Robinson+Cole

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Also admitted in Massachusetts

August 24, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
175 Dickinson Road, Glastonbury, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 167-foot level of an existing 176-foot tower at 175 Dickinson Road in Glastonbury, Connecticut (the "Property"). The tower is owned by SBA Communications Corporation ("SBA"). Cellco's use of the tower was approved by the Council in 2010. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/2100 MHz antennas and three model SBNHH-1D65B 1900 MHz antennas, all at same level on the tower. Cellco also intends to install six (6) remote radio heads ("RRHs") and two (2) HYBRIFLEX™ antenna cables inside of the monopole. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being sent to Richard J. Johnson, Town Manager of the Town of Glastonbury. A copy of this letter is also being sent to Randall S. Chapman, the owner of the Property and SBA, the tower owner.

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 tower. Cellco's new antennas and RRHs will be installed on its existing antenna platform at the 167-foot level of the existing 176-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, 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 (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis Report included in Attachment 3).

A copy of the Town Assessor's Parcel Map and property owner information is included in Attachment 4.

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Richard J. Johnson, Glastonbury Town Manager
Randall S. Chapman
SBA
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

SBNHH-1D65B

Multiband Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS (First Lobe), dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6	0 ° | 14.5	0 ° | 17.4	0 ° | 17.8	0 ° | 18.1	0 ° | 18.2
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Type	Sector with internal RET
Band	Multiband
Brand	DualPol®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground

Product Specifications

COMMSCOPE®

SBNHH-1D65B

Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Loading, lateral	197.0 N @ 150 km/h 44.3 lbf @ 150 km/h
Wind Loading, rear	728.0 N @ 150 km/h 163.7 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	180.0 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight, without mounting kit	18.4 kg | 40.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (1) | Low band (1)
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

Depth	296.0 mm | 11.7 in
Length	2025.0 mm | 79.7 in
Width	390.0 mm | 15.4 in
Shipping Weight	31.0 kg | 68.3 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Product Specifications

SBNHH-1D65B

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ALCATEL-LUCENT B13 RRH4X30-4R

Alcatel-Lucent B13 Remote Radio Head 4x30-4R is the newest addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solutions, aimed at facilitating smooth RF site acquisition and related civil engineering.

Supporting 2Tx/4Tx MIMO and 4-way Rx diversity, Alcatel-Lucent B13 RRH4x30-4R allows operators to have a compact radio solution to deploy LTE in the 700U band (700 MHz, 3GPP band 13), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B13 RRH4x30-4R product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x60 W or 4x30 W RF output power. It supports also 4-way Rx diversity and up to 10MHz instantaneous bandwidth.

The Alcatel-Lucent B13 RRH4x30-4R is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

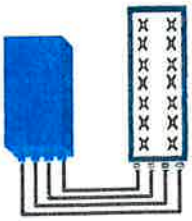
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 700 MHz band (700U, 3GPP band 13)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- 10MHz LTE carrier with 4Rx Diversity
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in 700U band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



4x30W with 4T4R
or
2x60W with 2T4R

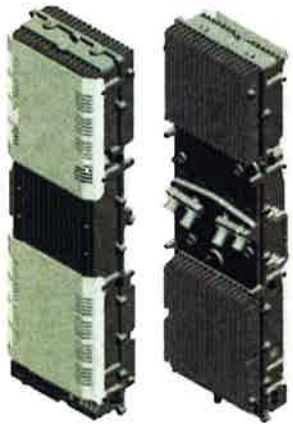
Can be switched between modes via SW w/o site visit

Alcatel·Lucent

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure – RX Diversity scheme	2 dB typ. (<2.5 dB max) – 2 or 4 way Rx diversity
Sizes (HxWxD) in mm (in.) Volume in L Weight in kg (lb) (w/o mounting HW)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield) 38 (with solar shield) 26 (57.2) (with solar shield)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 550W typical @100% RF load (in 2Tx or 4TX mode)
Environmental conditions Wind load (@150km/h or 93mph)	-40°C (-40°F) /+55°C (+131°F) IP65 Frontal: <200N / Lateral : <150N
Antenna ports	4 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate7, 9.8 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) – 4 RF Tx & 4 RF Rx monitor ports - 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

ALCATEL-LUCENT
WIRELESS PRODUCT DATASHEET
B4 RRH2X60-4R FOR AWS BAND APPLICATIONS

The Alcatel-Lucent B4 RRH2x60-4R is a high power, small form factor Remote Radio Head operating in the AWS frequency band (3GPP Band 4) for LTE technology. It is designed with an eco-efficient approach, providing operators with the means to achieve high quality and high capacity coverage with minimum site requirements and efficient operation.



A distributed Node B expands the deployment options by using two components, a Base Band Unit (BBU) containing the digital assets and a separate RRH containing the radio-frequency (RF) elements. This modular design optimizes available space and allows the main components of a Node B to be installed separately, within the same site or several kilometers apart.

The Alcatel-Lucent B4 RRH2x60-4R is linked to the BBU by an optical-fiber connection carrying downlink and uplink digital radio signals along with operations, administration and maintenance (OA&M) information.

SUPERIOR RF PERFORMANCE

The Alcatel-Lucent B4 RRH2x60-4R integrates all the latest technologies. This allows operators to offer best-in-class characteristics.

It delivers an outstanding 120 watts of total RF power thanks to its two transmit RF paths of 60 W each.

It is ideally suited to support multiple-input multiple-output (MIMO) 2x2 operation.

It includes four RF receivers to natively support 4-way uplink reception diversity. This improves the radio uplink coverage and this can be used to extend the cell radius commensurate with 2x2MIMO 2x60 W for the downlink.

It supports multiple discontinuous LTE carriers within an instantaneous bandwidth of 45 MHz corresponding to the entire AWS B4 spectrum.

The latest generation power amplifiers (PA) used in this product achieve high efficiency (>40%), resulting in improved power consumption figures.

OPTIMIZED TCO

The Alcatel-Lucent B4 RRH2x60-4R is designed to make available all the benefits of a distributed Node B, with excellent RF characteristics, with low capital expenditures (CAPEX) and low operating expenditures (OPEX).

The Alcatel-Lucent B4 RRH2x60-4R is a very cost-effective solution to deploy LTE MIMO.

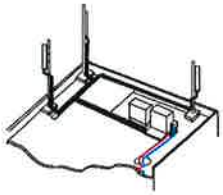
EASY INSTALLATION

The B4 RRH2x60-4R includes a reversible mounting bracket which allows for ease of installation behind an antenna, or on a rooftop knee wall while providing easy access to the mid body RF connectors.

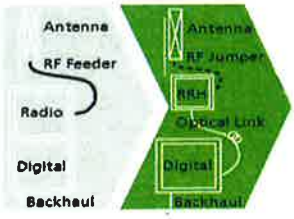
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent B4 RRH2x60-4R installation, providing more flexible site selection and improved network quality along with greatly reduced installation time and costs.

The Alcatel-Lucent B4 RRH2x60-4R is a zero-footprint solution and is convection cooled without fans for silent operation, simplifying negotiations with site property owners and minimizing environmental impacts.

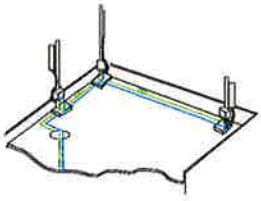
Installation can easily be done by a single person as the Alcatel–Lucent B4 RRH2x60-4R is compact and weighs about 25 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

FEATURES

- B4 RRH2x60-4R integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- B4 RRH2x60-4R is optimized for LTE operation
- B4 RRH2x60-4R is a very compact and lightweight product
- Advanced power management techniques are embedded to provide power savings, such as PA bias control

BENEFITS

- MIMO LTE operation with only one single unit per sector
- Improved uplink coverage with built-in 4-way receive diversity capability
- RRH can be mounted close to the antenna, eliminating nearly all losses in RF cables and thus reducing power consumption by 50% compared to conventional solutions
- Distributed configurations provide easily deployable and cost-effective solutions, near zero footprint and silent solutions, with minimum impact on the neighborhood, which ease the deployment
- RETA and TMA support without additional hardware thanks to the AISG v2.0 port and the integrated Bias-Tees. Bias-Tees support AISG DC supply and signaling.

TECHNICAL SPECIFICATIONS

Specifications listed are hardware capabilities. Some capabilities depend on support in a specific software release or future release.

Dimensions and weights

- HxWxD : 930x270x146 mm (with solar shield)
- Weight : 25 kg (55 lbs) (with solar shield)

Electrical Data

- Power Supply : -48V DC (-38 to -57V)
- Power Consumption: 346W typ. @2x30W (100%RF), 560W typ. @2x60W (100%RF)

RF Characteristics

- Frequency band: 1710-1755, UL / 2110-2155 MHz, DL (3GPP band 4)
- Output power: 2x60W at antenna connectors
- Technology supported: LTE
- Instantaneous bandwidth: 45 MHz
- Rx diversity: 2-way and 4-way uplink reception
- Typical sensitivity without Rx diversity: -105 dBm for LTE

Connectivity

- Two CPRI (3-6) optical ports for daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 300m using MM fiber, up to 15km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Four external alarms
- Surge protection for all external ports (DC and RF)

Environmental specifications

- Operating temperature: -40°C to 55°C including solar load
- Operating relative humidity: 8% to 100%
- Environmental Conditions : ETS 300 019-1-4 class 4.1E
- Ingress Protection : IEC 60529 IP65
- Acoustic Noise : Noiseless (natural convection cooling)

Safety and Regulatory Data

- EMC : 3GPP 25113, EN 301 489-1, EN 301 489-23, GR 1089, GR 3108, OET-65
- Safety : IEC60950-1, EN 60825-1, UL, ANSI/NFPA 70, CAN/CSA-C22.2
- Regulatory : FCC Part 15 Class B
- Health : EN 50385

Alcatel·Lucent

Product Data Sheet **HB158-1-08U8-S8J18**

HYBRIFLEX™ RRH Hybrid Feeder Cabling Solution, 1-5/8", Single-Mode Fiber

Product Description

RFS' HYBRIFLEX Remote Radio Head (RRH) hybrid feeder cabling solution combines optical fiber and DC power for RRHs in a single lightweight aluminum corrugated cable, making it the world's most innovative solution for RRH deployments.

It was developed to reduce installation complexity and costs at Cellular sites. HYBRIFLEX allows mobile operators deploying an RRH architecture to standardize the RRH installation process and eliminate the need for and cost of cable grounding. HYBRIFLEX combines optical fiber (multi-mode or single-mode) and power in a single corrugated cable. It eliminates the need for junction boxes and can connect multiple RRHs with a single feeder. Standard RFS CELLFLEX® accessories can be used with HYBRIFLEX cable. Both pre-connectorized and on-site options are available.

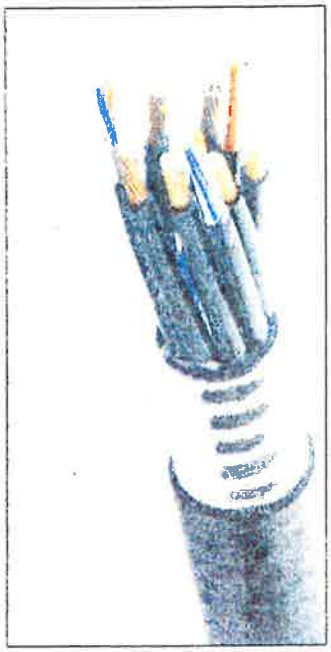


Figure 1: HYBRIFLEX Series

Features/Benefits

- Aluminum corrugated armor with outstanding bending characteristics – minimizes installation time and enables mechanical protection and shielding
- Same accessories as 1 5/8" coaxial cable
- Outer conductor grounding – Eliminates typical grounding requirements and saves on installation costs
- Lightweight solution and compact design – Decreases tower loading
- Robust cabling – Eliminates need for expensive cable trays and ducts
- Installation of tight bundled fiber optic cable pairs directly to the RRH – Reduces CAPEX and wind load by eliminating need for interconnection
- Optical fiber and power cables housed in single corrugated cable – Saves CAPEX by standardizing RRH cable installation and reducing installation requirements
- Outdoor polyethylene jacket – Ensures long-lasting cable protection

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Weight, Approximate		[kg/m (lb/ft)]	1.9 (1.30)
Minimum Bending Radius, Single Bending		[mm (in)]	200 (8)
Minimum Bending Radius, Repeated Bending		[mm (in)]	500 (20)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Version			Single-mode OM3
Quantity, Fiber Count			16 (8 pairs)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	245
Buffer Diameter, Nominal		[µm]	900
Secondary Protection, Jacket, Nominal		[mm (in)]	2.0 (0.08)
Minimum Bending Radius		[mm (in)]	104 (4.1)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL94-V0, UL1666 RoHS Compliant
Size (Power)		[mm² (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm² (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to149)

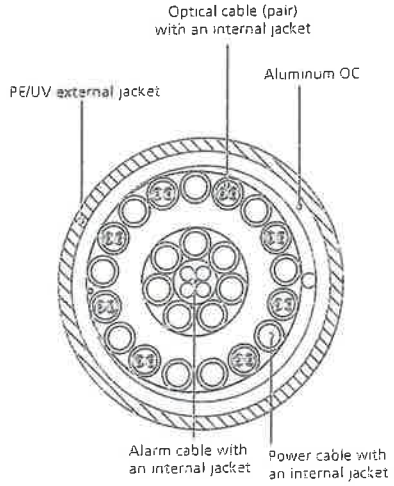


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: East Glastonbury 2								
Tower Height: 176Ft.								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*VoiceStream	4	470	177	1930	0.0231	1.0000	0.23%	
*Pocket (now MetroPCS)	3	631	147	2130	0.0342	1.0000	0.34%	
*Sprint	2	625	157.4	1900	0.0196	1.0000	0.20%	
*AT&T	2	565	137	880	0.0237	0.5867	0.40%	
*AT&T	2	875	137	1900	0.0367	1.0000	0.37%	
*AT&T	1	283	137	880	0.0059	0.5867	0.10%	
*AT&T	4	525	137	1900	0.0440	1.0000	0.44%	
*AT&T	1	1313	137	734	0.0275	0.4893	0.56%	
Verizon PCS	**1**	**5025**	**167**	**0.0648**	**1970**	**1.0000**	**6.48%**	
Verizon Cellular	**9**	**376**	**167**	**0.0436**	**869**	**0.5793**	**7.53%**	
Verizon AWS	**1**	**1750**	**167**	**0.0226**	**2145**	**1.0000**	**2.26%**	
Verizon 700	**1**	**4935**	**167**	**0.0636**	**746**	**0.4973**	**12.79%**	
								31.70%
* Source: Siting Council								

ATTACHMENT 3

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

Structural Analysis Report

Existing 176 ft SUMMIT Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT02216-S

Customer Site Name: Glastonbury

Carrier Name: Verizon

Carrier Site ID / Name: East Glastonbury 2 CT

Site Location: 175 Dickenson Road

Glastonbury, CT

Hartford County

Latitude: 41.655897

Longitude: -72.523255

Analysis Result:

Max Structural Usage: 80.3% [Pass]

Max Foundation Usage: 61.0% [Pass]

Report Prepared By : Fabiaye Arinyedokiari

1/20/16

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

Basic Wind Speed Used in the Analysis:	80 mph (fastest mile)
Basic Wind Speed with Ice:	69 mph (fastest mile) with 1/2" radial ice concurrent
Operational Wind Speed:	50 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-F / 2005 Connecticut State Building Code

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	177.0	6	EMS RR90-17-02DP - Panel	(3) T-Arm	(12) 1 5/8"	T-Mobile
2		12	MHA			
-	167.0	4	Antel LPA-80063/4CF - Panel	Low Profile Platform	(12) 1 5/8"	Verizon
-		3	Antel BXA-70063/6CF – Panel			
-		3	Antel BXA-171085/8BF - Panel			
-		2	RFS APL868013 - Panel			
-		6	RFS FD9R6004/2C-3L - Diplexers			
9	157.0	12	Decibel DB980H90E-M - Panel	Low Profile Platform	(12) 1 5/8"	Sprint
10	147.0	3	Kathrein 742 213 - Panel	Flush Mount	(6) 1 5/8"	Pocket Communications
11	137.0	6	Powerwave 7770.00 - Panel	Low Profile Platform	(12) 1 5/8" (1) 3" Flex Conduit	AT&T
12		3	KMW AM-X-CD-16-65-00T - Panel			
13		6	Powerwave LGP21401 - TMA			
14		6	Powerwave LGP21903 - Diplexers			
15		1	Raycap DC6-48-60-18-8F – Surge Arrestor			
16		3	Andrew ABT-DFDM-ADBH – Surge Arrestors			
17		9	Ericsson RRUS-11 - RRU	Dual Antenna Mount (MC-HPM1250-B)		
18		6	Ericsson RRUS 12 - RRU			
19		6	Ericsson RRUS A2 Module			
20		1	Ericsson RRUS-32 - RRU			
21		1	Ericsson RRUS-E2 -RRU			

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
3	167.0	6	Andrew SBNHH-1D65B - Panel	Low Profile Platform	(6) 1 5/8" (2) 1 5/8" Hybrid	Verizon
4		4	Antel LPA-80063-4CF-EDIN-5 - Panel			
5		2	RFS APL868013 - Panel			
6		3	Alcatel Lucent RRH2X60-700 - RRH			
7		3	Alcatel Lucent RRH2X60-AWS – RRH			
8		1	RFS DB-T1-6Z-8AB-0Z – Distribution Box			

All transmission lines are considered running inside of the pole shafts.

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:	**74.3%**	**62.6%**	**80.3%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	5100.0	38.0
Analysis Reactions	3827.3	29.7
% of Design Reactions	75.0%	78.2%

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-F for the installed antennas. Maximum twist/sway at the elevation of the proposed equipment is 2.0386 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-F 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 analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

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

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

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

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

Usage Diagram - Max Stress 74.3% at 49.0ft

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)			Page: 1	

Tower Engineering Solutions

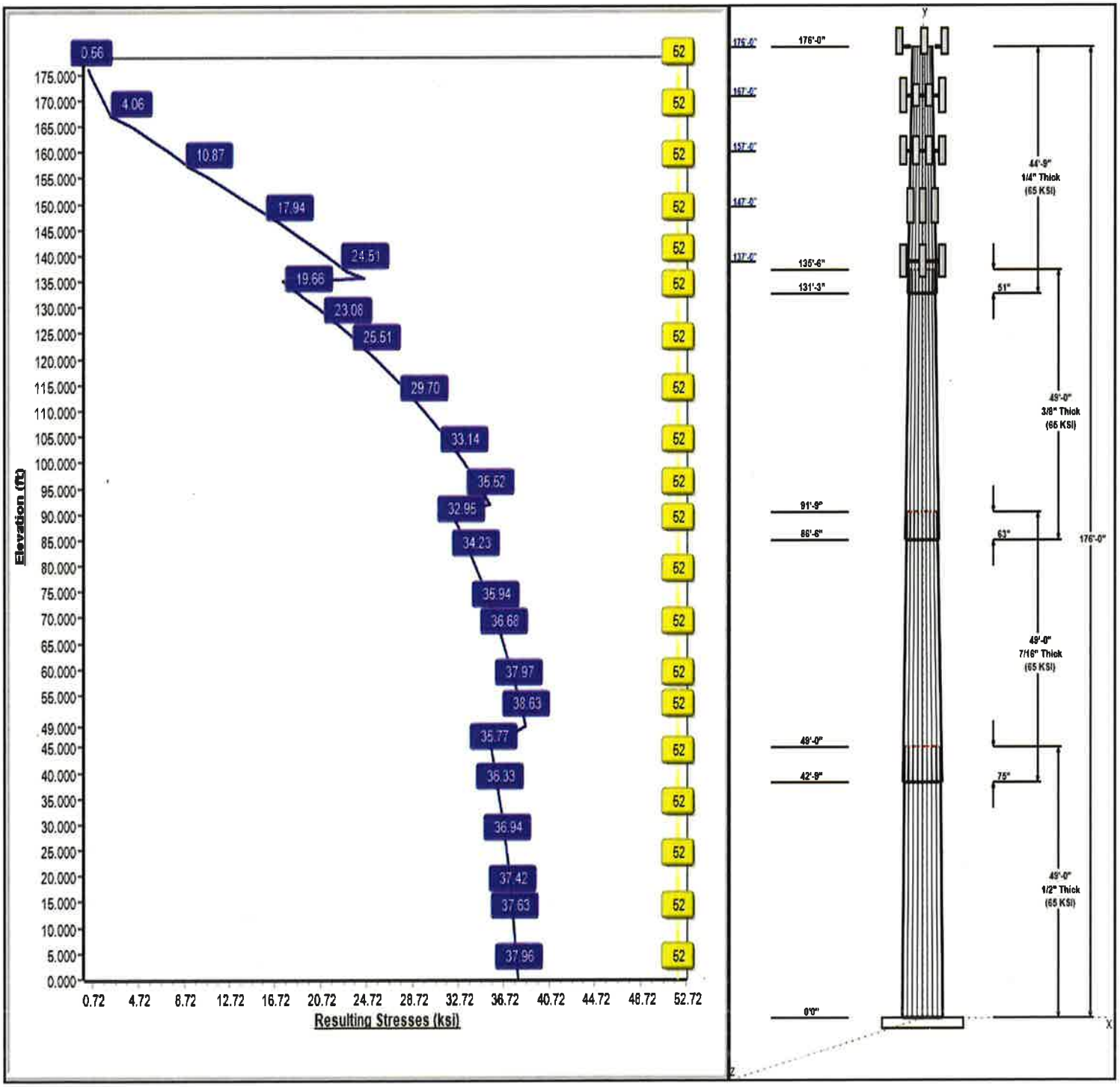
Dead Load Factor:	1.00
Wind Load Factor:	1.00

52 Alllowable Stress

39 Resulting Stress

Load Case : 80 mph Wind with 0 in Ice

Iterations: 26



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

1/19/2016

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	12	MHA	T-Mobile
176.00	177.00	6	RR90-17-02DP	T-Mobile
176.00	176.00	3	T-Arm (Round)	T-Mobile
167.00	167.00	2	APL868013	Verizon
167.00	167.00	1	DB-T1-6Z-8AB-0Z	Verizon
167.00	167.00	1	Low Profile	Verizon
167.00	167.00	4	LPA-80063-4CF-EDIN-5	Verizon
167.00	167.00	3	RRH2X60-700	Verizon
167.00	167.00	3	RRH2X60-AWS	Verizon
167.00	167.00	6	SBNHH-1D65B	Verizon
157.00	157.00	12	DB980H90E-M	Sprint
157.00	157.00	1	Low Profile	Sprint
147.00	147.00	3	742 213	Pocket
147.00	147.00	1	Flush Mount	Pocket
137.00	137.00	6	7770.00	AT&T
137.00	137.00	3	ABT-DFDM-ADBH	AT&T
137.00	137.00	3	AM-X-CD-16-65-00T-RET	AT&T
137.00	137.00	1	DC6-48-60-18-8F	AT&T
137.00	137.00	3	Dual Antenna Mount	AT&T
137.00	137.00	6	LGP21401	AT&T
137.00	137.00	6	LGP21903	AT&T
137.00	137.00	1	Low Profile	AT&T
137.00	137.00	6	RRUS 12	AT&T
137.00	137.00	6	RRUS A2 Module	AT&T
137.00	137.00	9	RRUS-11	AT&T
137.00	137.00	1	RRUS-32	AT&T
137.00	137.00	1	RRUS-E2	AT&T

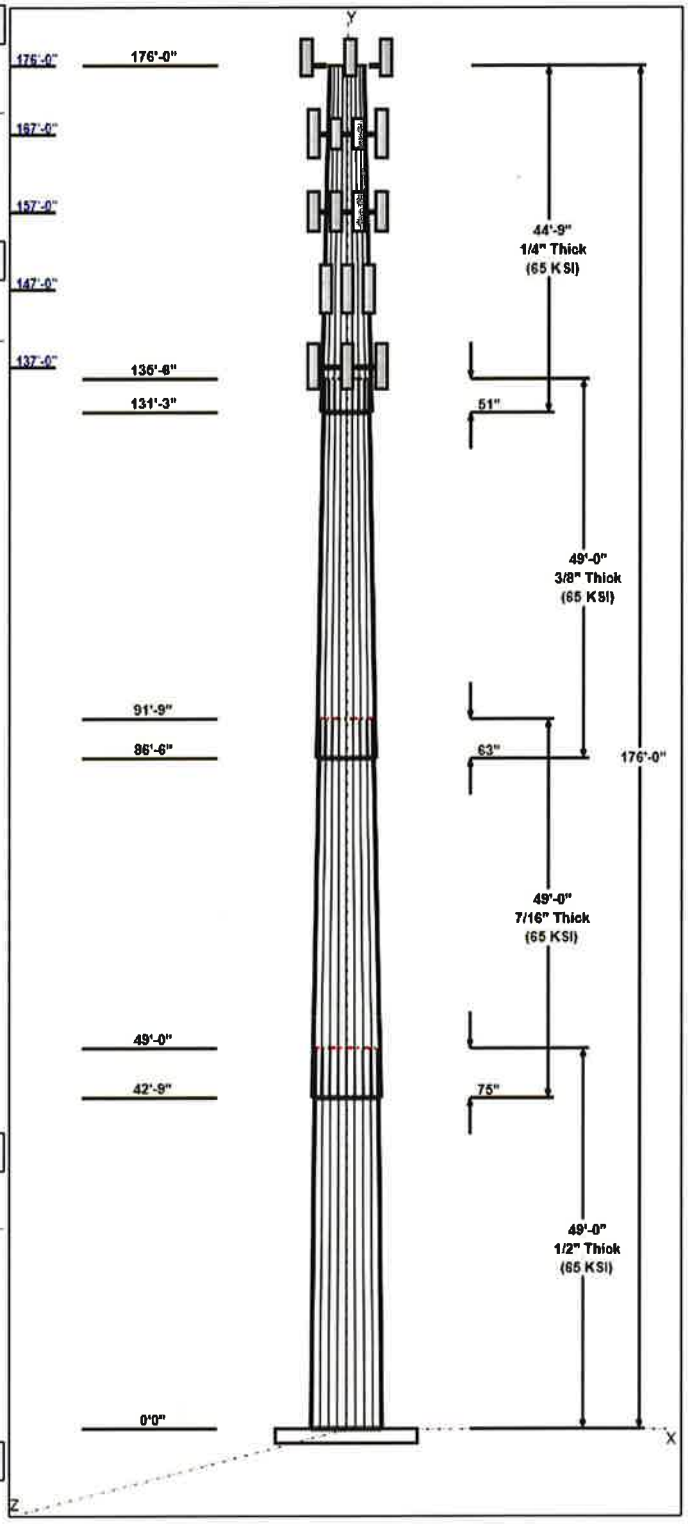
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	176.00	Inside	1 5/8" Coax	Verizon
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 5/8" Coax	Sprint
0.00	147.00	Inside	1 5/8" Coax	Pocket
0.00	137.00	Inside	1 5/8" Coax	AT&T
0.00	137.00	Inside	3" Coax	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

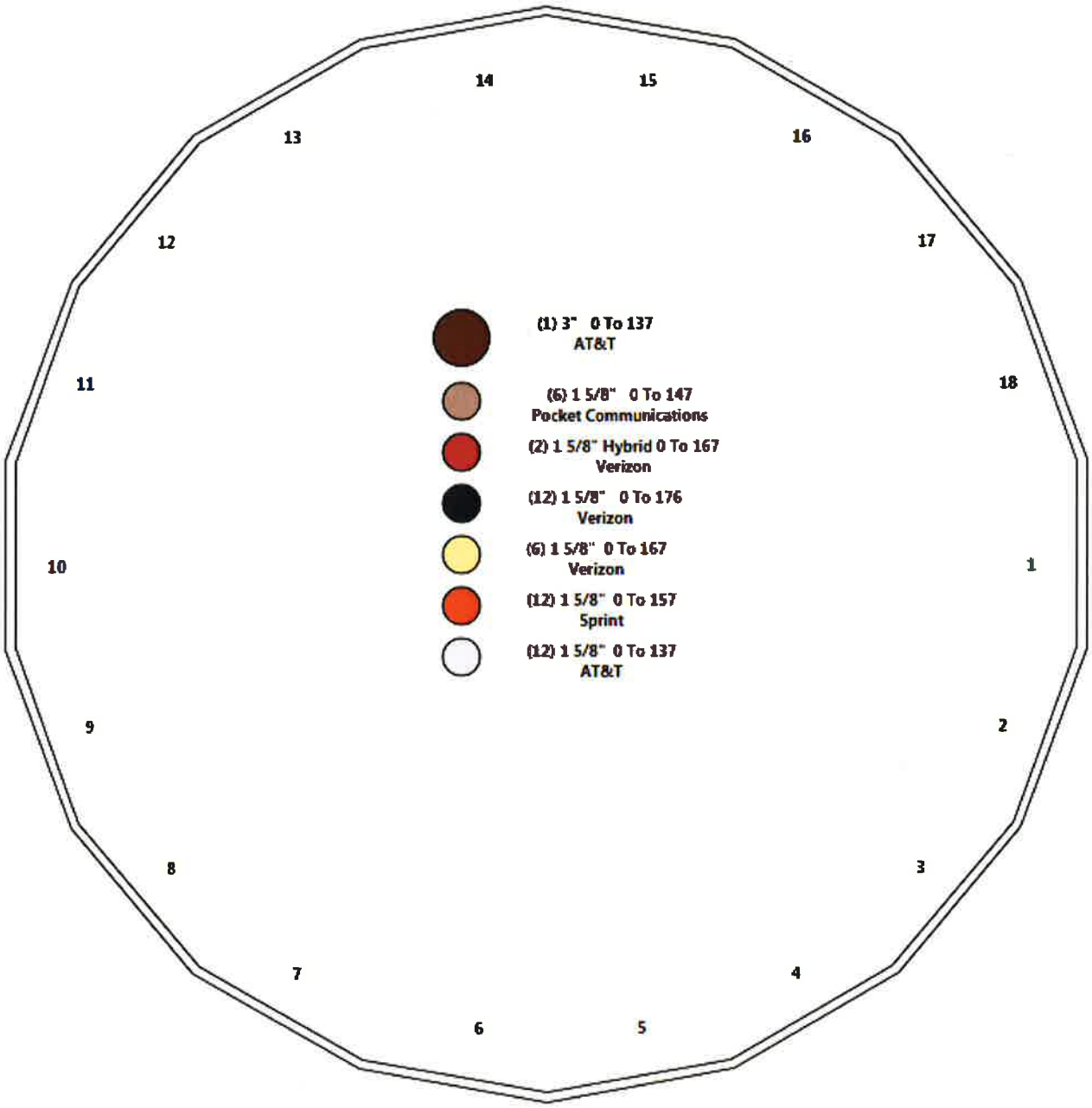
Load Case	Moment	Shear	Axial
80 mph Wind with 0" Ice	3827.3	29.7	53.0
69.28 mph Wind with 0.5" Ice	3206.6	24.3	59.6
50 mph Wind with 0" Ice	1496.6	11.6	53.0

Structure: CT02216-S-SBA - Coax Line Placement

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

1/19/2016

IES
Tower Engineering Solutions



Shaft Properties

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016
Site Name:	Glastonbury	**Exposure:**	C	
Height:	176.00 (ft)	**Gh:**	1.69	
Base Elev:	0.000 (ft)	**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	135.5	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	176.0	18.84	1343.00	15.52	96.00	0.197017

Loading Summary

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	176.00	MHA	12	11.00	0.93	0.65	16.50	1.140	0.68	0.00	1.00
2	176.00	RR90-17-02DP	6	13.50	4.36	0.68	0.00	4.990	0.68	0.00	1.00
3	176.00	T-Arm (Round)	3	350.00	8.00	0.75	420.00	10.500	0.75	0.00	0.00
4	167.00	APL868013	2	6.30	3.73	1.17	0.00	4.290	1.17	0.00	0.00
5	167.00	DB-T1-6Z-8AB-0Z	1	18.90	5.60	0.71	46.00	5.870	0.71	0.00	0.00
6	167.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
7	167.00	LPA-80063-4CF-EDIN-5	4	20.00	7.00	0.93	72.40	7.620	0.93	0.00	0.00
8	167.00	RRH2X60-700	3	60.00	3.96	0.76	80.10	4.230	0.76	0.00	0.00
9	167.00	RRH2X60-AWS	3	60.00	3.96	0.76	80.10	4.230	0.76	0.00	0.00
10	167.00	SBNHH-1D65B	6	40.00	8.40	0.83	86.60	8.870	0.83	0.00	0.00
11	157.00	DB980H90E-M	12	8.50	3.90	0.74	0.00	4.470	0.74	0.00	0.00
12	157.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
13	147.00	742 213	3	22.00	5.14	0.72	0.00	5.850	0.72	0.00	0.00
14	147.00	Flush Mount	1	350.00	5.00	1.00	450.00	6.000	1.00	0.00	0.00
15	137.00	7770.00	6	35.00	5.88	0.73	0.00	6.530	0.73	0.00	0.00
16	137.00	ABT-DFDM-ADBH	3	1.10	0.05	0.98	1.80	0.110	0.98	0.00	0.00
17	137.00	AM-X-CD-16-65-00T-RET	3	48.50	8.26	0.75	95.00	9.080	0.75	0.00	0.00
18	137.00	DC6-48-60-18-8F	1	31.80	1.47	0.67	49.50	1.670	0.67	0.00	0.00
19	137.00	Dual Antenna Mount	3	84.00	3.75	1.00	111.00	4.450	1.00	0.00	0.00
20	137.00	LGP21401	6	14.10	1.29	0.67	21.20	1.530	0.67	0.00	0.00
21	137.00	LGP21903	6	5.50	0.27	0.84	7.90	0.380	0.84	0.00	0.00
22	137.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
23	137.00	RRUS 12	6	58.00	3.67	0.70	75.70	3.890	0.70	0.00	0.00
24	137.00	RRUS A2 Module	6	21.20	1.86	0.62	31.40	2.150	0.62	0.00	0.00
25	137.00	RRUS-11	9	55.00	4.42	0.68	80.70	4.850	0.68	0.00	0.00
26	137.00	RRUS-32	1	77.00	3.87	0.87	103.50	4.300	0.87	0.00	0.00
27	137.00	RRUS-E2	1	77.00	3.87	0.87	103.50	4.300	0.87	0.00	0.00
		Totals:	**110**	**8,876.90**			**11,067.20**				

Linear Appurtenances

			No Ice		Ice		
Bottom Elev. (ft)	Top Elev. (ft)	Description	Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	Exposed
0.00	176.00	(12) 1 5/8" Coax	12.48	0.00	12.48	0.00	Inside
0.00	167.00	(6) 1 5/8" Coax	12.48	0.00	12.48	0.00	Inside
0.00	167.00	(2) 1 5/8" Hybrid	2.20	0.00	2.20	0.00	Inside
0.00	157.00	(12) 1 5/8" Coax	12.48	0.00	12.48	0.00	Inside
0.00	147.00	(6) 1 5/8" Coax	6.24	0.00	6.24	0.00	Inside
0.00	137.00	(12) 1 5/8" Coax	12.48	0.00	12.48	0.00	Inside
0.00	137.00	(1) 3" Coax	5.34	0.00	5.34	0.00	Inside
		Totals:	**9,966.02**		**9,966.02**		

Shaft Section Properties

Structure: CT02216-S-SBA
Site Name: Glastonbury
Height: 176.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

1/19/2016

Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.5000	56.550	88.948	35305.4	18.53	113.10	65	52	0.0
5.00		0.5000	55.565	87.385	33476.4	18.18	111.13	65	52	1500.1
10.00		0.5000	54.580	85.822	31711.8	17.84	109.16	65	52	1473.5
15.00		0.5000	53.595	84.258	30010.2	17.49	107.19	65	52	1446.9
20.00		0.5000	52.610	82.695	28370.6	17.14	105.22	65	52	1420.3
25.00		0.5000	51.625	81.132	26791.9	16.79	103.25	65	52	1393.7
30.00		0.5000	50.639	79.569	25272.8	16.45	101.28	65	52	1367.1
35.00		0.5000	49.654	78.005	23812.3	16.10	99.31	65	52	1340.5
40.00		0.5000	48.669	76.442	22409.2	15.75	97.34	65	52	1313.9
42.75	Bot - Section 2	0.5000	48.128	75.582	21661.5	15.56	96.26	65	52	711.3
45.00		0.5000	47.684	74.879	21062.3	15.41	95.37	65	52	1089.9
49.00	Top - Section 1	0.4375	47.771	65.726	18605.1	17.84	109.19	65	52	1912.7
50.00		0.4375	47.574	65.453	18373.8	17.76	108.74	65	52	223.2
55.00		0.4375	46.589	64.085	17245.7	17.37	106.49	65	52	1102.0
60.00		0.4375	45.604	62.717	16164.8	16.97	104.24	65	52	1078.7
65.00		0.4375	44.619	61.349	15130.1	16.57	101.99	65	52	1055.4
70.00		0.4375	43.634	59.981	14140.4	16.18	99.73	65	52	1032.2
75.00		0.4375	42.649	58.613	13194.9	15.78	97.48	65	52	1008.9
80.00		0.4375	41.664	57.246	12292.5	15.38	95.23	65	52	985.6
85.00		0.4375	40.679	55.878	11432.2	14.98	92.98	65	52	962.3
86.50	Bot - Section 3	0.4375	40.383	55.467	11182.2	14.87	92.30	65	52	284.2
90.00		0.4375	39.693	54.510	10613.0	14.59	90.73	65	52	1227.8
91.75	Top - Section 2	0.3750	40.099	47.279	9425.9	17.44	106.93	65	52	605.9
95.00		0.3750	39.458	46.517	8977.4	17.14	105.22	65	52	518.7
100.00		0.3750	38.473	45.345	8315.6	16.68	102.60	65	52	781.5
105.00		0.3750	37.488	44.172	7687.1	16.22	99.97	65	52	761.5
110.00		0.3750	36.503	43.000	7091.1	15.75	97.34	65	52	741.6
115.00		0.3750	35.518	41.827	6526.7	15.29	94.71	65	52	721.6
120.00		0.3750	34.533	40.655	5993.1	14.83	92.09	65	52	701.7
125.00		0.3750	33.548	39.483	5489.4	14.36	89.46	65	52	681.7
130.00		0.3750	32.563	38.310	5014.7	13.90	86.83	65	52	661.8
131.25	Bot - Section 4	0.3750	32.317	38.017	4900.5	13.78	86.18	65	52	162.3
135.00		0.3750	31.578	37.138	4568.3	13.44	84.21	65	52	805.5
135.50	Top - Section 3	0.2500	31.979	25.176	3202.3	21.14	127.92	65	52	106.0
137.00		0.2500	31.684	24.942	3113.6	20.94	126.73	65	52	127.9
140.00		0.2500	31.093	24.473	2941.3	20.52	124.37	65	52	252.2
145.00		0.2500	30.108	23.691	2668.4	19.82	120.43	65	52	409.7
147.00		0.2500	29.713	23.378	2564.1	19.55	118.85	65	52	160.2
150.00		0.2500	29.122	22.909	2412.9	19.13	116.49	65	52	236.3
155.00		0.2500	28.137	22.128	2174.2	18.43	112.55	65	52	383.1
157.00		0.2500	27.743	21.815	2083.4	18.16	110.97	65	52	149.5
160.00		0.2500	27.152	21.346	1951.9	17.74	108.61	65	52	220.3
165.00		0.2500	26.167	20.565	1745.2	17.05	104.67	65	52	356.5
167.00		0.2500	25.773	20.252	1666.8	16.77	103.09	65	52	138.9
170.00		0.2500	25.182	19.783	1553.7	16.35	100.73	65	52	204.3
175.00		0.2500	24.197	19.001	1376.7	15.66	96.79	65	52	329.9
176.00		0.2500	24.000	18.845	1343.0	15.52	96.00	65	52	64.4
										34212.9

Wind Loading - Shaft

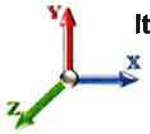
Structure: CT02216-S-SBA
Site Name: Glastonbury
Height: 176.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

1/19/2016

TES Tower Engineering Solutions

Load Case: 80 mph Wind with 0" Ice
Dead Load Factor 1.00
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		0.00	1.00	16.384	27.69	377.00	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	16.384	27.69	370.43	0.650	0.000	5.00	23.357	15.18	420.4	0.0	1500.1
10.00		0.00	1.00	16.384	27.69	363.87	0.650	0.000	5.00	22.947	14.92	413.0	0.0	1473.5
15.00		0.00	1.00	16.384	27.69	357.30	0.650	0.000	5.00	22.536	14.65	405.6	0.0	1446.9
20.00		0.00	1.00	16.384	27.69	350.73	0.650	0.000	5.00	22.126	14.38	398.2	0.0	1420.3
25.00		0.00	1.00	16.384	27.69	344.16	0.650	0.000	5.00	21.715	14.12	390.8	0.0	1393.7
30.00		0.00	1.00	16.384	27.69	337.60	0.650	0.000	5.00	21.305	13.85	383.4	0.0	1367.1
35.00		0.00	1.02	16.662	28.16	333.82	0.650	0.000	5.00	20.895	13.58	382.4	0.0	1340.5
40.00		0.00	1.06	17.310	29.25	333.50	0.650	0.000	5.00	20.484	13.31	389.5	0.0	1313.9
42.75	Bot - Section 2	0.00	1.08	17.642	29.81	332.94	0.650	0.000	2.75	11.091	7.21	214.9	0.0	711.3
45.00		0.00	1.09	17.902	30.25	332.30	0.650	0.000	2.25	9.146	5.95	179.9	0.0	1089.9
49.00	Top - Section 1	0.00	1.12	18.343	31.00	330.81	0.650	0.000	4.00	16.055	10.44	323.5	0.0	1912.7
50.00		0.00	1.13	18.449	31.18	336.56	0.650	0.000	1.00	3.973	2.58	80.5	0.0	223.2
55.00		0.00	1.16	18.959	32.04	334.11	0.650	0.000	5.00	19.617	12.75	408.6	0.0	1102.0
60.00		0.00	1.19	19.436	32.85	331.13	0.650	0.000	5.00	19.207	12.48	410.1	0.0	1078.7
65.00		0.00	1.21	19.885	33.61	327.71	0.650	0.000	5.00	18.796	12.22	410.6	0.0	1055.4
70.00		0.00	1.24	20.311	34.33	323.88	0.650	0.000	5.00	18.386	11.95	410.2	0.0	1032.2
75.00		0.00	1.26	20.715	35.01	319.71	0.650	0.000	5.00	17.976	11.68	409.0	0.0	1008.9
80.00		0.00	1.29	21.101	35.66	315.21	0.650	0.000	5.00	17.565	11.42	407.1	0.0	985.6
85.00		0.00	1.31	21.469	36.28	310.44	0.650	0.000	5.00	17.155	11.15	404.6	0.0	962.3
86.50	Bot - Section 3	0.00	1.32	21.577	36.47	308.95	0.650	0.000	1.50	5.066	3.29	120.1	0.0	284.2
90.00		0.00	1.33	21.823	36.88	305.40	0.650	0.000	3.50	11.897	7.73	285.2	0.0	1227.8
91.75	Top - Section 2	0.00	1.34	21.943	37.08	303.59	0.650	0.000	1.75	5.873	3.82	141.6	0.0	605.9
95.00		0.00	1.35	22.163	37.45	305.95	0.650	0.000	3.25	10.773	7.00	262.3	0.0	518.7
100.00		0.00	1.37	22.490	38.01	300.51	0.650	0.000	5.00	16.236	10.55	401.1	0.0	781.5
105.00		0.00	1.39	22.806	38.54	294.86	0.650	0.000	5.00	15.825	10.29	396.5	0.0	761.5
110.00		0.00	1.41	23.111	39.06	289.03	0.650	0.000	5.00	15.415	10.02	391.3	0.0	741.6
115.00		0.00	1.43	23.406	39.56	283.02	0.650	0.000	5.00	15.004	9.75	385.8	0.0	721.6
120.00		0.00	1.45	23.692	40.04	276.85	0.650	0.000	5.00	14.594	9.49	379.8	0.0	701.7
125.00		0.00	1.46	23.970	40.51	270.52	0.650	0.000	5.00	14.184	9.22	373.5	0.0	681.7
130.00		0.00	1.48	24.241	40.97	264.05	0.650	0.000	5.00	13.773	8.95	366.8	0.0	661.8
131.25	Bot - Section 4	0.00	1.48	24.307	41.08	262.41	0.650	0.000	1.25	3.379	2.20	90.2	0.0	162.3
135.00		0.00	1.50	24.503	41.41	257.45	0.650	0.000	3.75	10.140	6.59	272.9	0.0	805.5
135.50	Top - Section 3	0.00	1.50	24.529	41.45	256.78	0.650	0.000	0.50	1.335	0.87	36.0	0.0	106.0
137.00	Appurtenance(s)	0.00	1.50	24.607	41.59	258.86	0.650	0.000	1.50	3.979	2.59	107.6	0.0	127.9
140.00		0.00	1.51	24.759	41.84	254.82	0.650	0.000	3.00	7.847	5.10	213.4	0.0	252.2
145.00		0.00	1.53	25.009	42.26	247.98	0.650	0.000	5.00	12.750	8.29	350.3	0.0	409.7
147.00	Appurtenance(s)	0.00	1.53	25.107	42.43	245.22	0.650	0.000	2.00	4.985	3.24	137.5	0.0	160.2
150.00		0.00	1.54	25.252	42.68	241.03	0.650	0.000	3.00	7.354	4.78	204.0	0.0	236.3
155.00		0.00	1.56	25.490	43.08	233.97	0.650	0.000	5.00	11.929	7.75	334.0	0.0	383.1
157.00	Appurtenance(s)	0.00	1.56	25.583	43.24	231.12	0.650	0.000	2.00	4.657	3.03	130.9	0.0	149.5
160.00		0.00	1.57	25.722	43.47	226.81	0.650	0.000	3.00	6.862	4.46	193.9	0.0	220.3
165.00		0.00	1.58	25.949	43.85	219.54	0.650	0.000	5.00	11.108	7.22	316.6	0.0	356.5
167.00	Appurtenance(s)	0.00	1.59	26.039	44.01	216.61	0.650	0.000	2.00	4.328	2.81	123.8	0.0	138.9
170.00		0.00	1.60	26.172	44.23	212.18	0.650	0.000	3.00	6.369	4.14	183.1	0.0	204.3
175.00		0.00	1.61	26.389	44.60	204.73	0.650	0.000	5.00	10.287	6.69	298.2	0.0	329.9
176.00	Appurtenance(s)	0.00	1.61	26.432	44.67	203.22	0.650	0.000	1.00	2.008	1.31	58.3	0.0	64.4
								Totals:	**176.00**			**13,397.0**		**34,212.9**

Discrete Appurtenance Forces

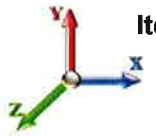
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 9	

TES Tower Engineering Solutions

Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	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	T-Arm (Round)	3	26.432	44.670	0.75	18.00	1050.00	0.000	0.000	804.07	0.00	0.00
2	176.00	RR90-17-02DP	6	26.475	44.743	0.68	17.79	81.00	0.000	1.000	795.92	0.00	795.92
3	176.00	MHA	12	26.475	44.743	0.65	7.25	132.00	0.000	1.000	324.56	0.00	324.56
4	167.00	APL868013	2	26.039	44.006	1.17	8.73	12.60	0.000	0.000	384.09	0.00	0.00
5	167.00	DB-T1-6Z-8AB-0Z	1	26.039	44.006	0.71	3.98	18.90	0.000	0.000	174.97	0.00	0.00
6	167.00	Low Profile Platform-Round	1	26.039	44.006	1.00	22.00	1500.00	0.000	0.000	968.12	0.00	0.00
7	167.00	LPA-80063-4CF-EDIN-5	4	26.039	44.006	0.93	26.04	80.00	0.000	0.000	1145.90	0.00	0.00
8	167.00	RRH2X60-700	3	26.039	44.006	0.76	9.03	180.00	0.000	0.000	397.32	0.00	0.00
9	167.00	RRH2X60-AWS	3	26.039	44.006	0.76	9.03	180.00	0.000	0.000	397.32	0.00	0.00
10	167.00	SBNHH-1D65B	6	26.039	44.006	0.83	41.83	240.00	0.000	0.000	1840.84	0.00	0.00
11	157.00	Low Profile Platform-Round	1	25.583	43.236	1.00	22.00	1500.00	0.000	0.000	951.19	0.00	0.00
12	157.00	DB980H90E-M	12	25.583	43.236	0.74	34.63	102.00	0.000	0.000	1497.35	0.00	0.00
13	147.00	Flush Mount	1	25.107	42.431	1.00	5.00	350.00	0.000	0.000	212.15	0.00	0.00
14	147.00	742 213	3	25.107	42.431	0.72	11.10	66.00	0.000	0.000	471.08	0.00	0.00
15	137.00	LGP21401	6	24.607	41.585	0.67	5.19	84.60	0.000	0.000	215.65	0.00	0.00
16	137.00	7770.00	6	24.607	41.585	0.73	25.75	210.00	0.000	0.000	1071.00	0.00	0.00
17	137.00	ABT-DFDM-ADBH	3	24.607	41.585	0.98	0.15	3.30	0.000	0.000	6.11	0.00	0.00
18	137.00	AM-X-CD-16-65-00T-RET	3	24.607	41.585	0.75	18.59	145.50	0.000	0.000	772.86	0.00	0.00
19	137.00	DC6-48-60-18-8F	1	24.607	41.585	0.67	0.98	31.80	0.000	0.000	40.96	0.00	0.00
20	137.00	Dual Antenna Mount	3	24.607	41.585	1.00	11.25	252.00	0.000	0.000	467.83	0.00	0.00
21	137.00	RRUS-E2	1	24.607	41.585	0.87	3.37	77.00	0.000	0.000	140.01	0.00	0.00
22	137.00	LGP21903	6	24.607	41.585	0.84	1.36	33.00	0.000	0.000	56.59	0.00	0.00
23	137.00	Low Profile Platform-Round	1	24.607	41.585	1.00	22.00	1500.00	0.000	0.000	914.87	0.00	0.00
24	137.00	RRUS 12	6	24.607	41.585	0.70	15.41	348.00	0.000	0.000	640.99	0.00	0.00
25	137.00	RRUS A2 Module	6	24.607	41.585	0.62	6.92	127.20	0.000	0.000	287.74	0.00	0.00
26	137.00	RRUS-11	9	24.607	41.585	0.68	27.05	495.00	0.000	0.000	1124.89	0.00	0.00
27	137.00	RRUS-32	1	24.607	41.585	0.87	3.37	77.00	0.000	0.000	140.01	0.00	0.00
						Totals:		**8,876.90**			**16,244.40**		

Total Applied Force Summary

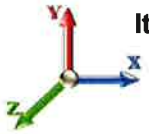
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 10	

TES Tower Engineering Solutions

Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00

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		420.38	1818.56	0.00	0.00
10.00		412.99	1791.96	0.00	0.00
15.00		405.61	1765.36	0.00	0.00
20.00		398.22	1738.76	0.00	0.00
25.00		390.83	1712.17	0.00	0.00
30.00		383.44	1685.57	0.00	0.00
35.00		382.43	1658.97	0.00	0.00
40.00		389.50	1632.37	0.00	0.00
42.75		214.94	886.47	0.00	0.00
45.00		179.87	1233.26	0.00	0.00
49.00		323.51	2167.53	0.00	0.00
50.00		80.51	286.89	0.00	0.00
55.00		408.55	1420.47	0.00	0.00
60.00		410.07	1397.20	0.00	0.00
65.00		410.59	1373.92	0.00	0.00
70.00		410.22	1350.65	0.00	0.00
75.00		409.05	1327.38	0.00	0.00
80.00		407.14	1304.11	0.00	0.00
85.00		404.58	1280.83	0.00	0.00
86.50		120.08	379.71	0.00	0.00
90.00		285.19	1450.71	0.00	0.00
91.75		141.56	717.41	0.00	0.00
95.00		262.29	725.68	0.00	0.00
100.00		401.11	1099.97	0.00	0.00
105.00		396.45	1080.02	0.00	0.00
110.00		391.34	1060.07	0.00	0.00
115.00		385.79	1040.12	0.00	0.00
120.00		379.83	1020.17	0.00	0.00
125.00		373.47	1000.23	0.00	0.00
130.00		366.75	980.28	0.00	0.00
131.25		90.23	241.95	0.00	0.00
135.00		272.93	1044.37	0.00	0.00
135.50		35.96	137.84	0.00	0.00
137.00	(52) appurtenances	5987.06	3607.86	0.00	0.00
140.00		213.42	389.86	0.00	0.00
145.00		350.27	639.13	0.00	0.00
147.00	(4) appurtenances	820.72	667.93	0.00	0.00
150.00		204.01	355.18	0.00	0.00
155.00		334.02	581.33	0.00	0.00
157.00	(13) appurtenances	2579.41	1830.81	0.00	0.00
160.00		193.89	301.78	0.00	0.00
165.00		316.64	492.33	0.00	0.00
167.00	(20) appurtenances	5432.36	2404.71	0.00	0.00
170.00		183.12	241.78	0.00	0.00
175.00		298.21	392.33	0.00	0.00
176.00	(21) appurtenances	1982.86	1339.87	0.00	1120.49
	Totals:	**29,641.44**	**53,055.85**	**0.00**	**1,120.49**

Resulting Forces and Deflections

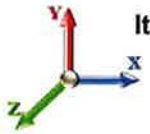
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 11	

TES Tower Engineering Solutions

Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-29.713	-53.016	0.000	0.000	0.000	-3827.303	0.000	0.000	0.000	0.000	0.000
5.00	-29.426	-51.120	0.000	0.000	0.000	-3678.744	-0.081	0.000	0.081	-0.151	0.000
10.00	-29.138	-49.251	0.000	0.000	0.000	-3531.619	-0.322	0.000	0.322	-0.304	0.000
15.00	-28.850	-47.410	0.000	0.000	0.000	-3385.931	-0.724	0.000	0.724	-0.460	0.000
20.00	-28.561	-45.597	0.000	0.000	0.000	-3241.684	-1.289	0.000	1.289	-0.617	0.000
25.00	-28.272	-43.811	0.000	0.000	0.000	-3098.880	-2.020	0.000	2.020	-0.776	0.000
30.00	-27.982	-42.052	0.000	0.000	0.000	-2957.523	-2.918	0.000	2.918	-0.936	0.000
35.00	-27.685	-40.321	0.000	0.000	0.000	-2817.615	-3.986	0.000	3.986	-1.099	0.000
40.00	-27.348	-38.637	0.000	0.000	0.000	-2679.190	-5.225	0.000	5.225	-1.263	0.000
42.75	-27.169	-37.715	0.000	0.000	0.000	-2603.983	-5.980	0.000	5.980	-1.355	0.000
45.00	-27.026	-36.437	0.000	0.000	0.000	-2542.855	-6.637	0.000	6.637	-1.431	0.000
49.00	-26.696	-34.240	0.000	0.000	0.000	-2434.753	-7.894	0.000	7.894	-1.566	0.000
50.00	-26.672	-33.905	0.000	0.000	0.000	-2408.057	-8.226	0.000	8.226	-1.600	0.000
55.00	-26.325	-32.413	0.000	0.000	0.000	-2274.699	-9.999	0.000	9.999	-1.782	0.000
60.00	-25.968	-30.948	0.000	0.000	0.000	-2143.077	-11.962	0.000	11.962	-1.964	0.000
65.00	-25.603	-29.508	0.000	0.000	0.000	-2013.239	-14.117	0.000	14.117	-2.147	0.000
70.00	-25.230	-28.094	0.000	0.000	0.000	-1885.227	-16.463	0.000	16.463	-2.330	0.000
75.00	-24.851	-26.706	0.000	0.000	0.000	-1759.079	-19.000	0.000	19.000	-2.513	0.000
80.00	-24.466	-25.343	0.000	0.000	0.000	-1634.827	-21.730	0.000	21.730	-2.696	0.000
85.00	-24.049	-24.034	0.000	0.000	0.000	-1512.501	-24.651	0.000	24.651	-2.878	0.000
86.50	-23.948	-23.623	0.000	0.000	0.000	-1476.428	-25.564	0.000	25.564	-2.934	0.000
90.00	-23.624	-22.150	0.000	0.000	0.000	-1392.613	-27.762	0.000	27.762	-3.062	0.000
91.75	-23.478	-21.403	0.000	0.000	0.000	-1351.271	-28.896	0.000	28.896	-3.126	0.000
95.00	-23.232	-20.630	0.000	0.000	0.000	-1274.969	-31.064	0.000	31.064	-3.244	0.000
100.00	-22.833	-19.480	0.000	0.000	0.000	-1158.810	-34.564	0.000	34.564	-3.436	0.000
105.00	-22.430	-18.353	0.000	0.000	0.000	-1044.650	-38.262	0.000	38.262	-3.625	0.000
110.00	-22.025	-17.252	0.000	0.000	0.000	-932.502	-42.155	0.000	42.155	-3.808	0.000
115.00	-21.618	-16.176	0.000	0.000	0.000	-822.379	-46.236	0.000	46.236	-3.984	0.000
120.00	-21.209	-15.125	0.000	0.000	0.000	-714.292	-50.496	0.000	50.496	-4.151	0.000
125.00	-20.800	-14.100	0.000	0.000	0.000	-608.246	-54.925	0.000	54.925	-4.308	0.000
130.00	-20.380	-13.120	0.000	0.000	0.000	-504.246	-59.512	0.000	59.512	-4.452	0.000
131.25	-20.286	-12.862	0.000	0.000	0.000	-478.771	-60.682	0.000	60.682	-4.487	0.000
135.00	-19.942	-11.824	0.000	0.000	0.000	-402.700	-64.243	0.000	64.243	-4.583	0.000
135.50	-19.900	-11.681	0.000	0.000	0.000	-392.729	-64.723	0.000	64.723	-4.596	0.000
137.00	-13.652	-8.551	0.000	0.000	0.000	-362.879	-66.172	0.000	66.172	-4.631	0.000
140.00	-13.424	-8.153	0.000	0.000	0.000	-321.923	-69.110	0.000	69.110	-4.725	0.000
145.00	-13.034	-7.524	0.000	0.000	0.000	-254.802	-74.130	0.000	74.130	-4.865	0.000
147.00	-12.167	-6.915	0.000	0.000	0.000	-228.734	-76.177	0.000	76.177	-4.916	0.000
150.00	-11.943	-6.561	0.000	0.000	0.000	-192.233	-79.286	0.000	79.286	-4.986	0.000
155.00	-11.565	-5.999	0.000	0.000	0.000	-132.520	-84.556	0.000	84.556	-5.082	0.000
157.00	-8.836	-4.400	0.000	0.000	0.000	-109.389	-86.690	0.000	86.690	-5.114	0.000
160.00	-8.619	-4.110	0.000	0.000	0.000	-82.881	-89.912	0.000	89.912	-5.153	0.000
165.00	-8.261	-3.644	0.000	0.000	0.000	-39.785	-95.329	0.000	95.329	-5.198	0.000
167.00	-2.633	-1.742	0.000	0.000	0.000	-23.263	-97.506	0.000	97.506	-5.208	0.000
170.00	-2.429	-1.517	0.000	0.000	0.000	-15.363	-100.777	0.000	100.777	-5.218	0.000
175.00	-2.097	-1.154	0.000	0.000	0.000	-3.217	-106.240	0.000	106.240	-5.226	0.000
176.00	-1.983	0.000	0.000	0.000	0.000	-1.120	0.000	0.000	107.333	-5.227	0.000

Resulting Stresses

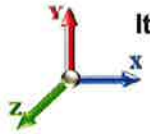
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 80 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 26

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.60	0.67	0.00	0.00	0.00	37.35	37.96	52.0	0.730
5.00	0.58	0.68	0.00	0.00	0.00	37.20	37.80	52.0	0.727
10.00	0.57	0.68	0.00	0.00	0.00	37.03	37.63	52.0	0.724
15.00	0.56	0.69	0.00	0.00	0.00	36.84	37.42	52.0	0.720
20.00	0.55	0.70	0.00	0.00	0.00	36.62	37.20	52.0	0.716
25.00	0.54	0.70	0.00	0.00	0.00	36.38	36.94	52.0	0.711
30.00	0.53	0.71	0.00	0.00	0.00	36.10	36.65	52.0	0.705
35.00	0.52	0.72	0.00	0.00	0.00	35.80	36.33	52.0	0.699
40.00	0.51	0.72	0.00	0.00	0.00	35.45	35.98	52.0	0.692
42.75	0.50	0.72	0.00	0.00	0.00	35.25	35.77	52.0	0.688
45.00	0.49	0.73	0.00	0.00	0.00	35.07	35.58	52.0	0.685
49.00	0.52	0.82	0.00	0.00	0.00	38.09	38.63	52.0	0.743
50.00	0.52	0.82	0.00	0.00	0.00	37.99	38.53	52.0	0.741
55.00	0.51	0.83	0.00	0.00	0.00	37.44	37.97	52.0	0.731
60.00	0.49	0.83	0.00	0.00	0.00	36.84	37.36	52.0	0.719
65.00	0.48	0.84	0.00	0.00	0.00	36.17	36.68	52.0	0.706
70.00	0.47	0.85	0.00	0.00	0.00	35.44	35.94	52.0	0.691
75.00	0.46	0.85	0.00	0.00	0.00	34.64	35.13	52.0	0.676
80.00	0.44	0.86	0.00	0.00	0.00	33.76	34.23	52.0	0.659
85.00	0.43	0.87	0.00	0.00	0.00	32.79	33.25	52.0	0.640
86.50	0.43	0.87	0.00	0.00	0.00	32.49	32.95	52.0	0.634
90.00	0.41	0.87	0.00	0.00	0.00	31.73	32.17	52.0	0.619
91.75	0.45	1.00	0.00	0.00	0.00	35.02	35.52	52.0	0.683
95.00	0.44	1.01	0.00	0.00	0.00	34.14	34.63	52.0	0.666
100.00	0.43	1.01	0.00	0.00	0.00	32.66	33.14	52.0	0.638
105.00	0.42	1.02	0.00	0.00	0.00	31.04	31.50	52.0	0.606
110.00	0.40	1.03	0.00	0.00	0.00	29.25	29.70	52.0	0.571
115.00	0.39	1.04	0.00	0.00	0.00	27.27	27.71	52.0	0.533
120.00	0.37	1.05	0.00	0.00	0.00	25.08	25.51	52.0	0.491
125.00	0.36	1.06	0.00	0.00	0.00	22.65	23.08	52.0	0.444
130.00	0.34	1.07	0.00	0.00	0.00	19.95	20.38	52.0	0.392
131.25	0.34	1.08	0.00	0.00	0.00	19.24	19.66	52.0	0.378
135.00	0.32	1.08	0.00	0.00	0.00	16.96	17.38	52.0	0.334
135.50	0.46	1.59	0.00	0.00	0.00	23.89	24.51	52.0	0.472
137.00	0.34	1.10	0.00	0.00	0.00	22.50	22.92	52.0	0.441
140.00	0.33	1.11	0.00	0.00	0.00	20.73	21.15	52.0	0.407
145.00	0.32	1.11	0.00	0.00	0.00	17.52	17.94	52.0	0.345
147.00	0.30	1.05	0.00	0.00	0.00	16.15	16.54	52.0	0.318
150.00	0.29	1.05	0.00	0.00	0.00	14.14	14.54	52.0	0.280
155.00	0.27	1.05	0.00	0.00	0.00	10.45	10.87	52.0	0.209
157.00	0.20	0.82	0.00	0.00	0.00	8.87	9.19	52.0	0.177
160.00	0.19	0.81	0.00	0.00	0.00	7.02	7.35	52.0	0.141
165.00	0.18	0.81	0.00	0.00	0.00	3.63	4.06	52.0	0.078
167.00	0.09	0.26	0.00	0.00	0.00	2.19	2.32	52.0	0.045
170.00	0.08	0.25	0.00	0.00	0.00	1.52	1.65	52.0	0.032
175.00	0.06	0.22	0.00	0.00	0.00	0.34	0.56	52.0	0.011
176.00	0.00	0.21	0.00	0.00	0.00	0.12	0.39	52.0	0.007

Resulting Stresses

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 13	

TES Tower Engineering Solutions

Wind Loading - Shaft

Structure: CT02216-S-SBA
Site Name: Glastonbury
Height: 176.00 (ft)
Base Elev: 0.000 (ft)

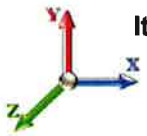
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

1/19/2016

TES Tower Engineering Solutions

Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00
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		0.00	1.00	12.287	20.77	326.48	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	12.287	20.77	320.79	0.650	0.500	5.00	23.774	15.45	320.9	173.0	1673.1
10.00		0.00	1.00	12.287	20.77	315.11	0.650	0.500	5.00	23.363	15.19	315.4	170.0	1643.4
15.00		0.00	1.00	12.287	20.77	309.42	0.650	0.500	5.00	22.953	14.92	309.8	166.9	1613.8
20.00		0.00	1.00	12.287	20.77	303.73	0.650	0.500	5.00	22.543	14.65	304.3	163.9	1584.1
25.00		0.00	1.00	12.287	20.77	298.05	0.650	0.500	5.00	22.132	14.39	298.7	160.8	1554.5
30.00		0.00	1.00	12.287	20.77	292.36	0.650	0.500	5.00	21.722	14.12	293.2	157.8	1524.9
35.00		0.00	1.02	12.496	21.12	289.09	0.650	0.500	5.00	21.311	13.85	292.5	154.8	1495.2
40.00		0.00	1.06	12.982	21.94	288.81	0.650	0.500	5.00	20.901	13.59	298.0	151.7	1465.6
42.75	Bot - Section 2	0.00	1.08	13.231	22.36	288.32	0.650	0.500	2.75	11.320	7.36	164.5	82.5	793.8
45.00		0.00	1.09	13.426	22.69	287.77	0.650	0.500	2.25	9.334	6.07	137.7	68.1	1158.1
49.00	Top - Section 1	0.00	1.12	13.756	23.25	286.48	0.650	0.500	4.00	16.388	10.65	247.7	119.2	2031.9
50.00		0.00	1.13	13.836	23.38	291.46	0.650	0.500	1.00	4.056	2.64	61.6	29.7	252.9
55.00		0.00	1.16	14.218	24.03	289.34	0.650	0.500	5.00	20.034	13.02	312.9	145.3	1247.3
60.00		0.00	1.19	14.576	24.63	286.76	0.650	0.500	5.00	19.624	12.76	314.2	142.3	1221.0
65.00		0.00	1.21	14.913	25.20	283.79	0.650	0.500	5.00	19.213	12.49	314.8	139.2	1194.6
70.00		0.00	1.24	15.232	25.74	280.48	0.650	0.500	5.00	18.803	12.22	314.6	136.2	1168.3
75.00		0.00	1.26	15.536	26.26	276.86	0.650	0.500	5.00	18.392	11.95	313.9	133.1	1142.0
80.00		0.00	1.29	15.825	26.74	272.98	0.650	0.500	5.00	17.982	11.69	312.6	130.1	1115.7
85.00		0.00	1.31	16.101	27.21	268.84	0.650	0.500	5.00	17.571	11.42	310.8	127.1	1089.4
86.50	Bot - Section 3	0.00	1.32	16.182	27.35	267.55	0.650	0.500	1.50	5.191	3.37	92.3	37.8	322.0
90.00		0.00	1.33	16.366	27.66	264.48	0.650	0.500	3.50	12.188	7.92	219.1	88.4	1316.2
91.75	Top - Section 2	0.00	1.34	16.457	27.81	262.90	0.650	0.500	1.75	6.019	3.91	108.8	43.8	649.8
95.00		0.00	1.35	16.621	28.09	264.95	0.650	0.500	3.25	11.044	7.18	201.6	80.1	598.8
100.00		0.00	1.37	16.866	28.50	260.24	0.650	0.500	5.00	16.652	10.82	308.5	120.3	901.7
105.00		0.00	1.39	17.103	28.90	255.35	0.650	0.500	5.00	16.242	10.56	305.2	117.2	878.7
110.00		0.00	1.41	17.332	29.29	250.30	0.650	0.500	5.00	15.832	10.29	301.4	114.2	855.8
115.00		0.00	1.43	17.554	29.67	245.09	0.650	0.500	5.00	15.421	10.02	297.4	111.1	832.8
120.00		0.00	1.45	17.768	30.03	239.75	0.650	0.500	5.00	15.011	9.76	293.0	108.1	809.8
125.00		0.00	1.46	17.977	30.38	234.27	0.650	0.500	5.00	14.600	9.49	288.3	105.1	786.8
130.00		0.00	1.48	18.179	30.72	228.67	0.650	0.500	5.00	14.190	9.22	283.4	102.0	763.8
131.25	Bot - Section 4	0.00	1.48	18.229	30.81	227.25	0.650	0.500	1.25	3.483	2.26	69.8	25.3	187.6
135.00		0.00	1.50	18.376	31.06	222.95	0.650	0.500	3.75	10.452	6.79	211.0	75.4	880.9
135.50	Top - Section 3	0.00	1.50	18.396	31.09	222.37	0.650	0.500	0.50	1.376	0.89	27.8	10.0	116.0
137.00	Appurtenance(s)	0.00	1.50	18.454	31.19	224.17	0.650	0.500	1.50	4.104	2.67	83.2	29.8	157.7
140.00		0.00	1.51	18.568	31.38	220.67	0.650	0.500	3.00	8.097	5.26	165.2	58.5	310.7
145.00		0.00	1.53	18.755	31.70	214.75	0.650	0.500	5.00	13.167	8.56	271.3	94.4	504.2
147.00	Appurtenance(s)	0.00	1.53	18.829	31.82	212.36	0.650	0.500	2.00	5.152	3.35	106.6	37.3	197.5
150.00		0.00	1.54	18.938	32.01	208.73	0.650	0.500	3.00	7.604	4.94	158.2	54.8	291.1
155.00		0.00	1.56	19.116	32.31	202.62	0.650	0.500	5.00	12.346	8.02	259.3	88.4	471.5
157.00	Appurtenance(s)	0.00	1.56	19.186	32.43	200.15	0.650	0.500	2.00	4.823	3.14	101.7	34.9	184.4
160.00		0.00	1.57	19.290	32.60	196.42	0.650	0.500	3.00	7.112	4.62	150.7	51.2	271.5
165.00		0.00	1.58	19.461	32.89	190.12	0.650	0.500	5.00	11.525	7.49	246.4	82.3	438.8
167.00	Appurtenance(s)	0.00	1.59	19.528	33.00	187.58	0.650	0.500	2.00	4.495	2.92	96.4	32.4	171.3
170.00		0.00	1.60	19.628	33.17	183.75	0.650	0.500	3.00	6.619	4.30	142.7	47.5	251.9
175.00		0.00	1.61	19.791	33.45	177.29	0.650	0.500	5.00	10.704	6.96	232.7	76.2	406.1
176.00	Appurtenance(s)	0.00	1.61	19.823	33.50	175.99	0.650	0.500	1.00	2.092	1.36	45.5	15.1	79.5
								Totals:	**176.00**			**10,305.3**		**38,606.5**

Discrete Appurtenance Forces

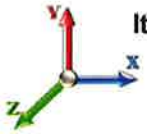
Structure: CT02216-S-SB
Site Name: Glastonbury
Height: 176.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

1/19/2016

TES Tower Engineering Solutions

Load Case: 69.28 mph Wind with 0.5" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 26

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	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	T-Arm (Round)	3	19.823	33.501	0.75	23.63	1260.00	0.000	0.000	791.46	0.00	0.00
2	176.00	RR90-17-02DP	6	19.855	33.555	0.68	20.36	0.00	0.000	1.000	683.16	0.00	683.16
3	176.00	MHA	12	19.855	33.555	0.68	9.30	198.00	0.000	1.000	312.14	0.00	312.14
4	167.00	APL868013	2	19.528	33.002	1.17	10.04	0.00	0.000	0.000	331.30	0.00	0.00
5	167.00	DB-T1-6Z-8AB-0Z	1	19.528	33.002	0.71	4.17	46.00	0.000	0.000	137.54	0.00	0.00
6	167.00	Low Profile Platform-Round	1	19.528	33.002	1.00	27.00	1800.00	0.000	0.000	891.06	0.00	0.00
7	167.00	LPA-80063-4CF-EDIN-5	4	19.528	33.002	0.93	28.35	289.60	0.000	0.000	935.49	0.00	0.00
8	167.00	RRH2X60-700	3	19.528	33.002	0.76	9.64	240.30	0.000	0.000	318.29	0.00	0.00
9	167.00	RRH2X60-AWS	3	19.528	33.002	0.76	9.64	240.30	0.000	0.000	318.29	0.00	0.00
10	167.00	SBNHH-1D65B	6	19.528	33.002	0.83	44.17	519.60	0.000	0.000	1457.79	0.00	0.00
11	157.00	Low Profile Platform-Round	1	19.186	32.425	1.00	27.00	1800.00	0.000	0.000	875.48	0.00	0.00
12	157.00	DB980H90E-M	12	19.186	32.425	0.74	39.69	0.00	0.000	0.000	1287.07	0.00	0.00
13	147.00	Flush Mount	1	18.829	31.821	1.00	6.00	450.00	0.000	0.000	190.93	0.00	0.00
14	147.00	742 213	3	18.829	31.821	0.72	12.64	0.00	0.000	0.000	402.09	0.00	0.00
15	137.00	LGP21401	6	18.454	31.187	0.67	6.15	127.20	0.000	0.000	191.82	0.00	0.00
16	137.00	7770.00	6	18.454	31.187	0.73	28.60	0.00	0.000	0.000	891.99	0.00	0.00
17	137.00	ABT-DFDM-ADBH	3	18.454	31.187	0.98	0.32	5.40	0.000	0.000	10.09	0.00	0.00
18	137.00	AM-X-CD-16-65-00T-RET	3	18.454	31.187	0.75	20.43	285.00	0.000	0.000	637.15	0.00	0.00
19	137.00	DC6-48-60-18-8F	1	18.454	31.187	0.67	1.12	49.50	0.000	0.000	34.90	0.00	0.00
20	137.00	Dual Antenna Mount	3	18.454	31.187	1.00	13.35	333.00	0.000	0.000	416.35	0.00	0.00
21	137.00	RRUS-E2	1	18.454	31.187	0.87	3.74	103.50	0.000	0.000	116.67	0.00	0.00
22	137.00	LGP21903	6	18.454	31.187	0.84	1.92	47.40	0.000	0.000	59.73	0.00	0.00
23	137.00	Low Profile Platform-Round	1	18.454	31.187	1.00	27.00	1800.00	0.000	0.000	842.05	0.00	0.00
24	137.00	RRUS 12	6	18.454	31.187	0.70	16.34	454.20	0.000	0.000	509.53	0.00	0.00
25	137.00	RRUS A2 Module	6	18.454	31.187	0.62	8.00	188.40	0.000	0.000	249.43	0.00	0.00
26	137.00	RRUS-11	9	18.454	31.187	0.68	29.68	726.30	0.000	0.000	925.69	0.00	0.00
27	137.00	RRUS-32	1	18.454	31.187	0.87	3.74	103.50	0.000	0.000	116.67	0.00	0.00
						Totals:		**11,067.20**			**13,934.14**		

Total Applied Force Summary

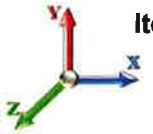
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 16	

TES Tower Engineering Solutions

Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00

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		320.89	1991.56	0.00	0.00
10.00		315.35	1961.92	0.00	0.00
15.00		309.81	1932.28	0.00	0.00
20.00		304.27	1902.64	0.00	0.00
25.00		298.73	1873.01	0.00	0.00
30.00		293.19	1843.37	0.00	0.00
35.00		292.53	1813.73	0.00	0.00
40.00		298.05	1784.10	0.00	0.00
42.75		164.53	969.00	0.00	0.00
45.00		137.66	1301.38	0.00	0.00
49.00		247.65	2286.69	0.00	0.00
50.00		61.65	316.56	0.00	0.00
55.00		312.90	1565.77	0.00	0.00
60.00		314.21	1539.46	0.00	0.00
65.00		314.75	1513.15	0.00	0.00
70.00		314.62	1486.84	0.00	0.00
75.00		313.88	1460.52	0.00	0.00
80.00		312.58	1434.21	0.00	0.00
85.00		310.79	1407.90	0.00	0.00
86.50		92.28	417.56	0.00	0.00
90.00		219.12	1539.15	0.00	0.00
91.75		108.80	761.26	0.00	0.00
95.00		201.65	805.82	0.00	0.00
100.00		308.53	1220.23	0.00	0.00
105.00		305.15	1197.24	0.00	0.00
110.00		301.42	1174.25	0.00	0.00
115.00		297.36	1151.26	0.00	0.00
120.00		292.98	1128.28	0.00	0.00
125.00		288.32	1105.29	0.00	0.00
130.00		283.37	1082.30	0.00	0.00
131.25		69.75	267.27	0.00	0.00
135.00		210.99	1119.77	0.00	0.00
135.50		27.81	147.86	0.00	0.00
137.00	(52) appurtenances	5085.25	4476.65	0.00	0.00
140.00		165.16	448.35	0.00	0.00
145.00		271.27	733.57	0.00	0.00
147.00	(4) appurtenances	699.57	739.22	0.00	0.00
150.00		158.20	410.03	0.00	0.00
155.00		259.25	669.70	0.00	0.00
157.00	(13) appurtenances	2264.21	2063.67	0.00	0.00
160.00		150.71	352.98	0.00	0.00
165.00		246.38	574.62	0.00	0.00
167.00	(20) appurtenances	4486.19	3361.44	0.00	0.00
170.00		142.72	289.33	0.00	0.00
175.00		232.71	468.54	0.00	0.00
176.00	(21) appurtenances	1832.30	1549.99	0.00	995.30
	Totals:	**24,239.49**	**59,639.70**	**0.00**	**995.30**

Resulting Forces and Deflections

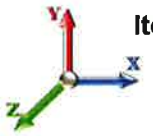
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 17	

TES Tower Engineering Solutions

Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 26

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-24.306	-59.612	0.000	0.000	0.000	-3206.632	0.000	0.000	0.000	0.000	0.000
5.00	-24.112	-57.567	0.000	0.000	0.000	-3085.102	-0.068	0.000	0.068	-0.127	0.000
10.00	-23.915	-55.553	0.000	0.000	0.000	-2964.546	-0.270	0.000	0.270	-0.255	0.000
15.00	-23.717	-53.568	0.000	0.000	0.000	-2844.973	-0.607	0.000	0.607	-0.386	0.000
20.00	-23.518	-51.613	0.000	0.000	0.000	-2726.388	-1.081	0.000	1.081	-0.518	0.000
25.00	-23.317	-49.689	0.000	0.000	0.000	-2608.801	-1.695	0.000	1.695	-0.651	0.000
30.00	-23.114	-47.795	0.000	0.000	0.000	-2492.220	-2.450	0.000	2.450	-0.787	0.000
35.00	-22.905	-45.930	0.000	0.000	0.000	-2376.651	-3.347	0.000	3.347	-0.924	0.000
40.00	-22.659	-44.109	0.000	0.000	0.000	-2262.128	-4.389	0.000	4.389	-1.062	0.000
42.75	-22.530	-43.116	0.000	0.000	0.000	-2199.816	-5.024	0.000	5.024	-1.140	0.000
45.00	-22.430	-41.782	0.000	0.000	0.000	-2149.126	-5.577	0.000	5.577	-1.205	0.000
49.00	-22.181	-39.474	0.000	0.000	0.000	-2059.406	-6.635	0.000	6.635	-1.318	0.000
50.00	-22.175	-39.124	0.000	0.000	0.000	-2037.225	-6.914	0.000	6.914	-1.347	0.000
55.00	-21.924	-37.507	0.000	0.000	0.000	-1926.351	-8.408	0.000	8.408	-1.501	0.000
60.00	-21.665	-35.919	0.000	0.000	0.000	-1816.732	-10.062	0.000	10.062	-1.655	0.000
65.00	-21.398	-34.358	0.000	0.000	0.000	-1708.409	-11.878	0.000	11.878	-1.810	0.000
70.00	-21.124	-32.825	0.000	0.000	0.000	-1601.422	-13.857	0.000	13.857	-1.966	0.000
75.00	-20.843	-31.320	0.000	0.000	0.000	-1495.806	-16.000	0.000	16.000	-2.122	0.000
80.00	-20.557	-29.843	0.000	0.000	0.000	-1391.593	-18.305	0.000	18.305	-2.277	0.000
85.00	-20.238	-28.414	0.000	0.000	0.000	-1288.812	-20.772	0.000	20.772	-2.432	0.000
86.50	-20.166	-27.973	0.000	0.000	0.000	-1258.455	-21.544	0.000	21.544	-2.480	0.000
90.00	-19.917	-26.417	0.000	0.000	0.000	-1187.874	-23.403	0.000	23.403	-2.589	0.000
91.75	-19.808	-25.634	0.000	0.000	0.000	-1153.020	-24.362	0.000	24.362	-2.644	0.000
95.00	-19.627	-24.793	0.000	0.000	0.000	-1088.644	-26.196	0.000	26.196	-2.744	0.000
100.00	-19.326	-23.535	0.000	0.000	0.000	-990.511	-29.158	0.000	29.158	-2.909	0.000
105.00	-19.020	-22.302	0.000	0.000	0.000	-893.885	-32.290	0.000	32.290	-3.070	0.000
110.00	-18.712	-21.096	0.000	0.000	0.000	-798.785	-35.588	0.000	35.588	-3.227	0.000
115.00	-18.400	-19.917	0.000	0.000	0.000	-705.229	-39.048	0.000	39.048	-3.377	0.000
120.00	-18.085	-18.764	0.000	0.000	0.000	-613.232	-42.661	0.000	42.661	-3.521	0.000
125.00	-17.768	-17.639	0.000	0.000	0.000	-522.809	-46.420	0.000	46.420	-3.656	0.000
130.00	-17.437	-16.555	0.000	0.000	0.000	-433.971	-50.314	0.000	50.314	-3.780	0.000
131.25	-17.366	-16.275	0.000	0.000	0.000	-412.175	-51.308	0.000	51.308	-3.810	0.000
135.00	-17.092	-15.159	0.000	0.000	0.000	-347.055	-54.332	0.000	54.332	-3.893	0.000
135.50	-17.060	-15.007	0.000	0.000	0.000	-338.509	-54.741	0.000	54.741	-3.903	0.000
137.00	-11.691	-10.877	0.000	0.000	0.000	-312.920	-55.971	0.000	55.971	-3.934	0.000
140.00	-11.514	-10.420	0.000	0.000	0.000	-277.848	-58.468	0.000	58.468	-4.015	0.000
145.00	-11.205	-9.692	0.000	0.000	0.000	-220.280	-62.736	0.000	62.736	-4.135	0.000
147.00	-10.462	-8.996	0.000	0.000	0.000	-197.872	-64.477	0.000	64.477	-4.180	0.000
150.00	-10.285	-8.586	0.000	0.000	0.000	-166.487	-67.122	0.000	67.122	-4.241	0.000
155.00	-9.984	-7.928	0.000	0.000	0.000	-115.064	-71.606	0.000	71.606	-4.324	0.000
157.00	-7.573	-6.037	0.000	0.000	0.000	-95.097	-73.422	0.000	73.422	-4.351	0.000
160.00	-7.400	-5.692	0.000	0.000	0.000	-72.379	-76.165	0.000	76.165	-4.385	0.000
165.00	-7.112	-5.135	0.000	0.000	0.000	-35.381	-80.777	0.000	80.777	-4.425	0.000
167.00	-2.380	-2.130	0.000	0.000	0.000	-21.158	-82.632	0.000	82.632	-4.434	0.000
170.00	-2.215	-1.852	0.000	0.000	0.000	-14.019	-85.418	0.000	85.418	-4.443	0.000
175.00	-1.947	-1.403	0.000	0.000	0.000	-2.942	-90.071	0.000	90.071	-4.451	0.000
176.00	-1.832	0.000	0.000	0.000	0.000	-0.995	0.000	0.000	91.003	-4.451	0.000

Resulting Stresses

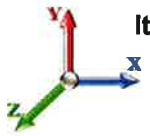
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 69.28 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 26

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.67	0.55	0.00	0.00	0.00	31.29	31.98	52.0	0.615
5.00	0.66	0.56	0.00	0.00	0.00	31.20	31.87	52.0	0.613
10.00	0.65	0.56	0.00	0.00	0.00	31.09	31.75	52.0	0.611
15.00	0.64	0.57	0.00	0.00	0.00	30.96	31.61	52.0	0.608
20.00	0.62	0.57	0.00	0.00	0.00	30.80	31.44	52.0	0.605
25.00	0.61	0.58	0.00	0.00	0.00	30.63	31.25	52.0	0.601
30.00	0.60	0.59	0.00	0.00	0.00	30.42	31.04	52.0	0.597
35.00	0.59	0.59	0.00	0.00	0.00	30.19	30.80	52.0	0.593
40.00	0.58	0.60	0.00	0.00	0.00	29.93	30.53	52.0	0.587
42.75	0.57	0.60	0.00	0.00	0.00	29.78	30.37	52.0	0.584
45.00	0.56	0.60	0.00	0.00	0.00	29.64	30.22	52.0	0.581
49.00	0.60	0.68	0.00	0.00	0.00	32.22	32.84	52.0	0.632
50.00	0.60	0.68	0.00	0.00	0.00	32.14	32.76	52.0	0.630
55.00	0.59	0.69	0.00	0.00	0.00	31.71	32.31	52.0	0.622
60.00	0.57	0.70	0.00	0.00	0.00	31.23	31.82	52.0	0.612
65.00	0.56	0.70	0.00	0.00	0.00	30.70	31.28	52.0	0.602
70.00	0.55	0.71	0.00	0.00	0.00	30.11	30.68	52.0	0.590
75.00	0.53	0.72	0.00	0.00	0.00	29.46	30.02	52.0	0.577
80.00	0.52	0.72	0.00	0.00	0.00	28.74	29.28	52.0	0.563
85.00	0.51	0.73	0.00	0.00	0.00	27.94	28.48	52.0	0.548
86.50	0.50	0.73	0.00	0.00	0.00	27.69	28.22	52.0	0.543
90.00	0.48	0.74	0.00	0.00	0.00	27.07	27.58	52.0	0.531
91.75	0.54	0.84	0.00	0.00	0.00	29.88	30.46	52.0	0.586
95.00	0.53	0.85	0.00	0.00	0.00	29.15	29.72	52.0	0.572
100.00	0.52	0.86	0.00	0.00	0.00	27.92	28.48	52.0	0.548
105.00	0.50	0.87	0.00	0.00	0.00	26.56	27.11	52.0	0.521
110.00	0.49	0.88	0.00	0.00	0.00	25.05	25.59	52.0	0.492
115.00	0.48	0.89	0.00	0.00	0.00	23.38	23.91	52.0	0.460
120.00	0.46	0.90	0.00	0.00	0.00	21.53	22.04	52.0	0.424
125.00	0.45	0.91	0.00	0.00	0.00	19.47	19.97	52.0	0.384
130.00	0.43	0.92	0.00	0.00	0.00	17.17	17.67	52.0	0.340
131.25	0.43	0.92	0.00	0.00	0.00	16.56	17.06	52.0	0.328
135.00	0.41	0.93	0.00	0.00	0.00	14.62	15.11	52.0	0.291
135.50	0.60	1.37	0.00	0.00	0.00	20.60	21.32	52.0	0.410
137.00	0.44	0.94	0.00	0.00	0.00	19.40	19.90	52.0	0.383
140.00	0.43	0.95	0.00	0.00	0.00	17.89	18.39	52.0	0.354
145.00	0.41	0.95	0.00	0.00	0.00	15.14	15.64	52.0	0.301
147.00	0.38	0.90	0.00	0.00	0.00	13.97	14.44	52.0	0.278
150.00	0.37	0.90	0.00	0.00	0.00	12.24	12.71	52.0	0.245
155.00	0.36	0.91	0.00	0.00	0.00	9.07	9.56	52.0	0.184
157.00	0.28	0.70	0.00	0.00	0.00	7.72	8.08	52.0	0.156
160.00	0.27	0.70	0.00	0.00	0.00	6.13	6.51	52.0	0.125
165.00	0.25	0.70	0.00	0.00	0.00	3.23	3.69	52.0	0.071
167.00	0.11	0.24	0.00	0.00	0.00	1.99	2.14	52.0	0.041
170.00	0.09	0.23	0.00	0.00	0.00	1.38	1.53	52.0	0.029
175.00	0.07	0.21	0.00	0.00	0.00	0.32	0.53	52.0	0.010
176.00	0.00	0.20	0.00	0.00	0.00	0.11	0.36	52.0	0.007

Wind Loading - Shaft

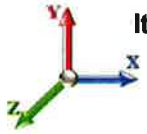
Structure: CT02216-S-SBA
Site Name: Glastonbury
Height: 176.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

1/19/2016

TES Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice
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		0.00	1.00	6.400	10.82	235.63	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	231.52	0.650	0.000	5.00	23.357	15.18	164.2	0.0	1500.1
10.00		0.00	1.00	6.400	10.82	227.42	0.650	0.000	5.00	22.947	14.92	161.3	0.0	1473.5
15.00		0.00	1.00	6.400	10.82	223.31	0.650	0.000	5.00	22.536	14.65	158.4	0.0	1446.9
20.00		0.00	1.00	6.400	10.82	219.21	0.650	0.000	5.00	22.126	14.38	155.6	0.0	1420.3
25.00		0.00	1.00	6.400	10.82	215.10	0.650	0.000	5.00	21.715	14.12	152.7	0.0	1393.7
30.00		0.00	1.00	6.400	10.82	211.00	0.650	0.000	5.00	21.305	13.85	149.8	0.0	1367.1
35.00		0.00	1.02	6.509	11.00	208.64	0.650	0.000	5.00	20.895	13.58	149.4	0.0	1340.5
40.00		0.00	1.06	6.762	11.43	208.44	0.650	0.000	5.00	20.484	13.31	152.1	0.0	1313.9
42.75	Bot - Section 2	0.00	1.08	6.891	11.65	208.09	0.650	0.000	2.75	11.091	7.21	84.0	0.0	711.3
45.00		0.00	1.09	6.993	11.82	207.69	0.650	0.000	2.25	9.146	5.95	70.3	0.0	1089.9
49.00	Top - Section 1	0.00	1.12	7.165	12.11	206.75	0.650	0.000	4.00	16.055	10.44	126.4	0.0	1912.7
50.00		0.00	1.13	7.207	12.18	210.35	0.650	0.000	1.00	3.973	2.58	31.5	0.0	223.2
55.00		0.00	1.16	7.406	12.52	208.82	0.650	0.000	5.00	19.617	12.75	159.6	0.0	1102.0
60.00		0.00	1.19	7.592	12.83	206.96	0.650	0.000	5.00	19.207	12.48	160.2	0.0	1078.7
65.00		0.00	1.21	7.768	13.13	204.82	0.650	0.000	5.00	18.796	12.22	160.4	0.0	1055.4
70.00		0.00	1.24	7.934	13.41	202.43	0.650	0.000	5.00	18.386	11.95	160.2	0.0	1032.2
75.00		0.00	1.26	8.092	13.68	199.82	0.650	0.000	5.00	17.976	11.68	159.8	0.0	1008.9
80.00		0.00	1.29	8.242	13.93	197.01	0.650	0.000	5.00	17.565	11.42	159.0	0.0	985.6
85.00		0.00	1.31	8.387	14.17	194.02	0.650	0.000	5.00	17.155	11.15	158.0	0.0	962.3
86.50	Bot - Section 3	0.00	1.32	8.429	14.24	193.10	0.650	0.000	1.50	5.066	3.29	46.9	0.0	284.2
90.00		0.00	1.33	8.525	14.41	190.88	0.650	0.000	3.50	11.897	7.73	111.4	0.0	1227.8
91.75	Top - Section 2	0.00	1.34	8.572	14.49	189.74	0.650	0.000	1.75	5.873	3.82	55.3	0.0	605.9
95.00		0.00	1.35	8.657	14.63	191.22	0.650	0.000	3.25	10.773	7.00	102.5	0.0	518.7
100.00		0.00	1.37	8.785	14.85	187.82	0.650	0.000	5.00	16.236	10.55	156.7	0.0	781.5
105.00		0.00	1.39	8.908	15.06	184.29	0.650	0.000	5.00	15.825	10.29	154.9	0.0	761.5
110.00		0.00	1.41	9.028	15.26	180.64	0.650	0.000	5.00	15.415	10.02	152.9	0.0	741.6
115.00		0.00	1.43	9.143	15.45	176.89	0.650	0.000	5.00	15.004	9.75	150.7	0.0	721.6
120.00		0.00	1.45	9.255	15.64	173.03	0.650	0.000	5.00	14.594	9.49	148.4	0.0	701.7
125.00		0.00	1.46	9.363	15.82	169.08	0.650	0.000	5.00	14.184	9.22	145.9	0.0	681.7
130.00		0.00	1.48	9.469	16.00	165.03	0.650	0.000	5.00	13.773	8.95	143.3	0.0	661.8
131.25	Bot - Section 4	0.00	1.48	9.495	16.05	164.01	0.650	0.000	1.25	3.379	2.20	35.2	0.0	162.3
135.00		0.00	1.50	9.572	16.18	160.91	0.650	0.000	3.75	10.140	6.59	106.6	0.0	805.5
135.50	Top - Section 3	0.00	1.50	9.582	16.19	160.49	0.650	0.000	0.50	1.335	0.87	14.0	0.0	106.0
137.00	Appurtenance(s)	0.00	1.50	9.612	16.24	161.79	0.650	0.000	1.50	3.979	2.59	42.0	0.0	127.9
140.00		0.00	1.51	9.672	16.35	159.26	0.650	0.000	3.00	7.847	5.10	83.4	0.0	252.2
145.00		0.00	1.53	9.769	16.51	154.99	0.650	0.000	5.00	12.750	8.29	136.8	0.0	409.7
147.00	Appurtenance(s)	0.00	1.53	9.807	16.57	153.26	0.650	0.000	2.00	4.985	3.24	53.7	0.0	160.2
150.00		0.00	1.54	9.864	16.67	150.65	0.650	0.000	3.00	7.354	4.78	79.7	0.0	236.3
155.00		0.00	1.56	9.957	16.83	146.23	0.650	0.000	5.00	11.929	7.75	130.5	0.0	383.1
157.00	Appurtenance(s)	0.00	1.56	9.994	16.89	144.45	0.650	0.000	2.00	4.657	3.03	51.1	0.0	149.5
160.00		0.00	1.57	10.048	16.98	141.76	0.650	0.000	3.00	6.862	4.46	75.7	0.0	220.3
165.00		0.00	1.58	10.136	17.13	137.21	0.650	0.000	5.00	11.108	7.22	123.7	0.0	356.5
167.00	Appurtenance(s)	0.00	1.59	10.171	17.19	135.38	0.650	0.000	2.00	4.328	2.81	48.4	0.0	138.9
170.00		0.00	1.60	10.223	17.28	132.61	0.650	0.000	3.00	6.369	4.14	71.5	0.0	204.3
175.00		0.00	1.61	10.308	17.42	127.95	0.650	0.000	5.00	10.287	6.69	116.5	0.0	329.9
176.00	Appurtenance(s)	0.00	1.61	10.325	17.45	127.02	0.650	0.000	1.00	2.008	1.31	22.8	0.0	64.4
								Totals:	**176.00**			**5,233.2**		**34,212.9**

Discrete Appurtenance Forces

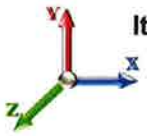
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	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	T-Arm (Round)	3	10.325	17.449	0.75	18.00	1050.00	0.000	0.000	314.09	0.00	0.00
2	176.00	RR90-17-02DP	6	10.342	17.478	0.68	17.79	81.00	0.000	1.000	310.91	0.00	310.91
3	176.00	MHA	12	10.342	17.478	0.65	7.25	132.00	0.000	1.000	126.78	0.00	126.78
4	167.00	APL868013	2	10.171	17.190	1.17	8.73	12.60	0.000	0.000	150.03	0.00	0.00
5	167.00	DB-T1-6Z-8AB-0Z	1	10.171	17.190	0.71	3.98	18.90	0.000	0.000	68.35	0.00	0.00
6	167.00	Low Profile Platform-Round	1	10.171	17.190	1.00	22.00	1500.00	0.000	0.000	378.17	0.00	0.00
7	167.00	LPA-80063-4CF-EDIN-5	4	10.171	17.190	0.93	26.04	80.00	0.000	0.000	447.62	0.00	0.00
8	167.00	RRH2X60-700	3	10.171	17.190	0.76	9.03	180.00	0.000	0.000	155.20	0.00	0.00
9	167.00	RRH2X60-AWS	3	10.171	17.190	0.76	9.03	180.00	0.000	0.000	155.20	0.00	0.00
10	167.00	SBNHH-1D65B	6	10.171	17.190	0.83	41.83	240.00	0.000	0.000	719.08	0.00	0.00
11	157.00	Low Profile Platform-Round	1	9.994	16.889	1.00	22.00	1500.00	0.000	0.000	371.56	0.00	0.00
12	157.00	DB980H90E-M	12	9.994	16.889	0.74	34.63	102.00	0.000	0.000	584.90	0.00	0.00
13	147.00	Flush Mount	1	9.807	16.574	1.00	5.00	350.00	0.000	0.000	82.87	0.00	0.00
14	147.00	742 213	3	9.807	16.574	0.72	11.10	66.00	0.000	0.000	184.02	0.00	0.00
15	137.00	LGP21401	6	9.612	16.244	0.67	5.19	84.60	0.000	0.000	84.24	0.00	0.00
16	137.00	7770.00	6	9.612	16.244	0.73	25.75	210.00	0.000	0.000	418.36	0.00	0.00
17	137.00	ABT-DFDM-ADBH	3	9.612	16.244	0.98	0.15	3.30	0.000	0.000	2.39	0.00	0.00
18	137.00	AM-X-CD-16-65-00T-RET	3	9.612	16.244	0.75	18.59	145.50	0.000	0.000	301.90	0.00	0.00
19	137.00	DC6-48-60-18-8F	1	9.612	16.244	0.67	0.98	31.80	0.000	0.000	16.00	0.00	0.00
20	137.00	Dual Antenna Mount	3	9.612	16.244	1.00	11.25	252.00	0.000	0.000	182.75	0.00	0.00
21	137.00	RRUS-E2	1	9.612	16.244	0.87	3.37	77.00	0.000	0.000	54.69	0.00	0.00
22	137.00	LGP21903	6	9.612	16.244	0.84	1.36	33.00	0.000	0.000	22.11	0.00	0.00
23	137.00	Low Profile Platform-Round	1	9.612	16.244	1.00	22.00	1500.00	0.000	0.000	357.37	0.00	0.00
24	137.00	RRUS 12	6	9.612	16.244	0.70	15.41	348.00	0.000	0.000	250.39	0.00	0.00
25	137.00	RRUS A2 Module	6	9.612	16.244	0.62	6.92	127.20	0.000	0.000	112.40	0.00	0.00
26	137.00	RRUS-11	9	9.612	16.244	0.68	27.05	495.00	0.000	0.000	439.41	0.00	0.00
27	137.00	RRUS-32	1	9.612	16.244	0.87	3.37	77.00	0.000	0.000	54.69	0.00	0.00
						Totals:		**8,876.90**			**6,345.47**		

Total Applied Force Summary

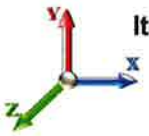
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

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		164.21	1818.56	0.00	0.00
10.00		161.33	1791.96	0.00	0.00
15.00		158.44	1765.36	0.00	0.00
20.00		155.55	1738.76	0.00	0.00
25.00		152.67	1712.17	0.00	0.00
30.00		149.78	1685.57	0.00	0.00
35.00		149.39	1658.97	0.00	0.00
40.00		152.15	1632.37	0.00	0.00
42.75		83.96	886.47	0.00	0.00
45.00		70.26	1233.26	0.00	0.00
49.00		126.37	2167.53	0.00	0.00
50.00		31.45	286.89	0.00	0.00
55.00		159.59	1420.47	0.00	0.00
60.00		160.18	1397.20	0.00	0.00
65.00		160.39	1373.92	0.00	0.00
70.00		160.24	1350.65	0.00	0.00
75.00		159.78	1327.38	0.00	0.00
80.00		159.04	1304.11	0.00	0.00
85.00		158.04	1280.83	0.00	0.00
86.50		46.91	379.71	0.00	0.00
90.00		111.40	1450.71	0.00	0.00
91.75		55.30	717.41	0.00	0.00
95.00		102.46	725.68	0.00	0.00
100.00		156.68	1099.97	0.00	0.00
105.00		154.87	1080.02	0.00	0.00
110.00		152.87	1060.07	0.00	0.00
115.00		150.70	1040.12	0.00	0.00
120.00		148.37	1020.17	0.00	0.00
125.00		145.89	1000.23	0.00	0.00
130.00		143.26	980.28	0.00	0.00
131.25		35.24	241.95	0.00	0.00
135.00		106.61	1044.37	0.00	0.00
135.50		14.05	137.84	0.00	0.00
137.00	(52) appurtenances	2338.70	3607.86	0.00	0.00
140.00		83.37	389.86	0.00	0.00
145.00		136.82	639.13	0.00	0.00
147.00	(4) appurtenances	320.59	667.93	0.00	0.00
150.00		79.69	355.18	0.00	0.00
155.00		130.48	581.33	0.00	0.00
157.00	(13) appurtenances	1007.58	1830.81	0.00	0.00
160.00		75.74	301.78	0.00	0.00
165.00		123.69	492.33	0.00	0.00
167.00	(20) appurtenances	2122.02	2404.71	0.00	0.00
170.00		71.53	241.78	0.00	0.00
175.00		116.49	392.33	0.00	0.00
176.00	(21) appurtenances	774.56	1339.87	0.00	437.69
	Totals:	**11,578.69**	**53,055.85**	**0.00**	**437.69**

Resulting Forces and Deflections

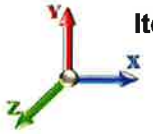
Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 23	

TES Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-11.606	-53.050	0.000	0.000	0.000	-1496.603	0.000	0.000	0.000	0.000	0.000
5.00	-11.494	-51.219	0.000	0.000	0.000	-1438.574	-0.032	0.000	0.032	-0.059	0.000
10.00	-11.382	-49.416	0.000	0.000	0.000	-1381.105	-0.126	0.000	0.126	-0.119	0.000
15.00	-11.270	-47.639	0.000	0.000	0.000	-1324.196	-0.283	0.000	0.283	-0.180	0.000
20.00	-11.157	-45.889	0.000	0.000	0.000	-1267.849	-0.504	0.000	0.504	-0.241	0.000
25.00	-11.045	-44.165	0.000	0.000	0.000	-1212.064	-0.790	0.000	0.790	-0.303	0.000
30.00	-10.932	-42.468	0.000	0.000	0.000	-1156.842	-1.141	0.000	1.141	-0.366	0.000
35.00	-10.816	-40.798	0.000	0.000	0.000	-1102.184	-1.559	0.000	1.559	-0.430	0.000
40.00	-10.685	-39.158	0.000	0.000	0.000	-1048.103	-2.044	0.000	2.044	-0.494	0.000
42.75	-10.615	-38.266	0.000	0.000	0.000	-1018.719	-2.339	0.000	2.339	-0.530	0.000
45.00	-10.560	-37.026	0.000	0.000	0.000	-994.835	-2.596	0.000	2.596	-0.560	0.000
49.00	-10.432	-34.854	0.000	0.000	0.000	-952.595	-3.088	0.000	3.088	-0.612	0.000
50.00	-10.423	-34.560	0.000	0.000	0.000	-942.164	-3.217	0.000	3.217	-0.626	0.000
55.00	-10.288	-33.129	0.000	0.000	0.000	-890.052	-3.911	0.000	3.911	-0.697	0.000
60.00	-10.149	-31.721	0.000	0.000	0.000	-838.614	-4.679	0.000	4.679	-0.768	0.000
65.00	-10.008	-30.337	0.000	0.000	0.000	-787.869	-5.522	0.000	5.522	-0.840	0.000
70.00	-9.863	-28.976	0.000	0.000	0.000	-737.832	-6.440	0.000	6.440	-0.911	0.000
75.00	-9.716	-27.640	0.000	0.000	0.000	-688.518	-7.433	0.000	7.433	-0.983	0.000
80.00	-9.567	-26.327	0.000	0.000	0.000	-639.939	-8.501	0.000	8.501	-1.055	0.000
85.00	-9.404	-25.042	0.000	0.000	0.000	-592.107	-9.644	0.000	9.644	-1.126	0.000
86.50	-9.365	-24.657	0.000	0.000	0.000	-578.001	-10.001	0.000	10.001	-1.148	0.000
90.00	-9.239	-23.203	0.000	0.000	0.000	-545.223	-10.862	0.000	10.862	-1.198	0.000
91.75	-9.183	-22.481	0.000	0.000	0.000	-529.054	-11.306	0.000	11.306	-1.223	0.000
95.00	-9.088	-21.748	0.000	0.000	0.000	-499.210	-12.154	0.000	12.154	-1.269	0.000
100.00	-8.933	-20.640	0.000	0.000	0.000	-453.770	-13.524	0.000	13.524	-1.345	0.000
105.00	-8.777	-19.553	0.000	0.000	0.000	-409.105	-14.972	0.000	14.972	-1.418	0.000
110.00	-8.620	-18.487	0.000	0.000	0.000	-365.219	-16.496	0.000	16.496	-1.490	0.000
115.00	-8.462	-17.441	0.000	0.000	0.000	-322.119	-18.094	0.000	18.094	-1.559	0.000
120.00	-8.304	-16.416	0.000	0.000	0.000	-279.808	-19.763	0.000	19.763	-1.625	0.000
125.00	-8.145	-15.412	0.000	0.000	0.000	-238.289	-21.498	0.000	21.498	-1.686	0.000
130.00	-7.981	-14.432	0.000	0.000	0.000	-197.564	-23.294	0.000	23.294	-1.743	0.000
131.25	-7.945	-14.188	0.000	0.000	0.000	-187.588	-23.752	0.000	23.752	-1.756	0.000
135.00	-7.811	-13.144	0.000	0.000	0.000	-157.794	-25.147	0.000	25.147	-1.794	0.000
135.50	-7.795	-13.006	0.000	0.000	0.000	-153.889	-25.336	0.000	25.336	-1.799	0.000
137.00	-5.348	-9.471	0.000	0.000	0.000	-142.197	-25.903	0.000	25.903	-1.813	0.000
140.00	-5.259	-9.080	0.000	0.000	0.000	-126.154	-27.054	0.000	27.054	-1.849	0.000
145.00	-5.107	-8.442	0.000	0.000	0.000	-99.858	-29.021	0.000	29.021	-1.904	0.000
147.00	-4.768	-7.783	0.000	0.000	0.000	-89.644	-29.823	0.000	29.823	-1.924	0.000
150.00	-4.680	-7.428	0.000	0.000	0.000	-75.341	-31.041	0.000	31.041	-1.952	0.000
155.00	-4.533	-6.850	0.000	0.000	0.000	-51.940	-33.106	0.000	33.106	-1.989	0.000
157.00	-3.463	-5.054	0.000	0.000	0.000	-42.875	-33.942	0.000	33.942	-2.002	0.000
160.00	-3.378	-4.754	0.000	0.000	0.000	-32.485	-35.205	0.000	35.205	-2.017	0.000
165.00	-3.238	-4.266	0.000	0.000	0.000	-15.593	-37.328	0.000	37.328	-2.035	0.000
167.00	-1.032	-1.938	0.000	0.000	0.000	-9.117	-38.181	0.000	38.181	-2.039	0.000
170.00	-0.952	-1.699	0.000	0.000	0.000	-6.021	-39.463	0.000	39.463	-2.043	0.000
175.00	-0.822	-1.311	0.000	0.000	0.000	-1.260	-41.604	0.000	41.604	-2.046	0.000
176.00	-0.775	0.000	0.000	0.000	0.000	-0.438	0.000	0.000	42.033	-2.046	0.000

Resulting Stresses

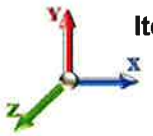
Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016
Site Name:	Glastonbury	**Exposure:**	C	
Height:	176.00 (ft)	**Gh:**	1.69	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 24

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.60	0.26	0.00	0.00	0.00	14.60	15.21	52.0	0.293
5.00	0.59	0.27	0.00	0.00	0.00	14.55	15.14	52.0	0.291
10.00	0.58	0.27	0.00	0.00	0.00	14.48	15.07	52.0	0.290
15.00	0.57	0.27	0.00	0.00	0.00	14.41	14.98	52.0	0.288
20.00	0.55	0.27	0.00	0.00	0.00	14.32	14.89	52.0	0.286
25.00	0.54	0.27	0.00	0.00	0.00	14.23	14.78	52.0	0.284
30.00	0.53	0.28	0.00	0.00	0.00	14.12	14.66	52.0	0.282
35.00	0.52	0.28	0.00	0.00	0.00	14.00	14.53	52.0	0.280
40.00	0.51	0.28	0.00	0.00	0.00	13.87	14.39	52.0	0.277
42.75	0.51	0.28	0.00	0.00	0.00	13.79	14.30	52.0	0.275
45.00	0.49	0.28	0.00	0.00	0.00	13.72	14.23	52.0	0.274
49.00	0.53	0.32	0.00	0.00	0.00	14.90	15.44	52.0	0.297
50.00	0.53	0.32	0.00	0.00	0.00	14.86	15.40	52.0	0.296
55.00	0.52	0.32	0.00	0.00	0.00	14.65	15.18	52.0	0.292
60.00	0.51	0.33	0.00	0.00	0.00	14.41	14.93	52.0	0.287
65.00	0.49	0.33	0.00	0.00	0.00	14.16	14.66	52.0	0.282
70.00	0.48	0.33	0.00	0.00	0.00	13.87	14.37	52.0	0.276
75.00	0.47	0.33	0.00	0.00	0.00	13.56	14.04	52.0	0.270
80.00	0.46	0.34	0.00	0.00	0.00	13.21	13.69	52.0	0.263
85.00	0.45	0.34	0.00	0.00	0.00	12.84	13.30	52.0	0.256
86.50	0.44	0.34	0.00	0.00	0.00	12.72	13.18	52.0	0.253
90.00	0.43	0.34	0.00	0.00	0.00	12.42	12.86	52.0	0.247
91.75	0.48	0.39	0.00	0.00	0.00	13.71	14.20	52.0	0.273
95.00	0.47	0.39	0.00	0.00	0.00	13.37	13.85	52.0	0.266
100.00	0.46	0.40	0.00	0.00	0.00	12.79	13.26	52.0	0.255
105.00	0.44	0.40	0.00	0.00	0.00	12.16	12.62	52.0	0.243
110.00	0.43	0.40	0.00	0.00	0.00	11.45	11.90	52.0	0.229
115.00	0.42	0.41	0.00	0.00	0.00	10.68	11.12	52.0	0.214
120.00	0.40	0.41	0.00	0.00	0.00	9.82	10.25	52.0	0.197
125.00	0.39	0.42	0.00	0.00	0.00	8.87	9.29	52.0	0.179
130.00	0.38	0.42	0.00	0.00	0.00	7.82	8.22	52.0	0.158
131.25	0.37	0.42	0.00	0.00	0.00	7.54	7.94	52.0	0.153
135.00	0.35	0.42	0.00	0.00	0.00	6.65	7.04	52.0	0.135
135.50	0.52	0.62	0.00	0.00	0.00	9.36	9.94	52.0	0.191
137.00	0.38	0.43	0.00	0.00	0.00	8.82	9.23	52.0	0.177
140.00	0.37	0.43	0.00	0.00	0.00	8.12	8.53	52.0	0.164
145.00	0.36	0.43	0.00	0.00	0.00	6.86	7.26	52.0	0.140
147.00	0.33	0.41	0.00	0.00	0.00	6.33	6.70	52.0	0.129
150.00	0.32	0.41	0.00	0.00	0.00	5.54	5.91	52.0	0.114
155.00	0.31	0.41	0.00	0.00	0.00	4.10	4.46	52.0	0.086
157.00	0.23	0.32	0.00	0.00	0.00	3.48	3.75	52.0	0.072
160.00	0.22	0.32	0.00	0.00	0.00	2.75	3.03	52.0	0.058
165.00	0.21	0.32	0.00	0.00	0.00	1.42	1.72	52.0	0.033
167.00	0.10	0.10	0.00	0.00	0.00	0.86	0.97	52.0	0.019
170.00	0.09	0.10	0.00	0.00	0.00	0.59	0.70	52.0	0.013
175.00	0.07	0.09	0.00	0.00	0.00	0.13	0.25	52.0	0.005
176.00	0.00	0.08	0.00	0.00	0.00	0.05	0.15	52.0	0.003

Resulting Stresses

Structure:	CT02216-S-SBA	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 25	

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
80 mph Wind with 0" Ice	29.7	0.00	53.02	0.00	0.00	3827.30
69.28 mph Wind with 0.5" Ice	24.3	0.00	59.61	0.00	0.00	3206.63
50 mph Wind with 0" Ice	11.6	0.00	53.05	0.00	0.00	1496.60

Max Stresses

Load Case	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
80 mph Wind with 0" Ice	0.52	0.82	0.00	0.00	0.00	38.09	38.63	52.0	49.00	0.743
69.28 mph Wind with 0.5" Ice	0.60	0.68	0.00	0.00	0.00	32.22	32.84	52.0	49.00	0.632
50 mph Wind with 0" Ice	0.53	0.32	0.00	0.00	0.00	14.90	15.44	52.0	49.00	0.297

Base Plate Summary

Structure:	CT02216-S-SB	**Code:**	EIA/TIA-222-F	1/19/2016	
Site Name:	Glastonbury	**Exposure:**	C		
Height:	176.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 27	

TES 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):	3827.30	**Effective Len (in):**	7.55	**Ultimate (ksi):**	100.00
Axial (kip):	59.61	**Moment (kip-in):**	454.77	**Arrangement:**	Clustered
Shear (kip):	29.71	**Allow Stress (ksi):**	50.00	**Cluster Dist (in):**	6.00
		Applied Stress (ksi):	40.14	**Start Angle (deg):**	45.00
Moment Design %:	75.05	**Stress Ratio:**	0.80	Compression	
				Force (kip):	122.09
				Allowable (kip):	195.00
				Ratio:	0.63
				Tension	
				Force (kip):	117.12
				Allowable (kip):	195.00
				Ratio:	0.60

Pier Foundation Design For Monopole

Date	1/19/2016		
Customer Name:	Verizon	EIA/TIA Standard:	EIA-222-F
Site Name:	Glastonbury	Structure Height (Ft.):	176
Site Number:	CT02216-S-SBA	Engineer Name:	F. Arinyedokiari
Engr. Number:	20041	Engineer Login ID:	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

Analysis or Design? Analysis

Base Reactions (Unfactored)

Axial Load (Kips):	53.0	Shear Force (Kips):	29.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3827.3

Foundation Geometries:

Mods required -Yes/No ?:	No			ft.
Diameter of Pier (ft.):	8.0	Depth of Base B. G. S. :	28.0	ft.
Pier Height A. G. (ft.):	0.50			

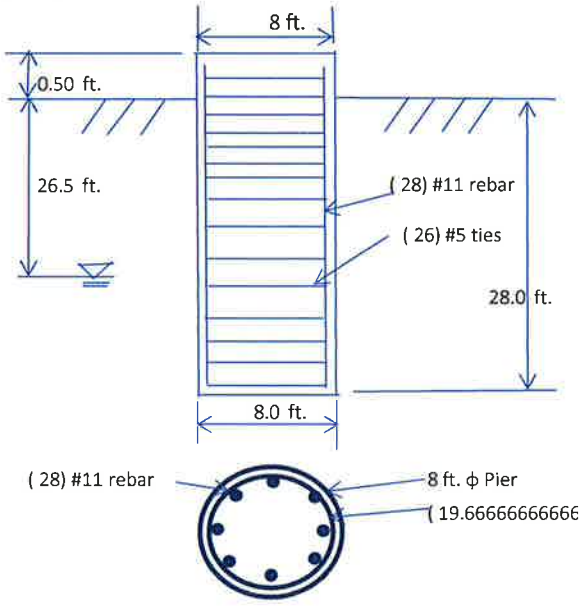
Material Properties and Reabr Info:

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)	Allowable Skin Friction (psf)	Allowable 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	Sand
19.0	26.5	125	36			0	Sand
26.5	29.0	125	36			19800	Sand
29.0	34.0						

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

Foundation Analysis and Design:

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):	106.6			

Check Soil Capacities:

					Usage	
Allowable Foundation Overturning Resistance (kips-ft.):	8584.0	>	Applied Momont (kips-ft):	4425	0.52	OK!
Factor of Safety of Passive Soil Resistance against Moment:	3.88	OK!				

Check the capacities of Reinforceing Concrete:

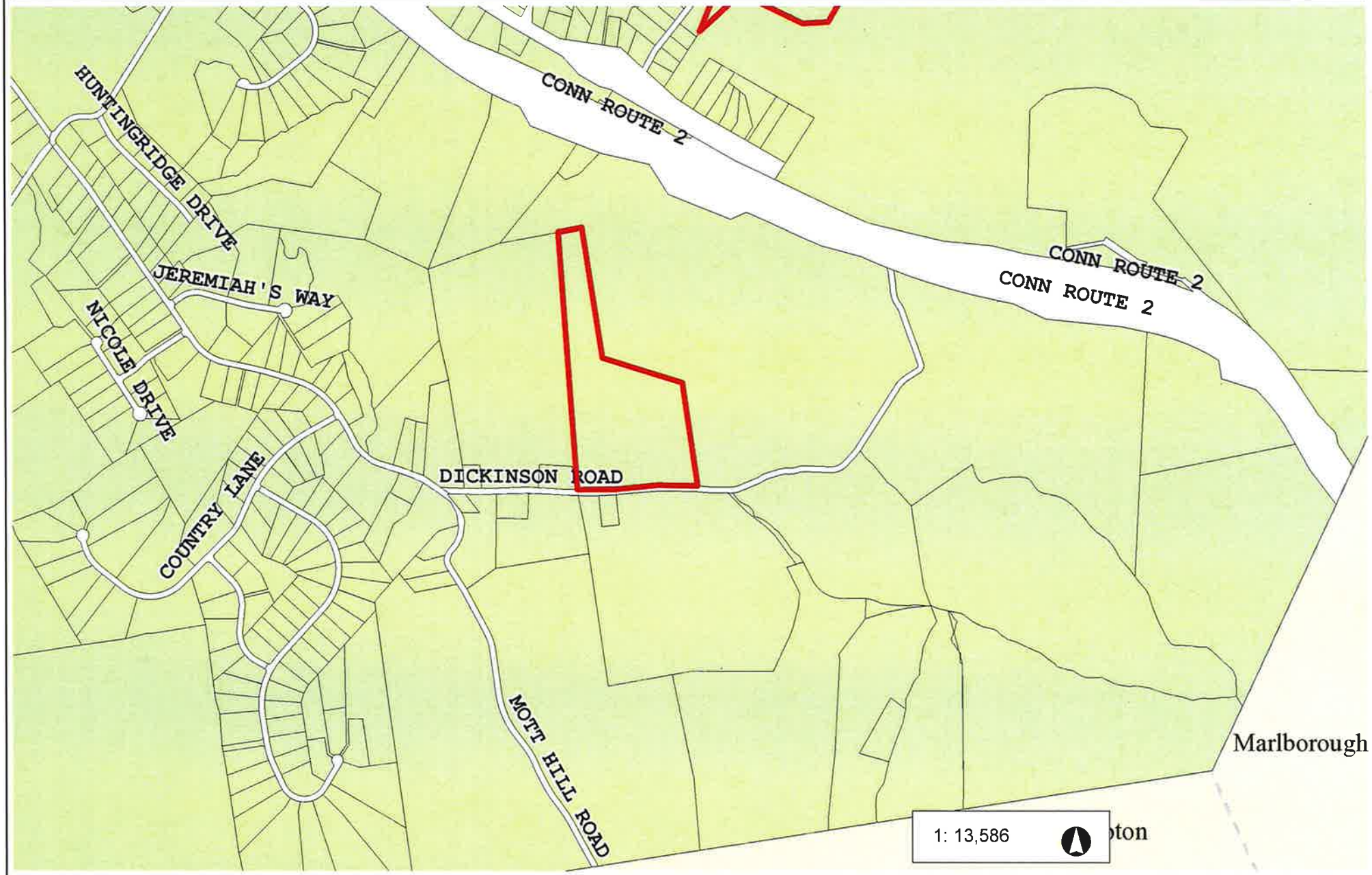
Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.30

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):	5154.9	0.61	OK!
Calculated Shear Capacity (Kips):	1471.3	>	Design Factored Shear (Kips):	504.2	0.34	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):	68.9	0.01	OK!
Moment & Axial Strength Combination:	0.61	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.006	Reinforcement Ratio is satisfied per ACI				

ATTACHMENT 4

Town of Glastonbury GIS



2,264 0 1,132 2,264 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

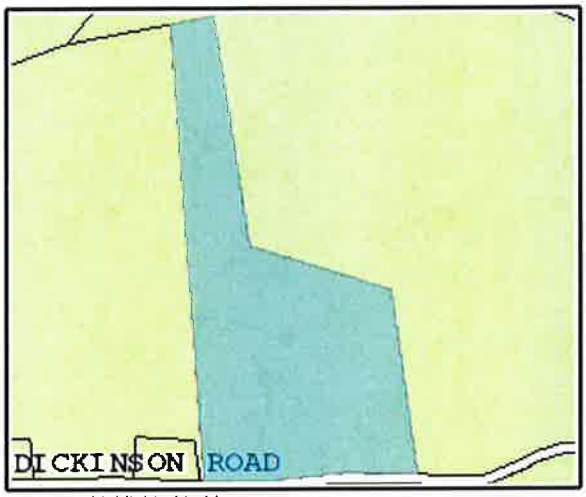
Town of Glastonbury GIS Parcel Report

Report Generated 8/17/2016 8:50:19 AM

Owner of Record

GIS ID: 18600175
Owner: CHAPMAN RANDALL S+
Co-Owner: BRONZI BRIAN J
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	1098900	769300
Appurtenances	0	0
Total	**1098900**	**769300**

Building Picture Not Applicable

Owner of Record	Deed / Page	Sale Date	Sale Price
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