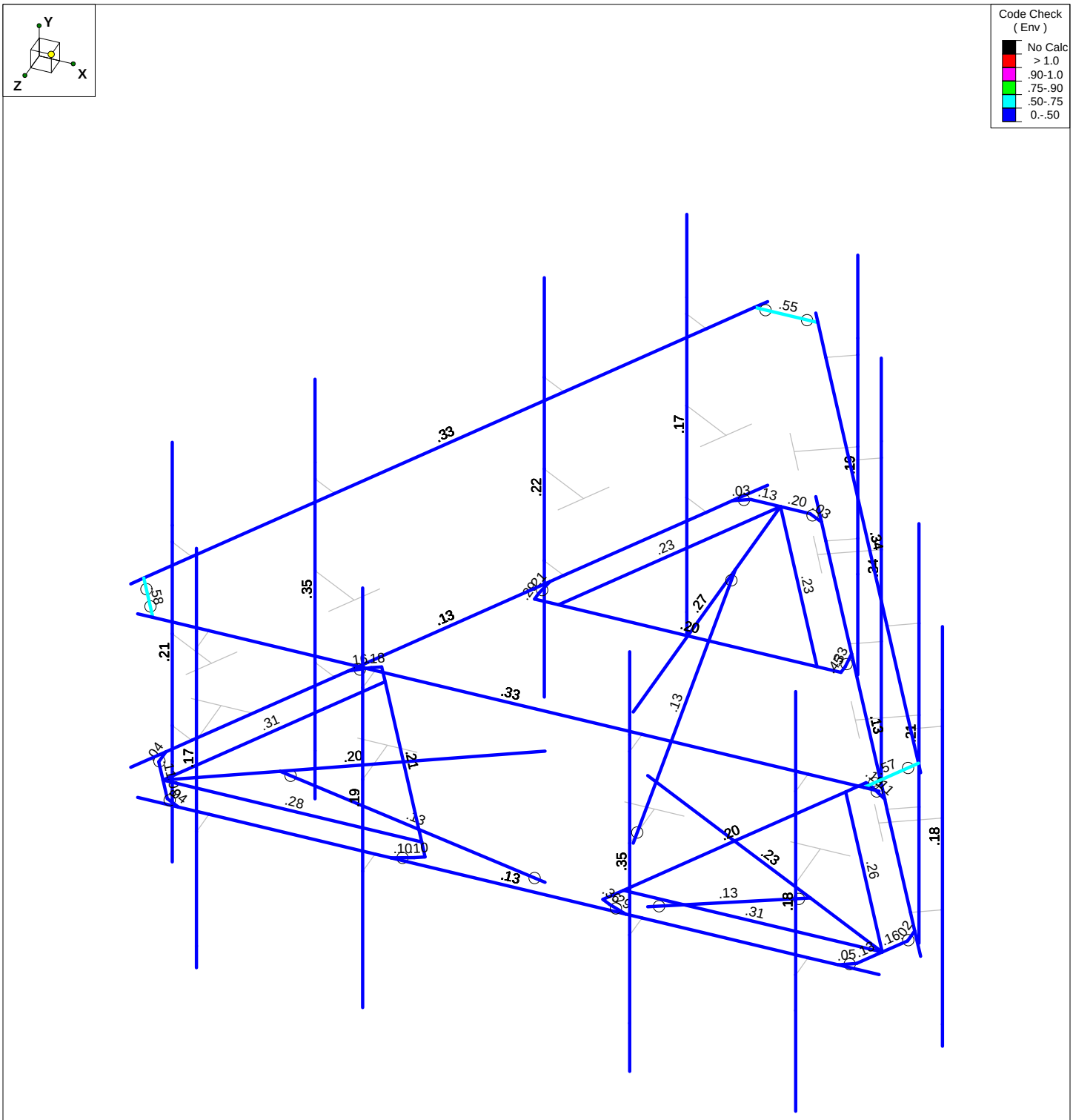
7.0 Calculations & Software Output

This page intentionally left blank.



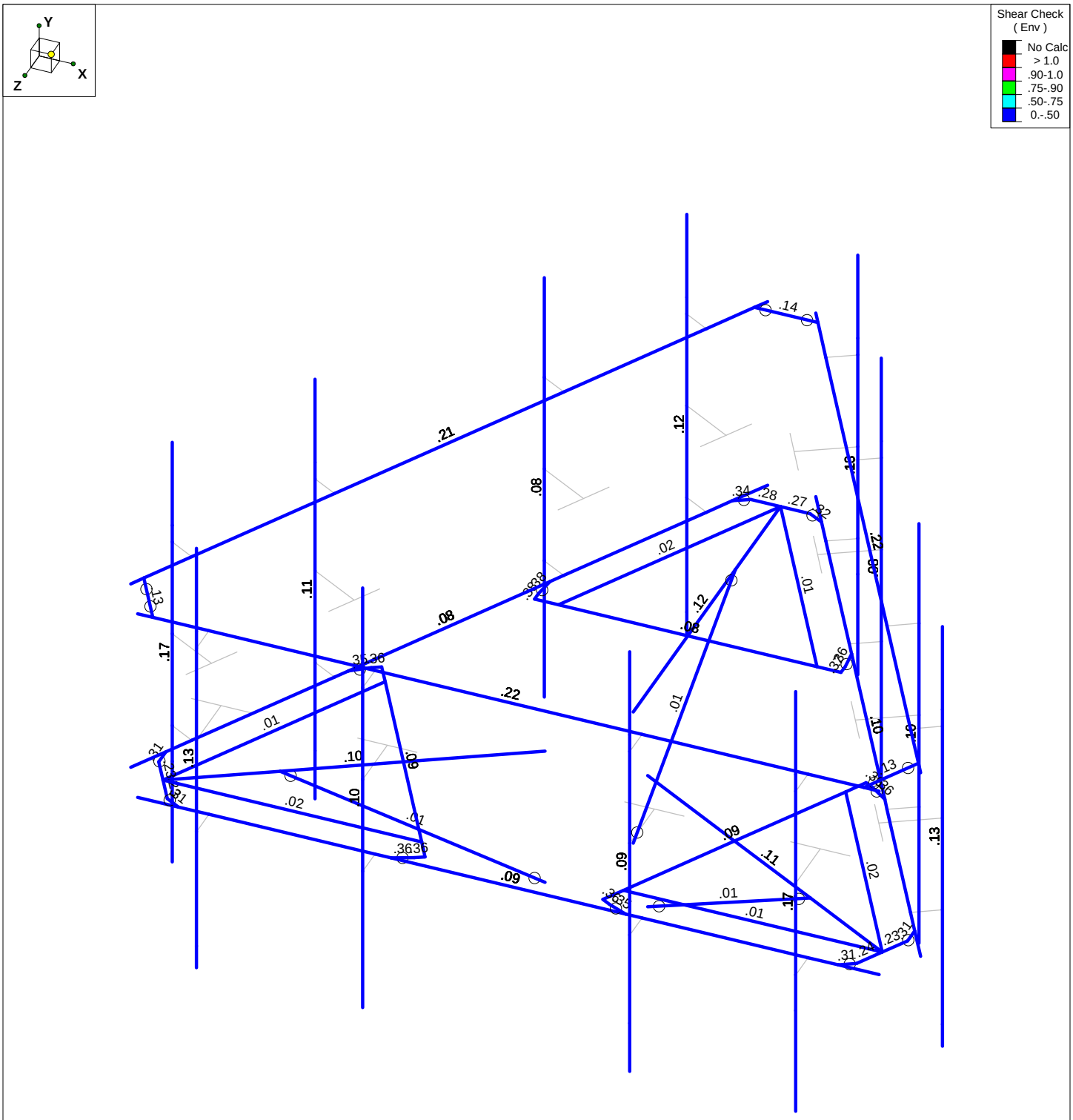
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 1
Jesse Drennen, PE		Aug 5, 2019 at 2:57 PM
		CT11336A_Mount Analysis_R0 19...



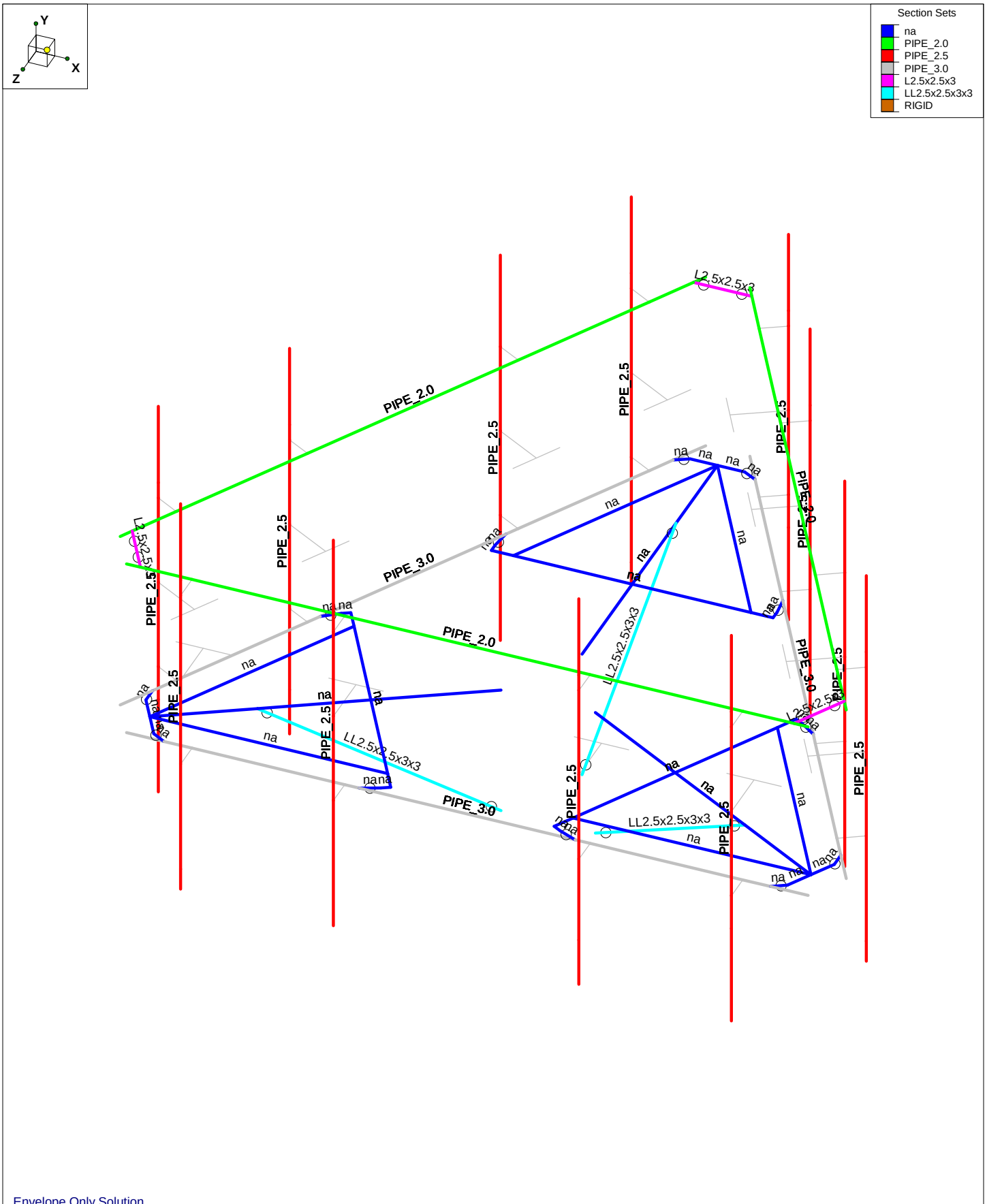
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 2
Jesse Drennen, PE		Aug 5, 2019 at 2:57 PM
		CT11336A_Mount Analysis_R0 19...



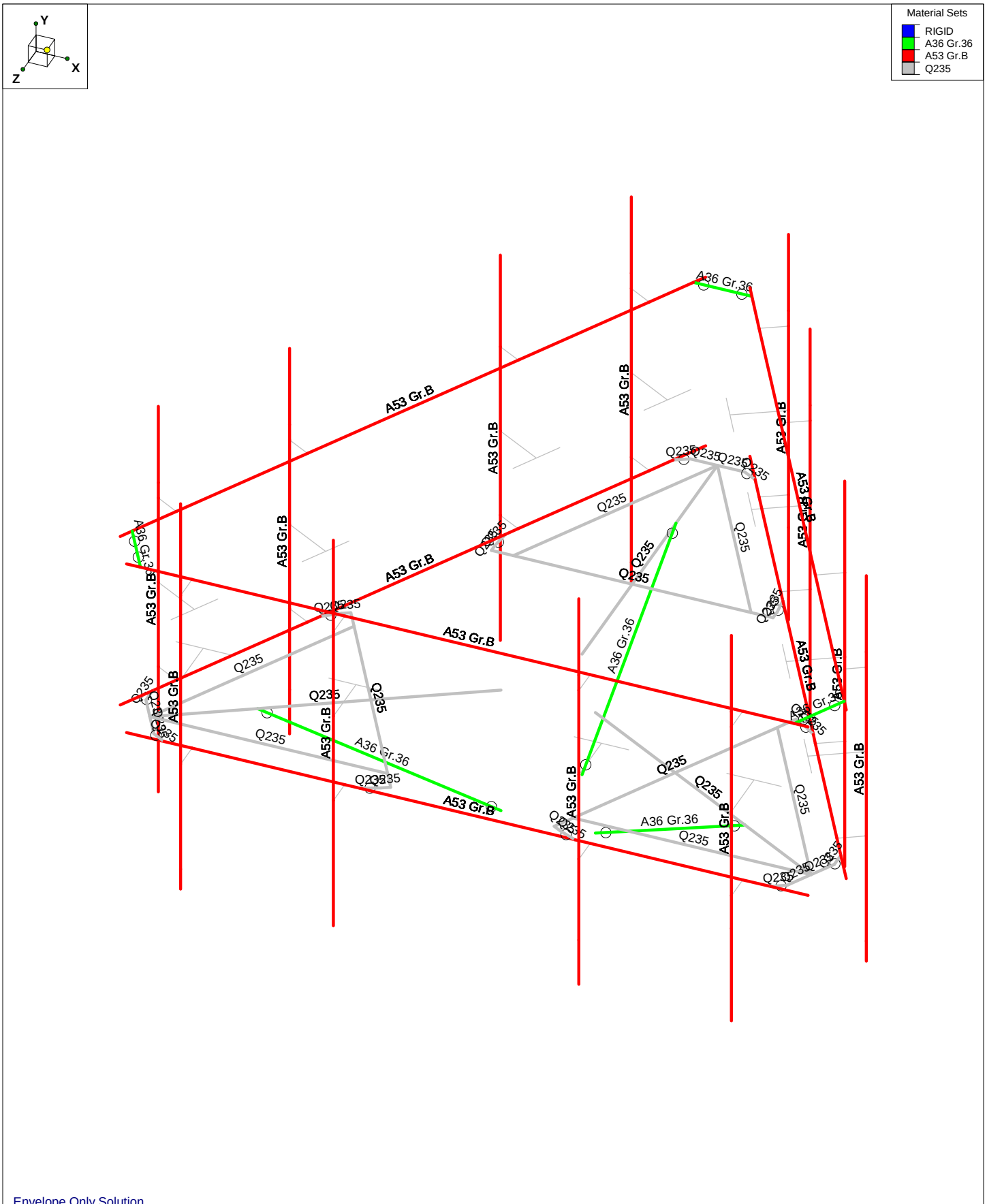
Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 3
Jesse Drennen, PE		Aug 5, 2019 at 2:57 PM
		CT11336A_Mount Analysis_R0 19...



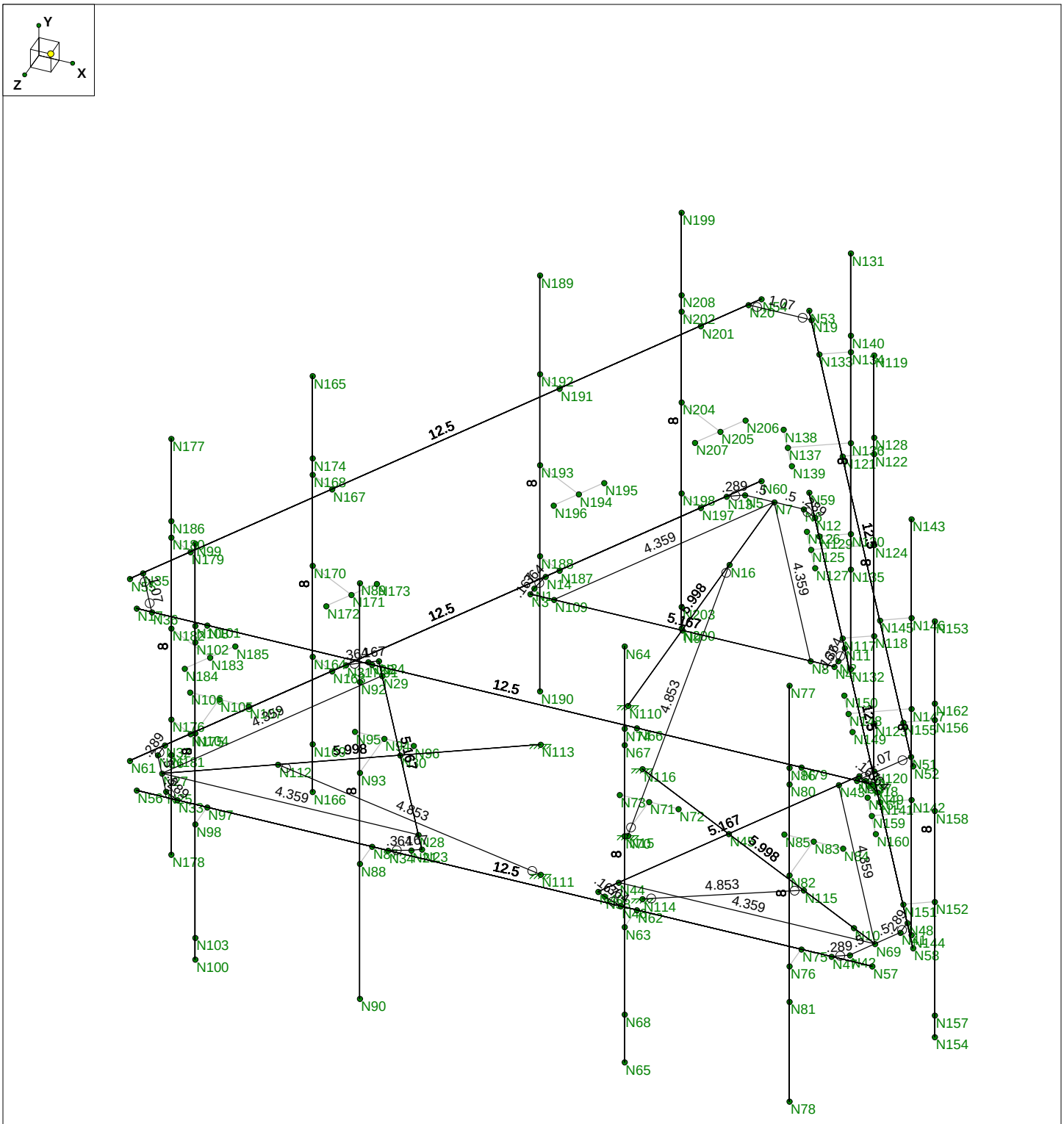
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 4
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...



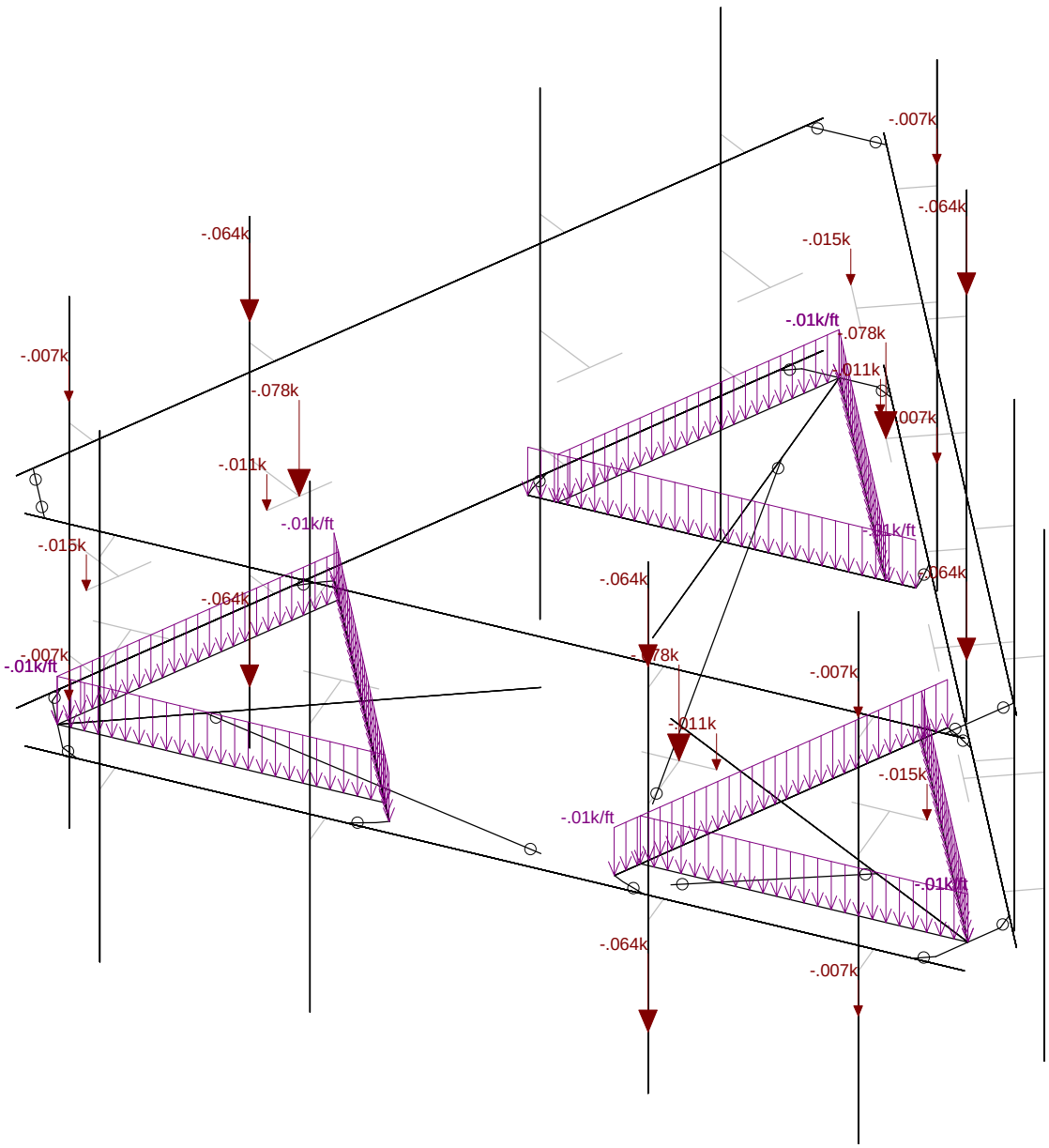
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 5
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...



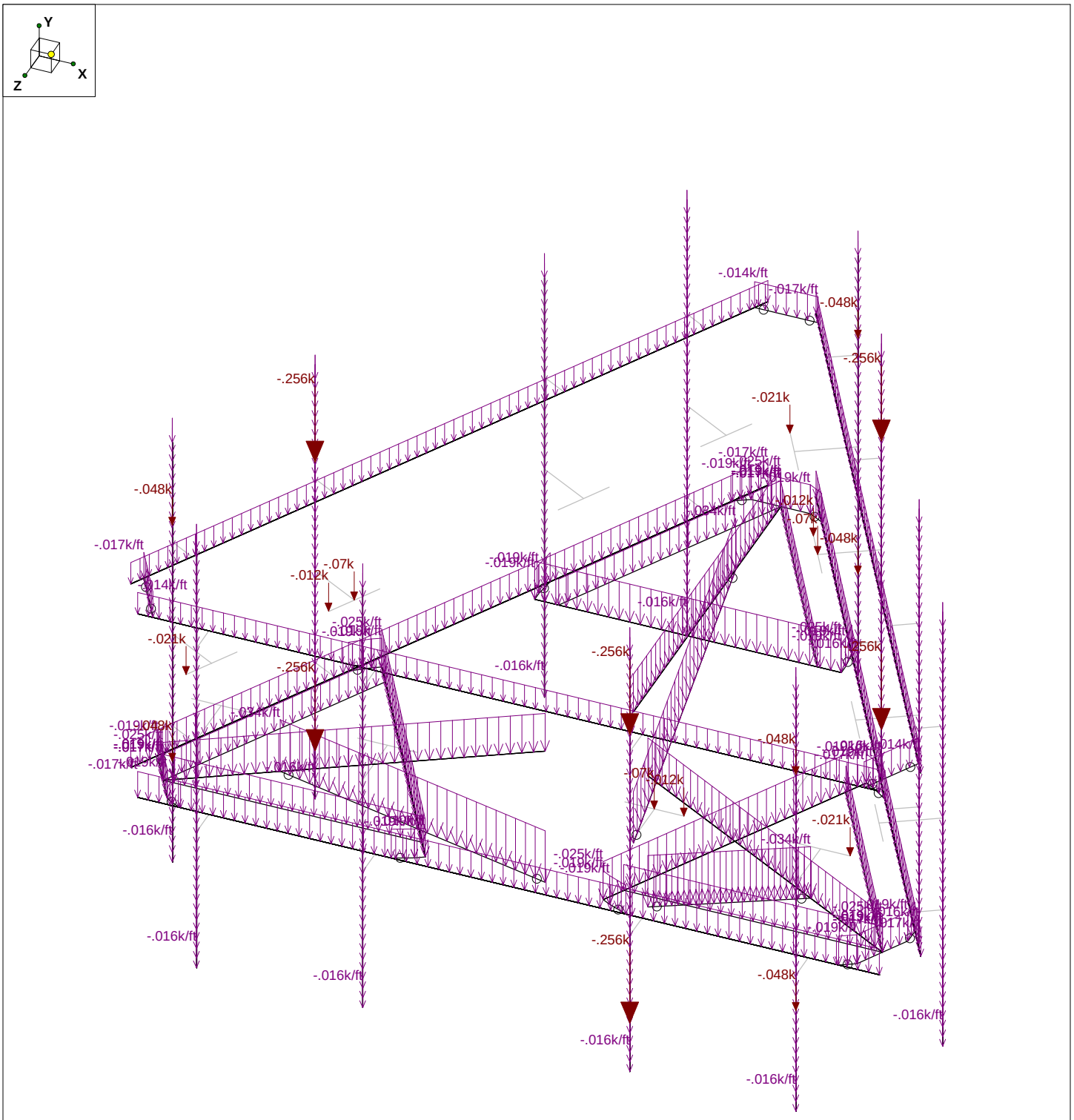
Member Length (ft) Displayed
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 6
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...



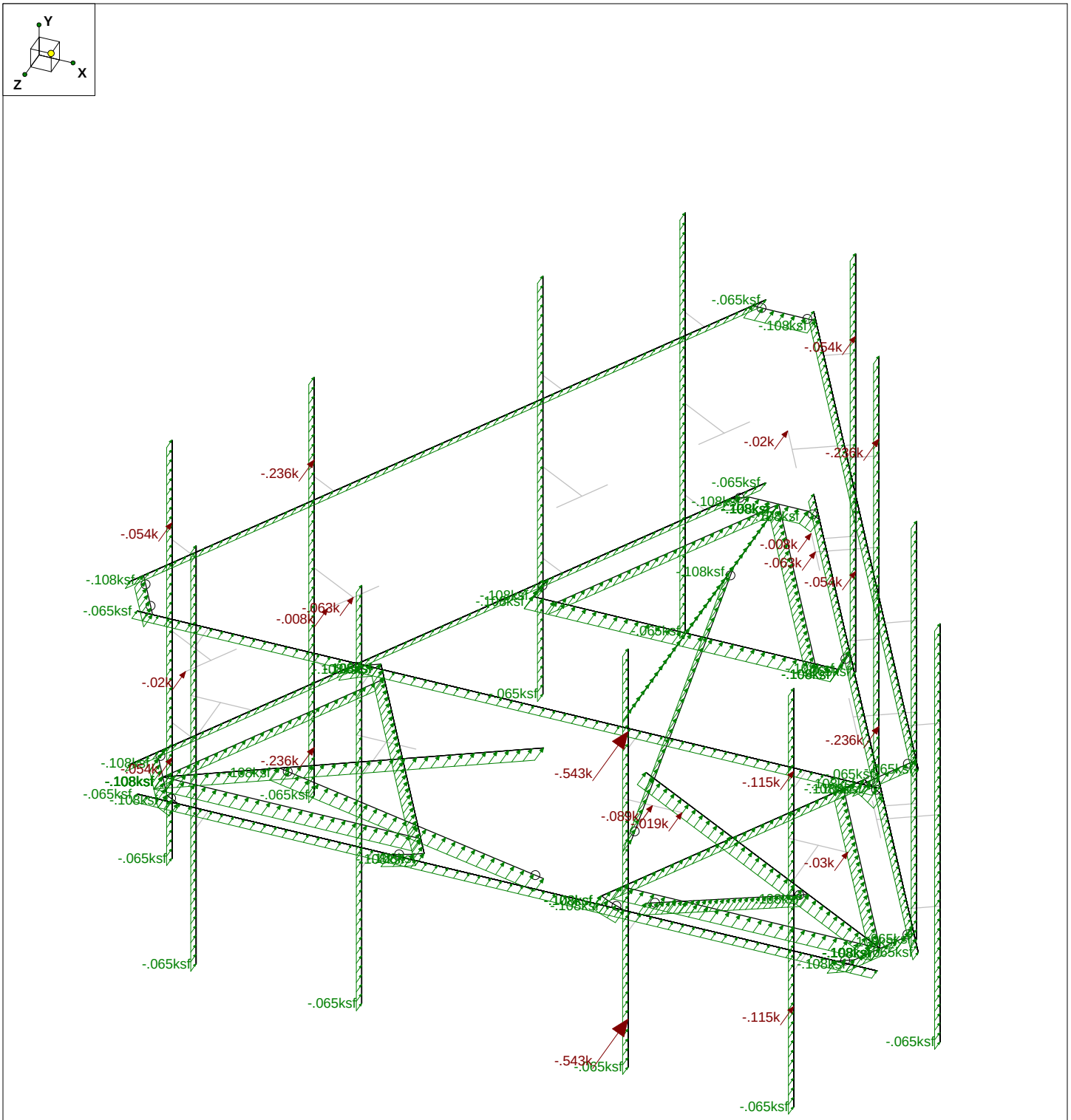
Loads: BLC 1, D
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 7
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...



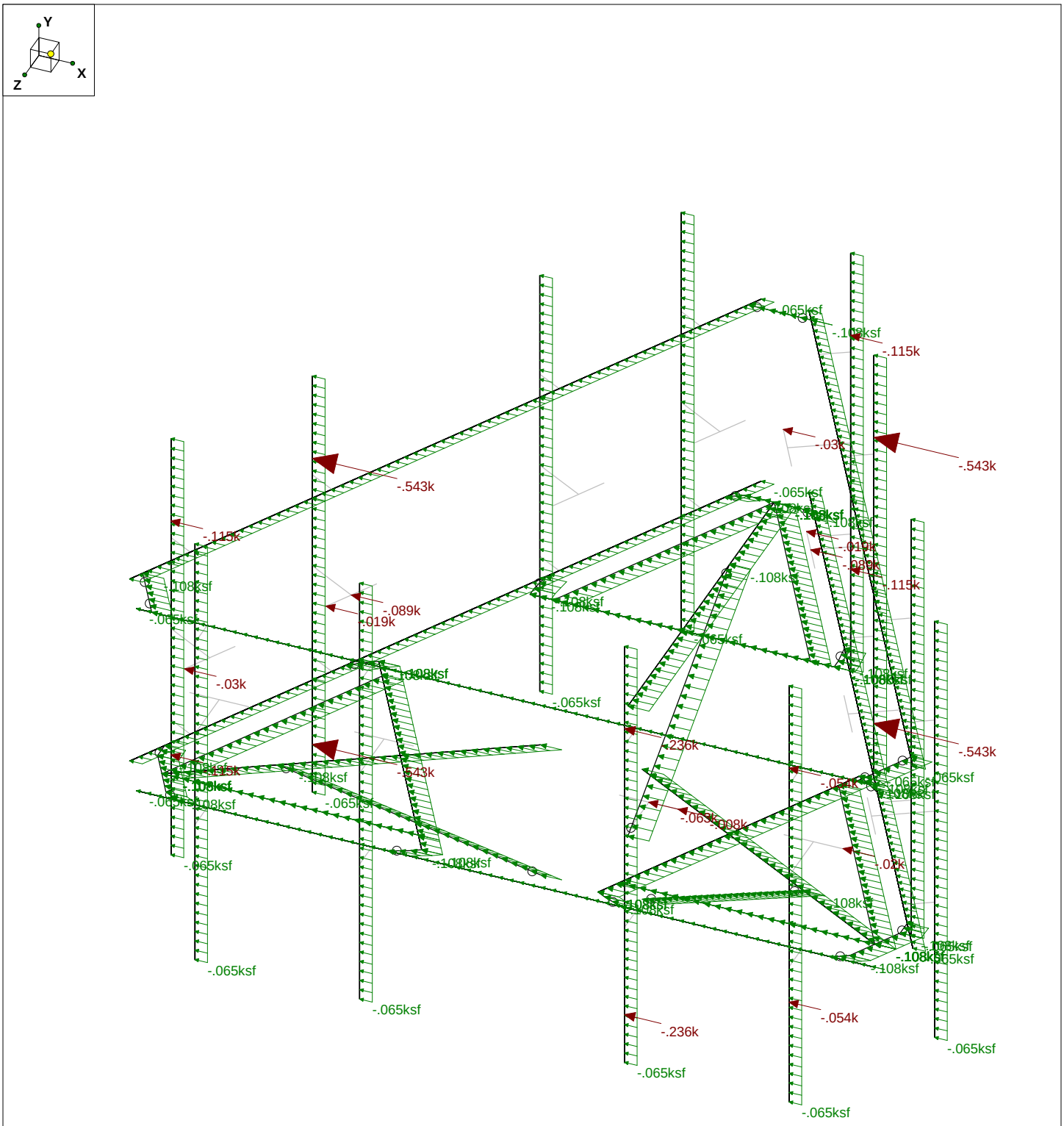
Loads: BLC 2, Di
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 8
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...



Loads: BLC 5, Woz
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 9
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...



Loads: BLC 6, Wox
Envelope Only Solution

GeoStructural, LLC	CT11336A	SK - 10
Jesse Drennen, PE		Aug 5, 2019 at 2:58 PM
		CT11336A_Mount Analysis_R0 19...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	D	DL		-1		22		9		
2	Di	SL				22		63		
3	Lm [500]	LL				1				
4	Lv [250]	LL				2				
5	Woz	WL				22		60		
6	Wox	WL				22		60		
7	Wiz	WL				22		60		
8	Wix	WL				22		60		
9	Ez	EL				22				
10	Ex	EL				22				

Load Combination Design

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1) 1.4D				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
42	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	6) 1.2D+1.5Lv				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
75	Dead Only				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A500 Gr.B RND_1	29000	11154	.3	.65	.527	42	1.4	58	1.3
8	A500 Gr.B Rect_1	29000	11154	.3	.65	.527	46	1.4	58	1.3
9	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
10	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
11	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
12	Q235	29000	11154	.3	.65	.49	34	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE_1.5	PIPE_1.5	Beam	None	A53 Gr.B	Typical	.749	.293	.293	.586
2	PIPE_2.0	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	PIPE_2.5	PIPE_2.5	Beam	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	PIPE_3.0	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
5	PIPE_3.5	PIPE_3.5	Beam	None	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
6	PIPE_4.0	PIPE_4.0	Beam	None	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
7	PIPE_2.0X	PIPE_2.0X	Beam	None	A53 Gr.B	Typical	1.4	.827	.827	1.65
8	HSS2x2x3	HSS2x2x3	Beam	None	A500 Gr.B Rect	Typical	1.19	.641	.641	1.09
9	HSS3x3x3	HSS3x3x3	Beam	None	A500 Gr.B Rect	Typical	1.89	2.46	2.46	4.03
10	HSS4x4x3	HSS4x4x3	Beam	None	A500 Gr.B Rect	Typical	2.58	6.21	6.21	10
11	HSS4x4x4	HSS4x4x4	Beam	None	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
12	HSS5x5x4	HSS5x5x4	Beam	None	A500 Gr.B Rect	Typical	4.3	16	16	25.8
13	C3x3.5	C3x3.5	Beam	None	A36 Gr.36	Typical	1.09	.169	1.57	.023
14	C4x4.5	C4X4.5_HRA	Beam	None	A36 Gr.36	Typical	1.38	.289	3.65	.032
15	C5x6.7	C5x6.7	Beam	None	A36 Gr.36	Typical	1.97	.47	7.48	.055
16	L2.5x2.5x3	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical	.901	.535	.535	.011
17	L2.5x2.5x4	L2.5x2.5x4	Beam	None	A36 Gr.36	Typical	1.19	.692	.692	.026
18	L3x3x3	L3x3x3	Beam	None	A36 Gr.36	Typical	1.09	.948	.948	.014
19	L3x3x4	L3x3x4	Beam	None	A36 Gr.36	Typical	1.44	1.23	1.23	.031
20	L3x3x6	L3x3x6	Beam	None	A36 Gr.36	Typical	2.11	1.75	1.75	.101
21	L3.5x3.5x4	L3.5x3.5x4	Beam	None	A36 Gr.36	Typical	1.7	2	2	.039
22	L4x4x4	L4x4x4	Beam	None	A36 Gr.36	Typical	1.93	3	3	.044
23	LL2.5x2.5x3x3	LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical	1.8	2.46	1.07	.023

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N16						
3	N110	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N111	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N112						
6	N113	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N114	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N115						
9	N116	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N3	N1		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
2	M2	N1	N14		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
3	M3	N4	N2		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
4	M4	N2	N11		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
5	M5	N4	N3			HSS4x4x4	Beam	None	Q235	Typical_APP
6	M6	N16	N15			LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical
7	M7	N17	N18			PIPE_2.0	Beam	None	A53 Gr.B	Typical
8	M8	N27	N25		90	1/2 x 6	Beam	None	Q235	Typical_APP
9	M9	N27	N26		90	1/2 x 6	Beam	None	Q235	Typical_APP
10	M10	N23	N21		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
11	M11	N21	N34		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
12	M12	N24	N22		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
13	M13	N22	N31		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
14	M14	N27	N29			L2x2x4	Beam	None	Q235	Typical_APP
15	M15	N27	N28		270	L2x2x4	Beam	None	Q235	Typical_APP
16	M16	N25	N33		90	1/2 x 6	Beam	None	Q235	Typical_APP

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
17	M17	N26	N32		90	1/2 x 6	Beam	None	Q235	Typical_APP
18	M18	N24	N23			HSS4x4x4	Beam	None	Q235	Typical_APP
19	M19	N39	N37		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
20	M20	N37	N49		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
21	M21	N40	N38		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
22	M22	N38	N46		90	3/8x6_HRA	Beam	None	Q235	Typical_APP
23	M23	N40	N39			HSS4x4x4	Beam	None	Q235	Typical_APP
24	M24	N50	N51		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
25	M25	N52	N53			PIPE_2.0	Beam	None	A53 Gr.B	Typical
26	M26	N54	N55			PIPE_2.0	Beam	None	A53 Gr.B	Typical
27	M27	N56	N57			PIPE_3.0	Beam	None	A53 Gr.B	Typical
28	M28	N58	N59			PIPE_3.0	Beam	None	A53 Gr.B	Typical
29	M29	N60	N61			PIPE_3.0	Beam	None	A53 Gr.B	Typical
30	M30	N62	N63			RIGID	None	None	RIGID	Typical
31	M31	N65	N64			PIPE_2.5	Beam	None	A53 Gr.B	Typical
32	M32	N66	N67			RIGID	None	None	RIGID	Typical
33	M33	N69	N41		90	1/2 x 6	Beam	None	Q235	Typical_APP
34	M34	N69	N42		90	1/2 x 6	Beam	None	Q235	Typical_APP
35	M35	N41	N48		90	1/2 x 6	Beam	None	Q235	Typical_APP
36	M36	N42	N47		90	1/2 x 6	Beam	None	Q235	Typical_APP
37	M37	N7	N5		90	1/2 x 6	Beam	None	Q235	Typical_APP
38	M38	N7	N6		90	1/2 x 6	Beam	None	Q235	Typical_APP
39	M39	N5	N13		90	1/2 x 6	Beam	None	Q235	Typical_APP
40	M40	N6	N12		90	1/2 x 6	Beam	None	Q235	Typical_APP
41	M41	N69	N44			L2x2x4	Beam	None	Q235	Typical_APP
42	M42	N69	N43		270	L2x2x4	Beam	None	Q235	Typical_APP
43	M43	N7	N8			L2x2x4	Beam	None	Q235	Typical_APP
44	M44	N7	N110			HSS4x4x4	Beam	None	Q235	Typical_APP
45	M45	N19	N20		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
46	M46	N35	N36		180	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical
47	M47	N70	N71			RIGID	None	None	RIGID	Typical
48	M48	N73	N72			RIGID	None	None	RIGID	Typical
49	M49	N75	N76			RIGID	None	None	RIGID	Typical
50	M50	N78	N77			PIPE_2.5	Beam	None	A53 Gr.B	Typical
51	M51	N79	N80			RIGID	None	None	RIGID	Typical
52	M52	N82	N83			RIGID	None	None	RIGID	Typical
53	M53	N85	N84			RIGID	None	None	RIGID	Typical
54	M54	N87	N88			RIGID	None	None	RIGID	Typical
55	M55	N90	N89			PIPE_2.5	Beam	None	A53 Gr.B	Typical
56	M56	N91	N92			RIGID	None	None	RIGID	Typical
57	M57	N93	N94			RIGID	None	None	RIGID	Typical
58	M58	N96	N95			RIGID	None	None	RIGID	Typical
59	M59	N97	N98			RIGID	None	None	RIGID	Typical
60	M60	N100	N99			PIPE_2.5	Beam	None	A53 Gr.B	Typical
61	M61	N101	N102			RIGID	None	None	RIGID	Typical
62	M62	N104	N105			RIGID	None	None	RIGID	Typical
63	M63	N107	N106			RIGID	None	None	RIGID	Typical
64	M64	N7	N109		270	L2x2x4	Beam	None	Q235	Typical_APP
65	M65	N112	N111			LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical
66	M66	N27	N113			HSS4x4x4	Beam	None	Q235	Typical_APP
67	M67	N115	N114			LL2.5x2.5x3x3	Beam	None	A36 Gr.36	Typical
68	M68	N69	N116			HSS4x4x4	Beam	None	Q235	Typical_APP
69	M69	N117	N118			RIGID	None	None	RIGID	Typical
70	M70	N120	N119			PIPE_2.5	Beam	None	A53 Gr.B	Typical
71	M71	N121	N122			RIGID	None	None	RIGID	Typical
72	M72	N124	N125			RIGID	None	None	RIGID	Typical
73	M73	N127	N126			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
74	M74	N129	N130			RIGID	None	None	RIGID	Typical
75	M75	N132	N131			PIPE_2.5	Beam	None	A53 Gr.B	Typical
76	M76	N133	N134			RIGID	None	None	RIGID	Typical
77	M77	N136	N137			RIGID	None	None	RIGID	Typical
78	M78	N139	N138			RIGID	None	None	RIGID	Typical
79	M79	N141	N142			RIGID	None	None	RIGID	Typical
80	M80	N144	N143			PIPE_2.5	Beam	None	A53 Gr.B	Typical
81	M81	N145	N146			RIGID	None	None	RIGID	Typical
82	M82	N147	N148			RIGID	None	None	RIGID	Typical
83	M83	N150	N149			RIGID	None	None	RIGID	Typical
84	M84	N151	N152			RIGID	None	None	RIGID	Typical
85	M85	N154	N153			PIPE_2.5	Beam	None	A53 Gr.B	Typical
86	M86	N155	N156			RIGID	None	None	RIGID	Typical
87	M87	N158	N159			RIGID	None	None	RIGID	Typical
88	M88	N161	N160			RIGID	None	None	RIGID	Typical
89	M89	N163	N164			RIGID	None	None	RIGID	Typical
90	M90	N166	N165			PIPE_2.5	Beam	None	A53 Gr.B	Typical
91	M91	N167	N168			RIGID	None	None	RIGID	Typical
92	M92	N170	N171			RIGID	None	None	RIGID	Typical
93	M93	N173	N172			RIGID	None	None	RIGID	Typical
94	M94	N175	N176			RIGID	None	None	RIGID	Typical
95	M95	N178	N177			PIPE_2.5	Beam	None	A53 Gr.B	Typical
96	M96	N179	N180			RIGID	None	None	RIGID	Typical
97	M97	N182	N183			RIGID	None	None	RIGID	Typical
98	M98	N185	N184			RIGID	None	None	RIGID	Typical
99	M99	N187	N188			RIGID	None	None	RIGID	Typical
100	M100	N190	N189			PIPE_2.5	Beam	None	A53 Gr.B	Typical
101	M101	N191	N192			RIGID	None	None	RIGID	Typical
102	M102	N193	N194			RIGID	None	None	RIGID	Typical
103	M103	N196	N195			RIGID	None	None	RIGID	Typical
104	M104	N197	N198			RIGID	None	None	RIGID	Typical
105	M105	N200	N199			PIPE_2.5	Beam	None	A53 Gr.B	Typical
106	M106	N201	N202			RIGID	None	None	RIGID	Typical
107	M107	N204	N205			RIGID	None	None	RIGID	Typical
108	M108	N207	N206			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2		BenPIN				Yes				None
3	M3						Yes				None
4	M4		BenPIN				Yes				None
5	M5						Yes				None
6	M6	BenPIN	BenPIN				Yes				None
7	M7						Yes				None
8	M8						Yes				None
9	M9						Yes				None
10	M10						Yes				None
11	M11		BenPIN				Yes				None
12	M12						Yes				None
13	M13		BenPIN				Yes				None
14	M14						Yes				None
15	M15						Yes				None
16	M16		BenPIN				Yes				None
17	M17		BenPIN				Yes				None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
18	M18						Yes				None
19	M19						Yes				None
20	M20		BenPIN				Yes				None
21	M21						Yes				None
22	M22		BenPIN				Yes				None
23	M23						Yes				None
24	M24	BenPIN	OOOOXX				Yes	Default			None
25	M25						Yes				None
26	M26						Yes				None
27	M27						Yes				None
28	M28						Yes				None
29	M29						Yes				None
30	M30						Yes	** NA **			None
31	M31						Yes				None
32	M32						Yes	** NA **			None
33	M33						Yes				None
34	M34						Yes				None
35	M35		BenPIN				Yes				None
36	M36		BenPIN				Yes				None
37	M37						Yes				None
38	M38						Yes				None
39	M39		BenPIN				Yes				None
40	M40		BenPIN				Yes				None
41	M41						Yes				None
42	M42						Yes				None
43	M43						Yes				None
44	M44						Yes				None
45	M45	BenPIN	OOOOXX				Yes				None
46	M46	BenPIN	OOOOXX				Yes				None
47	M47						Yes	** NA **			None
48	M48						Yes	** NA **			None
49	M49						Yes	** NA **			None
50	M50						Yes				None
51	M51						Yes	** NA **			None
52	M52						Yes	** NA **			None
53	M53						Yes	** NA **			None
54	M54						Yes	** NA **			None
55	M55						Yes				None
56	M56						Yes	** NA **			None
57	M57						Yes	** NA **			None
58	M58						Yes	** NA **			None
59	M59						Yes	** NA **			None
60	M60						Yes				None
61	M61						Yes	** NA **			None
62	M62						Yes	** NA **			None
63	M63						Yes	** NA **			None
64	M64						Yes				None
65	M65	BenPIN	BenPIN				Yes				None
66	M66						Yes				None
67	M67	BenPIN	BenPIN				Yes				None
68	M68						Yes				None
69	M69						Yes	** NA **			None
70	M70						Yes				None
71	M71						Yes	** NA **			None
72	M72						Yes	** NA **			None
73	M73						Yes	** NA **			None
74	M74						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
75	M75						Yes				None
76	M76						Yes	** NA **			None
77	M77						Yes	** NA **			None
78	M78						Yes	** NA **			None
79	M79						Yes	** NA **			None
80	M80						Yes				None
81	M81						Yes	** NA **			None
82	M82						Yes	** NA **			None
83	M83						Yes	** NA **			None
84	M84						Yes	** NA **			None
85	M85						Yes				None
86	M86						Yes	** NA **			None
87	M87						Yes	** NA **			None
88	M88						Yes	** NA **			None
89	M89						Yes	** NA **			None
90	M90						Yes				None
91	M91						Yes	** NA **			None
92	M92						Yes	** NA **			None
93	M93						Yes	** NA **			None
94	M94						Yes	** NA **			None
95	M95						Yes				None
96	M96						Yes	** NA **			None
97	M97						Yes	** NA **			None
98	M98						Yes	** NA **			None
99	M99						Yes	** NA **			None
100	M100						Yes				None
101	M101						Yes	** NA **			None
102	M102						Yes	** NA **			None
103	M103						Yes	** NA **			None
104	M104						Yes	** NA **			None
105	M105						Yes				None
106	M106						Yes	** NA **			None
107	M107						Yes	** NA **			None
108	M108						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	3/8x6_HRA	.167			Lbyy						Lateral
2	M2	3/8x6_HRA	.364			Lbyy						Lateral
3	M3	3/8x6_HRA	.167			Lbyy						Lateral
4	M4	3/8x6_HRA	.364			Lbyy						Lateral
5	M5	HSS4x4x4	5.167			Lbyy						Lateral
6	M6	LL2.5x2.5x3...	4.853			Lbyy						Lateral
7	M7	PIPE_2.0	12.5			Lbyy						Lateral
8	M8	1/2 x 6	.5			Lbyy						Lateral
9	M9	1/2 x 6	.5			Lbyy						Lateral
10	M10	3/8x6_HRA	.167			Lbyy						Lateral
11	M11	3/8x6_HRA	.364			Lbyy						Lateral
12	M12	3/8x6_HRA	.167			Lbyy						Lateral
13	M13	3/8x6_HRA	.364			Lbyy						Lateral
14	M14	L2x2x4	4.359			Lbyy						Lateral
15	M15	L2x2x4	4.359			Lbyy						Lateral
16	M16	1/2 x 6	.289			Lbyy						Lateral
17	M17	1/2 x 6	.289			Lbyy						Lateral
18	M18	HSS4x4x4	5.167			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
19	M19	3/8x6_HRA	.167			Lbyy						Lateral
20	M20	3/8x6_HRA	.364			Lbyy						Lateral
21	M21	3/8x6_HRA	.167			Lbyy						Lateral
22	M22	3/8x6_HRA	.364			Lbyy						Lateral
23	M23	HSS4x4x4	5.167			Lbyy						Lateral
24	M24	L2.5x2.5x3	1.07			Lbyy						Lateral
25	M25	PIPE_2.0	12.5			Lbyy						Lateral
26	M26	PIPE_2.0	12.5			Lbyy						Lateral
27	M27	PIPE_3.0	12.5	4	4	Lbyy						Lateral
28	M28	PIPE_3.0	12.5	4	4	Lbyy						Lateral
29	M29	PIPE_3.0	12.5	4	4	Lbyy						Lateral
30	M31	PIPE_2.5	8			Lbyy						Lateral
31	M33	1/2 x 6	.5			Lbyy						Lateral
32	M34	1/2 x 6	.5			Lbyy						Lateral
33	M35	1/2 x 6	.289			Lbyy						Lateral
34	M36	1/2 x 6	.289			Lbyy						Lateral
35	M37	1/2 x 6	.5			Lbyy						Lateral
36	M38	1/2 x 6	.5			Lbyy						Lateral
37	M39	1/2 x 6	.289			Lbyy						Lateral
38	M40	1/2 x 6	.289			Lbyy						Lateral
39	M41	L2x2x4	4.359			Lbyy						Lateral
40	M42	L2x2x4	4.359			Lbyy						Lateral
41	M43	L2x2x4	4.359			Lbyy						Lateral
42	M44	HSS4x4x4	5.998			Lbyy						Lateral
43	M45	L2.5x2.5x3	1.07			Lbyy						Lateral
44	M46	L2.5x2.5x3	1.07			Lbyy						Lateral
45	M50	PIPE_2.5	8			Lbyy						Lateral
46	M55	PIPE_2.5	8			Lbyy						Lateral
47	M60	PIPE_2.5	8			Lbyy						Lateral
48	M64	L2x2x4	4.359			Lbyy						Lateral
49	M65	LL2.5x2.5x3...	4.853			Lbyy						Lateral
50	M66	HSS4x4x4	5.998			Lbyy						Lateral
51	M67	LL2.5x2.5x3...	4.853			Lbyy						Lateral
52	M68	HSS4x4x4	5.998			Lbyy						Lateral
53	M70	PIPE_2.5	8			Lbyy						Lateral
54	M75	PIPE_2.5	8			Lbyy						Lateral
55	M80	PIPE_2.5	8			Lbyy						Lateral
56	M85	PIPE_2.5	8			Lbyy						Lateral
57	M90	PIPE_2.5	8			Lbyy						Lateral
58	M95	PIPE_2.5	8			Lbyy						Lateral
59	M100	PIPE_2.5	8			Lbyy						Lateral
60	M105	PIPE_2.5	8			Lbyy						Lateral

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N15	max	.053	17	3.029	26	.309	20	0	74	0	19	0	36
2		min	-.053	23	-.206	20	-4.867	26	0	1	0	36	0	19
3	N110	max	1.674	17	.573	32	5.492	2	.874	31	2.844	23	.619	11
4		min	-1.687	11	-.081	14	-3.058	20	.019	25	-2.836	5	-.416	17
5	N111	max	.368	24	3.041	30	2.443	30	0	4	0	22	0	22
6		min	-4.23	30	-.288	24	-.212	24	0	22	0	4	0	4
7	N113	max	5.875	6	.578	36	2.065	25	.485	16	.673	25	-.019	20
8		min	-3.77	24	-.111	18	-3.28	7	-.579	10	-.673	7	-.965	26
9	N114	max	4.233	34	3.043	34	2.445	34	0	25	0	25	0	25
10		min	-.386	16	-.3	16	-.222	16	0	6	0	6	0	6

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
11	N116	max	3.304	16	.58	28	2.884	15	.214	25	2.072	21	.593	27
12		min	-5.391	10	-.123	22	-4.122	9	-.85	31	-2.067	3	-.218	21
13	Totals:	max	7.517	17	10.073	32	6.877	2						
14		min	-7.517	11	2.339	63	-6.877	20						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M46	L2.5x2.5x3	.582	1.07	10	.133	1.07	z	10	27.66	29.192	.873	1.972	1....	H2-1
2	M24	L2.5x2.5x3	.573	1.07	13	.135	0	z	13	27.66	29.192	.873	1.972	1....	H2-1
3	M45	L2.5x2.5x3	.553	1.07	5	.137	1.07	y	5	27.66	29.192	.873	1.972	1....	H2-1
4	M3	3/8x6_HRA	.445	0	11	.370	0	y	6	67.691	68.85	8.606	.538	1....	H1-1b
5	M21	3/8x6_HRA	.362	0	9	.364	0	y	2	67.691	68.85	8.606	.538	1....	H1-1b
6	M90	PIPE_2.5	.352	2.667	11	.106	4.416		6	30.04	50.715	3.596	3.596	1....	H1-1b
7	M31	PIPE_2.5	.349	2.667	2	.093	4.416		9	30.04	50.715	3.596	3.596	2....	H1-1b
8	M70	PIPE_2.5	.339	2.667	5	.078	4.416		2	30.04	50.715	3.596	3.596	1....	H1-1b
9	M25	PIPE_2.0	.339	1.172	13	.219	1.172		13	6.295	32.13	1.872	1.872	4....	H1-1b
10	M7	PIPE_2.0	.334	1.172	9	.222	1.172		10	6.295	32.13	1.872	1.872	3....	H1-1b
11	M26	PIPE_2.0	.332	1.172	5	.212	1.172		5	6.295	32.13	1.872	1.872	3....	H1-1b
12	M4	3/8x6_HRA	.327	0	11	.355	0	y	6	63.5	68.85	8.606	.538	1....	H1-1b
13	M41	L2x2x4	.312	4.359	9	.012	0	y	26	11.646	28.886	.653	1.489	1....	H2-1
14	M14	L2x2x4	.306	4.359	5	.012	0	y	34	11.646	28.886	.653	1.489	2....	H2-1
15	M22	3/8x6_HRA	.294	0	9	.351	0	y	2	63.5	68.85	8.606	.538	1....	H1-1b
16	M1	3/8x6_HRA	.291	0	5	.379	0	y	11	67.691	68.85	8.606	.538	1....	H1-1b
17	M15	L2x2x4	.279	0	6	.018	0	z	28	11.646	28.886	.653	1.489	2....	H2-1
18	M44	HSS4x4x4	.272	5.998	5	.121	5.998	z	11	92.262	103.122	11.96	11.96	2....	H1-1b
19	M42	L2x2x4	.262	0	10	.018	0	z	31	11.646	28.886	.653	1.489	2....	H2-1
20	M68	HSS4x4x4	.235	5.998	3	.110	5.998	z	8	92.262	103.122	11.96	11.96	1....	H1-1b
21	M43	L2x2x4	.234	4.359	12	.011	0	y	30	11.646	28.886	.653	1.489	3....	H2-1
22	M64	L2x2x4	.228	0	26	.018	0	z	35	11.646	28.886	.653	1.489	2.7	H2-1
23	M100	PIPE_2.5	.217	2.667	12	.079	2.667		10	30.04	50.715	3.596	3.596	2....	H1-1b
24	M80	PIPE_2.5	.212	2.667	9	.098	2.667		11	30.04	50.715	3.596	3.596	2....	H1-1b
25	M95	PIPE_2.5	.211	2.667	6	.173	4.416		5	30.04	50.715	3.596	3.596	2....	H1-1b
26	M2	3/8x6_HRA	.211	0	5	.384	0	y	4	63.5	68.85	8.606	.538	1....	H1-1b
27	M18	HSS4x4x4	.209	2.583	29	.085	.377	z	5	94.949	103.122	11.96	11.96	1....	H1-1b
28	M23	HSS4x4x4	.205	2.583	32	.085	.377	z	9	94.949	103.122	11.96	11.96	1....	H1-1b
29	M5	HSS4x4x4	.204	2.583	37	.077	2.583	y	27	94.949	103.122	11.96	11.96	1....	H1-1b
30	M66	HSS4x4x4	.200	3.811	10	.097	5.998	z	4	92.262	103.122	11.96	11.96	2....	H1-1b
31	M38	1/2 x 6	.196	0	11	.266	0	y	5	84.3	91.8	11.475	.956	1....	H1-1b
32	M55	PIPE_2.5	.193	2.667	5	.097	2.667		7	30.04	50.715	3.596	3.596	2....	H1-1b
33	M75	PIPE_2.5	.192	2.667	3	.134	6.083		12	30.04	50.715	3.596	3.596	2....	H1-1b
34	M19	3/8x6_HRA	.189	0	3	.361	.167	y	6	67.691	68.85	8.606	.538	1....	H1-1b
35	M50	PIPE_2.5	.181	2.667	10	.169	6.083		9	30.04	50.715	3.596	3.596	2....	H1-1b
36	M12	3/8x6_HRA	.181	0	4	.362	0	y	10	67.691	68.85	8.606	.538	1....	H1-1b
37	M85	PIPE_2.5	.175	6.083	2	.127	6.083		11	30.04	50.715	3.596	3.596	2....	H1-1b
38	M60	PIPE_2.5	.174	6.083	10	.133	6.083		8	30.04	50.715	3.596	3.596	2....	H1-1b
39	M105	PIPE_2.5	.169	6.083	6	.122	2.667		4	30.04	50.715	3.596	3.596	2....	H1-1b
40	M13	3/8x6_HRA	.163	0	4	.347	0	y	10	63.5	68.85	8.606	.538	1....	H1-1b
41	M33	1/2 x 6	.157	0	10	.230	.5	y	7	84.3	91.8	11.475	.956	1....	H1-1b
42	M67	LL2.5x2.5x3x3	.135	4.853	34	.009	0	z	6	42.67	58.32	3.954	2.55	1....	H1-1b*
43	M65	LL2.5x2.5x3x3	.135	4.853	30	.010	0	z	4	42.67	58.32	3.954	2.55	1....	H1-1b*
44	M6	LL2.5x2.5x3x3	.134	4.853	26	.007	4.853	y	37	42.67	58.32	3.954	2.55	1	H1-1b*
45	M37	1/2 x 6	.127	0	6	.278	0	y	11	84.3	91.8	11.475	.956	1....	H1-1b
46	M27	PIPE_3.0	.126	4.297	6	.088	8.333		7	59.853	65.205	5.749	5.749	2....	H1-1b
47	M34	1/2 x 6	.126	0	7	.240	.5	y	2	84.3	91.8	11.475	.956	1....	H1-1b
48	M28	PIPE_3.0	.126	4.297	10	.095	8.333		11	59.853	65.205	5.749	5.749	2....	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn
49	M29	PIPE_3.0	.126	8.464	11	.083	4.167		11	59.853	65.205	5.749	5.749	1	H1-1b
50	M20	3/8x6_HRA	.112	0	3	.357	0	y	12	63.5	68.85	8.606	.538	1....	H1-1b
51	M9	1/2 x 6	.106	0	7	.229	.5	y	10	84.3	91.8	11.475	.956	1....	H1-1b
52	M10	3/8x6_HRA	.097	.167	7	.358	.167	y	2	67.691	68.85	8.606	.538	1....	H1-1b
53	M11	3/8x6_HRA	.095	0	7	.357	0	y	8	63.5	68.85	8.606	.538	1....	H1-1b
54	M8	1/2 x 6	.076	0	6	.233	0	y	3	84.3	91.8	11.475	.956	1....	H1-1b
55	M36	1/2 x 6	.051	0	11	.309	.289	y	8	89.215	91.8	11.475	.956	1....	H1-1b
56	M16	1/2 x 6	.040	0	6	.306	0	y	9	89.215	91.8	11.475	.956	1....	H1-1b
57	M17	1/2 x 6	.036	0	32	.315	0	y	4	89.215	91.8	11.475	.956	1....	H1-1b
58	M40	1/2 x 6	.034	0	27	.315	.289	y	12	89.215	91.8	11.475	.956	1....	H1-1b
59	M39	1/2 x 6	.032	0	3	.338	.289	y	5	89.215	91.8	11.475	.956	1....	H1-1b
60	M35	1/2 x 6	.021	0	34	.311	0	y	12	89.215	91.8	11.475	.956	1....	H1-1b

Envelope Plate/Shell Principal Stresses

Plate	Surf...	Sigma1 [ksi]	LC	Sigma2 [ksi]	LC	Tau Max [ksi]	LC	Angle [rad]	LC	Von Mises [ksi]	LC
No Data to Print ...											

EXHIBIT 9

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11336A

RT 2/Glastonbury/SBA
175 Dickinson Road
Glastonbury, CT 06447

May 30, 2019

Transcom Engineering Project Number: 737001-0072

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.26 %**

May 30, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CT11336A – RT 2/Glastonbury/SBA**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **175 Dickinson Road, Glastonbury, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **175 Dickinson Road, Glastonbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
GSM	1900 MHz (PCS)	1	15
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAARR24_43-U-NA20	177
B	1	RFS APXVAARR24_43-U-NA20	177
C	1	RFS APXVAARR24_43-U-NA20	177

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **1900 MHz (PCS)** & **2100 MHz (AWS)** radios are ground mounted the following cable loss values were used. For each ground mounted **1900 MHz (PCS)** radio there was **1.95 dB** of cable loss calculated into the system gains / losses for this site. For each ground mounted **2100 MHz (AWS)** radio there was **2.06 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **160 feet** of **1-1/4"** coax.

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	15.65 / 16.35 / 12.95 / 13.35	11	415	9,767.84	1.62
						Sector A Composite MPE%	**1.62**
Antenna B1	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	15.65 / 16.35 / 12.95 / 13.35	11	415	9,767.84	1.62
						Sector B Composite MPE%	**1.62**
Antenna C1	RFS APXVAARR24_43-U-NA20	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	15.65 / 16.35 / 12.95 / 13.35	11	415	9,767.84	1.62
						Sector C Composite MPE%	**1.62**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**1.62 %**
MetroPCS	0.34 %
Verizon Wireless	3.13 %
Sprint	2.41 %
AT&T	2.76 %
Site Total MPE %:	**10.26 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	1.62 %
T-MOBILE Sector B Total:	1.62 %
T-MOBILE Sector C Total:	1.62 %
Site Total:	10.26 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	4	937.69	177	4.61	1900 MHz (PCS)	1000	0.46%
T-Mobile 1900 MHz (PCS) GSM	1	351.63	177	0.43	1900 MHz (PCS)	1000	0.04%
T-Mobile 2100 MHz (AWS) LTE	2	1,611.21	177	3.96	2100 MHz (AWS)	1000	0.40%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	177	1.94	600 MHz	400	0.49%
T-Mobile 700 MHz LTE	2	432.54	177	1.06	700 MHz	467	0.23%
						Total:	**1.62%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	1.62 %
Sector B:	1.62 %
Sector C:	1.62 %
T-MOBILE Maximum Total (per sector):	1.62 %
Site Total:	10.26 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.26 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Transcom Engineering, Inc
PO Box 1048
Sterling, MA 01564

EXHIBIT 10

EXHIBIT 11

EXHIBIT 12