

September 2, 2015

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

Re: **Notice of Exempt Modification – Facility Modification  
225 Grist Mill Road, Simsbury, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) antennas at the 141-foot level of the existing 150-foot tower at 225 Grist Mill Road in Simsbury, Connecticut (the “Property”). The tower is owned by SBA. The Council approved Cellco’s use of this tower in 2001. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/2100 MHz antennas and three (3) model SBNHH-1D65B, 1900 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) existing remote radio heads (“RRHs”), and install six (6) new RRHs and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cable.

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 letter is being sent to Lisa L. Heavner, Simsbury’s First Selectwoman. A copy of this letter is also being sent to Ensign-Bickford Realty Corporation, 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).

Melanie A. Bachman  
September 2, 2015  
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1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRH's will be located on its existing platform at the 141-foot level on the 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 worst-case 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*).

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:

Lisa L. Heavner, Simsbury First Selectwoman  
Ensign-Bickford Realty Corporation  
Victoria Barrios, SBA Communications Corporation  
Tim Parks

# **ATTACHMENT 1**



## SBNHH-1D65B

**Andrew® Tri-band 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, dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
CPR at Boresight, dB	20	23	20	20	17	21
CPR at Sector, dB	14	10	12	10	9	1
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
Gain by Beam Tilt, average, dBi	7°   14.6	7°   14.4	3°   17.5	3°   17.9	3°   18.3	3°   18.4
Gain by Beam Tilt, average, dBi	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, 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 Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol®   Teletilt®
Operating Frequency Band	1695 – 2360 MHz   698 – 896 MHz
Performance Note	Outdoor usage

SBNHH-1D65B

POWERED BY



## Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
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, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h   150.0 mph

## Dimensions

Depth	181.0 mm   7.1 in
Length	1851.0 mm   72.9 in
Width	301.0 mm   11.9 in
Net Weight	18.4 kg   40.6 lb

## Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
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
RET System	Teletilt®

## Packed Dimensions

Depth	299.0 mm   11.8 in
Length	1970.0 mm   77.6 in
Width	409.0 mm   16.1 in
Shipping Weight	31.0 kg   68.3 lb

## Regulatory Compliance/Certifications

### Agency

RoHS 2011/65/EU  
China RoHS SJ/T 11364-2006  
ISO 9001:2008

### Classification

Compliant by Exemption  
Above Maximum Concentration Value (MCV)  
Designed, manufactured and/or distributed under this quality management system



## Included Products

# Product Specifications

COMMSCOPE®

SBNHH-1D65B



**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.

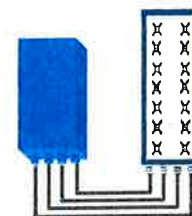
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

# TECHNICAL SPECIFICATIONS

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.)	550 x 305 x 230 (21.6" x 12.0" x 9") (with solar shield)
Volume in L	38 (with solar shield)
Weight in kg (lb) (w/o mounting HW)	26 (57.2) (with solar shield)
DC voltage range	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	550W typical @100% RF load ( in 2Tx or 4TX mode)
Environmental conditions	-40°C (-40°F) / +55°C (+131°F)
Wind load (@150km/h or 93mph)	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

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# PCS RF MODULES

## RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

RRH2x60	
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



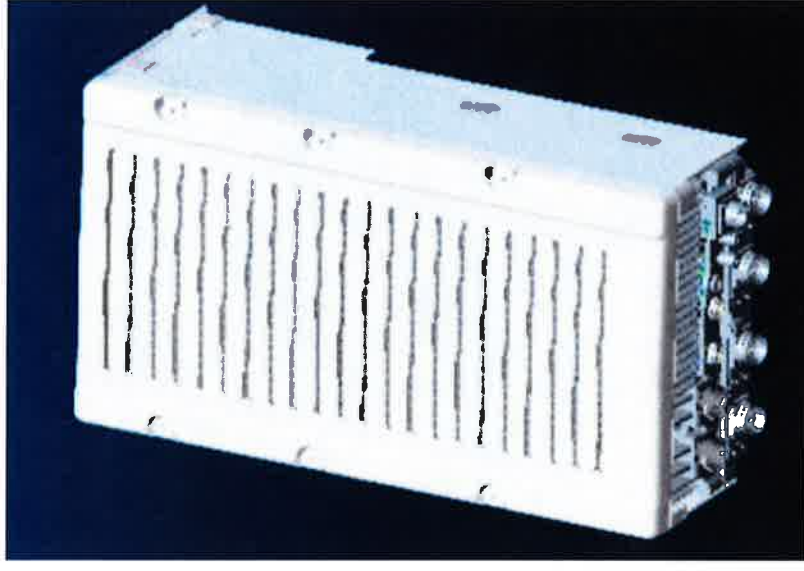
\*\* Not a Verizon Wireless deployed product

# NEW PCS RF MODULES FOR VZW

## RRH2X60 - HW CHARACTERISTICS

LR14.3

RRH2x60	
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (downward facing)
Dimensions	22"(h) x 12"(w) x 9.4" (d)**
Weight	55lb**



\*\* - Includes solar shield but not mounting brackets (8 lbs.)



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

The Alcatel-Lucent RRH2x60-AWS 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 RRH2x60-AWS 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 RRH2x60-AWS integrates all the latest technologies. This allows 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 RRH2x60-AWS 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 RRH2x60-AWS is a very cost-effective solution to deploy LTE MIMO.

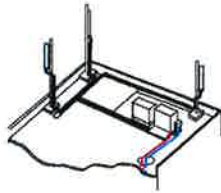
### EASY INSTALLATION

The RRH2x60-AWS 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.

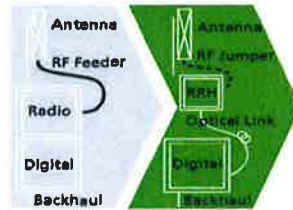
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

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

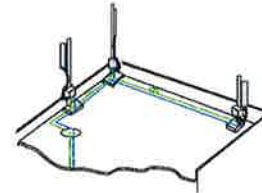
Installation can easily be done by a single person as the Alcatel-Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



Macro



RRH for space-constrained cell sites



Distributed

**FEATURES**

- RRH2x60-AWS integrates two power amplifiers of 60W rating (at each antenna connector)
- Support multiple carriers over the entire 3GPP band 4
- RRH2x60-AWS is optimized for LTE operation
- RRH2x60-AWS 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 : 510x285x186mm (27 l with solar shield)
- Weight : 20 kg (44 lbs)

**Electrical Data**

- Power Supply : -48V DC (-40.5 to -57V)
- Power Consumption (ETSI average traffic load reference) : 250W @2x60W

**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 optical ports for daisy chaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 500m using MM fiber, up to 20km using SM fiber
- TMA/RETA : AISG 2.0 (RS485 connector and internal Bias-Tee)
- Six 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, CE Mark – European Directive : 2002/95/EC (ROHS); 2002/96/EC (WEEE); 1999/5/EC (R&TTE)
- Health : EN 50385

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**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.

**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



Figure 1: HYBRIFLEX Series

**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
<b>Weight and Bending</b>			
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)
<b>Electrical Properties</b>			
DC-Resistance Outer Conductor Armor		(Ω/km (Ω/1000ft))	068 (0.205)
DC-Resistance Power Cable, 8 4mm <sup>2</sup> (8AWG)		(Ω/km (Ω/1000ft))	2.1 (0.307)
<b>Optical Properties</b>			
Version			Single-mode OMB3
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)			UL34-V0, UL1666 RoHS Compliant
<b>DC Power Cable Properties</b>			
Size (Power)	(mm (AWG))		8 4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)	(mm (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 XI-HW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
<b>Operating Temperature</b>			
Installation Temperature	(°C (°F))		-40 to +65 (-40 to 149)
Operation Temperature	(°C (°F))		-40 to +65 (-40 to 149)

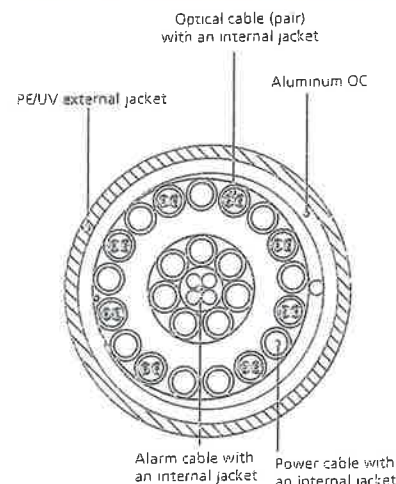


Figure 2: Construction Detail

All information contained in the present datasheet is subject to confirmation at time of ordering.

\* This data is provisional and subject to change

# **ATTACHMENT 2**



# **ATTACHMENT 3**





**Tower Engineering Solutions**

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

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## **Structural Analysis Report**

**Existing 150 ft. Rohn Monopole**

**Customer Name: SBA Communications Corp**

**Customer Site Number: CT10022-A**

**Customer Site Name: Simsbury 2, CT**

**Carrier Name: Verizon**

**Carrier Site ID / Name: Simsbury**

**Site Location: 225 Grist Mill Road**

**Simsbury, Connecticut**

**Hartford County**

**Latitude: 41.866708**

**Longitude: -72.815772**

### **Analysis Result:**

**Max Structural Usage: 98.6% [Pass]**

**Max Foundation Usage: 87.3% [Pass]**

**Report Prepared By : Kyle Wyant**



## Introduction

The purpose of this report is to summarize the analysis results on the 150 ft. Rohn Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

## Sources of Information

<b>Tower Drawings</b>	Rohn Industries, Inc., File No. 50754AE, Drawing No. A020293, dated February 13, 2002
<b>Foundation Drawing</b>	Rohn Industries, Inc., File No. 50754AE, Drawing No. A020294 1-3, dated February 13, 2002
<b>Geotechnical Report</b>	FDH Engineering, Inc., Project No. 15BGSH1600, dated March 19, 2015
<b>Modification Drawings</b>	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.

<b>Basic Wind Speed Used in the Analysis:</b>	80 mph (Fastest Mile)
<b>Basic Wind Speed with Ice:</b>	69 mph (Fastest Mile) with 1/2" Radial Ice Concurrent
<b>Operational Wind Speed:</b>	50 mph + 0" Radial Ice
<b>Standard/Codes:</b>	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	151.0	3	Andrew ABT-DRDM-ADBH	Low Profile Platform	(12) 1 5/8" (1) 10mm Fiber (2) 12 Gauge DC Cables (1) 3" Conduit	Cingular
2		3	CCI DTMAPB7819VG12A			
3		3	CSS DBC-750			
4		6	Ericsson RUS-01			
5		3	Kathrein 782 10250			
6		3	Kathrein 800-10121 - Panel			
7		12	Kathrein 860 1006			
8		2	KMW AM-X-CD-16-65-00T-RET - Panel			
9		1	LMU			
10		4	Powerwave P65-17-XLH-RR - Panel			
11		1	Raycap DC6-48-60-18-8F			
12	143.0	1	GPS	Low Profile Platform	(1) 7/8"	Verizon
13	141.0	3	Alcatel Lucent RRH2x40-AWS		(12) 1 5/8" (1) 1 5/8" Hybrid	
17		3	Antel BXA 171063/12CF - Panel			
18		3	Antel BXA 171085/8BF - Panel			
19		3	Antel BXA-70063-6CF-EDIN-0 - Panel			
20		3	Antel BXA-70080-4CF-EDIN-0 - Panel			
22		1	RFS DB-T1-6Z-8AB-OZ			
24	6	RFS FD9R6004/2C-3L				
25	131.0	3	Commscope LNX-6515DS - Panel	(3) T-Arms (Site Pro P/N UDS-NPL)	(18) 7/8"	T-Mobile
26		3	Ericsson KRY 144/1			
27		3	Kathrein 782 11056			
28		3	RFS APX16DWV-16DWVS-C - Panel			
29	3	RFS ATM1412D-1A20				
30	123.0	3	Alcatel Lucent 1900 MHz	Low Profile Platform	(4) 1-1/4" Fiber	Sprint
31		6	Alcatel Lucent 800 MHz			
32		3	Alcatel Lucent TD-RRH8x20-25			
33		4	RFS ACU-A20-N			
34		3	RFS APXVSP18-C-A20 - Panel			
35		3	RFS APXVTM14-C-I30 - Panel			

## 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
14	141.0	3	Alcatel Lucent RRH2X60-700 - RRU	Low Profile Platform	(12) 1 5/8" (2) 1 5/8" Hybrid	Verizon
15		3	Alcatel Lucent RRH2X60-AWS - RRU			
16		3	Alcatel Lucent RRH2X60-PCS - RRU			
19		3	Antel BXA-70063-6CF-EDIN-0 - Panel			
20		3	Antel BXA-70080-4CF-EDIN-0 - Panel			
21		6	Commscope SBNHH-1D65B - Panel			
23		2	RFS DB-T1-6Z-8AB-OZ – 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:	<b>98.6%</b>	<b>88.3%</b>	<b>98.4%</b>
Pass/Fail	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

## Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Original Design Reactions	3324.0	26.4	65.6
Analysis Reactions	3331.6	29.1	46.2
% of Design Reactions	100.2%	110.3%	70.5%

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 1.6874 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 and the 2005 Connecticut State Building Code 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 98.6% at 0.0ft

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69

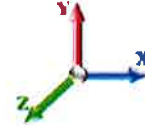
7/14/2015



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**Dead Load Factor:** 1.00  
**Wind Load Factor:** 1.00

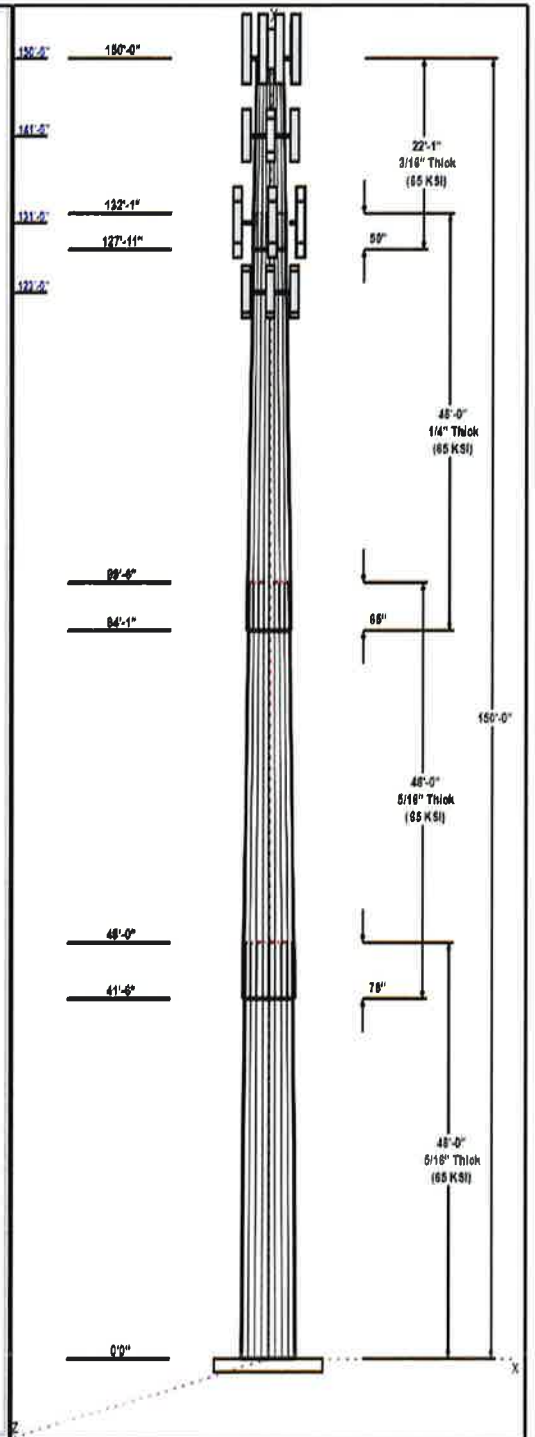
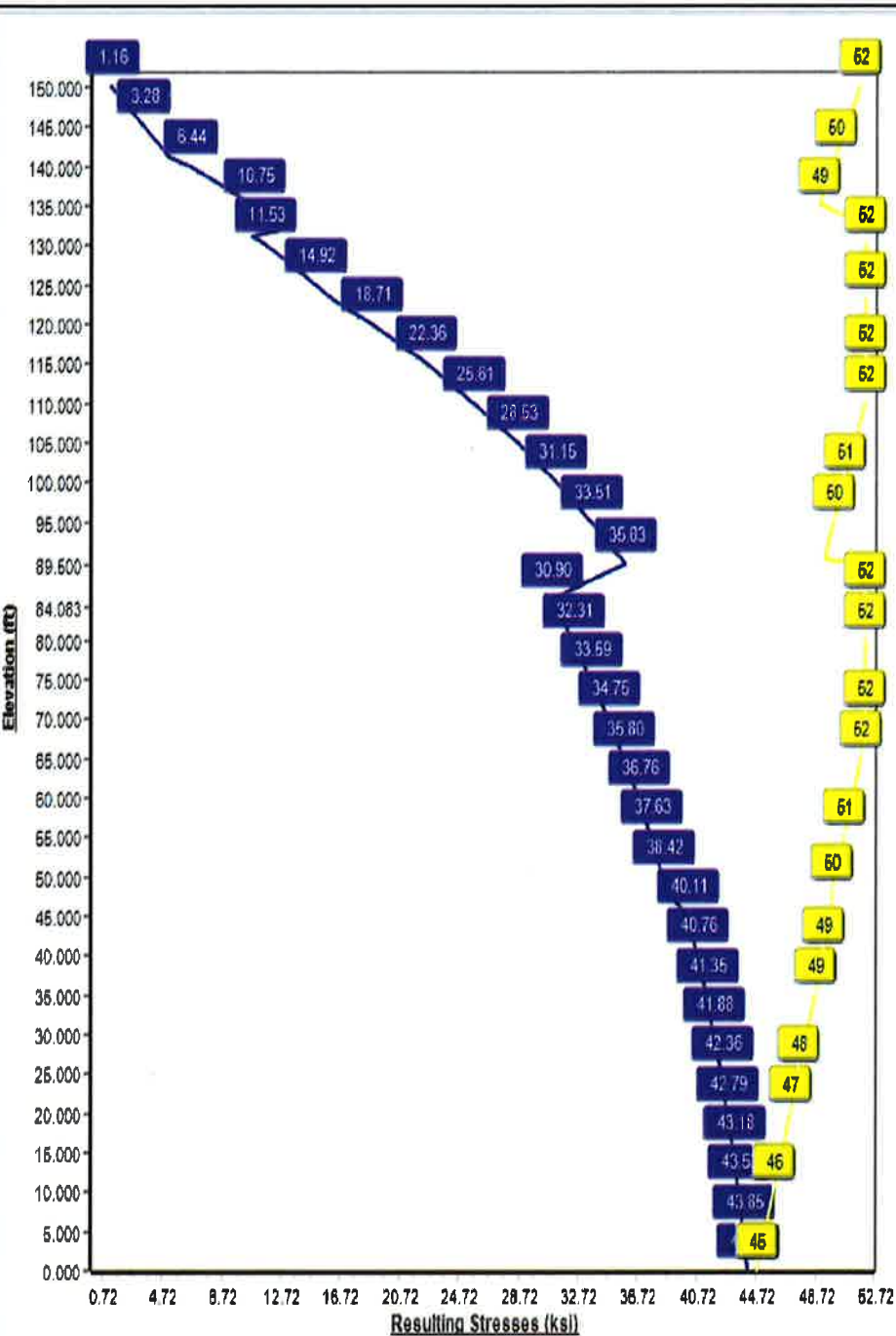
**Load Case : 80 mph Wind with 0 in Ice**



**Iterations:** 23

- 45 Allowable Stress
- 44 Resulting Stress

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**Structure: CT10022-A-SBA**

**Type:** Tapered  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.23136

7/14/2015

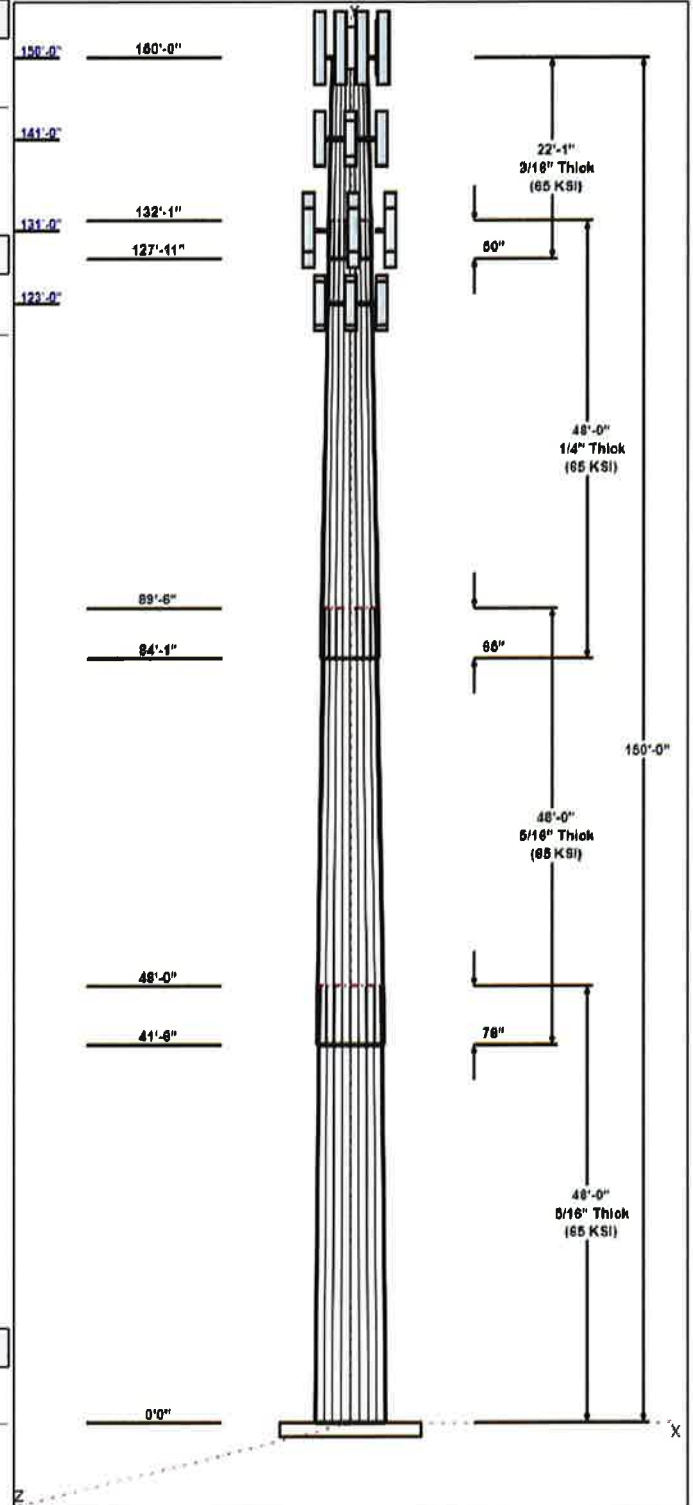
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Shaft Properties							
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	50.39	61.50	0.313		0.23136	65
2	48.00	41.42	52.52	0.313	Slip	0.23136	65
3	48.00	32.07	43.17	0.250	Slip	0.23136	65
4	22.08	28.30	33.41	0.188	Slip	0.23136	65

Discrete Appurtenances					
Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier	
150.00	151.00	3	Andrew ABT-DRDM-ADBH	Cingular	
150.00	151.00	3	CCI DTMABP7819VG12A	Cingular	
150.00	151.00	3	CSS DBC-750	Cingular	
150.00	151.00	6	Ericsson RUS-01	Cingular	
150.00	151.00	3	Kathrein 782 10250	Cingular	
150.00	151.00	3	Kathrein 800-10121	Cingular	
150.00	151.00	12	Kathrein 860 1006	Cingular	
150.00	151.00	2	KMW	Cingular	
150.00	151.00	1	LMU	Cingular	
150.00	150.00	1	Low Profile Platform	Cingular	
150.00	151.00	4	Powerwave	Cingular	
150.00	151.00	1	Raycap DC6-48-60-18-8F	Cingular	
141.00	141.00	3	Alcatel Lucent	Verizon	
141.00	141.00	3	Alcatel Lucent	Verizon	
141.00	141.00	3	Alcatel Lucent	Verizon	
141.00	141.00	3	Antel	Verizon	
141.00	141.00	3	Antel	Verizon	
141.00	141.00	6	Commscope	Verizon	
141.00	141.00	1	Low Profile Platform	Verizon	
141.00	141.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon	
141.00	141.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon	
131.00	131.00	3	Commscope LNX-6515DS	T-Mobile	
131.00	131.00	3	Ericsson KRY 144/1	T-Mobile	
131.00	131.00	3	Kathrein 782 11056	T-Mobile	
131.00	131.00	3	RFS	T-Mobile	
131.00	131.00	3	RFS ATM1412D-1A20	T-Mobile	
131.00	131.00	3	T-Arms (Site Pro P/N	T-Mobile	
123.00	123.00	3	Alcatel Lucent 1900 MHz	Sprint	
123.00	123.00	6	Alcatel Lucent 800 MHz	Sprint	
123.00	123.00	3	Alcatel Lucent	Sprint	
123.00	123.00	1	Low Profile Platform	Sprint	
123.00	123.00	4	RFS ACU-A20-N	Sprint	
123.00	123.00	3	RFS APXVSP18-C-A20	Sprint	
123.00	123.00	3	RFS APXVTM14-C-I30	Sprint	

Linear Appurtenances				
Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	150.00	Inside	1 5/8" Coax	Cingular
0.00	150.00	Inside	10mm Fiber	Cingular
0.00	150.00	Inside	12 Gauge DC Cables	Cingular
0.00	150.00	Inside	3" Conduit	Cingular
0.00	141.00	Inside	1 5/8" Coax	Verizon
0.00	141.00	Inside	1 5/8" Hybrid	Verizon
0.00	131.00	Inside	7/8" Coax	T-Mobile
0.00	123.00	Inside	1-1/4" Fiber	Sprint





**Type:** Tapered  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.00 (ft)

**Base Shape:** 18 Sided  
**Taper:** 0.23136

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**Anchor Bolts**

Qty	Specifications	Grade (ksi)	Arrangement
14	2.25" 18J	75.0	Radial

**Base Plate**

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.0000	73.5	50.0	Round

**Reactions**

Load Case	Moment	Shear	Axial
80 mph Wind with 0" Ice	3331.6	29.1	37.8
69.28 mph Wind with 0.5" Ice	2857.5	24.3	46.2
50 mph Wind with 0" Ice	1302.4	11.4	37.9

## Shaft Properties

<b>Structure:</b> CT10022-A-SBA	<b>Code:</b> EIA/TIA-222-F	7/14/2015
<b>Site Name:</b> Simsbury 2, CT	<b>Exposure:</b> C	
<b>Height:</b> 150.00 (ft)	<b>Gh:</b> 1.69	
<b>Base Elev:</b> 0.000 (ft)	<b>Struct Class:</b> II	Page: 4



Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.3125	65		0.00	9,013
2	18	48.000	0.3125	65	Slip	78.00	7,559
3	18	48.000	0.2500	65	Slip	65.00	4,843
4	18	22.083	0.1875	65	Slip	50.00	1,371
<b>Total Shaft Weight:</b>							<b>22,786</b>

Bottom

Top

Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper
1	61.50	0.00	60.69	28706.65	33.29	196.8	50.39	48.00	49.67	15741.4	27.02	161.2	0.231360
2	52.52	41.50	51.78	17835.36	28.22	168.0	41.42	89.50	40.77	8703.68	21.95	132.5	0.231360
3	43.17	84.08	34.06	7926.99	29.03	172.6	32.07	132.0	25.25	3228.71	21.20	128.2	0.231360
4	33.41	127.9	19.77	2755.84	30.00	178.1	28.30	150.0	16.73	1669.78	25.19	150.9	0.231360

## Loading Summary

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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### Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	150.0	Andrew ABT-DRDM-ADBH	3	1.10	0.05	0.98	1.80	0.110	1.00	0.00	1.00
2	150.0	CCI DTMABP7819VG12A	3	19.20	1.14	0.67	26.50	1.360	0.70	0.00	1.00
3	150.0	CSS DBC-750	3	4.80	0.51	0.67	7.70	0.660	0.70	0.00	1.00
4	150.0	Ericsson RUS-01	6	50.70	2.94	0.76	66.00	3.140	0.79	0.00	1.00
5	150.0	Kathrein 782 10250	3	6.40	0.52	0.50	10.00	0.690	0.53	0.00	1.00
6	150.0	Kathrein 800-10121	3	62.40	5.55	0.90	101.20	6.090	0.92	0.00	1.00
7	150.0	Kathrein 860 1006	12	1.20	0.18	0.92	2.80	0.280	0.95	0.00	1.00
8	150.0	KMW AM-X-CD-16-65-00T-RET	2	70.50	8.26	0.87	124.20	9.080	0.90	0.00	1.00
9	150.0	LMU	1	28.00	0.88	1.00	35.30	0.930	1.00	0.00	1.00
10	150.0	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.00	1.00	0.00	0.00
11	150.0	Powerwave P65-17-XLH-RR	4	88.30	11.46	0.88	160.80	12.39	0.92	0.00	1.00
12	150.0	Raycap DC6-48-60-18-8F	1	31.80	1.47	1.00	49.50	1.670	1.00	0.00	1.00
13	141.0	Alcatel Lucent RRH2X60-700	3	60.00	3.96	0.76	80.10	4.230	0.79	0.00	0.00
14	141.0	Alcatel Lucent RRH2X60-AWS	3	60.00	3.96	0.76	80.10	4.230	0.79	0.00	0.00
15	141.0	Alcatel Lucent RRH2X60-PCS	3	55.00	2.57	0.89	70.90	2.760	0.90	0.00	0.00
16	141.0	Antel BXA-70063-6CF-EDIN-0	3	39.00	7.75	0.86	89.10	8.220	0.89	0.00	0.00
17	141.0	Antel BXA-70080-4CF-EDIN-0	3	30.30	3.90	1.02	62.00	4.300	1.04	0.00	0.00
18	141.0	Commscope SBNHH-1D65B	6	72.70	8.30	0.91	129.30	8.770	0.93	0.00	0.00
19	141.0	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.00	1.00	0.00	0.00
20	141.0	RFS DB-T1-6Z-8AB-0Z	1	21.40	4.78	0.96	51.10	5.040	0.99	0.00	0.00
21	141.0	RFS DB-T1-6Z-8AB-0Z	1	21.40	4.78	0.96	51.10	5.040	0.99	0.00	0.00
22	131.0	Commscope LNX-6515DS	3	79.10	11.45	0.92	155.00	11.92	0.95	0.00	0.00
23	131.0	Ericsson KRY 144/1	3	11.00	0.41	0.70	14.10	0.550	0.73	0.00	0.00
24	131.0	Kathrein 782 11056	3	11.00	0.66	0.76	15.60	0.830	0.79	0.00	0.00
25	131.0	RFS APX16DWV-16DWVS-C	3	62.70	7.33	0.74	104.00	7.830	0.78	0.00	0.00
26	131.0	RFS ATM1412D-1A20	3	13.00	1.17	0.73	20.60	1.390	0.76	0.00	0.00
27	131.0	T-Arms (Site Pro P/N UDS-NPL)	3	132.00	3.25	0.90	420.00	10.50	0.90	0.00	0.00
28	123.0	Alcatel Lucent 1900 MHz	3	60.00	2.71	0.98	83.10	3.070	1.00	0.00	0.00
29	123.0	Alcatel Lucent 800 MHz	6	53.00	2.49	0.92	74.10	2.820	0.95	0.00	0.00
30	123.0	Alcatel Lucent TD-RRH8x20-25	3	70.00	4.72	0.69	92.00	4.970	0.75	0.00	0.00
31	123.0	Low Profile Platform	1	1500.00	22.00	1.00	1800.00	27.00	1.00	0.00	0.00
32	123.0	RFS ACU-A20-N	4	1.00	0.14	0.79	2.30	0.220	0.82	0.00	0.00
33	123.0	RFS APXVSP18-C-A20	3	79.00	8.26	0.91	135.20	8.730	0.83	0.00	0.00
34	123.0	RFS APXVTM14-C-I30	3	78.00	7.16	0.85	124.40	7.650	0.88	0.00	0.00
<b>Totals:</b>			<b>107</b>	<b>8,975.60</b>			<b>13,218.00</b>				

### Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	No Ice		Ice		Exposed
			Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	
0.00	150.0	(12) 1 5/8" Coax	12.48	0.00	12.48	0.00	Inside
0.00	150.0	(1) 10mm Fiber	0.06	0.00	0.06	0.00	Inside
0.00	150.0	(2) 12 Gauge DC Cables	0.65	0.00	0.06	0.00	Inside
0.00	150.0	(1) 3" Conduit	2.40	0.00	2.40	0.00	Inside
0.00	141.0	(12) 1 5/8" Coax	12.48	0.00	12.48	0.00	Inside

## Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
0.00	141.0	(2) 1 5/8" Hybrid		2.20	0.00		2.20	0.00		Inside	
0.00	131.0	(18) 7/8" Coax		9.36	0.00		9.36	0.00		Inside	
0.00	123.0	(4) 1-1/4" Fiber		3.82	0.00		3.82	0.00		Inside	
<b>Totals:</b>				<b>6,103.91</b>			<b>6,015.90</b>				

## Shaft Section Properties

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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**Increment Length:** 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.3125	61.500	60.688	28706.7	33.29	196.80	65	45	0.0
5.00		0.3125	60.343	59.541	27109.1	32.64	193.10	65	45	1022.8
10.00		0.3125	59.186	58.393	25571.9	31.99	189.40	65	46	1003.3
15.00		0.3125	58.030	57.246	24093.9	31.33	185.69	65	46	983.7
20.00		0.3125	56.873	56.099	22674.1	30.68	181.99	65	47	964.2
25.00		0.3125	55.716	54.951	21311.1	30.03	178.29	65	48	944.7
30.00		0.3125	54.559	53.804	20003.9	29.37	174.59	65	48	925.2
35.00		0.3125	53.402	52.657	18751.2	28.72	170.89	65	49	905.7
40.00		0.3125	52.246	51.509	17552.0	28.07	167.19	65	49	886.1
41.50	Bot - Section 2	0.3125	51.899	51.165	17202.5	27.87	166.08	65	49	262.0
45.00		0.3125	51.089	50.362	16405.0	27.42	163.48	65	50	1216.5
48.00	Top - Section 1	0.3125	51.020	50.293	16338.2	27.38	163.26	65	50	1027.5
50.00		0.3125	50.557	49.834	15895.0	27.12	161.78	65	50	340.7
55.00		0.3125	49.400	48.687	14822.2	26.46	158.08	65	51	838.1
60.00		0.3125	48.243	47.540	13798.8	25.81	154.38	65	51	818.6
65.00		0.3125	47.087	46.392	12823.6	25.16	150.68	65	52	799.1
70.00		0.3125	45.930	45.245	11895.5	24.51	146.98	65	52	779.6
75.00		0.3125	44.773	44.098	11013.3	23.85	143.27	65	52	760.0
80.00		0.3125	43.616	42.950	10175.8	23.20	139.57	65	52	740.5
84.08	Bot - Section 3	0.3125	42.671	42.013	9524.3	22.67	136.55	65	52	590.3
85.00		0.3125	42.459	41.803	9381.9	22.55	135.87	65	52	236.7
89.50	Top - Section 2	0.2500	41.918	33.063	7252.7	28.15	167.67	65	52	1144.8
90.00		0.2500	41.803	32.971	7192.5	28.07	167.21	65	49	56.2
95.00		0.2500	40.646	32.053	6608.3	27.26	162.58	65	50	553.2
100.00		0.2500	39.489	31.135	6056.7	26.44	157.96	65	51	537.5
105.00		0.2500	38.332	30.217	5536.7	25.63	153.33	65	51	521.9
110.00		0.2500	37.175	29.299	5047.3	24.81	148.70	65	52	506.3
115.00		0.2500	36.019	28.381	4587.6	23.99	144.07	65	52	490.7
120.00		0.2500	34.862	27.463	4156.8	23.18	139.45	65	52	475.1
123.00		0.2500	34.168	26.913	3911.7	22.69	136.67	65	52	277.5
125.00		0.2500	33.705	26.546	3753.8	22.36	134.82	65	52	181.9
127.92	Bot - Section 4	0.2500	33.030	26.010	3531.2	21.89	132.12	65	52	260.8
130.00		0.2500	32.548	25.628	3377.7	21.55	130.19	65	52	322.2
131.00		0.2500	32.317	25.444	3305.6	21.38	129.27	65	52	152.9
132.08	Top - Section 3	0.1875	32.441	19.194	2522.8	29.10	173.02	65	52	164.5
135.00		0.1875	31.766	18.793	2367.8	28.46	169.42	65	49	188.5
140.00		0.1875	30.610	18.104	2117.0	27.37	163.25	65	50	313.9
141.00		0.1875	30.378	17.967	2069.0	27.16	162.02	65	50	61.4
145.00		0.1875	29.453	17.416	1884.5	26.29	157.08	65	51	240.8
150.00		0.1875	28.296	16.727	1669.8	25.20	150.91	65	52	290.5

**22785.8**

## Wind Loading - Shaft

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

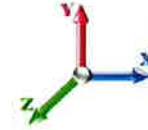
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**Load Case:** 80 mph Wind with 0" Ice

**Iterations:** 23

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



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	16.384	27.69	410.00	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	402.29	0.650	0.000	5.00	25.384	16.50	456.9	0.0	1022.8
10.00		0.00	1.00	16.384	27.69	394.58	0.650	0.000	5.00	24.902	16.19	448.2	0.0	1003.3
15.00		0.00	1.00	16.384	27.69	386.86	0.650	0.000	5.00	24.420	15.87	439.5	0.0	983.7
20.00		0.00	1.00	16.384	27.69	379.15	0.650	0.000	5.00	23.938	15.56	430.8	0.0	964.2
25.00		0.00	1.00	16.384	27.69	371.44	0.650	0.000	5.00	23.456	15.25	422.2	0.0	944.7
30.00		0.00	1.00	16.384	27.69	363.73	0.650	0.000	5.00	22.974	14.93	413.5	0.0	925.2
35.00		0.00	1.02	16.662	28.16	359.02	0.650	0.000	5.00	22.492	14.62	411.7	0.0	905.7
40.00		0.00	1.06	17.310	29.25	358.01	0.650	0.000	5.00	22.010	14.31	418.5	0.0	886.1
41.50 Bot - Section 2		0.00	1.07	17.493	29.56	357.51	0.650	0.000	1.50	6.509	4.23	125.1	0.0	262.0
45.00		0.00	1.09	17.902	30.25	356.02	0.650	0.000	3.50	15.201	9.88	298.9	0.0	1216.5
48.00 Top - Section 1		0.00	1.11	18.235	30.82	354.44	0.650	0.000	3.00	12.842	8.35	257.2	0.0	1027.5
50.00		0.00	1.13	18.449	31.18	357.66	0.650	0.000	2.00	8.465	5.50	171.6	0.0	340.7
55.00		0.00	1.16	18.959	32.04	354.27	0.650	0.000	5.00	20.824	13.54	433.7	0.0	838.1
60.00		0.00	1.19	19.436	32.85	350.30	0.650	0.000	5.00	20.342	13.22	434.3	0.0	818.6
65.00		0.00	1.21	19.885	33.61	345.83	0.650	0.000	5.00	19.860	12.91	433.8	0.0	799.1
70.00		0.00	1.24	20.311	34.33	340.92	0.650	0.000	5.00	19.378	12.60	432.4	0.0	779.6
75.00		0.00	1.26	20.715	35.01	335.63	0.650	0.000	5.00	18.896	12.28	430.0	0.0	760.0
80.00		0.00	1.29	21.101	35.66	329.99	0.650	0.000	5.00	18.414	11.97	426.8	0.0	740.5
84.08 Bot - Section 3		0.00	1.31	21.403	36.17	325.14	0.650	0.000	4.08	14.681	9.54	345.2	0.0	590.3
85.00		0.00	1.31	21.469	36.28	324.03	0.650	0.000	0.92	3.290	2.14	77.6	0.0	236.7
89.50 Top - Section 2		0.00	1.33	21.788	36.82	318.42	0.650	0.000	4.50	15.915	10.34	380.9	0.0	1144.8
90.00		0.00	1.33	21.823	36.88	321.63	0.650	0.000	0.50	1.744	1.13	41.8	0.0	56.2
95.00		0.00	1.35	22.163	37.45	315.16	0.650	0.000	5.00	17.177	11.16	418.2	0.0	553.2
100.00		0.00	1.37	22.490	38.01	308.44	0.650	0.000	5.00	16.695	10.85	412.4	0.0	537.5
105.00		0.00	1.39	22.806	38.54	301.50	0.650	0.000	5.00	16.213	10.54	406.2	0.0	521.9
110.00		0.00	1.41	23.111	39.06	294.35	0.650	0.000	5.00	15.731	10.22	399.4	0.0	506.3
115.00		0.00	1.43	23.406	39.56	287.01	0.650	0.000	5.00	15.249	9.91	392.1	0.0	490.7
120.00		0.00	1.45	23.692	40.04	279.48	0.650	0.000	5.00	14.767	9.60	384.3	0.0	475.1
123.00 Appurtenance(s)		0.00	1.46	23.860	40.32	274.89	0.650	0.000	3.00	8.629	5.61	226.2	0.0	277.5
125.00		0.00	1.46	23.970	40.51	271.79	0.650	0.000	2.00	5.656	3.68	148.9	0.0	181.9
127.92 Bot - Section 4		0.00	1.47	24.129	40.78	267.23	0.650	0.000	2.92	8.110	5.27	215.0	0.0	260.8
130.00		0.00	1.48	24.241	40.97	263.94	0.650	0.000	2.08	5.758	3.74	153.3	0.0	322.2
131.00 Appurtenance(s)		0.00	1.48	24.294	41.06	262.35	0.650	0.000	1.00	2.734	1.78	73.0	0.0	152.9
132.08 Top - Section 3		0.00	1.49	24.351	41.15	260.62	0.650	0.000	1.08	2.940	1.91	78.6	0.0	164.5
135.00		0.00	1.50	24.503	41.41	258.99	0.650	0.000	2.92	7.803	5.07	210.0	0.0	188.5
140.00		0.00	1.51	24.759	41.84	250.86	0.650	0.000	5.00	12.995	8.45	353.4	0.0	313.9
141.00 Appurtenance(s)		0.00	1.51	24.810	41.93	249.21	0.650	0.000	1.00	2.541	1.65	69.3	0.0	61.4
145.00		0.00	1.53	25.009	42.26	242.59	0.650	0.000	4.00	9.972	6.48	273.9	0.0	240.8
150.00 Appurtenance(s)		0.00	1.54	25.252	42.68	234.19	0.650	0.000	5.00	12.031	7.82	333.7	0.0	290.5
<b>Totals:</b>									<b>150.00</b>			<b>12,278.4</b>		<b>22,785.8</b>

## Discrete Appurtenance Forces

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

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	150.00	Kathrein 800-10121	3	25.300	42.757	0.90	15.05	187.20	0.000	1.000	643.57	0.00	643.57
2	150.00	Andrew ABT-DRDM-ADBH	3	25.300	42.757	0.98	0.15	3.30	0.000	1.000	6.29	0.00	6.29
3	150.00	CCI DTMAPB7819VG12A	3	25.300	42.757	0.67	2.29	57.60	0.000	1.000	97.97	0.00	97.97
4	150.00	CSS DBC-750	3	25.300	42.757	0.67	1.03	14.40	0.000	1.000	43.83	0.00	43.83
5	150.00	Ericsson RUS-01	6	25.300	42.757	0.76	13.41	304.20	0.000	1.000	573.22	0.00	573.22
6	150.00	Kathrein 782 10250	3	25.300	42.757	0.50	0.78	19.20	0.000	1.000	33.35	0.00	33.35
7	150.00	Raycap DC6-48-60-18-8F	1	25.300	42.757	1.00	1.47	31.80	0.000	1.000	62.85	0.00	62.85
8	150.00	Kathrein 860 1006	12	25.300	42.757	0.92	1.99	14.40	0.000	1.000	84.97	0.00	84.97
9	150.00	KMW	2	25.300	42.757	0.87	14.32	141.00	0.000	1.000	612.41	0.00	612.41
10	150.00	LMU	1	25.300	42.757	1.00	0.88	28.00	0.000	1.000	37.63	0.00	37.63
11	150.00	Low Profile Platform	1	25.252	42.676	1.00	22.00	1500.00	0.000	0.000	938.88	0.00	0.00
12	150.00	Powerwave P65-17-XLH-RR	4	25.300	42.757	0.88	40.29	353.20	0.000	1.000	1722.84	0.00	1722.84
13	141.00	RFS DB-T1-6Z-8AB-0Z	1	24.810	41.928	0.96	4.59	21.40	0.000	0.000	192.40	0.00	0.00
14	141.00	RFS DB-T1-6Z-8AB-0Z	1	24.810	41.928	0.96	4.59	21.40	0.000	0.000	192.40	0.00	0.00
15	141.00	Low Profile Platform	1	24.810	41.928	1.00	22.00	1500.00	0.000	0.000	922.42	0.00	0.00
16	141.00	Commscope SBNHH-1D65B	6	24.810	41.928	0.91	45.22	436.20	0.000	0.000	1895.93	0.00	0.00
17	141.00	Antel	3	24.810	41.928	1.02	11.93	90.90	0.000	0.000	500.37	0.00	0.00
18	141.00	Antel	3	24.810	41.928	0.86	20.00	117.00	0.000	0.000	838.36	0.00	0.00
19	141.00	Alcatel Lucent	3	24.810	41.928	0.76	9.03	180.00	0.000	0.000	378.56	0.00	0.00
20	141.00	Alcatel Lucent RRH2X60-700	3	24.810	41.928	0.76	9.03	180.00	0.000	0.000	378.56	0.00	0.00
21	141.00	Alcatel Lucent	3	24.810	41.928	0.89	6.88	165.00	0.000	0.000	288.35	0.00	0.00
22	131.00	Kathrein 782 11056	3	24.294	41.056	0.76	1.50	33.00	0.000	0.000	61.78	0.00	0.00
23	131.00	Commscope LNX-6515DS	3	24.294	41.056	0.92	31.57	237.30	0.000	0.000	1296.05	0.00	0.00
24	131.00	Ericsson KRY 144/1	3	24.294	41.056	0.70	0.86	33.00	0.000	0.000	35.35	0.00	0.00
25	131.00	RFS	3	24.294	41.056	0.74	16.38	188.10	0.000	0.000	672.61	0.00	0.00
26	131.00	RFS ATM1412D-1A20	3	24.294	41.056	0.73	2.56	39.00	0.000	0.000	105.20	0.00	0.00
27	131.00	T-Arms (Site Pro P/N	3	24.294	41.056	0.90	8.78	396.00	0.000	0.000	360.27	0.00	0.00
28	123.00	RFS APXVTM14-C-I30	3	23.860	40.324	0.85	18.30	234.00	0.000	0.000	737.96	0.00	0.00
29	123.00	RFS APXVSP18-C-A20	3	23.860	40.324	0.91	22.45	237.00	0.000	0.000	905.30	0.00	0.00
30	123.00	RFS ACU-A20-N	4	23.860	40.324	0.79	0.44	4.00	0.000	0.000	17.84	0.00	0.00
31	123.00	Low Profile Platform	1	23.860	40.324	1.00	22.00	1500.00	0.000	0.000	887.12	0.00	0.00
32	123.00	Alcatel Lucent	3	23.860	40.324	0.69	9.77	210.00	0.000	0.000	393.98	0.00	0.00
33	123.00	Alcatel Lucent 800 MHz	6	23.860	40.324	0.92	13.74	318.00	0.000	0.000	554.24	0.00	0.00
34	123.00	Alcatel Lucent 1900 MHz	3	23.860	40.324	0.98	7.97	180.00	0.000	0.000	321.28	0.00	0.00
<b>Totals:</b>								<b>8,975.60</b>			<b>16,794.15</b>		

## Total Applied Force Summary

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

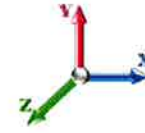
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**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

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		456.86	1240.01	0.00	0.00
10.00		448.18	1220.49	0.00	0.00
15.00		439.51	1200.97	0.00	0.00
20.00		430.83	1181.45	0.00	0.00
25.00		422.16	1161.93	0.00	0.00
30.00		413.48	1142.41	0.00	0.00
35.00		411.67	1122.88	0.00	0.00
40.00		418.51	1103.36	0.00	0.00
41.50		125.08	327.20	0.00	0.00
45.00		298.94	1368.60	0.00	0.00
48.00		257.24	1157.86	0.00	0.00
50.00		171.55	427.60	0.00	0.00
55.00		433.69	1055.35	0.00	0.00
60.00		434.31	1035.83	0.00	0.00
65.00		433.83	1016.31	0.00	0.00
70.00		432.36	996.78	0.00	0.00
75.00		430.00	977.26	0.00	0.00
80.00		426.83	957.74	0.00	0.00
84.08		345.17	767.68	0.00	0.00
85.00		77.59	276.51	0.00	0.00
89.50		380.91	1340.30	0.00	0.00
90.00		41.81	77.90	0.00	0.00
95.00		418.18	770.38	0.00	0.00
100.00		412.45	754.77	0.00	0.00
105.00		406.16	739.15	0.00	0.00
110.00		399.36	723.53	0.00	0.00
115.00		392.07	707.92	0.00	0.00
120.00		384.32	692.30	0.00	0.00
123.00	(23) appurtenances	4043.88	3090.88	0.00	0.00
125.00		148.93	261.17	0.00	0.00
127.92		214.97	376.39	0.00	0.00
130.00		153.32	404.72	0.00	0.00
131.00	(18) appurtenances	2604.22	1118.98	0.00	0.00
132.08		78.64	197.25	0.00	0.00
135.00		210.03	276.79	0.00	0.00
140.00		353.44	465.23	0.00	0.00
141.00	(24) appurtenances	5656.63	2803.54	0.00	0.00
145.00		273.95	303.16	0.00	0.00
150.00	(42) appurtenances	5191.53	3022.71	0.00	3918.92
	<b>Totals:</b>	<b>29,072.58</b>	<b>37,865.29</b>	<b>0.00</b>	<b>3,918.92</b>



## Resulting Forces and Deflections

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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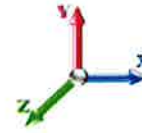
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**Load Case:** 80 mph Wind with 0" Ice

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



**Iterations:** 23

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	-29.127	-37.823	0.000	0.000	0.000	-3331.6	0.000	0.000	0.000	0.000	0.000
5.00	-28.772	-36.502	0.000	0.000	0.000	-3186.0	-0.087	0.000	0.087	-0.161	0.000
10.00	-28.420	-35.202	0.000	0.000	0.000	-3042.1	-0.344	0.000	0.344	-0.325	0.000
15.00	-28.070	-33.923	0.000	0.000	0.000	-2900.0	-0.774	0.000	0.774	-0.490	0.000
20.00	-27.723	-32.665	0.000	0.000	0.000	-2759.7	-1.377	0.000	1.377	-0.657	0.000
25.00	-27.379	-31.428	0.000	0.000	0.000	-2621.0	-2.157	0.000	2.157	-0.826	0.000
30.00	-27.038	-30.211	0.000	0.000	0.000	-2484.1	-3.114	0.000	3.114	-0.996	0.000
35.00	-26.693	-29.016	0.000	0.000	0.000	-2349.0	-4.250	0.000	4.250	-1.168	0.000
40.00	-26.305	-27.871	0.000	0.000	0.000	-2215.5	-5.567	0.000	5.567	-1.341	0.000
41.50	-26.215	-27.506	0.000	0.000	0.000	-2176.0	-5.998	0.000	5.998	-1.395	0.000
45.00	-25.933	-26.094	0.000	0.000	0.000	-2084.3	-7.067	0.000	7.067	-1.518	0.000
48.00	-25.683	-24.904	0.000	0.000	0.000	-2006.5	-8.055	0.000	8.055	-1.625	0.000
50.00	-25.551	-24.427	0.000	0.000	0.000	-1955.1	-8.752	0.000	8.752	-1.696	0.000
55.00	-25.153	-23.311	0.000	0.000	0.000	-1827.4	-10.619	0.000	10.619	-1.865	0.000
60.00	-24.750	-22.218	0.000	0.000	0.000	-1701.6	-12.664	0.000	12.664	-2.035	0.000
65.00	-24.341	-21.147	0.000	0.000	0.000	-1577.9	-14.886	0.000	14.886	-2.204	0.000
70.00	-23.928	-20.098	0.000	0.000	0.000	-1456.2	-17.285	0.000	17.285	-2.372	0.000
75.00	-23.512	-19.072	0.000	0.000	0.000	-1336.5	-19.859	0.000	19.859	-2.539	0.000
80.00	-23.089	-18.075	0.000	0.000	0.000	-1219.0	-22.607	0.000	22.607	-2.704	0.000
84.08	-22.732	-17.293	0.000	0.000	0.000	-1124.7	-24.978	0.000	24.978	-2.838	0.000
85.00	-22.666	-16.986	0.000	0.000	0.000	-1103.9	-25.526	0.000	25.526	-2.868	0.000
89.50	-22.239	-15.636	0.000	0.000	0.000	-1001.9	-28.299	0.000	28.299	-3.012	0.000
90.00	-22.221	-15.521	0.000	0.000	0.000	-990.78	-28.615	0.000	28.615	-3.028	0.000
95.00	-21.808	-14.705	0.000	0.000	0.000	-879.68	-31.887	0.000	31.887	-3.213	0.000
100.00	-21.395	-13.911	0.000	0.000	0.000	-770.64	-35.347	0.000	35.347	-3.391	0.000
105.00	-20.982	-13.138	0.000	0.000	0.000	-663.67	-38.989	0.000	38.989	-3.559	0.000
110.00	-20.570	-12.387	0.000	0.000	0.000	-558.76	-42.802	0.000	42.802	-3.716	0.000
115.00	-20.159	-11.660	0.000	0.000	0.000	-455.91	-46.771	0.000	46.771	-3.859	0.000
120.00	-19.747	-10.963	0.000	0.000	0.000	-355.11	-50.881	0.000	50.881	-3.985	0.000
123.00	-15.504	-8.149	0.000	0.000	0.000	-295.87	-53.406	0.000	53.406	-4.052	0.000
125.00	-15.343	-7.886	0.000	0.000	0.000	-264.87	-55.111	0.000	55.111	-4.093	0.000
127.92	-15.107	-7.515	0.000	0.000	0.000	-220.12	-57.627	0.000	57.627	-4.146	0.000
130.00	-14.928	-7.116	0.000	0.000	0.000	-188.64	-59.444	0.000	59.444	-4.181	0.000
131.00	-12.251	-6.187	0.000	0.000	0.000	-173.71	-60.321	0.000	60.321	-4.196	0.000
132.08	-12.161	-5.990	0.000	0.000	0.000	-160.44	-61.274	0.000	61.274	-4.212	0.000
135.00	-11.936	-5.719	0.000	0.000	0.000	-124.97	-63.857	0.000	63.857	-4.248	0.000
140.00	-11.551	-5.276	0.000	0.000	0.000	-65.301	-68.337	0.000	68.337	-4.305	0.000
141.00	-5.701	-2.904	0.000	0.000	0.000	-53.750	-69.240	0.000	69.240	-4.313	0.000
145.00	-5.406	-2.621	0.000	0.000	0.000	-30.947	-72.861	0.000	72.861	-4.337	0.000
150.00	-5.191	0.000	0.000	0.000	0.000	-3.919	0.000	0.000	77.408	-4.350	0.000

## Resulting Stresses

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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**Load Case:** 80 mph Wind with 0" Ice

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



**Iterations:** 23

### 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.62	0.97	0.00	0.00	0.00	43.49	44.14	44.8	0.986
5.00	0.61	0.97	0.00	0.00	0.00	43.21	43.85	45.3	0.967
10.00	0.60	0.98	0.00	0.00	0.00	42.90	43.53	45.9	0.949
15.00	0.59	0.99	0.00	0.00	0.00	42.55	43.18	46.4	0.930
20.00	0.58	1.00	0.00	0.00	0.00	42.17	42.79	47.0	0.910
25.00	0.57	1.00	0.00	0.00	0.00	41.75	42.36	47.6	0.891
30.00	0.56	1.01	0.00	0.00	0.00	41.28	41.88	48.1	0.870
35.00	0.55	1.02	0.00	0.00	0.00	40.76	41.35	48.7	0.850
40.00	0.54	1.03	0.00	0.00	0.00	40.18	40.76	49.2	0.828
41.50	0.54	1.03	0.00	0.00	0.00	40.00	40.58	49.4	0.822
45.00	0.52	1.04	0.00	0.00	0.00	39.55	40.11	49.8	0.806
48.00	0.50	1.03	0.00	0.00	0.00	38.18	38.71	50.1	0.773
50.00	0.49	1.03	0.00	0.00	0.00	37.89	38.42	50.0	0.768
55.00	0.48	1.04	0.00	0.00	0.00	37.11	37.63	50.6	0.744
60.00	0.47	1.05	0.00	0.00	0.00	36.25	36.76	51.1	0.719
65.00	0.46	1.06	0.00	0.00	0.00	35.30	35.80	51.7	0.693
70.00	0.44	1.07	0.00	0.00	0.00	34.26	34.75	52.0	0.669
75.00	0.43	1.07	0.00	0.00	0.00	33.10	33.59	52.0	0.646
80.00	0.42	1.08	0.00	0.00	0.00	31.83	32.31	52.0	0.622
84.08	0.41	1.09	0.00	0.00	0.00	30.70	31.17	52.0	0.600
85.00	0.41	1.09	0.00	0.00	0.00	30.44	30.90	52.0	0.594
89.50	0.47	1.36	0.00	0.00	0.00	35.28	35.83	52.0	0.689
90.00	0.47	1.36	0.00	0.00	0.00	35.08	35.63	49.2	0.724
95.00	0.46	1.37	0.00	0.00	0.00	32.96	33.51	49.9	0.671
100.00	0.45	1.38	0.00	0.00	0.00	30.61	31.15	50.6	0.616
105.00	0.43	1.40	0.00	0.00	0.00	27.99	28.53	51.3	0.556
110.00	0.42	1.41	0.00	0.00	0.00	25.07	25.61	52.0	0.493
115.00	0.41	1.43	0.00	0.00	0.00	21.81	22.36	52.0	0.430
120.00	0.40	1.45	0.00	0.00	0.00	18.15	18.71	52.0	0.360
123.00	0.30	1.16	0.00	0.00	0.00	15.75	16.17	52.0	0.311
125.00	0.30	1.16	0.00	0.00	0.00	14.49	14.92	52.0	0.287
127.92	0.29	1.17	0.00	0.00	0.00	12.54	12.99	52.0	0.250
130.00	0.28	1.17	0.00	0.00	0.00	11.08	11.53	52.0	0.222
131.00	0.24	0.97	0.00	0.00	0.00	10.35	10.72	52.0	0.206
132.08	0.31	1.28	0.00	0.00	0.00	12.57	13.07	52.0	0.251
135.00	0.30	1.28	0.00	0.00	0.00	10.22	10.75	48.9	0.220
140.00	0.29	1.29	0.00	0.00	0.00	5.75	6.44	49.8	0.129
141.00	0.16	0.64	0.00	0.00	0.00	4.81	5.09	50.0	0.102
145.00	0.15	0.63	0.00	0.00	0.00	2.95	3.28	50.7	0.065
150.00	0.00	0.63	0.00	0.00	0.00	0.40	1.16	51.6	0.022

## Wind Loading - Shaft

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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**Load Case:** 69.28 mph Wind with 0.5" Ice

**Iterations:** 23

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



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	12.287	20.77	355.06	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	348.38	0.650	0.500	5.00	25.801	16.77	348.2	187.7	1210.5
10.00		0.00	1.00	12.287	20.77	341.70	0.650	0.500	5.00	25.319	16.46	341.7	184.2	1187.4
15.00		0.00	1.00	12.287	20.77	335.02	0.650	0.500	5.00	24.837	16.14	335.2	180.6	1164.3
20.00		0.00	1.00	12.287	20.77	328.35	0.650	0.500	5.00	24.355	15.83	328.7	177.0	1141.3
25.00		0.00	1.00	12.287	20.77	321.67	0.650	0.500	5.00	23.873	15.52	322.2	173.5	1118.2
30.00		0.00	1.00	12.287	20.77	314.99	0.650	0.500	5.00	23.391	15.20	315.7	169.9	1095.1
35.00		0.00	1.02	12.496	21.12	310.91	0.650	0.500	5.00	22.909	14.89	314.5	166.3	1072.0
40.00		0.00	1.06	12.982	21.94	310.04	0.650	0.500	5.00	22.427	14.58	319.8	162.8	1048.9
41.50 Bot - Section 2		0.00	1.07	13.119	22.17	309.60	0.650	0.500	1.50	6.634	4.31	95.6	48.5	310.5
45.00		0.00	1.09	13.426	22.69	308.32	0.650	0.500	3.50	15.493	10.07	228.5	112.8	1329.3
48.00 Top - Section 1		0.00	1.11	13.676	23.11	306.94	0.650	0.500	3.00	13.092	8.51	196.7	95.4	1122.9
50.00		0.00	1.13	13.836	23.38	309.73	0.650	0.500	2.00	8.631	5.61	131.2	63.0	403.7
55.00		0.00	1.16	14.218	24.03	306.79	0.650	0.500	5.00	21.241	13.81	331.8	154.0	992.1
60.00		0.00	1.19	14.576	24.63	303.36	0.650	0.500	5.00	20.759	13.49	332.4	150.4	969.0
65.00		0.00	1.21	14.913	25.20	299.49	0.650	0.500	5.00	20.277	13.18	332.2	146.8	945.9
70.00		0.00	1.24	15.232	25.74	295.24	0.650	0.500	5.00	19.795	12.87	331.2	143.3	922.8
75.00		0.00	1.26	15.536	26.26	290.66	0.650	0.500	5.00	19.313	12.55	329.6	139.7	899.7
80.00		0.00	1.29	15.825	26.74	285.77	0.650	0.500	5.00	18.831	12.24	327.3	136.1	876.6
84.08 Bot - Section 3		0.00	1.31	16.051	27.13	281.57	0.650	0.500	4.08	15.021	9.76	264.9	108.8	699.1
85.00		0.00	1.31	16.101	27.21	280.61	0.650	0.500	0.92	3.366	2.19	59.5	24.6	261.3
89.50 Top - Section 2		0.00	1.33	16.340	27.61	275.75	0.650	0.500	4.50	16.290	10.59	292.4	117.8	1262.6
90.00		0.00	1.33	16.366	27.66	278.53	0.650	0.500	0.50	1.786	1.16	32.1	13.1	69.2
95.00		0.00	1.35	16.621	28.09	272.93	0.650	0.500	5.00	17.593	11.44	321.2	127.0	680.1
100.00		0.00	1.37	16.866	28.50	267.11	0.650	0.500	5.00	17.111	11.12	317.0	123.4	660.9
105.00		0.00	1.39	17.103	28.90	261.10	0.650	0.500	5.00	16.629	10.81	312.4	119.8	641.7
110.00		0.00	1.41	17.332	29.29	254.91	0.650	0.500	5.00	16.147	10.50	307.4	116.3	622.6
115.00		0.00	1.43	17.554	29.67	248.55	0.650	0.500	5.00	15.665	10.18	302.1	112.7	603.4
120.00		0.00	1.45	17.768	30.03	242.03	0.650	0.500	5.00	15.183	9.87	296.4	109.1	584.2
123.00 Appurtenance(s)		0.00	1.46	17.894	30.24	238.05	0.650	0.500	3.00	8.879	5.77	174.5	64.2	341.7
125.00		0.00	1.46	17.977	30.38	235.37	0.650	0.500	2.00	5.823	3.78	115.0	42.2	224.1
127.92 Bot - Section 4		0.00	1.47	18.096	30.58	231.42	0.650	0.500	2.92	8.353	5.43	166.0	60.4	321.2
130.00		0.00	1.48	18.179	30.72	228.57	0.650	0.500	2.08	5.931	3.86	118.4	43.0	365.1
131.00 Appurtenance(s)		0.00	1.48	18.219	30.79	227.19	0.650	0.500	1.00	2.817	1.83	56.4	20.5	173.4
132.08 Top - Section 3		0.00	1.49	18.262	30.86	225.69	0.650	0.500	1.08	3.030	1.97	60.8	22.0	186.5
135.00		0.00	1.50	18.376	31.06	224.28	0.650	0.500	2.92	8.046	5.23	162.4	58.1	246.6
140.00		0.00	1.51	18.568	31.38	217.24	0.650	0.500	5.00	13.412	8.72	273.6	96.0	409.9
141.00 Appurtenance(s)		0.00	1.51	18.606	31.44	215.82	0.650	0.500	1.00	2.624	1.71	53.6	19.1	80.4
145.00		0.00	1.53	18.755	31.70	210.08	0.650	0.500	4.00	10.305	6.70	212.3	73.9	314.7
150.00 Appurtenance(s)		0.00	1.54	18.938	32.01	202.81	0.650	0.500	5.00	12.448	8.09	259.0	88.9	379.3
<b>Totals:</b>									<b>150.00</b>			<b>9,420.1</b>	<b>26,938.5</b>	

## Discrete Appurtenance Forces

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/14/2015

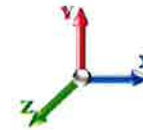


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**Load Case:** 69.28 mph Wind with 0.5" Ice

**Dead Load Factor** 1.00

**Wind Load Factor** 1.00



**Iterations:** 23

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	150.00	Kathrein 800-10121	3	18.974	32.066	0.92	16.88	303.60	0.000	1.000	541.32	0.00	541.32
2	150.00	Andrew ABT-DRDM-ADBH	3	18.974	32.066	1.00	0.33	5.40	0.000	1.000	10.58	0.00	10.58
3	150.00	CCI DTMABP7819VG12A	3	18.974	32.066	0.70	2.86	79.50	0.000	1.000	91.58	0.00	91.58
4	150.00	CSS DBC-750	3	18.974	32.066	0.70	1.39	23.10	0.000	1.000	44.44	0.00	44.44
5	150.00	Ericsson RUS-01	6	18.974	32.066	0.79	14.88	396.00	0.000	1.000	477.26	0.00	477.26
6	150.00	Kathrein 782 10250	3	18.974	32.066	0.53	1.10	30.00	0.000	1.000	35.18	0.00	35.18
7	150.00	Raycap DC6-48-60-18-8F	1	18.974	32.066	1.00	1.67	49.50	0.000	1.000	53.55	0.00	53.55
8	150.00	Kathrein 860 1006	12	18.974	32.066	0.95	3.19	33.60	0.000	1.000	102.35	0.00	102.35
9	150.00	KMW	2	18.974	32.066	0.90	16.25	248.40	0.000	1.000	521.18	0.00	521.18
10	150.00	LMU	1	18.974	32.066	1.00	0.93	35.30	0.000	1.000	29.82	0.00	29.82
11	150.00	Low Profile Platform	1	18.938	32.005	1.00	27.00	1800.00	0.000	0.000	864.14	0.00	0.00
12	150.00	Powerwave P65-17-XLH-RR	4	18.974	32.066	0.92	45.40	643.20	0.000	1.000	1455.70	0.00	1455.70
13	141.00	RFS DB-T1-6Z-8AB-0Z	1	18.606	31.444	0.99	4.99	51.10	0.000	0.000	156.90	0.00	0.00
14	141.00	RFS DB-T1-6Z-8AB-0Z	1	18.606	31.444	0.99	4.99	51.10	0.000	0.000	156.90	0.00	0.00
15	141.00	Low Profile Platform	1	18.606	31.444	1.00	27.00	1800.00	0.000	0.000	849.00	0.00	0.00
16	141.00	Commscope SBNHH-1D65B	6	18.606	31.444	0.93	49.15	775.80	0.000	0.000	1545.40	0.00	0.00
17	141.00	Antel	3	18.606	31.444	1.04	13.38	186.00	0.000	0.000	420.64	0.00	0.00
18	141.00	Antel	3	18.606	31.444	0.89	21.92	267.30	0.000	0.000	689.35	0.00	0.00
19	141.00	Alcatel Lucent	3	18.606	31.444	0.79	10.03	240.30	0.000	0.000	315.23	0.00	0.00
20	141.00	Alcatel Lucent RRH2X60-700	3	18.606	31.444	0.79	10.03	240.30	0.000	0.000	315.23	0.00	0.00
21	141.00	Alcatel Lucent	3	18.606	31.444	0.90	7.44	212.70	0.000	0.000	233.80	0.00	0.00
22	131.00	Kathrein 782 11056	3	18.219	30.790	0.79	1.97	46.80	0.000	0.000	60.57	0.00	0.00
23	131.00	Commscope LNX-6515DS	3	18.219	30.790	0.95	34.15	465.00	0.000	0.000	1051.52	0.00	0.00
24	131.00	Ericsson KRY 144/1	3	18.219	30.790	0.73	1.20	42.30	0.000	0.000	37.09	0.00	0.00
25	131.00	RFS	3	18.219	30.790	0.78	18.23	312.00	0.000	0.000	561.26	0.00	0.00
26	131.00	RFS ATM1412D-1A20	3	18.219	30.790	0.76	3.17	61.80	0.000	0.000	97.58	0.00	0.00
27	131.00	T-Arms (Site Pro P/N	3	18.219	30.790	0.90	28.35	1260.00	0.000	0.000	872.91	0.00	0.00
28	123.00	RFS APXVTM14-C-I30	3	17.894	30.241	0.88	20.17	373.20	0.000	0.000	610.05	0.00	0.00
29	123.00	RFS APXVSP18-C-A20	3	17.894	30.241	0.83	21.79	405.60	0.000	0.000	658.96	0.00	0.00
30	123.00	RFS ACU-A20-N	4	17.894	30.241	0.82	0.72	9.20	0.000	0.000	21.82	0.00	0.00
31	123.00	Low Profile Platform	1	17.894	30.241	1.00	27.00	1800.00	0.000	0.000	816.51	0.00	0.00
32	123.00	Alcatel Lucent	3	17.894	30.241	0.75	11.18	276.00	0.000	0.000	338.17	0.00	0.00
33	123.00	Alcatel Lucent 800 MHz	6	17.894	30.241	0.95	16.07	444.60	0.000	0.000	486.09	0.00	0.00
34	123.00	Alcatel Lucent 1900 MHz	3	17.894	30.241	1.00	9.21	249.30	0.000	0.000	278.52	0.00	0.00
<b>Totals:</b>							<b>13,218.00</b>				<b>14,800.62</b>		

## Total Applied Force Summary

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

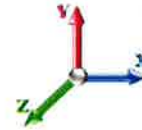
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**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

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		348.25	1427.76	0.00	0.00
10.00		341.74	1404.67	0.00	0.00
15.00		335.23	1381.58	0.00	0.00
20.00		328.73	1358.48	0.00	0.00
25.00		322.22	1335.39	0.00	0.00
30.00		315.72	1312.30	0.00	0.00
35.00		314.45	1289.21	0.00	0.00
40.00		319.81	1266.12	0.00	0.00
41.50		95.60	375.71	0.00	0.00
45.00		228.49	1481.38	0.00	0.00
48.00		196.67	1253.25	0.00	0.00
50.00		131.19	490.62	0.00	0.00
55.00		331.76	1209.33	0.00	0.00
60.00		332.39	1186.24	0.00	0.00
65.00		332.18	1163.14	0.00	0.00
70.00		331.22	1140.05	0.00	0.00
75.00		329.59	1116.96	0.00	0.00
80.00		327.35	1093.87	0.00	0.00
84.08		264.86	876.47	0.00	0.00
85.00		59.54	301.10	0.00	0.00
89.50		292.39	1458.11	0.00	0.00
90.00		32.11	90.95	0.00	0.00
95.00		321.22	897.35	0.00	0.00
100.00		317.04	878.16	0.00	0.00
105.00		312.43	858.97	0.00	0.00
110.00		307.43	839.79	0.00	0.00
115.00		302.07	820.60	0.00	0.00
120.00		296.36	801.42	0.00	0.00
123.00	(23) appurtenances	3384.65	4029.97	0.00	0.00
125.00		114.98	303.39	0.00	0.00
127.92		166.05	436.74	0.00	0.00
130.00		118.45	447.69	0.00	0.00
131.00	(18) appurtenances	2737.30	2400.96	0.00	0.00
132.08		60.79	219.28	0.00	0.00
135.00		162.42	334.87	0.00	0.00
140.00		273.56	561.23	0.00	0.00
141.00	(24) appurtenances	4736.10	3935.30	0.00	0.00
145.00		212.32	377.10	0.00	0.00
150.00	(42) appurtenances	4486.07	4104.86	0.00	3362.98
	<b>Totals:</b>	<b>24,220.75</b>	<b>46,260.37</b>	<b>0.00</b>	<b>3,362.98</b>

## Resulting Forces and Deflections

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/14/2015

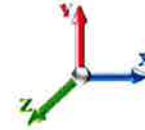
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**Load Case:** 69.28 mph Wind with 0.5" Ice

**Iterations:** 23

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



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	-24.278	-46.230	0.000	0.000	0.000	-2857.5	0.000	0.000	0.000	0.000	0.000
5.00	-24.037	-44.744	0.000	0.000	0.000	-2736.1	-0.075	0.000	0.075	-0.139	0.000
10.00	-23.797	-43.282	0.000	0.000	0.000	-2615.9	-0.296	0.000	0.296	-0.279	0.000
15.00	-23.558	-41.844	0.000	0.000	0.000	-2496.9	-0.665	0.000	0.665	-0.421	0.000
20.00	-23.319	-40.430	0.000	0.000	0.000	-2379.1	-1.183	0.000	1.183	-0.565	0.000
25.00	-23.082	-39.039	0.000	0.000	0.000	-2262.5	-1.854	0.000	1.854	-0.711	0.000
30.00	-22.846	-37.673	0.000	0.000	0.000	-2147.1	-2.677	0.000	2.677	-0.858	0.000
35.00	-22.605	-36.330	0.000	0.000	0.000	-2032.9	-3.656	0.000	3.656	-1.007	0.000
40.00	-22.321	-35.032	0.000	0.000	0.000	-1919.9	-4.791	0.000	4.791	-1.157	0.000
41.50	-22.264	-34.629	0.000	0.000	0.000	-1886.4	-5.162	0.000	5.162	-1.203	0.000
45.00	-22.061	-33.114	0.000	0.000	0.000	-1808.5	-6.085	0.000	6.085	-1.310	0.000
48.00	-21.877	-31.837	0.000	0.000	0.000	-1742.3	-6.938	0.000	6.938	-1.402	0.000
50.00	-21.792	-31.309	0.000	0.000	0.000	-1698.5	-7.539	0.000	7.539	-1.464	0.000
55.00	-21.505	-30.054	0.000	0.000	0.000	-1589.6	-9.152	0.000	9.152	-1.611	0.000
60.00	-21.212	-28.824	0.000	0.000	0.000	-1482.1	-10.919	0.000	10.919	-1.759	0.000
65.00	-20.914	-27.618	0.000	0.000	0.000	-1376.0	-12.840	0.000	12.840	-1.906	0.000
70.00	-20.611	-26.438	0.000	0.000	0.000	-1271.4	-14.916	0.000	14.916	-2.053	0.000
75.00	-20.304	-25.282	0.000	0.000	0.000	-1168.4	-17.144	0.000	17.144	-2.199	0.000
80.00	-19.989	-24.157	0.000	0.000	0.000	-1066.9	-19.525	0.000	19.525	-2.343	0.000
84.08	-19.716	-23.268	0.000	0.000	0.000	-985.30	-21.581	0.000	21.581	-2.460	0.000
85.00	-19.675	-22.943	0.000	0.000	0.000	-967.23	-22.056	0.000	22.056	-2.487	0.000
89.50	-19.344	-21.476	0.000	0.000	0.000	-878.70	-24.461	0.000	24.461	-2.613	0.000
90.00	-19.341	-21.356	0.000	0.000	0.000	-869.02	-24.736	0.000	24.736	-2.627	0.000
95.00	-19.035	-20.422	0.000	0.000	0.000	-772.32	-27.575	0.000	27.575	-2.790	0.000
100.00	-18.726	-19.512	0.000	0.000	0.000	-677.15	-30.581	0.000	30.581	-2.946	0.000
105.00	-18.415	-18.624	0.000	0.000	0.000	-583.52	-33.746	0.000	33.746	-3.094	0.000
110.00	-18.103	-17.761	0.000	0.000	0.000	-491.45	-37.061	0.000	37.061	-3.232	0.000
115.00	-17.789	-16.922	0.000	0.000	0.000	-400.93	-40.514	0.000	40.514	-3.358	0.000
120.00	-17.469	-16.115	0.000	0.000	0.000	-311.99	-44.091	0.000	44.091	-3.468	0.000
123.00	-13.855	-12.288	0.000	0.000	0.000	-259.58	-46.289	0.000	46.289	-3.527	0.000
125.00	-13.730	-11.982	0.000	0.000	0.000	-231.88	-47.774	0.000	47.774	-3.563	0.000
127.92	-13.544	-11.548	0.000	0.000	0.000	-191.83	-49.964	0.000	49.964	-3.609	0.000
130.00	-13.402	-11.103	0.000	0.000	0.000	-163.61	-51.546	0.000	51.546	-3.639	0.000
131.00	-10.519	-8.879	0.000	0.000	0.000	-150.21	-52.309	0.000	52.309	-3.652	0.000
132.08	-10.448	-8.660	0.000	0.000	0.000	-138.82	-53.139	0.000	53.139	-3.666	0.000
135.00	-10.271	-8.328	0.000	0.000	0.000	-108.34	-55.388	0.000	55.388	-3.698	0.000
140.00	-9.965	-7.782	0.000	0.000	0.000	-56.993	-59.289	0.000	59.289	-3.747	0.000
141.00	-4.983	-4.164	0.000	0.000	0.000	-47.028	-60.074	0.000	60.074	-3.754	0.000
145.00	-4.747	-3.800	0.000	0.000	0.000	-27.098	-63.227	0.000	63.227	-3.775	0.000
150.00	-4.486	0.000	0.000	0.000	0.000	-3.363	0.000	0.000	67.186	-3.786	0.000

## Resulting Stresses

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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**Load Case:** 69.28 mph Wind with 0.5" Ice

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



**Iterations:** 23

### 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.76	0.81	0.00	0.00	0.00	37.30	38.09	44.8	0.850
5.00	0.75	0.81	0.00	0.00	0.00	37.11	37.88	45.3	0.836
10.00	0.74	0.82	0.00	0.00	0.00	36.89	37.66	45.9	0.820
15.00	0.73	0.83	0.00	0.00	0.00	36.64	37.40	46.4	0.805
20.00	0.72	0.84	0.00	0.00	0.00	36.36	37.11	47.0	0.789
25.00	0.71	0.85	0.00	0.00	0.00	36.04	36.78	47.6	0.773
30.00	0.70	0.86	0.00	0.00	0.00	35.68	36.41	48.1	0.757
35.00	0.69	0.87	0.00	0.00	0.00	35.27	36.00	48.7	0.740
40.00	0.68	0.87	0.00	0.00	0.00	34.82	35.53	49.2	0.722
41.50	0.68	0.88	0.00	0.00	0.00	34.67	35.38	49.4	0.717
45.00	0.66	0.88	0.00	0.00	0.00	34.31	35.01	49.8	0.703
48.00	0.63	0.88	0.00	0.00	0.00	33.15	33.82	50.1	0.675
50.00	0.63	0.88	0.00	0.00	0.00	32.92	33.58	50.0	0.671
55.00	0.62	0.89	0.00	0.00	0.00	32.28	32.93	50.6	0.651
60.00	0.61	0.90	0.00	0.00	0.00	31.57	32.21	51.1	0.630
65.00	0.60	0.91	0.00	0.00	0.00	30.78	31.42	51.7	0.608
70.00	0.58	0.92	0.00	0.00	0.00	29.91	30.54	52.0	0.587
75.00	0.57	0.93	0.00	0.00	0.00	28.94	29.56	52.0	0.569
80.00	0.56	0.94	0.00	0.00	0.00	27.86	28.47	52.0	0.548
84.08	0.55	0.95	0.00	0.00	0.00	26.90	27.50	52.0	0.529
85.00	0.55	0.95	0.00	0.00	0.00	26.67	27.27	52.0	0.525
89.50	0.65	1.18	0.00	0.00	0.00	30.94	31.66	52.0	0.609
90.00	0.65	1.18	0.00	0.00	0.00	30.77	31.49	49.2	0.640
95.00	0.64	1.20	0.00	0.00	0.00	28.94	29.65	49.9	0.594
100.00	0.63	1.21	0.00	0.00	0.00	26.90	27.60	50.6	0.546
105.00	0.62	1.23	0.00	0.00	0.00	24.61	25.32	51.3	0.494
110.00	0.61	1.25	0.00	0.00	0.00	22.05	22.76	52.0	0.438
115.00	0.60	1.26	0.00	0.00	0.00	19.18	19.90	52.0	0.383
120.00	0.59	1.28	0.00	0.00	0.00	15.94	16.68	52.0	0.321
123.00	0.46	1.04	0.00	0.00	0.00	13.81	14.38	52.0	0.277
125.00	0.45	1.04	0.00	0.00	0.00	12.69	13.26	52.0	0.255
127.92	0.44	1.05	0.00	0.00	0.00	10.93	11.52	52.0	0.222
130.00	0.43	1.05	0.00	0.00	0.00	9.61	10.20	52.0	0.196
131.00	0.35	0.83	0.00	0.00	0.00	8.95	9.41	52.0	0.181
132.08	0.45	1.10	0.00	0.00	0.00	10.88	11.49	52.0	0.221
135.00	0.44	1.10	0.00	0.00	0.00	8.86	9.49	48.9	0.194
140.00	0.43	1.11	0.00	0.00	0.00	5.02	5.78	49.8	0.116
141.00	0.23	0.56	0.00	0.00	0.00	4.21	4.54	50.0	0.091
145.00	0.22	0.55	0.00	0.00	0.00	2.58	2.96	50.7	0.058
150.00	0.00	0.54	0.00	0.00	0.00	0.35	1.00	51.6	0.019

## Wind Loading - Shaft

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/14/2015

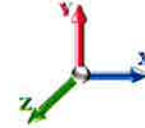
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**Load Case:** 50 mph Wind with 0" Ice

**Iterations:** 22

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



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	6.400	10.82	256.25	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	251.43	0.650	0.000	5.00	25.384	16.50	178.5	0.0	1022.8
10.00		0.00	1.00	6.400	10.82	246.61	0.650	0.000	5.00	24.902	16.19	175.1	0.0	1003.3
15.00		0.00	1.00	6.400	10.82	241.79	0.650	0.000	5.00	24.420	15.87	171.7	0.0	983.7
20.00		0.00	1.00	6.400	10.82	236.97	0.650	0.000	5.00	23.938	15.56	168.3	0.0	964.2
25.00		0.00	1.00	6.400	10.82	232.15	0.650	0.000	5.00	23.456	15.25	164.9	0.0	944.7
30.00		0.00	1.00	6.400	10.82	227.33	0.650	0.000	5.00	22.974	14.93	161.5	0.0	925.2
35.00		0.00	1.02	6.509	11.00	224.39	0.650	0.000	5.00	22.492	14.62	160.8	0.0	905.7
40.00		0.00	1.06	6.762	11.43	223.76	0.650	0.000	5.00	22.010	14.31	163.5	0.0	886.1
41.50 Bot - Section 2		0.00	1.07	6.833	11.55	223.44	0.650	0.000	1.50	6.509	4.23	48.9	0.0	262.0
45.00		0.00	1.09	6.993	11.82	222.51	0.650	0.000	3.50	15.201	9.88	116.8	0.0	1216.5
48.00 Top - Section 1		0.00	1.11	7.123	12.04	221.52	0.650	0.000	3.00	12.842	8.35	100.5	0.0	1027.5
50.00		0.00	1.13	7.207	12.18	223.54	0.650	0.000	2.00	8.465	5.50	67.0	0.0	340.7
55.00		0.00	1.16	7.406	12.52	221.42	0.650	0.000	5.00	20.824	13.54	169.4	0.0	838.1
60.00		0.00	1.19	7.592	12.83	218.94	0.650	0.000	5.00	20.342	13.22	169.7	0.0	818.6
65.00		0.00	1.21	7.768	13.13	216.14	0.650	0.000	5.00	19.860	12.91	169.5	0.0	799.1
70.00		0.00	1.24	7.934	13.41	213.08	0.650	0.000	5.00	19.378	12.60	168.9	0.0	779.6
75.00		0.00	1.26	8.092	13.68	209.77	0.650	0.000	5.00	18.896	12.28	168.0	0.0	760.0
80.00		0.00	1.29	8.242	13.93	206.24	0.650	0.000	5.00	18.414	11.97	166.7	0.0	740.5
84.08 Bot - Section 3		0.00	1.31	8.361	14.13	203.21	0.650	0.000	4.08	14.681	9.54	134.8	0.0	590.3
85.00		0.00	1.31	8.387	14.17	202.52	0.650	0.000	0.92	3.290	2.14	30.3	0.0	236.7
89.50 Top - Section 2		0.00	1.33	8.511	14.38	199.01	0.650	0.000	4.50	15.915	10.34	148.8	0.0	1144.8
90.00		0.00	1.33	8.525	14.41	201.02	0.650	0.000	0.50	1.744	1.13	16.3	0.0	56.2
95.00		0.00	1.35	8.657	14.63	196.97	0.650	0.000	5.00	17.177	11.16	163.4	0.0	553.2
100.00		0.00	1.37	8.785	14.85	192.77	0.650	0.000	5.00	16.695	10.85	161.1	0.0	537.5
105.00		0.00	1.39	8.908	15.06	188.44	0.650	0.000	5.00	16.213	10.54	158.7	0.0	521.9
110.00		0.00	1.41	9.028	15.26	183.97	0.650	0.000	5.00	15.731	10.22	156.0	0.0	506.3
115.00		0.00	1.43	9.143	15.45	179.38	0.650	0.000	5.00	15.249	9.91	153.2	0.0	490.7
120.00		0.00	1.45	9.255	15.64	174.68	0.650	0.000	5.00	14.767	9.60	150.1	0.0	475.1
123.00 Appurtenance(s)		0.00	1.46	9.320	15.75	171.80	0.650	0.000	3.00	8.629	5.61	88.3	0.0	277.5
125.00		0.00	1.46	9.363	15.82	169.87	0.650	0.000	2.00	5.656	3.68	58.2	0.0	181.9
127.92 Bot - Section 4		0.00	1.47	9.425	15.93	167.02	0.650	0.000	2.92	8.110	5.27	84.0	0.0	260.8
130.00		0.00	1.48	9.469	16.00	164.96	0.650	0.000	2.08	5.758	3.74	59.9	0.0	322.2
131.00 Appurtenance(s)		0.00	1.48	9.490	16.04	163.97	0.650	0.000	1.00	2.734	1.78	28.5	0.0	152.9
132.08 Top - Section 3		0.00	1.49	9.512	16.08	162.89	0.650	0.000	1.08	2.940	1.91	30.7	0.0	164.5
135.00		0.00	1.50	9.572	16.18	161.87	0.650	0.000	2.92	7.803	5.07	82.0	0.0	188.5
140.00		0.00	1.51	9.672	16.35	156.79	0.650	0.000	5.00	12.995	8.45	138.1	0.0	313.9
141.00 Appurtenance(s)		0.00	1.51	9.691	16.38	155.76	0.650	0.000	1.00	2.541	1.65	27.1	0.0	61.4
145.00		0.00	1.53	9.769	16.51	151.62	0.650	0.000	4.00	9.972	6.48	107.0	0.0	240.8
150.00 Appurtenance(s)		0.00	1.54	9.864	16.67	146.37	0.650	0.000	5.00	12.031	7.82	130.4	0.0	290.5
<b>Totals:</b>									<b>150.00</b>			<b>4,796.3</b>		<b>22,785.8</b>



## Discrete Appurtenance Forces

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

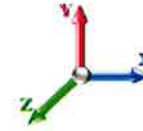
**Code:** EIA/TIA-222-F  
**Exposure:** C  
**Gh:** 1.69  
**Struct Class:** II

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**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

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	150.00	Kathrein 800-10121	3	9.883	16.702	0.90	15.05	187.20	0.000	1.000	251.39	0.00	251.39
2	150.00	Andrew ABT-DRDM-ADBH	3	9.883	16.702	0.98	0.15	3.30	0.000	1.000	2.46	0.00	2.46
3	150.00	CCI DTMAPB7819VG12A	3	9.883	16.702	0.67	2.29	57.60	0.000	1.000	38.27	0.00	38.27
4	150.00	CSS DBC-750	3	9.883	16.702	0.67	1.03	14.40	0.000	1.000	17.12	0.00	17.12
5	150.00	Ericsson RUS-01	6	9.883	16.702	0.76	13.41	304.20	0.000	1.000	223.91	0.00	223.91
6	150.00	Kathrein 782 10250	3	9.883	16.702	0.50	0.78	19.20	0.000	1.000	13.03	0.00	13.03
7	150.00	Raycap DC6-48-60-18-8F	1	9.883	16.702	1.00	1.47	31.80	0.000	1.000	24.55	0.00	24.55
8	150.00	Kathrein 860 1006	12	9.883	16.702	0.92	1.99	14.40	0.000	1.000	33.19	0.00	33.19
9	150.00	KMW	2	9.883	16.702	0.87	14.32	141.00	0.000	1.000	239.22	0.00	239.22
10	150.00	LMU	1	9.883	16.702	1.00	0.88	28.00	0.000	1.000	14.70	0.00	14.70
11	150.00	Low Profile Platform	1	9.864	16.670	1.00	22.00	1500.00	0.000	0.000	366.75	0.00	0.00
12	150.00	Powerwave P65-17-XLH-RR	4	9.883	16.702	0.88	40.29	353.20	0.000	1.000	672.98	0.00	672.98
13	141.00	RFS DB-T1-6Z-8AB-0Z	1	9.691	16.378	0.96	4.59	21.40	0.000	0.000	75.16	0.00	0.00
14	141.00	RFS DB-T1-6Z-8AB-0Z	1	9.691	16.378	0.96	4.59	21.40	0.000	0.000	75.16	0.00	0.00
15	141.00	Low Profile Platform	1	9.691	16.378	1.00	22.00	1500.00	0.000	0.000	360.32	0.00	0.00
16	141.00	Commscope SBNHH-1D65B	6	9.691	16.378	0.91	45.22	436.20	0.000	0.000	740.60	0.00	0.00
17	141.00	Antel	3	9.691	16.378	1.02	11.93	90.90	0.000	0.000	195.46	0.00	0.00
18	141.00	Antel	3	9.691	16.378	0.86	20.00	117.00	0.000	0.000	327.48	0.00	0.00
19	141.00	Alcatel Lucent	3	9.691	16.378	0.76	9.03	180.00	0.000	0.000	147.88	0.00	0.00
20	141.00	Alcatel Lucent RRH2X60-700	3	9.691	16.378	0.76	9.03	180.00	0.000	0.000	147.88	0.00	0.00
21	141.00	Alcatel Lucent	3	9.691	16.378	0.89	6.88	165.00	0.000	0.000	112.64	0.00	0.00
22	131.00	Kathrein 782 11056	3	9.490	16.038	0.76	1.50	33.00	0.000	0.000	24.13	0.00	0.00
23	131.00	Commscope LNX-6515DS	3	9.490	16.038	0.92	31.57	237.30	0.000	0.000	506.27	0.00	0.00
24	131.00	Ericsson KRY 144/1	3	9.490	16.038	0.70	0.86	33.00	0.000	0.000	13.81	0.00	0.00
25	131.00	RFS	3	9.490	16.038	0.74	16.38	188.10	0.000	0.000	262.74	0.00	0.00
26	131.00	RFS ATM1412D-1A20	3	9.490	16.038	0.73	2.56	39.00	0.000	0.000	41.09	0.00	0.00
27	131.00	T-Arms (Site Pro P/N	3	9.490	16.038	0.90	8.78	396.00	0.000	0.000	140.73	0.00	0.00
28	123.00	RFS APXVTM14-C-I30	3	9.320	15.751	0.85	18.30	234.00	0.000	0.000	288.27	0.00	0.00
29	123.00	RFS APXVSP18-C-A20	3	9.320	15.751	0.91	22.45	237.00	0.000	0.000	353.63	0.00	0.00
30	123.00	RFS ACU-A20-N	4	9.320	15.751	0.79	0.44	4.00	0.000	0.000	6.97	0.00	0.00
31	123.00	Low Profile Platform	1	9.320	15.751	1.00	22.00	1500.00	0.000	0.000	346.53	0.00	0.00
32	123.00	Alcatel Lucent	3	9.320	15.751	0.69	9.77	210.00	0.000	0.000	153.90	0.00	0.00
33	123.00	Alcatel Lucent 800 MHz	6	9.320	15.751	0.92	13.74	318.00	0.000	0.000	216.50	0.00	0.00
34	123.00	Alcatel Lucent 1900 MHz	3	9.320	15.751	0.98	7.97	180.00	0.000	0.000	125.50	0.00	0.00
<b>Totals:</b>								<b>8,975.60</b>			<b>6,560.21</b>		

## Total Applied Force Summary

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

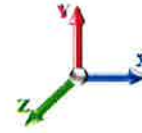
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**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		178.46	1240.01	0.00	0.00
10.00		175.07	1220.49	0.00	0.00
15.00		171.68	1200.97	0.00	0.00
20.00		168.29	1181.45	0.00	0.00
25.00		164.91	1161.93	0.00	0.00
30.00		161.52	1142.41	0.00	0.00
35.00		160.81	1122.88	0.00	0.00
40.00		163.48	1103.36	0.00	0.00
41.50		48.86	327.20	0.00	0.00
45.00		116.77	1368.60	0.00	0.00
48.00		100.48	1157.86	0.00	0.00
50.00		67.01	427.60	0.00	0.00
55.00		169.41	1055.35	0.00	0.00
60.00		169.65	1035.83	0.00	0.00
65.00		169.47	1016.31	0.00	0.00
70.00		168.89	996.78	0.00	0.00
75.00		167.97	977.26	0.00	0.00
80.00		166.73	957.74	0.00	0.00
84.08		134.83	767.68	0.00	0.00
85.00		30.31	276.51	0.00	0.00
89.50		148.79	1340.30	0.00	0.00
90.00		16.33	77.90	0.00	0.00
95.00		163.35	770.38	0.00	0.00
100.00		161.11	754.77	0.00	0.00
105.00		158.66	739.15	0.00	0.00
110.00		156.00	723.53	0.00	0.00
115.00		153.15	707.92	0.00	0.00
120.00		150.13	692.30	0.00	0.00
123.00	(23) appurtenances	1579.64	3090.88	0.00	0.00
125.00		58.18	261.17	0.00	0.00
127.92		83.97	376.39	0.00	0.00
130.00		59.89	404.72	0.00	0.00
131.00	(18) appurtenances	1017.27	1118.98	0.00	0.00
132.08		30.72	197.25	0.00	0.00
135.00		82.04	276.79	0.00	0.00
140.00		138.06	465.23	0.00	0.00
141.00	(24) appurtenances	2209.62	2803.54	0.00	0.00
145.00		107.01	303.16	0.00	0.00
150.00	(42) appurtenances	2027.94	3022.71	0.00	1530.83
	<b>Totals:</b>	<b>11,356.48</b>	<b>37,865.29</b>	<b>0.00</b>	<b>1,530.83</b>

## Resulting Forces and Deflections

**Structure:** CT10022-A-SB  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

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**Load Case:** 50 mph Wind with 0" Ice

**Iterations:** 22

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



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	-11.377	-37.859	0.000	0.000	0.000	-1302.4	0.000	0.000	0.000	0.000	0.000
5.00	-11.238	-36.606	0.000	0.000	0.000	-1245.5	-0.034	0.000	0.034	-0.063	0.000
10.00	-11.101	-35.374	0.000	0.000	0.000	-1189.3	-0.135	0.000	0.135	-0.127	0.000
15.00	-10.965	-34.161	0.000	0.000	0.000	-1133.8	-0.303	0.000	0.303	-0.192	0.000
20.00	-10.830	-32.968	0.000	0.000	0.000	-1079.0	-0.539	0.000	0.539	-0.257	0.000
25.00	-10.696	-31.794	0.000	0.000	0.000	-1024.8	-0.843	0.000	0.843	-0.323	0.000
30.00	-10.563	-30.641	0.000	0.000	0.000	-971.38	-1.217	0.000	1.217	-0.390	0.000
35.00	-10.428	-29.507	0.000	0.000	0.000	-918.56	-1.662	0.000	1.662	-0.457	0.000
40.00	-10.277	-28.397	0.000	0.000	0.000	-866.42	-2.177	0.000	2.177	-0.524	0.000
41.50	-10.242	-28.064	0.000	0.000	0.000	-851.01	-2.345	0.000	2.345	-0.545	0.000
45.00	-10.133	-26.689	0.000	0.000	0.000	-815.16	-2.763	0.000	2.763	-0.594	0.000
48.00	-10.036	-25.526	0.000	0.000	0.000	-784.76	-3.150	0.000	3.150	-0.635	0.000
50.00	-9.984	-25.091	0.000	0.000	0.000	-764.69	-3.422	0.000	3.422	-0.663	0.000
55.00	-9.830	-24.026	0.000	0.000	0.000	-714.77	-4.152	0.000	4.152	-0.729	0.000
60.00	-9.673	-22.982	0.000	0.000	0.000	-665.62	-4.952	0.000	4.952	-0.796	0.000
65.00	-9.514	-21.957	0.000	0.000	0.000	-617.26	-5.821	0.000	5.821	-0.862	0.000
70.00	-9.354	-20.952	0.000	0.000	0.000	-569.69	-6.759	0.000	6.759	-0.928	0.000
75.00	-9.192	-19.968	0.000	0.000	0.000	-522.92	-7.766	0.000	7.766	-0.993	0.000
80.00	-9.028	-19.004	0.000	0.000	0.000	-476.96	-8.841	0.000	8.841	-1.058	0.000
84.08	-8.888	-18.234	0.000	0.000	0.000	-440.10	-9.769	0.000	9.769	-1.110	0.000
85.00	-8.864	-17.953	0.000	0.000	0.000	-431.95	-9.983	0.000	9.983	-1.122	0.000
89.50	-8.697	-16.611	0.000	0.000	0.000	-392.06	-11.068	0.000	11.068	-1.178	0.000
90.00	-8.691	-16.527	0.000	0.000	0.000	-387.72	-11.192	0.000	11.192	-1.184	0.000
95.00	-8.530	-15.750	0.000	0.000	0.000	-344.26	-12.472	0.000	12.472	-1.257	0.000
100.00	-8.370	-14.989	0.000	0.000	0.000	-301.61	-13.826	0.000	13.826	-1.326	0.000
105.00	-8.210	-14.245	0.000	0.000	0.000	-259.76	-15.251	0.000	15.251	-1.392	0.000
110.00	-8.050	-13.517	0.000	0.000	0.000	-218.71	-16.743	0.000	16.743	-1.454	0.000
115.00	-7.890	-12.806	0.000	0.000	0.000	-178.47	-18.297	0.000	18.297	-1.510	0.000
120.00	-7.729	-12.113	0.000	0.000	0.000	-139.02	-19.905	0.000	19.905	-1.559	0.000
123.00	-6.069	-9.065	0.000	0.000	0.000	-115.83	-20.894	0.000	20.894	-1.585	0.000
125.00	-6.006	-8.803	0.000	0.000	0.000	-103.69	-21.562	0.000	21.562	-1.601	0.000
127.92	-5.914	-8.428	0.000	0.000	0.000	-86.179	-22.547	0.000	22.547	-1.622	0.000
130.00	-5.844	-8.024	0.000	0.000	0.000	-73.858	-23.258	0.000	23.258	-1.635	0.000
131.00	-4.796	-6.934	0.000	0.000	0.000	-68.014	-23.601	0.000	23.601	-1.641	0.000
132.08	-4.761	-6.737	0.000	0.000	0.000	-62.818	-23.974	0.000	23.974	-1.648	0.000
135.00	-4.673	-6.461	0.000	0.000	0.000	-48.932	-24.985	0.000	24.985	-1.662	0.000
140.00	-4.523	-5.999	0.000	0.000	0.000	-25.566	-26.739	0.000	26.739	-1.684	0.000
141.00	-2.232	-3.261	0.000	0.000	0.000	-21.043	-27.093	0.000	27.093	-1.687	0.000
145.00	-2.117	-2.961	0.000	0.000	0.000	-12.114	-28.511	0.000	28.511	-1.696	0.000
150.00	-2.028	0.000	0.000	0.000	0.000	-1.531	0.000	0.000	30.291	-1.702	0.000

## Resulting Stresses

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/14/2015  
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**Load Case:** 50 mph Wind with 0" Ice

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



**Iterations:** 22

### 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.62	0.38	0.00	0.00	0.00	17.00	17.64	44.8	0.394
5.00	0.61	0.38	0.00	0.00	0.00	16.89	17.52	45.3	0.386
10.00	0.61	0.38	0.00	0.00	0.00	16.77	17.39	45.9	0.379
15.00	0.60	0.39	0.00	0.00	0.00	16.64	17.25	46.4	0.371
20.00	0.59	0.39	0.00	0.00	0.00	16.49	17.09	47.0	0.364
25.00	0.58	0.39	0.00	0.00	0.00	16.32	16.92	47.6	0.356
30.00	0.57	0.40	0.00	0.00	0.00	16.14	16.73	48.1	0.348
35.00	0.56	0.40	0.00	0.00	0.00	15.94	16.51	48.7	0.339
40.00	0.55	0.40	0.00	0.00	0.00	15.71	16.28	49.2	0.331
41.50	0.55	0.40	0.00	0.00	0.00	15.64	16.21	49.4	0.328
45.00	0.53	0.41	0.00	0.00	0.00	15.47	16.01	49.8	0.322
48.00	0.51	0.40	0.00	0.00	0.00	14.93	15.45	50.1	0.308
50.00	0.50	0.40	0.00	0.00	0.00	14.82	15.34	50.0	0.307
55.00	0.49	0.41	0.00	0.00	0.00	14.51	15.02	50.6	0.297
60.00	0.48	0.41	0.00	0.00	0.00	14.18	14.68	51.1	0.287
65.00	0.47	0.41	0.00	0.00	0.00	13.81	14.30	51.7	0.277
70.00	0.46	0.42	0.00	0.00	0.00	13.40	13.88	52.0	0.267
75.00	0.45	0.42	0.00	0.00	0.00	12.95	13.42	52.0	0.258
80.00	0.44	0.42	0.00	0.00	0.00	12.46	12.92	52.0	0.249
84.08	0.43	0.43	0.00	0.00	0.00	12.01	12.47	52.0	0.240
85.00	0.43	0.43	0.00	0.00	0.00	11.91	12.36	52.0	0.238
89.50	0.50	0.53	0.00	0.00	0.00	13.81	14.34	52.0	0.276
90.00	0.50	0.53	0.00	0.00	0.00	13.73	14.26	49.2	0.290
95.00	0.49	0.54	0.00	0.00	0.00	12.90	13.42	49.9	0.269
100.00	0.48	0.54	0.00	0.00	0.00	11.98	12.50	50.6	0.247
105.00	0.47	0.55	0.00	0.00	0.00	10.96	11.47	51.3	0.224
110.00	0.46	0.55	0.00	0.00	0.00	9.81	10.32	52.0	0.199
115.00	0.45	0.56	0.00	0.00	0.00	8.54	9.04	52.0	0.174
120.00	0.44	0.57	0.00	0.00	0.00	7.10	7.61	52.0	0.146
123.00	0.34	0.45	0.00	0.00	0.00	6.16	6.55	52.0	0.126
125.00	0.33	0.46	0.00	0.00	0.00	5.67	6.06	52.0	0.117
127.92	0.32	0.46	0.00	0.00	0.00	4.91	5.30	52.0	0.102
130.00	0.31	0.46	0.00	0.00	0.00	4.34	4.72	52.0	0.091
131.00	0.27	0.38	0.00	0.00	0.00	4.05	4.37	52.0	0.084
132.08	0.35	0.50	0.00	0.00	0.00	4.92	5.34	52.0	0.103
135.00	0.34	0.50	0.00	0.00	0.00	4.00	4.43	48.9	0.091
140.00	0.33	0.50	0.00	0.00	0.00	2.25	2.73	49.8	0.055
141.00	0.18	0.25	0.00	0.00	0.00	1.88	2.11	50.0	0.042
145.00	0.17	0.24	0.00	0.00	0.00	1.15	1.39	50.7	0.027
150.00	0.00	0.24	0.00	0.00	0.00	0.16	0.45	51.6	0.009

## Final Analysis Summary

**Structure:** CT10022-A-SBA  
**Site Name:** Simsbury 2, CT  
**Height:** 150.00 (ft)  
**Base Elev:** 0.000 (ft)

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

7/14/2015

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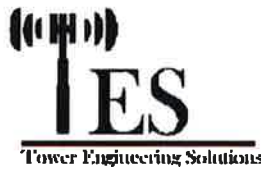


### Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	t MZ (ft-kips)
80 mph Wind with 0" Ice	29.1	0.00	37.82	0.00	0.00	3331.63
69.28 mph Wind with 0.5" Ice	24.3	0.00	46.23	0.00	0.00	2857.52
50 mph Wind with 0" Ice	11.4	0.00	37.86	0.00	0.00	1302.41

### 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	0.62	0.97	0.00	0.00	0.00	43.49	44.14	44.8	0.00	0.986
69.28 mph Wind with 0.5" Ice	0.76	0.81	0.00	0.00	0.00	37.30	38.09	44.8	0.00	0.850
50 mph Wind with 0" Ice	0.62	0.38	0.00	0.00	0.00	17.00	17.64	44.8	0.00	0.394



# Monopole Mat Foundation Design

Date	
7/14/2015	
Customer Name:	Verizon
EIA/TIA Standard:	EIA-222-F
Site Name:	Simsbury 2, CT
Structure Height (Ft.):	150
Site Number:	CT10022-A-SBA
Engineer Name:	K. Wyant
Engr. Number:	16420
Engineer Login ID:	

**Foundation Info Obtained from:**

Drawings/Calculations

**Structure Type:**

Monopole

**Analysis or Design?**

Analysis

**Base Reactions (Unfactored)**

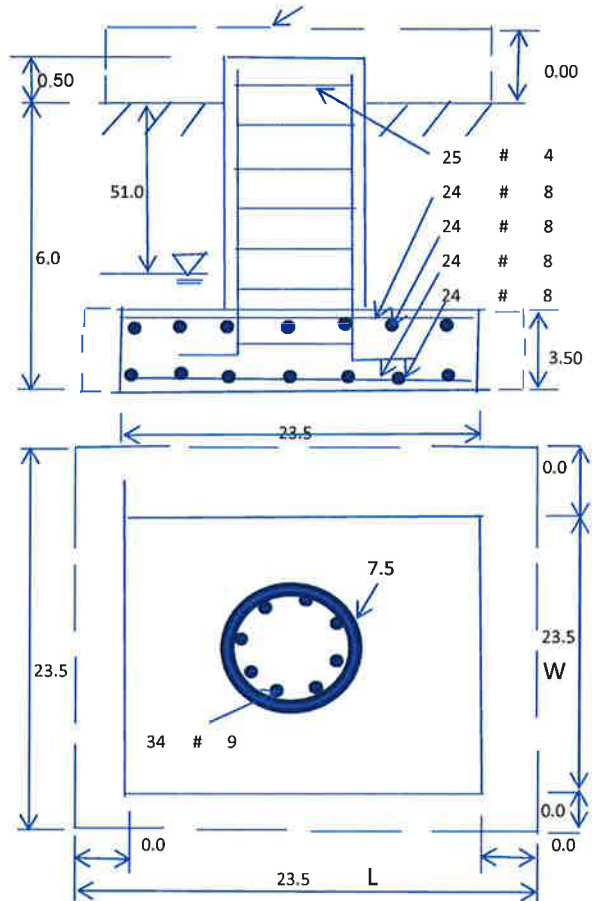
Axial Load (Kips):	46.2	Shear Force (Kips):	29.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3331.6

**Foundation Geometries:**

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.5	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	3.50
Length of Pad (ft.):	23.5	Width of Pad (ft.):	23.5
Final Length of pad (ft)	23.5	Final width of pad (ft):	23.5
Control Value for Cell D18:	0	Control Value for Cell F18:	0

**Material Properties and Rebar Info:**

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	34	Tie Spacing (in):	3.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	



**Soil Design Parameters:**

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	60.0	Pcf	
Water Table B.G.S. (ft):	51.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad: 30
Allowable Net Soil Bearing (psf):	7000	Allowable Skin Friction:	0	Psf	Angle from Botm of Pad: 25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Botm of Pad: 25
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00		

**Foundation Analysis and Design:**

Total Dry Soil Volume (cu. Ft.):	1270.18	Total Dry Soil Weight (Kips):	158.77
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	158.77	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2065.41	Total Dry Concrete Weight (Kips):	309.81
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	309.81	Total Vertical Load on Base (Kips):	514.78

**Check Soil Capacities:**

Calculated Maxium Net Soil Pressure under the base (psf):	3249	<	Allowable Soil Bearing (psf):	7000	0.46	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	4032.5	>	Applied Momont (kips-ft):	3521	0.87	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.72					OK!

**Check the capacities of Reinforcing Concrete:**

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

Load/  
Capacity  
Ratio**(1) Concrete Pier:**

Vertical Steel Rebar Area (sq. in./each):	1.00	Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	6200.6	> Design Factored Moment (Mu, Kips-Ft)	4444.6	0.72	OK!
Calculated Shear Capacity (Kips):	1098.7	> Design Factored Shear (Kips):	37.8	0.03	OK!
Calculated Tension Capacity (Tn, Kips):	1836.0	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	8390.6	> Design Factored Axial Load (Pu Kips):	60.1	0.01	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.72	OK! Check Tie Spacing (Design/Required):		0.25	OK!
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is satisfied per ACI			

**(2).Concrete Pad:**

One-Way Design Shear Capacity (L-Direction, Kips):	881.9	> One-Way Factored Shear (L-D. Kips):	255.6	0.29	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	881.9	> One-Way Factored Shear (W-D., Kips)	255.6	0.29	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	965.7	> One-Way Factored Shear (C-C, Kips):	500.5	0.52	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct. ):	0.0018	OK! Lower Steel Pad Reinf. Ratio (W-Direct	0.0018		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	3180.0	> Moment at Bottom ( L-Direct. K-Ft):	474.7	0.15	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	3180.0	> Moment at Bottom ( W-Direct. K-Ft):	474.7	0.15	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4469.4	> Moment at Bottom ( C-C Dir. K-Ft):	671.3	0.15	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct. ):	0.0018	OK! Upper Steel Reinf. Ratio (W-Direct. ):	0.0018		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	3180.0	> Moment at the top (L-Dir Kips-Ft):	380.0	0.12	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	3180.0	> Moment at the top (W-Dir Kips-Ft):	380.0	0.12	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	4469.4	> Moment at the top (C-C Direc. K-Ft):	675.0	0.15	OK!