Robinson+Cole

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Also admitted in Massachusetts

September 23, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
548 Green Hollow Road, Plainfield, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 125-foot level on an existing 178-foot tower at 548 Green Hollow Road in Plainfield, Connecticut (the "Property"). The tower is owned by SBA. Cellco's use of the tower was approved by the Council in 2000. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/2100 MHz antennas and three (3) model SBNHH-1D65B, 1900 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads ("RRHs") and install six (6) new RRHs and two (2) HYBRIFLEX™ fiber optic antenna cables. Included in Attachment 1 are specifications for Cellco's replacement antennas, RRHs and HYBRIFLEX™ cables.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Paul E. Sweet, First Selectman for the Town of Plainfield. A copy of this letter is also being sent to Tilcon Minerals, Inc., the owner of the Property and SBA, the tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed on the existing platform at the 125-foot level of the existing 178-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

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

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.

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

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

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:
Paul E. Sweet, Plainfield First Selectman
Tilcon Minerals, Inc.
Victoria Barrios, SBA
Tim Parks

ATTACHMENT 1

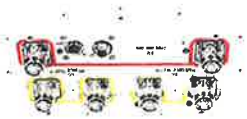
Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

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
	7 ° | 14.6	7 ° | 14.4	3 ° | 17.5	3 ° | 17.9	3 ° | 18.3	3 ° | 18.4
	14 ° | 14.2	14 ° | 13.6	7 ° | 17.4	7 ° | 17.9	7 ° | 18.2	7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, 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

Product Specifications

SBNHH-1D65B

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

Included Products

Product Specifications

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.

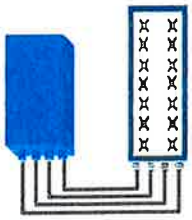
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

Alcatel·Lucent

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

PCS RF MODULES

RRH1900 2X60 - HW CHARACTERISTICS

LA6.0.1/13.3

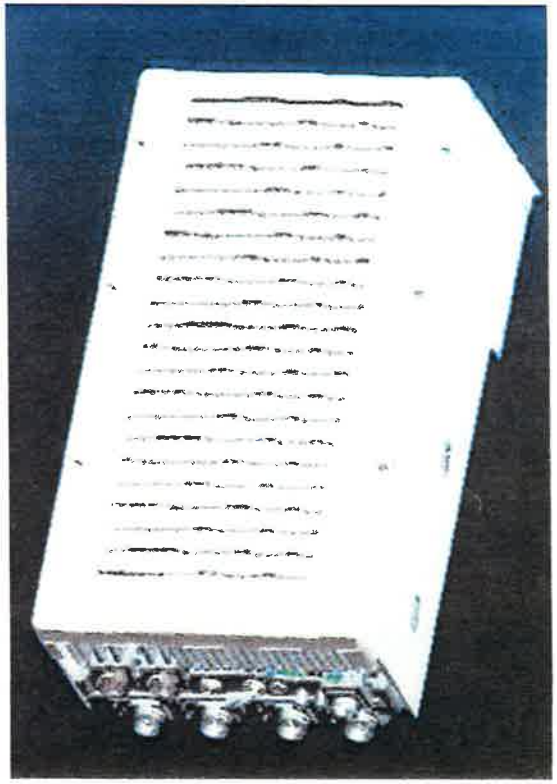
	RRH2x60
RF Output Power	2x60W
Instantaneous Bandwidth	20MHz
Transmitter	2 TX
Receiver 1900 HW version	2 Branch RX – LA6.0.1
Receiver 1900A HW version	4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA
	Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
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

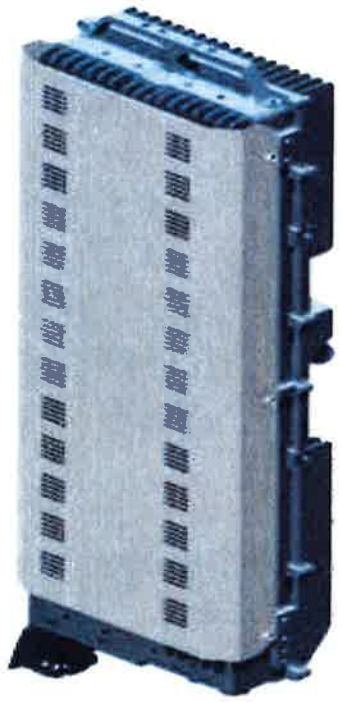
	RRH2x60
RF Output Power	2x60W (4x30W HW Ready)
Instantaneous Bandwidth	60MHz
Target Reliability (Annual Return Rate)	<2%
Receiver	4 Branch Rx
Features	AISG 2.0 for RET/TMA
Power	-48VDC
	Internal Smart Bias-T
CPRI Ports	2 CPRI Rate 5 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX, RX
Environmental	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.

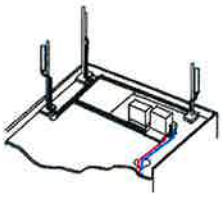
EASY INSTALLATION

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.

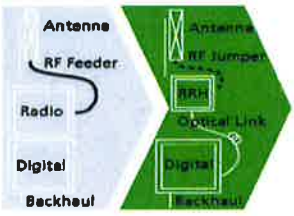
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

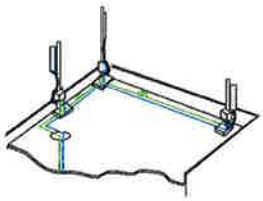
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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 daisychaining and up to six RRHs per fiber
- Type of optical fiber: Single-Mode (SM) and Multi-Mode (MM) SFPs
- Optical fiber length: up to 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

Alcatel·Lucent

AT THE SPEED OF IDEAS™

Product Data Sheet HB158-1-08U8-S8J18

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

Product Description

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

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

Figure 1: HYBRIFLEX Series

Features/Benefits

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

Technical Specifications

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

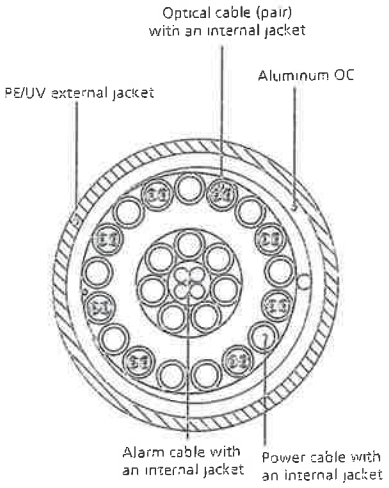


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Plainfield N								
Tower Height: 178ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	155	0.0183	880	0.5867	0.31%	
*AT&T UMTS	2	875	155	0.0283	1900	1.0000	0.28%	
*AT&T GSM	1	283	155	0.0046	880	0.5867	0.08%	
*AT&T GSM	4	525	155	0.0340	1900	1.0000	0.34%	
*AT&T LTE	1	1771	155	0.0287	734	0.4893	0.59%	
*MetroPCS	3	444	135	0.0288	2140	1.0000	0.29%	
*Sprint CDMA/LTE	2	626	145.4	0.0232	1900	1.0000	0.23%	
*T-Mobile	16	250	165	0.0569	1945	1.0000	0.57%	
*Nextel	9	100	175	0.0113	806	0.5373	0.21%	
Verizon PCS	**11**	**446**	**125**	**0.1129**	**1970**	**1.0000**	**11.29%**	
Verizon Cellular	**9**	**268**	**125**	**0.0555**	**869**	**0.5793**	**9.58%**	
Verizon AWS	**1**	**2302**	**125**	**0.0530**	**2145**	**1.0000**	**5.30%**	
Verizon 700	**1**	**842**	**125**	**0.0194**	**746**	**0.4973**	**3.90%**	
								32.96%
* Source: Siting Council								

ATTACHMENT 3

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

Structural Analysis Report

Existing 178 ft. Valmont Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT00594-S

Customer Site Name: Plainfield North

Carrier Name: Verizon

Carrier Site Number: Plainfield North

Carrier Site Name: Unknown

Site Location: 56 Roper Road

Plainfield, Connecticut

Windham County

Latitude: 41.746002

Longitude: -71.880158

8/26/15

Analysis Result:

Max Structural Usage: 89.4% [Pass]

Max Foundation Usage: 95.2%[Pass]

Report Prepared By : Walter Velez

Introduction

The purpose of this report is to summarize the analysis results on the 178 ft. Valmont Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Monopole original shaft section data prepared by Valmont. Dated 09-11-1998. Project No F138. Order No 17665-98. Monopole previous structural report prepared by FDH Engineering, Inc. Dated 03-28-2014. Project No 1425O21400.
Foundation Drawing	Monopole foundation mapping report prepared by FDH Engineering, Inc. Dated 08-16-2012. Project No 1207132 EN1.
Geotechnical Report	N/A
Modification Drawings	N/A

Analysis Criteria

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

Wind Speed Used in the Analysis:	85.0 mph (fastest mile)
Wind Speed with Ice:	74 mph (fastest mile) with 1/2" radial ice concurrent
Operational Wind Speed:	50 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA-222-F, 2003 IBC & 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	175.0	-	-	Low Profile Platform	-	-
2	165.0	3	EMS RR90-18-02DP - Panel	Platform w/ Hand Rails	(6) 1 5/8"	T-Mobile
3		3	TMAs			
4	155.0	1	Kathrein 800 10764 - Panel	Platform w/ Hand Rails	(12) 1 5/8"; (2) 3/4" DC Power; (1) 7/16" Fiber; (1) 1/2"	AT&T
5		1	KMW AM-X-CD-17-65-00T - Panel			
6		1	Nokia CS72188.01			
7		6	Powerwave 7770 - Panel			
8		6	Powerwave LGP21401 TMAs			
9		6	Powerwave LGP21903 Diplexers			
10		1	Powerwave P65-17-XLH-RR - Panel			
11	152.5	6	Ericsson RRUS11 RRUs	Ring Mount (Part No LWRM)	-	-
12		1	Raycap DC2-48-60-18-8F			
13	145.0	6	Decibel DB908H90E-M - Panel	Platform w/ Hand Rails	(6) 1 5/8"	Sprint
14	135.0	6	Kathrein 742-351 - Panel	(3) T-Arms	(12) 1 5/8"; (1) 3/8"	Metro PCS
15	125.0	3	Antel BXA-70063-6CF - Panel	Low Profile Platform	(12) 1 5/8"; (1) 1 5/8" Fiber	Verizon
16		3	Antel BXA-185090/8CF - Panel			
17		3	Antel WBX065X19R050 - Panel			
18		3	Antel BXA-70080-4CF - Panel			
19		3	ALU RRH2X40-AWS			
20		6	RFS FD9R6004/2C-3L			
21		1	RFS DB-T1-6Z-8AB-0Z			

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

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

Items	Elevation (ft.)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
22	125.0	6	Antel LPA-80080-4CF-EDIN-0 - Panel	Low Profile Platform	(11) 1 5/8"' (2) 1 5/8" Hybrid; (1) 1/2"	Verizon
23		6	Commscope SBNHH-1D65B - Panel			
24		3	ALU RRH2x60-700			
25		3	ALU RRH2x60-AWS			
26		3	ALU RRH2X60-PCS			
27		1	GPS			
28		2	RFS DB-T1-6Z-8AB-0Z			
29		6	RFS FD9R6004/2C-3L			

All transmission lines are considered running outside 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:	**89.4%**	**78.3%**	**54.7%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	5595.9	45.2
Analysis Reactions	5015.2	43.0
% of Design Reactions	89.6%	95.2%

No geotechnical report is available for the analysis of the existing foundation. Since the reactions calculated from the current analysis are less than those indicated on the original structural design drawing, the foundations is assumed to be adequate to resist the reactions from the current analysis if it was properly designed and constructed.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA-222-F for the installed antennas. Maximum twist/sway at the elevation of the proposed equipment is 1.6933 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, the 2003 IBC & 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 and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

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

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

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

Usage Diagram - Max Stress 89.4% at 0.0ft

Structure:	CT00594-S-SBA	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)			Page: 1	

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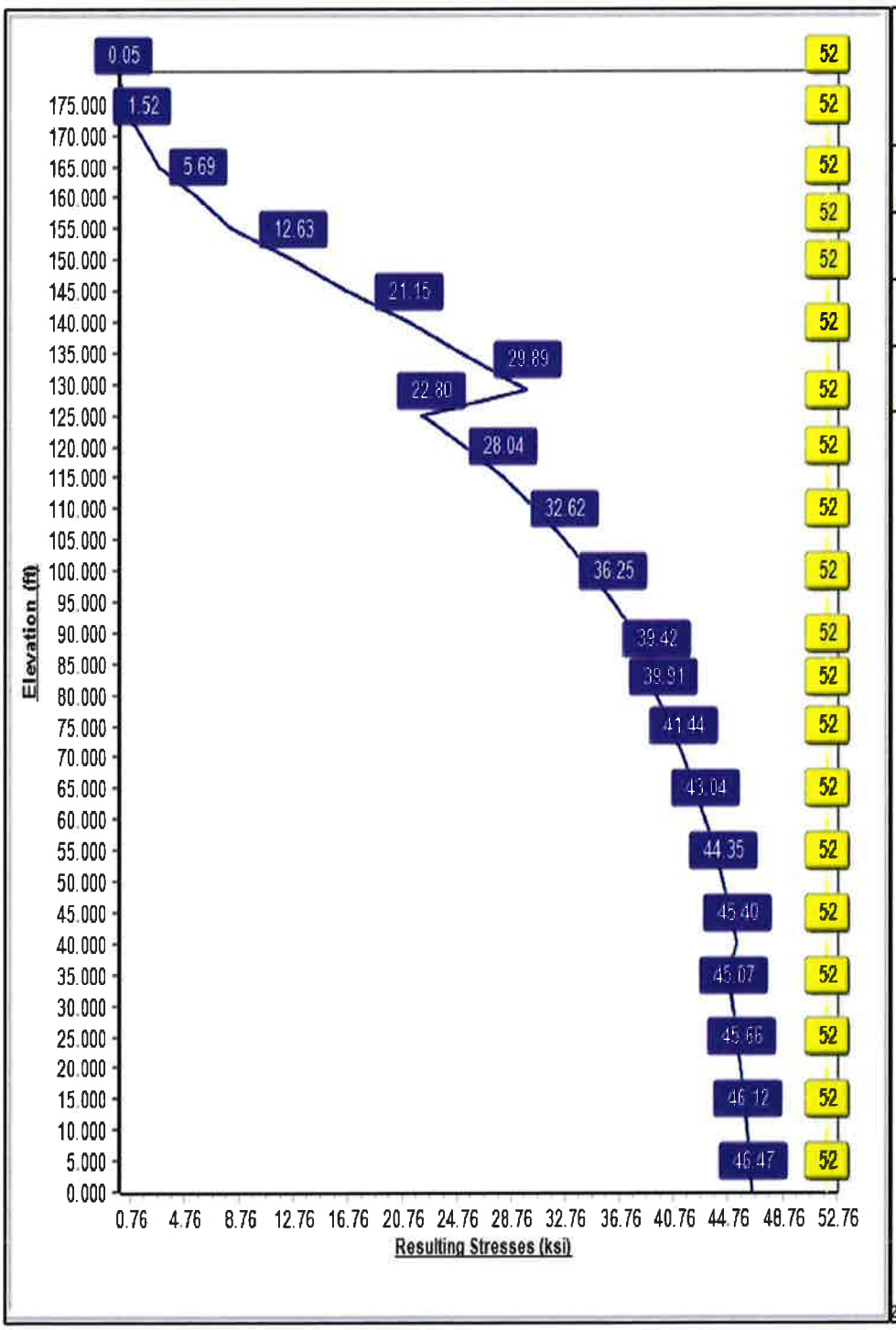
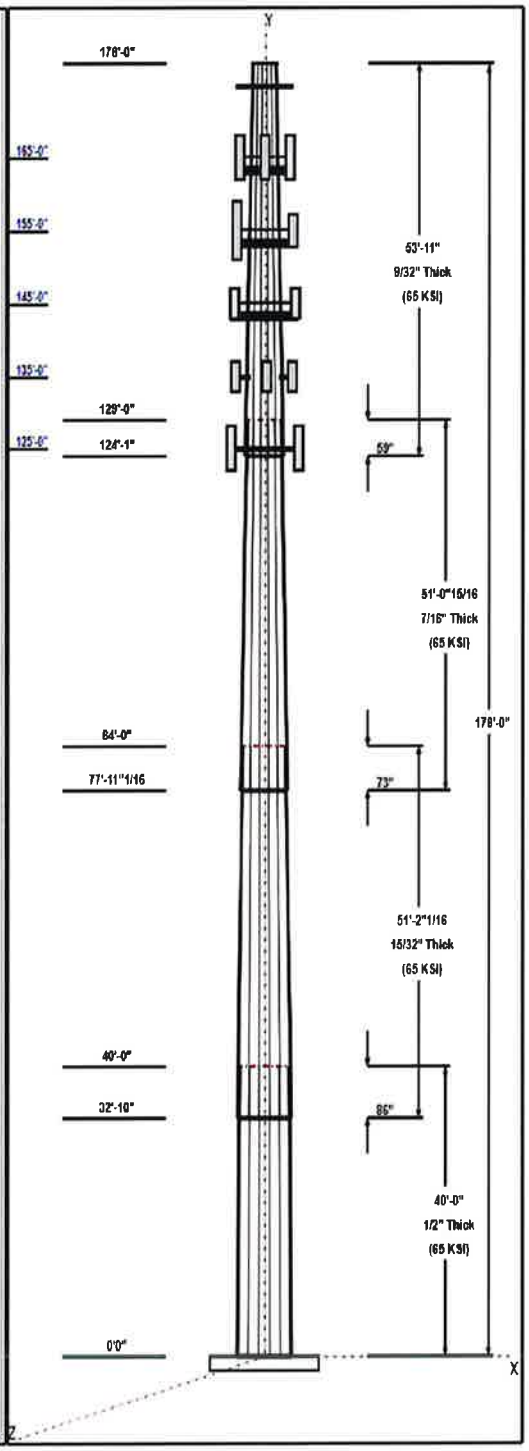
Dead Load Factor: 1.00
Wind Load Factor: 1.00

52 Alllowable Stress
46 Resulting Stress

Load Case : 85 mph Wind with 0 in Ice

Iterations: 25





Structure: CT00594-S-SBA

Type: Tapered
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.22997

8/26/2015

TES Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	40.00	49.05	58.25	0.500		0.22997	65
2	51.17	39.87	51.64	0.469	Slip	0.22997	65
3	51.08	30.40	42.14	0.438	Slip	0.22997	65
4	53.92	19.69	32.09	0.281	Slip	0.22997	65

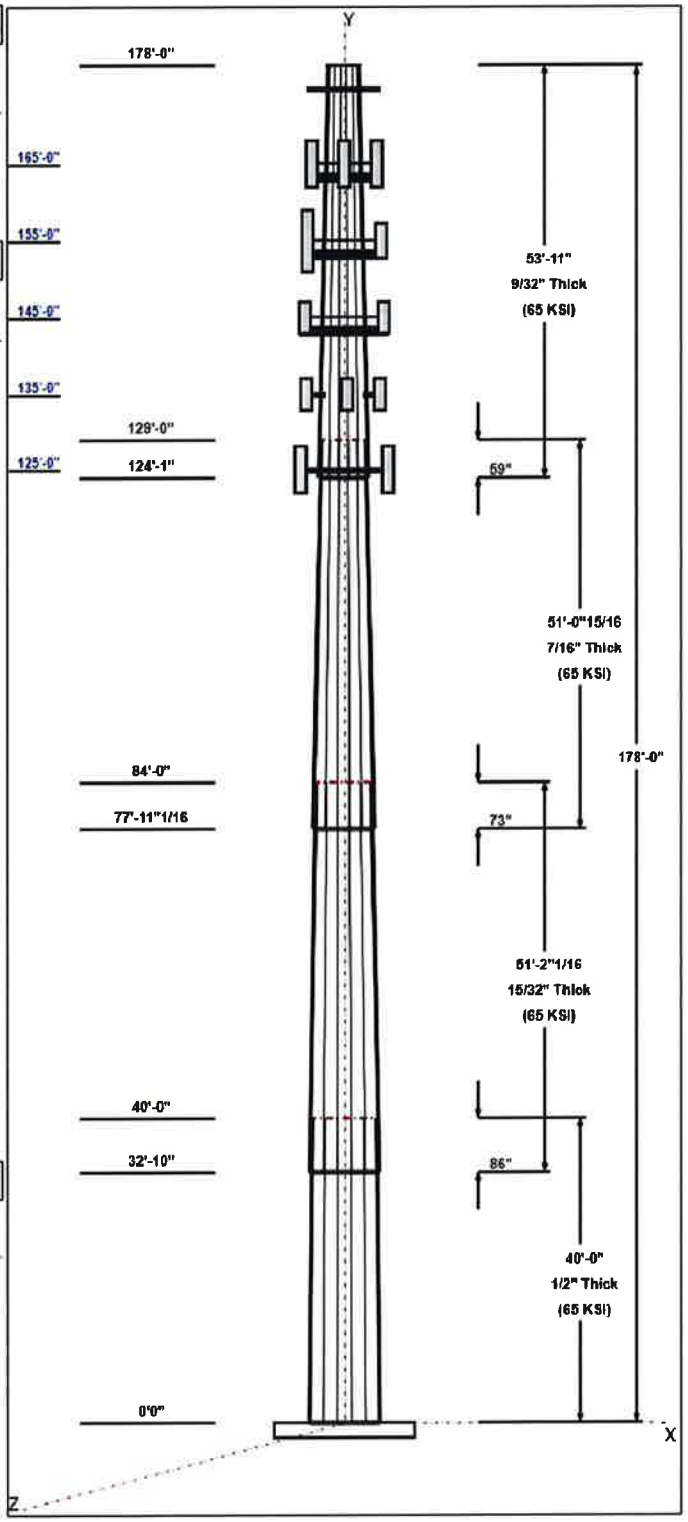
Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
175.00	175.00	1	Low Profile Platform	---
165.00	165.00	3	EMS RR90-18-02DP	T-Mobile
165.00	165.00	1	Platform w/ Hand Rails	T-Mobile
165.00	165.00	3	TMAs	T-Mobile
155.00	155.00	1	Kathrein 800 10764	AT&T
155.00	155.00	1	KMW AM-X-CD-17-65-00T	AT&T
155.00	155.00	1	Nokia CS72188.01	AT&T
155.00	155.00	1	Platform w/ Hand Rails	AT&T
155.00	155.00	6	Powerwave 7770	AT&T
155.00	155.00	6	Powerwave LGP21401	AT&T
155.00	155.00	6	Powerwave LGP21903	AT&T
155.00	155.00	1	Powerwave	AT&T
152.50	152.50	6	Ericsson RRUS11 RRUs	---
152.50	152.50	1	Raycap DC2-48-60-18-8F	---
152.50	152.50	1	Ring Mount (Part No	---
145.00	145.00	6	Decibel DB908H90E-M	Sprint
145.00	145.00	1	Platform w/ Hand Rails	Sprint
135.00	135.00	6	Kathrein 742-351	Metro PCS
135.00	135.00	3	T-Arms	Metro PCS
125.00	125.00	3	ALU RRH2x60-700	Verizon
125.00	125.00	3	ALU RRH2x60-AWS	Verizon
125.00	125.00	3	ALU RRH2X60-PCS	Verizon
125.00	125.00	6	Antel	Verizon
125.00	125.00	6	Commscope	Verizon
125.00	125.00	1	GPS	Verizon
125.00	125.00	1	Low Profile Platform	Verizon
125.00	125.00	2	RFS DB-T1-6Z-8AB-0Z	Verizon
125.00	125.00	6	RFS FD9R6004/2C-3L	Verizon

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
3.00	165.00	Inside	1 5/8" Coax	T-Mobile
3.00	155.00	Inside	1 5/8" Coax	AT&T
3.00	155.00	Inside	1/2" Coax	AT&T
3.00	155.00	Inside	3/4" DC Power	AT&T
3.00	155.00	Inside	7/16" Fiber	AT&T
3.00	145.00	Inside	1 5/8" Coax	Sprint
3.00	135.00	Inside	1 5/8" Coax	Metro PCS
3.00	135.00	Inside	3/8" Coax	Metro PCS
3.00	125.00	Outside	1 5/8" Coax	Verizon
3.00	125.00	Outside	1 5/8" Hybrid	Verizon
3.00	125.00	Outside	1/2" Coax	Verizon

Anchor Bolts



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

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	72.8	60.0	Polygon

Reactions

Load Case	Moment	Shear	Axial
85 mph Wind with 0" Ice	5015.2	43.0	55.5
73.61 mph Wind with 0.5" Ice	4310.1	36.4	62.5
50 mph Wind with 0" Ice	1737.6	14.9	55.5

Structure: CT00594-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Plainfield North
Height: 178.00 (ft)

8/26/2015

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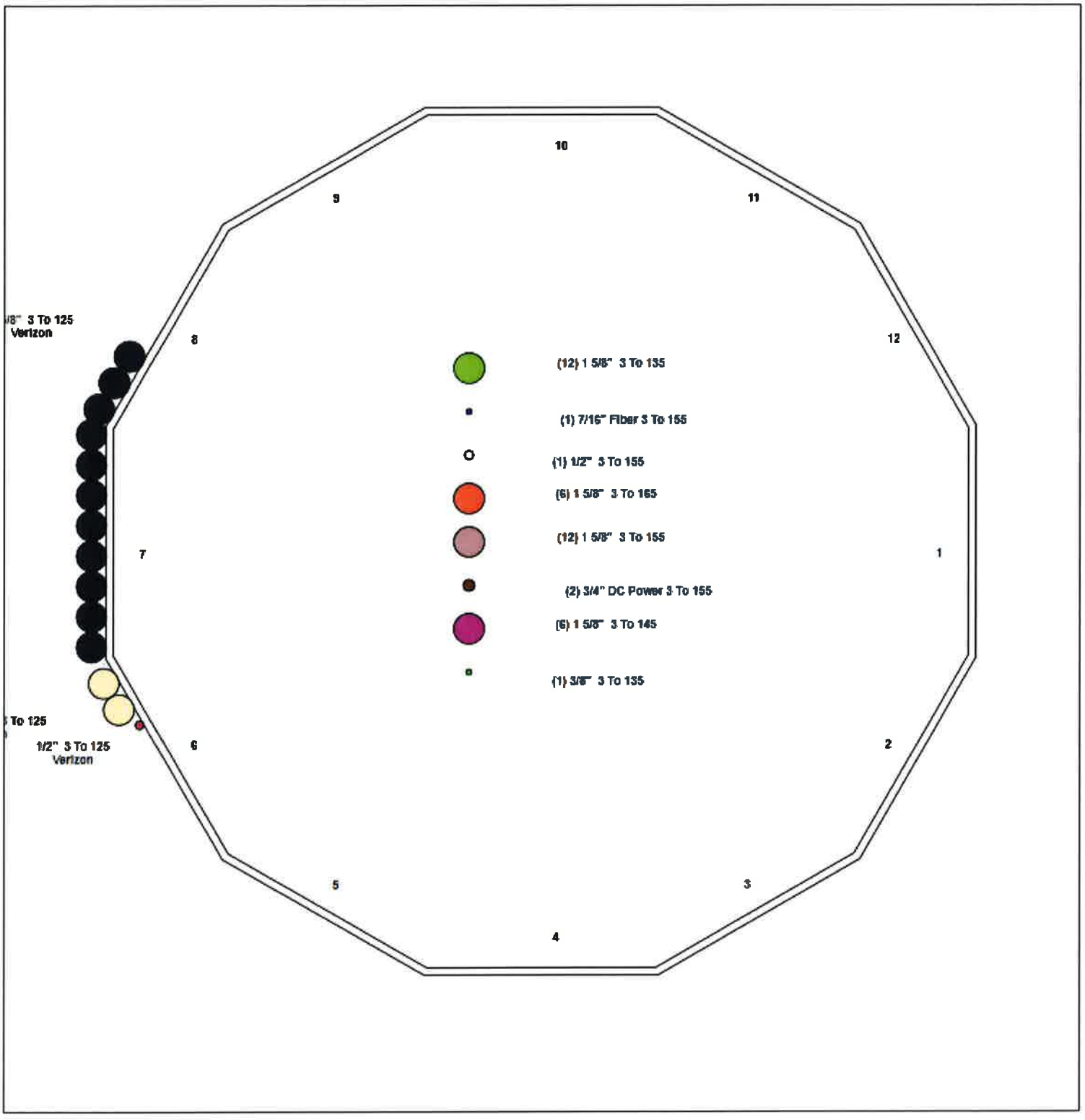


Shaft Properties

Structure:	CT00594-S-SBA	**Code:**	EIA/TIA-222-F	8/26/2015
Site Name:	Plainfield North	**Exposure:**	C	
Height:	178.00 (ft)	**Gh:**	1.69	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 5

TES Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	12	40.000	0.5000	65		0.00	11,647
2	12	51.170	0.4688	65	Slip	86.00	11,901
3	12	51.080	0.4375	65	Slip	73.00	8,774
4	12	53.917	0.2813	65	Slip	59.00	4,255
					Total Shaft Weight:		**36,577**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	58.25	0.00	92.98	39579.27	29.07	116.5	49.05	40.00	78.17	23518.5	24.14	98.10	0.229972
2	51.64	32.83	77.23	25809.44	27.37	110.1	39.87	84.00	59.47	11783.7	20.64	85.05	0.229972
3	42.14	77.92	58.75	13043.76	23.66	96.32	30.40	129.0	42.20	4834.88	16.47	69.47	0.229972
4	32.09	124.0	28.81	3720.03	28.42	114.0	19.69	178.0	17.58	845.14	16.61	70.00	0.229972

Loading Summary

Structure:	CT00594-S-SBA	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	175.0	Low Profile Platform	1	1200.00	25.00	1.00	1500.00	31.00	1.00	0.00	0.00
2	165.0	EMS RR90-18-02DP	3	16.00	5.86	0.78	44.60	6.550	0.78	0.00	0.00
3	165.0	Platform w/ Hand Rails	1	2000.00	40.00	1.00	2600.00	48.00	1.00	0.00	0.00
4	165.0	TMAs	3	9.90	0.70	0.67	14.40	0.880	0.67	0.00	0.00
5	155.0	Kathrein 800 10764	1	40.80	6.33	0.77	77.30	6.990	0.77	0.00	0.00
6	155.0	KMW AM-X-CD-17-65-00T	1	30.80	5.51	0.78	63.00	6.100	0.78	0.00	0.00
7	155.0	Nokia CS72188.01	1	19.80	1.32	0.67	28.10	1.560	0.67	0.00	0.00
8	155.0	Platform w/ Hand Rails	1	2000.00	40.00	1.00	2600.00	48.00	1.00	0.00	0.00
9	155.0	Powerwave 7770	6	27.00	5.92	0.78	59.70	6.600	0.78	0.00	0.00
10	155.0	Powerwave LGP21401 TMAs	6	14.10	1.29	0.67	21.20	1.530	0.67	0.00	0.00
11	155.0	Powerwave LGP21903 Diplexers	6	5.50	0.27	0.67	7.90	0.380	0.67	0.00	0.00
12	155.0	Powerwave P65-17-XLH-RR	1	59.00	11.46	0.81	121.00	12.39	0.81	0.00	0.00
13	152.5	Ericsson RRUS11 RRUs	6	51.00	3.26	0.67	72.90	3.620	0.67	0.00	0.00
14	152.5	Raycap DC2-48-60-18-8F	1	32.80	1.47	0.67	50.50	1.670	0.67	0.00	0.00
15	152.5	Ring Mount (Part No LWRM)	1	150.00	5.00	0.75	450.00	6.000	0.75	0.00	0.00
16	145.0	Decibel DB908H90E-M	6	7.00	2.91	0.79	0.00	3.380	0.79	0.00	0.00
17	145.0	Platform w/ Hand Rails	1	2000.00	40.00	1.00	2600.00	48.00	1.00	0.00	0.00
18	135.0	Kathrein 742-351	6	29.80	5.88	0.66	57.10	6.510	0.66	0.00	0.00
19	135.0	T-Arms	3	350.00	8.00	0.75	420.00	10.50	0.75	0.00	0.00
20	125.0	ALU RRH2x60-700	3	60.00	3.96	0.67	80.10	4.230	0.67	0.00	0.00
21	125.0	ALU RRH2x60-AWS	3	60.00	3.96	0.67	80.10	4.230	0.67	0.00	0.00
22	125.0	ALU RRH2X60-PCS	3	55.00	2.57	0.67	80.10	4.230	0.67	0.00	0.00
23	125.0	Antel LPA-80080-4CF-EDIN-0	6	12.00	6.06	0.73	45.10	6.650	0.73	0.00	0.00
24	125.0	Commscope SBNHH-1D65B	6	50.71	8.30	0.83	87.00	8.800	0.83	0.00	0.00
25	125.0	GPS	1	10.00	1.00	0.67	18.00	1.250	0.67	0.00	0.00
26	125.0	Low Profile Platform	1	1200.00	25.00	1.00	1500.00	31.00	1.00	0.00	0.00
27	125.0	RFS DB-T1-6Z-8AB-0Z	2	44.00	5.60	0.67	51.10	5.040	0.67	0.00	0.00
28	125.0	RFS FD9R6004/2C-3L	6	3.10	0.37	0.67	5.40	0.500	0.67	0.00	0.00
		Totals:	**86**	**11,685.16**			**16,005.80**				

Linear Appurtenances

			No Ice		Ice		
Bottom Elev. (ft)	Top Elev. (ft)	Description	Weight (lb/ft)	CaAa (sf/ft)	Weight (lb/ft)	CaAa (sf/ft)	Exposed
3.00	165.0	(6) 1 5/8" Coax	6.24	0.00	0.00	0.00	Inside
3.00	155.0	(12) 1 5/8" Coax	12.48	0.00	0.00	0.00	Inside
3.00	155.0	(1) 1/2" Coax	0.16	0.00	0.00	0.00	Inside
3.00	155.0	(2) 3/4" DC Power	0.80	0.00	0.00	0.00	Inside
3.00	155.0	(1) 7/16" Fiber	0.08	0.00	0.00	0.00	Inside
3.00	145.0	(6) 1 5/8" Coax	6.24	0.00	0.00	0.00	Inside
3.00	135.0	(12) 1 5/8" Coax	12.48	0.00	0.00	0.00	Inside
3.00	135.0	(1) 3/8" Coax	0.08	0.00	0.00	0.00	Inside
3.00	125.0	(11) 1 5/8" Coax	11.44	0.00	0.00	0.16	Outside
3.00	125.0	(2) 1 5/8" Hybrid	2.20	0.00	0.00	0.16	Outside
3.00	125.0	(1) 1/2" Coax	0.16	0.00	0.00	0.05	Outside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
		Totals:		7,293.52			0.00				

Shaft Section Properties

Structure: CT00594-S-SBA
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

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

8/26/2015

TES Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)
0.00		0.5000	58.250	92.978	39579.3	29.07	116.50	65	52	0.0
5.00		0.5000	57.100	91.126	37261.8	28.46	114.20	65	52	1566.2
10.00		0.5000	55.950	89.275	35036.7	27.84	111.90	65	52	1534.7
15.00		0.5000	54.800	87.424	32901.9	27.22	109.60	65	52	1503.2
20.00		0.5000	53.651	85.572	30855.7	26.61	107.30	65	52	1471.7
25.00		0.5000	52.501	83.721	28896.1	25.99	105.00	65	52	1440.2
30.00		0.5000	51.351	81.870	27021.3	25.38	102.70	65	52	1408.7
32.83	Bot - Section 2	0.5000	50.699	80.821	25995.8	25.03	101.40	65	52	784.3
35.00		0.5000	50.201	80.019	25229.4	24.76	100.40	65	52	1159.5
40.00	Top - Section 1	0.4688	49.989	74.744	23394.9	26.43	106.64	65	52	2632.1
45.00		0.4688	48.839	73.008	21802.8	25.77	104.19	65	52	1256.9
50.00		0.4688	47.689	71.273	20284.5	25.12	101.74	65	52	1227.4
55.00		0.4688	46.539	69.537	18838.5	24.46	99.28	65	52	1197.9
60.00		0.4688	45.389	67.802	17462.8	23.80	96.83	65	52	1168.3
65.00		0.4688	44.239	66.066	16155.9	23.14	94.38	65	52	1138.8
70.00		0.4688	43.089	64.331	14915.8	22.49	91.92	65	52	1109.3
75.00		0.4688	41.940	62.595	13740.8	21.83	89.47	65	52	1079.8
77.92	Bot - Section 3	0.4688	41.268	61.582	13084.1	21.45	88.04	65	52	616.9
80.00		0.4688	40.790	60.860	12629.2	21.17	87.02	65	52	846.8
84.00	Top - Section 2	0.4375	40.744	56.782	11774.7	22.81	93.13	65	52	1601.9
85.00		0.4375	40.515	56.459	11574.9	22.67	92.61	65	52	192.0
90.00		0.4375	39.365	54.839	10606.9	21.97	89.98	65	52	946.8
95.00		0.4375	38.215	53.219	9694.5	21.26	87.35	65	52	919.2
100.00		0.4375	37.065	51.599	8835.9	20.56	84.72	65	52	891.7
105.00		0.4375	35.915	49.980	8029.6	19.85	82.09	65	52	864.1
110.00		0.4375	34.766	48.360	7273.9	19.15	79.46	65	52	836.6
115.00		0.4375	33.616	46.740	6567.2	18.44	76.84	65	52	809.0
120.00		0.4375	32.466	45.120	5907.8	17.74	74.21	65	52	781.4
124.08	Bot - Section 4	0.4375	31.527	43.797	5403.2	17.17	72.06	65	52	617.7
125.00		0.4375	31.316	43.500	5294.1	17.04	71.58	65	52	225.7
129.00	Top - Section 3	0.2813	30.959	27.782	3337.3	27.35	110.08	65	52	967.1
130.00		0.2813	30.729	27.574	3262.8	27.13	109.26	65	52	94.2
135.00		0.2813	29.579	26.533	2906.9	26.04	105.17	65	52	460.3
140.00		0.2813	28.429	25.491	2577.9	24.94	101.08	65	52	442.6
145.00		0.2813	27.279	24.450	2274.7	23.85	96.99	65	52	424.8
150.00		0.2813	26.129	23.409	1996.2	22.75	92.90	65	52	407.1
152.50		0.2813	25.554	22.888	1866.0	22.20	90.86	65	52	196.9
155.00		0.2813	24.979	22.367	1741.5	21.65	88.82	65	52	192.5
160.00		0.2813	23.829	21.326	1509.4	20.56	84.73	65	52	371.7
165.00		0.2813	22.680	20.285	1298.9	19.46	80.64	65	52	354.0
170.00		0.2813	21.530	19.243	1109.0	18.37	76.55	65	52	336.3
175.00		0.2813	20.380	18.202	938.5	17.27	72.46	65	52	318.5
178.00		0.2813	19.690	17.577	845.1	16.62	70.01	65	52	182.6
										36577.3

Wind Loading - Shaft

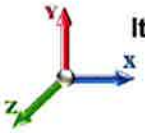
Structure: CT00594-S-SBA
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

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

8/26/2015

TES Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	18.496	31.26	412.60	1.030	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	18.496	31.26	404.46	1.030	0.000	5.00	24.031	24.75	773.7	0.0	1566.2
10.00		0.00	1.00	18.496	31.26	396.31	1.030	0.000	5.00	23.552	24.26	758.3	0.0	1534.7
15.00		0.00	1.00	18.496	31.26	388.17	1.030	0.000	5.00	23.073	23.77	742.9	0.0	1503.2
20.00		0.00	1.00	18.496	31.26	380.02	1.030	0.000	5.00	22.594	23.27	727.4	0.0	1471.7
25.00		0.00	1.00	18.496	31.26	371.88	1.030	0.000	5.00	22.115	22.78	712.0	0.0	1440.2
30.00		0.00	1.00	18.496	31.26	363.74	1.030	0.000	5.00	21.636	22.28	696.6	0.0	1408.7
32.83	Bot - Section 2	0.00	1.00	18.496	31.26	359.12	1.030	0.000	2.83	12.048	12.41	387.9	0.0	784.3
35.00		0.00	1.02	18.810	31.79	358.59	1.030	0.000	2.17	9.278	9.56	303.8	0.0	1159.5
40.00	Top - Section 1	0.00	1.06	19.541	33.02	357.13	1.030	0.000	5.00	21.068	21.70	716.6	0.0	2632.1
45.00		0.00	1.09	20.210	34.15	361.61	1.030	0.000	5.00	20.589	21.21	724.3	0.0	1256.9
50.00		0.00	1.13	20.827	35.20	358.45	1.030	0.000	5.00	20.110	20.71	729.1	0.0	1227.4
55.00		0.00	1.16	21.402	36.17	354.61	1.030	0.000	5.00	19.631	20.22	731.4	0.0	1197.9
60.00		0.00	1.19	21.941	37.08	350.17	1.030	0.000	5.00	19.152	19.73	731.5	0.0	1168.3
65.00		0.00	1.21	22.449	37.94	345.23	1.030	0.000	5.00	18.673	19.23	729.7	0.0	1138.8
70.00		0.00	1.24	22.929	38.75	339.83	1.030	0.000	5.00	18.193	18.74	726.2	0.0	1109.3
75.00		0.00	1.26	23.386	39.52	334.04	1.030	0.000	5.00	17.714	18.25	721.1	0.0	1079.8
77.92	Bot - Section 3	0.00	1.28	23.642	39.96	330.49	1.030	0.000	2.92	10.124	10.43	416.6	0.0	616.9
80.00		0.00	1.29	23.821	40.26	327.89	1.030	0.000	2.08	7.263	7.48	301.2	0.0	846.8
84.00	Top - Section 2	0.00	1.31	24.155	40.82	322.73	1.030	0.000	4.00	13.746	14.16	578.0	0.0	1601.9
85.00		0.00	1.31	24.237	40.96	328.51	1.030	0.000	1.00	3.375	3.48	142.4	0.0	192.0
90.00		0.00	1.33	24.636	41.63	321.81	1.030	0.000	5.00	16.642	17.14	713.7	0.0	946.8
95.00		0.00	1.35	25.020	42.28	314.83	1.030	0.000	5.00	16.163	16.65	703.9	0.0	919.2
100.00		0.00	1.37	25.389	42.91	307.60	1.030	0.000	5.00	15.683	16.15	693.1	0.0	891.7
105.00		0.00	1.39	25.745	43.51	300.14	1.030	0.000	5.00	15.204	15.66	681.4	0.0	864.1
110.00		0.00	1.41	26.090	44.09	292.47	1.030	0.000	5.00	14.725	15.17	668.7	0.0	836.6
115.00		0.00	1.43	26.423	44.66	284.60	1.030	0.000	5.00	14.246	14.67	655.3	0.0	809.0
120.00		0.00	1.45	26.747	45.20	276.54	1.030	0.000	5.00	13.767	14.18	641.0	0.0	781.4
124.08	Bot - Section 4	0.00	1.46	27.004	45.64	269.83	1.030	0.000	4.08	10.888	11.21	511.8	0.0	617.7
125.00	Appurtenance(s)	0.00	1.46	27.060	45.73	268.31	1.030	0.000	0.92	2.443	2.52	115.1	0.0	225.7
129.00	Top - Section 3	0.00	1.48	27.305	46.15	261.60	1.030	0.000	4.00	10.473	10.79	497.8	0.0	967.1
130.00		0.00	1.48	27.365	46.25	264.75	1.030	0.000	1.00	2.570	2.65	122.4	0.0	94.2
135.00	Appurtenance(s)	0.00	1.50	27.662	46.75	256.22	1.030	0.000	5.00	12.564	12.94	605.0	0.0	460.3
140.00		0.00	1.51	27.951	47.24	247.55	1.030	0.000	5.00	12.085	12.45	588.0	0.0	442.6
145.00	Appurtenance(s)	0.00	1.53	28.233	47.71	238.73	1.030	0.000	5.00	11.606	11.95	570.4	0.0	424.8
150.00		0.00	1.54	28.507	48.18	229.78	1.030	0.000	5.00	11.127	11.46	552.1	0.0	407.1
152.50	Appurtenance(s)	0.00	1.55	28.642	48.41	225.25	1.030	0.000	2.50	5.384	5.55	268.4	0.0	196.9
155.00	Appurtenance(s)	0.00	1.56	28.776	48.63	220.70	1.030	0.000	2.50	5.264	5.42	263.7	0.0	192.5
160.00		0.00	1.57	29.038	49.07	211.49	1.030	0.000	5.00	10.169	10.47	514.0	0.0	371.7
165.00	Appurtenance(s)	0.00	1.58	29.294	49.51	202.17	1.030	0.000	5.00	9.689	9.98	494.1	0.0	354.0
170.00		0.00	1.60	29.545	49.93	192.74	1.030	0.000	5.00	9.210	9.49	473.7	0.0	336.3
175.00	Appurtenance(s)	0.00	1.61	29.791	50.35	183.21	1.030	0.000	5.00	8.731	8.99	452.8	0.0	318.5
178.00		0.00	1.62	29.936	50.59	177.44	1.030	0.000	3.00	5.009	5.16	261.0	0.0	182.6
								Totals:	**178.00**			**23,397.6**		**36,577.3**

Discrete Appurtenance Forces

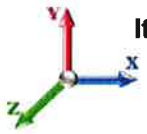
Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	175.00	Low Profile Platform	1	29.791	50.347	1.00	25.00	1200.00	0.000	0.000	1258.67	0.00	0.00
2	165.00	TMAs	3	29.294	49.507	0.67	1.41	29.70	0.000	0.000	69.66	0.00	0.00
3	165.00	Platform w/ Hand Rails	1	29.294	49.507	1.00	40.00	2000.00	0.000	0.000	1980.30	0.00	0.00
4	165.00	EMS RR90-18-02DP	3	29.294	49.507	0.78	13.71	48.00	0.000	0.000	678.87	0.00	0.00
5	155.00	Platform w/ Hand Rails	1	28.776	48.631	1.00	40.00	2000.00	0.000	0.000	1945.24	0.00	0.00
6	155.00	Kathrein 800 10764	1	28.776	48.631	0.77	4.87	40.80	0.000	0.000	237.03	0.00	0.00
7	155.00	KMW AM-X-CD-17-65-00T	1	28.776	48.631	0.78	4.30	30.80	0.000	0.000	209.01	0.00	0.00
8	155.00	Nokia CS72188.01	1	28.776	48.631	0.67	0.88	19.80	0.000	0.000	43.01	0.00	0.00
9	155.00	Powerwave LGP21401 TMAs	6	28.776	48.631	0.67	5.19	84.60	0.000	0.000	252.19	0.00	0.00
10	155.00	Powerwave 7770	6	28.776	48.631	0.78	27.71	162.00	0.000	0.000	1347.35	0.00	0.00
11	155.00	Powerwave LGP21903	6	28.776	48.631	0.67	1.09	33.00	0.000	0.000	52.78	0.00	0.00
12	155.00	Powerwave P65-17-XLH-RR	1	28.776	48.631	0.81	9.28	59.00	0.000	0.000	451.42	0.00	0.00
13	152.50	Ring Mount (Part No LWRM)	1	28.642	48.406	0.75	3.75	150.00	0.000	0.000	181.52	0.00	0.00
14	152.50	Raycap DC2-48-60-18-8F	1	28.642	48.406	0.67	0.98	32.80	0.000	0.000	47.67	0.00	0.00
15	152.50	Ericsson RRUS11 RRUs	6	28.642	48.406	0.67	13.11	306.00	0.000	0.000	634.36	0.00	0.00
16	145.00	Decibel DB908H90E-M	6	28.233	47.713	0.79	13.79	42.00	0.000	0.000	658.13	0.00	0.00
17	145.00	Platform w/ Hand Rails	1	28.233	47.713	1.00	40.00	2000.00	0.000	0.000	1908.52	0.00	0.00
18	135.00	T-Arms	3	27.662	46.749	0.75	18.00	1050.00	0.000	0.000	841.48	0.00	0.00
19	135.00	Kathrein 742-351	6	27.662	46.749	0.66	23.28	178.80	0.000	0.000	1088.54	0.00	0.00
20	125.00	Antel	6	27.060	45.732	0.73	26.54	72.00	0.000	0.000	1213.86	0.00	0.00
21	125.00	ALU RRH2x60-700	3	27.060	45.732	0.67	7.96	180.00	0.000	0.000	364.01	0.00	0.00
22	125.00	ALU RRH2x60-AWS	3	27.060	45.732	0.67	7.96	180.00	0.000	0.000	364.01	0.00	0.00
23	125.00	ALU RRH2X60-PCS	3	27.060	45.732	0.67	5.17	165.00	0.000	0.000	236.24	0.00	0.00
24	125.00	Low Profile Platform	1	27.060	45.732	1.00	25.00	1200.00	0.000	0.000	1143.30	0.00	0.00
25	125.00	Commscope SBNHH-1D65B	6	27.060	45.732	0.83	41.33	304.26	0.000	0.000	1890.29	0.00	0.00
26	125.00	GPS	1	27.060	45.732	0.67	0.67	10.00	0.000	0.000	30.64	0.00	0.00
27	125.00	RFS DB-T1-6Z-8AB-0Z	2	27.060	45.732	0.67	7.50	88.00	0.000	0.000	343.17	0.00	0.00
28	125.00	RFS FD9R6004/2C-3L	6	27.060	45.732	0.67	1.49	18.60	0.000	0.000	68.02	0.00	0.00
						Totals:		**11,685.16**			**19,539.27**		

Total Applied Force Summary

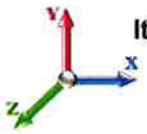
Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 11	

TES Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		773.71	1670.88	0.00	0.00
10.00		758.29	1796.46	0.00	0.00
15.00		742.86	1764.97	0.00	0.00
20.00		727.43	1733.47	0.00	0.00
25.00		712.01	1701.97	0.00	0.00
30.00		696.58	1670.47	0.00	0.00
32.83		387.88	932.62	0.00	0.00
35.00		303.79	1272.99	0.00	0.00
40.00		716.64	2893.93	0.00	0.00
45.00		724.31	1518.72	0.00	0.00
50.00		729.07	1489.19	0.00	0.00
55.00		731.35	1459.67	0.00	0.00
60.00		731.46	1430.14	0.00	0.00
65.00		729.66	1400.61	0.00	0.00
70.00		726.15	1371.08	0.00	0.00
75.00		721.11	1341.55	0.00	0.00
77.92		416.63	769.81	0.00	0.00
80.00		301.17	955.67	0.00	0.00
84.00		577.99	1811.55	0.00	0.00
85.00		142.37	244.21	0.00	0.00
90.00		713.66	1208.61	0.00	0.00
95.00		703.91	1181.05	0.00	0.00
100.00		693.12	1153.49	0.00	0.00
105.00		681.38	1125.93	0.00	0.00
110.00		668.74	1098.37	0.00	0.00
115.00		655.25	1070.81	0.00	0.00
120.00		640.96	1043.25	0.00	0.00
124.08		511.77	831.54	0.00	0.00
125.00	(31) appurtenances	5768.62	2491.56	0.00	0.00
129.00		497.77	1121.32	0.00	0.00
130.00		122.44	132.74	0.00	0.00
135.00	(9) appurtenances	2534.99	1881.88	0.00	0.00
140.00		587.98	572.56	0.00	0.00
145.00	(7) appurtenances	3137.01	2596.85	0.00	0.00
150.00		552.14	505.93	0.00	0.00
152.50	(8) appurtenances	1131.98	735.12	0.00	0.00
155.00	(23) appurtenances	4801.70	2671.89	0.00	0.00
160.00		513.98	402.89	0.00	0.00
165.00	(7) appurtenances	3222.91	2462.88	0.00	0.00
170.00		473.68	336.26	0.00	0.00
175.00	(1) appurtenances	1711.44	1518.54	0.00	0.00
178.00		261.00	182.62	0.00	0.00
	Totals:	**42,936.90**	**55,556.03**	**0.00**	**0.00**

Resulting Forces and Deflections

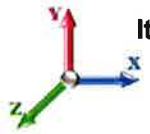
Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 12	

TES Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-43.024	-55.488	0.000	0.000	0.000	-5015.2	0.000	0.000	0.000	0.000	0.000
5.00	-42.415	-53.687	0.000	0.000	0.000	-4800.1	-0.095	0.000	0.095	-0.176	0.000
10.00	-41.811	-51.762	0.000	0.000	0.000	-4588.0	-0.376	0.000	0.376	-0.356	0.000
15.00	-41.215	-49.872	0.000	0.000	0.000	-4378.9	-0.846	0.000	0.846	-0.538	0.000
20.00	-40.625	-48.014	0.000	0.000	0.000	-4172.9	-1.509	0.000	1.509	-0.722	0.000
25.00	-40.041	-46.191	0.000	0.000	0.000	-3969.7	-2.367	0.000	2.367	-0.910	0.000
30.00	-39.432	-44.430	0.000	0.000	0.000	-3769.5	-3.422	0.000	3.422	-1.101	0.000
32.83	-39.100	-43.438	0.000	0.000	0.000	-3657.8	-4.109	0.000	4.109	-1.211	0.000
35.00	-38.872	-42.076	0.000	0.000	0.000	-3573.1	-4.680	0.000	4.680	-1.297	0.000
40.00	-38.220	-39.069	0.000	0.000	0.000	-3378.7	-6.143	0.000	6.143	-1.493	0.000
45.00	-37.585	-37.440	0.000	0.000	0.000	-3187.7	-7.814	0.000	7.814	-1.692	0.000
50.00	-36.936	-35.844	0.000	0.000	0.000	-2999.7	-9.694	0.000	9.694	-1.894	0.000
55.00	-36.277	-34.281	0.000	0.000	0.000	-2815.1	-11.787	0.000	11.787	-2.098	0.000
60.00	-35.610	-32.752	0.000	0.000	0.000	-2633.7	-14.094	0.000	14.094	-2.303	0.000
65.00	-34.936	-31.257	0.000	0.000	0.000	-2455.6	-16.617	0.000	16.617	-2.511	0.000
70.00	-34.257	-29.795	0.000	0.000	0.000	-2280.9	-19.358	0.000	19.358	-2.719	0.000
75.00	-33.553	-28.394	0.000	0.000	0.000	-2109.7	-22.317	0.000	22.317	-2.928	0.000
77.92	-33.148	-27.585	0.000	0.000	0.000	-2011.7	-24.147	0.000	24.147	-3.053	0.000
80.00	-32.856	-26.573	0.000	0.000	0.000	-1942.7	-25.497	0.000	25.497	-3.142	0.000
84.00	-32.222	-24.737	0.000	0.000	0.000	-1811.2	-28.203	0.000	28.203	-3.312	0.000
85.00	-32.120	-24.430	0.000	0.000	0.000	-1779.1	-28.899	0.000	28.899	-3.355	0.000
90.00	-31.419	-23.153	0.000	0.000	0.000	-1618.5	-32.524	0.000	32.524	-3.564	0.000
95.00	-30.720	-21.910	0.000	0.000	0.000	-1461.4	-36.365	0.000	36.365	-3.770	0.000
100.00	-30.023	-20.701	0.000	0.000	0.000	-1307.8	-40.421	0.000	40.421	-3.973	0.000
105.00	-29.330	-19.526	0.000	0.000	0.000	-1157.7	-44.687	0.000	44.687	-4.172	0.000
110.00	-28.642	-18.387	0.000	0.000	0.000	-1011.0	-49.157	0.000	49.157	-4.364	0.000
115.00	-27.959	-17.283	0.000	0.000	0.000	-867.89	-53.823	0.000	53.823	-4.548	0.000
120.00	-27.279	-16.223	0.000	0.000	0.000	-728.09	-58.676	0.000	58.676	-4.721	0.000
124.08	-26.721	-15.400	0.000	0.000	0.000	-616.70	-62.768	0.000	62.768	-4.853	0.000
125.00	-20.779	-13.380	0.000	0.000	0.000	-592.21	-63.702	0.000	63.702	-4.882	0.000
129.00	-20.202	-12.281	0.000	0.000	0.000	-509.09	-67.839	0.000	67.839	-5.000	0.000
130.00	-20.093	-12.119	0.000	0.000	0.000	-488.89	-68.888	0.000	68.888	-5.030	0.000
135.00	-17.433	-10.417	0.000	0.000	0.000	-388.43	-74.255	0.000	74.255	-5.221	0.000
140.00	-16.821	-9.855	0.000	0.000	0.000	-301.26	-79.809	0.000	79.809	-5.390	0.000
145.00	-13.468	-7.539	0.000	0.000	0.000	-217.16	-85.527	0.000	85.527	-5.533	0.000
150.00	-12.879	-7.071	0.000	0.000	0.000	-149.82	-91.377	0.000	91.377	-5.648	0.000
152.50	-11.685	-6.443	0.000	0.000	0.000	-117.62	-94.343	0.000	94.343	-5.695	0.000
155.00	-6.644	-4.257	0.000	0.000	0.000	-88.416	-97.332	0.000	97.332	-5.734	0.000
160.00	-6.096	-3.903	0.000	0.000	0.000	-55.195	-103.36	0.000	103.361	-5.793	0.000
165.00	-2.641	-1.778	0.000	0.000	0.000	-24.717	-109.44	0.000	109.441	-5.831	0.000
170.00	-2.136	-1.491	0.000	0.000	0.000	-11.513	-115.54	0.000	115.548	-5.851	0.000
175.00	-0.278	-0.155	0.000	0.000	0.000	-0.835	-121.67	0.000	121.670	-5.859	0.000
178.00	-0.261	0.000	0.000	0.000	0.000	0.000	0.000	0.000	125.345	-5.859	0.000

Resulting Stresses

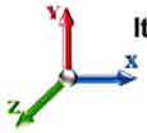
Structure: CT00594-S-SBA
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

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

8/26/2015

TES Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.60	0.94	0.00	0.00	0.00	45.85	46.47	52.0	0.894
5.00	0.59	0.95	0.00	0.00	0.00	45.69	46.31	52.0	0.891
10.00	0.58	0.95	0.00	0.00	0.00	45.51	46.12	52.0	0.887
15.00	0.57	0.96	0.00	0.00	0.00	45.30	45.91	52.0	0.883
20.00	0.56	0.96	0.00	0.00	0.00	45.07	45.66	52.0	0.878
25.00	0.55	0.97	0.00	0.00	0.00	44.80	45.39	52.0	0.873
30.00	0.54	0.98	0.00	0.00	0.00	44.50	45.07	52.0	0.867
32.83	0.54	0.98	0.00	0.00	0.00	44.31	44.88	52.0	0.863
35.00	0.53	0.99	0.00	0.00	0.00	44.16	44.72	52.0	0.860
40.00	0.52	1.04	0.00	0.00	0.00	44.85	45.40	52.0	0.873
45.00	0.51	1.05	0.00	0.00	0.00	44.35	44.90	52.0	0.864
50.00	0.50	1.05	0.00	0.00	0.00	43.81	44.35	52.0	0.853
55.00	0.49	1.06	0.00	0.00	0.00	43.20	43.73	52.0	0.841
60.00	0.48	1.07	0.00	0.00	0.00	42.52	43.04	52.0	0.828
65.00	0.47	1.07	0.00	0.00	0.00	41.77	42.28	52.0	0.813
70.00	0.46	1.08	0.00	0.00	0.00	40.93	41.44	52.0	0.797
75.00	0.45	1.09	0.00	0.00	0.00	40.00	40.50	52.0	0.779
77.92	0.45	1.09	0.00	0.00	0.00	39.41	39.91	52.0	0.767
80.00	0.44	1.10	0.00	0.00	0.00	38.98	39.46	52.0	0.759
84.00	0.44	1.15	0.00	0.00	0.00	38.93	39.42	52.0	0.758
85.00	0.43	1.16	0.00	0.00	0.00	38.68	39.17	52.0	0.753
90.00	0.42	1.16	0.00	0.00	0.00	37.31	37.79	52.0	0.727
95.00	0.41	1.17	0.00	0.00	0.00	35.79	36.25	52.0	0.697
100.00	0.40	1.18	0.00	0.00	0.00	34.08	34.54	52.0	0.664
105.00	0.39	1.19	0.00	0.00	0.00	32.17	32.62	52.0	0.627
110.00	0.38	1.20	0.00	0.00	0.00	30.02	30.47	52.0	0.586
115.00	0.37	1.22	0.00	0.00	0.00	27.60	28.04	52.0	0.539
120.00	0.36	1.23	0.00	0.00	0.00	24.85	25.30	52.0	0.487
124.08	0.35	1.24	0.00	0.00	0.00	22.35	22.80	52.0	0.439
125.00	0.31	0.97	0.00	0.00	0.00	21.76	22.13	52.0	0.426
129.00	0.44	1.48	0.00	0.00	0.00	29.34	29.89	52.0	0.575
130.00	0.44	1.48	0.00	0.00	0.00	28.60	29.15	52.0	0.561
135.00	0.39	1.33	0.00	0.00	0.00	24.55	25.05	52.0	0.482
140.00	0.39	1.34	0.00	0.00	0.00	20.64	21.15	52.0	0.407
145.00	0.31	1.12	0.00	0.00	0.00	16.18	16.60	52.0	0.319
150.00	0.30	1.12	0.00	0.00	0.00	12.18	12.63	52.0	0.243
152.50	0.28	1.04	0.00	0.00	0.00	10.01	10.44	52.0	0.201
155.00	0.19	0.60	0.00	0.00	0.00	7.88	8.14	52.0	0.156
160.00	0.18	0.58	0.00	0.00	0.00	5.41	5.69	52.0	0.109
165.00	0.09	0.26	0.00	0.00	0.00	2.68	2.81	52.0	0.054
170.00	0.08	0.23	0.00	0.00	0.00	1.39	1.52	52.0	0.029
175.00	0.01	0.03	0.00	0.00	0.00	0.11	0.13	52.0	0.003
178.00	0.00	0.03	0.00	0.00	0.00	0.00	0.05	52.0	0.001

Wind Loading - Shaft

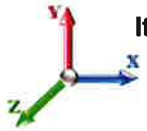
Structure: CT00594-S-SBA
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

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

8/26/2015
Page: 14

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	13.871	23.44	357.32	1.030	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	13.871	23.44	350.26	1.030	0.500	5.00	24.448	25.18	590.3	180.3	1746.5
10.00		0.00	1.00	13.871	23.44	343.21	1.030	0.500	5.00	23.969	24.69	578.7	176.7	1711.4
15.00		0.00	1.00	13.871	23.44	336.15	1.030	0.500	5.00	23.490	24.19	567.2	173.1	1676.3
20.00		0.00	1.00	13.871	23.44	329.10	1.030	0.500	5.00	23.011	23.70	555.6	169.5	1641.2
25.00		0.00	1.00	13.871	23.44	322.05	1.030	0.500	5.00	22.532	23.21	544.0	165.9	1606.1
30.00		0.00	1.00	13.871	23.44	314.99	1.030	0.500	5.00	22.052	22.71	532.5	162.3	1571.0
32.83	Bot - Section 2	0.00	1.00	13.871	23.44	311.00	1.030	0.500	2.83	12.284	12.65	296.6	90.8	875.1
35.00		0.00	1.02	14.106	23.84	310.54	1.030	0.500	2.17	9.459	9.74	232.3	70.1	1229.6
40.00	Top - Section 1	0.00	1.06	14.655	24.77	309.27	1.030	0.500	5.00	21.485	22.13	548.1	158.1	2790.2
45.00		0.00	1.09	15.156	25.61	313.16	1.030	0.500	5.00	21.006	21.64	554.2	154.5	1411.4
50.00		0.00	1.13	15.620	26.40	310.42	1.030	0.500	5.00	20.527	21.14	558.1	150.9	1378.3
55.00		0.00	1.16	16.051	27.13	307.09	1.030	0.500	5.00	20.047	20.65	560.1	147.3	1345.1
60.00		0.00	1.19	16.455	27.81	303.25	1.030	0.500	5.00	19.568	20.16	560.5	143.7	1312.0
65.00		0.00	1.21	16.836	28.45	298.97	1.030	0.500	5.00	19.089	19.66	559.4	140.1	1278.9
70.00		0.00	1.24	17.196	29.06	294.29	1.030	0.500	5.00	18.610	19.17	557.1	136.5	1245.7
75.00		0.00	1.26	17.538	29.64	289.28	1.030	0.500	5.00	18.131	18.67	553.5	132.9	1212.6
77.92	Bot - Section 3	0.00	1.28	17.731	29.96	286.20	1.030	0.500	2.92	10.367	10.68	320.0	76.4	693.3
80.00		0.00	1.29	17.865	30.19	283.95	1.030	0.500	2.08	7.437	7.66	231.3	54.9	901.7
84.00	Top - Section 2	0.00	1.31	18.116	30.62	279.49	1.030	0.500	4.00	14.080	14.50	444.0	103.4	1705.3
85.00		0.00	1.31	18.177	30.72	284.49	1.030	0.500	1.00	3.458	3.56	109.4	25.6	217.6
90.00		0.00	1.33	18.476	31.22	278.68	1.030	0.500	5.00	17.058	17.57	548.6	124.8	1071.6
95.00		0.00	1.35	18.764	31.71	272.64	1.030	0.500	5.00	16.579	17.08	541.5	121.2	1040.4
100.00		0.00	1.37	19.041	32.18	266.38	1.030	0.500	5.00	16.100	16.58	533.6	117.6	1009.3
105.00		0.00	1.39	19.308	32.63	259.92	1.030	0.500	5.00	15.621	16.09	525.0	114.0	978.1
110.00		0.00	1.41	19.566	33.07	253.28	1.030	0.500	5.00	15.142	15.60	515.7	110.4	947.0
115.00		0.00	1.43	19.816	33.49	246.46	1.030	0.500	5.00	14.663	15.10	505.8	106.8	915.8
120.00		0.00	1.45	20.059	33.90	239.48	1.030	0.500	5.00	14.184	14.61	495.2	103.2	884.6
124.08	Bot - Section 4	0.00	1.46	20.251	34.22	233.67	1.030	0.500	4.08	11.228	11.56	395.8	81.9	699.6
125.00	Appurtenance(s)	0.00	1.46	20.294	34.30	232.35	1.030	0.500	0.92	2.520	2.60	89.0	18.6	244.3
129.00	Top - Section 3	0.00	1.48	20.478	34.61	226.55	1.030	0.500	4.00	10.806	11.13	385.2	78.8	1045.9
130.00		0.00	1.48	20.523	34.68	229.28	1.030	0.500	1.00	2.654	2.73	94.8	19.6	113.7
135.00	Appurtenance(s)	0.00	1.50	20.745	35.06	221.89	1.030	0.500	5.00	12.981	13.37	468.8	94.2	554.4
140.00		0.00	1.51	20.962	35.43	214.38	1.030	0.500	5.00	12.502	12.88	456.2	90.6	533.1
145.00	Appurtenance(s)	0.00	1.53	21.173	35.78	206.74	1.030	0.500	5.00	12.023	12.38	443.1	87.0	511.8
150.00		0.00	1.54	21.379	36.13	198.99	1.030	0.500	5.00	11.543	11.89	429.6	83.4	490.5
152.50	Appurtenance(s)	0.00	1.55	21.480	36.30	195.07	1.030	0.500	2.50	5.592	5.76	209.1	40.8	237.7
155.00	Appurtenance(s)	0.00	1.56	21.581	36.47	191.12	1.030	0.500	2.50	5.472	5.64	205.6	39.9	232.4
160.00		0.00	1.57	21.777	36.80	183.15	1.030	0.500	5.00	10.585	10.90	401.3	76.2	447.9
165.00	Appurtenance(s)	0.00	1.58	21.969	37.13	175.08	1.030	0.500	5.00	10.106	10.41	386.5	72.6	426.5
170.00		0.00	1.60	22.158	37.45	166.92	1.030	0.500	5.00	9.627	9.92	371.3	69.0	405.2
175.00	Appurtenance(s)	0.00	1.61	22.342	37.76	158.66	1.030	0.500	5.00	9.148	9.42	355.8	65.4	383.9
178.00		0.00	1.62	22.451	37.94	153.66	1.030	0.500	3.00	5.259	5.42	205.5	37.9	220.5
								Totals:	**178.00**			**18,015.7**		**40,943.6**

Discrete Appurtenance Forces

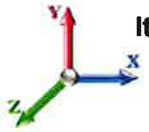
Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	175.00	Low Profile Platform	1	22.342	37.758	1.00	31.00	1500.00	0.000	0.000	1170.49	0.00	0.00
2	165.00	TMAs	3	21.969	37.128	0.67	1.77	43.20	0.000	0.000	65.67	0.00	0.00
3	165.00	Platform w/ Hand Rails	1	21.969	37.128	1.00	48.00	2600.00	0.000	0.000	1782.16	0.00	0.00
4	165.00	EMS RR90-18-02DP	3	21.969	37.128	0.78	15.33	133.80	0.000	0.000	569.07	0.00	0.00
5	155.00	Platform w/ Hand Rails	1	21.581	36.471	1.00	48.00	2600.00	0.000	0.000	1750.61	0.00	0.00
6	155.00	Kathrein 800 10764	1	21.581	36.471	0.77	5.38	77.30	0.000	0.000	196.30	0.00	0.00
7	155.00	KMW AM-X-CD-17-65-00T	1	21.581	36.471	0.78	4.76	63.00	0.000	0.000	173.53	0.00	0.00
8	155.00	Nokia CS72188.01	1	21.581	36.471	0.67	1.05	28.10	0.000	0.000	38.12	0.00	0.00
9	155.00	Powerwave LGP21401 TMAs	6	21.581	36.471	0.67	6.15	127.20	0.000	0.000	224.32	0.00	0.00
10	155.00	Powerwave 7770	6	21.581	36.471	0.78	30.89	358.20	0.000	0.000	1126.52	0.00	0.00
11	155.00	Powerwave LGP21903	6	21.581	36.471	0.67	1.53	47.40	0.000	0.000	55.71	0.00	0.00
12	155.00	Powerwave P65-17-XLH-RR	1	21.581	36.471	0.81	10.04	121.00	0.000	0.000	366.02	0.00	0.00
13	152.50	Ring Mount (Part No LWRM)	1	21.480	36.302	0.75	4.50	450.00	0.000	0.000	163.36	0.00	0.00
14	152.50	Raycap DC2-48-60-18-8F	1	21.480	36.302	0.67	1.12	50.50	0.000	0.000	40.62	0.00	0.00
15	152.50	Ericsson RRUS11 RRUs	6	21.480	36.302	0.67	14.55	437.40	0.000	0.000	528.28	0.00	0.00
16	145.00	Decibel DB908H90E-M	6	21.173	35.783	0.79	16.02	0.00	0.000	0.000	573.28	0.00	0.00
17	145.00	Platform w/ Hand Rails	1	21.173	35.783	1.00	48.00	2600.00	0.000	0.000	1717.57	0.00	0.00
18	135.00	T-Arms	3	20.745	35.060	0.75	23.63	1260.00	0.000	0.000	828.28	0.00	0.00
19	135.00	Kathrein 742-351	6	20.745	35.060	0.66	25.78	342.60	0.000	0.000	903.82	0.00	0.00
20	125.00	Antel	6	20.294	34.297	0.73	29.13	270.60	0.000	0.000	998.97	0.00	0.00
21	125.00	ALU RRH2x60-700	3	20.294	34.297	0.67	8.50	240.30	0.000	0.000	291.60	0.00	0.00
22	125.00	ALU RRH2x60-AWS	3	20.294	34.297	0.67	8.50	240.30	0.000	0.000	291.60	0.00	0.00
23	125.00	ALU RRH2X60-PCS	3	20.294	34.297	0.67	8.50	240.30	0.000	0.000	291.60	0.00	0.00
24	125.00	Low Profile Platform	1	20.294	34.297	1.00	31.00	1500.00	0.000	0.000	1063.21	0.00	0.00
25	125.00	Commscope SBNHH-1D65B	6	20.294	34.297	0.83	43.82	522.00	0.000	0.000	1503.03	0.00	0.00
26	125.00	GPS	1	20.294	34.297	0.67	0.84	18.00	0.000	0.000	28.72	0.00	0.00
27	125.00	RFS DB-T1-6Z-8AB-0Z	2	20.294	34.297	0.67	6.75	102.20	0.000	0.000	231.63	0.00	0.00
28	125.00	RFS FD9R6004/2C-3L	6	20.294	34.297	0.67	2.01	32.40	0.000	0.000	68.94	0.00	0.00
						Totals:		**16,005.80**			**17,043.04**		

Total Applied Force Summary

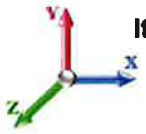
Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		607.66	1823.60	0.00	0.00
10.00		622.11	1904.18	0.00	0.00
15.00		610.54	1869.09	0.00	0.00
20.00		598.97	1833.99	0.00	0.00
25.00		587.40	1798.89	0.00	0.00
30.00		575.84	1763.80	0.00	0.00
32.83		321.17	984.35	0.00	0.00
35.00		251.37	1313.14	0.00	0.00
40.00		593.89	2982.99	0.00	0.00
45.00		601.58	1604.18	0.00	0.00
50.00		606.94	1571.05	0.00	0.00
55.00		610.31	1537.92	0.00	0.00
60.00		611.94	1504.80	0.00	0.00
65.00		612.06	1471.67	0.00	0.00
70.00		610.82	1438.54	0.00	0.00
75.00		608.35	1405.41	0.00	0.00
77.92		352.34	805.87	0.00	0.00
80.00		254.49	981.88	0.00	0.00
84.00		489.34	1859.68	0.00	0.00
85.00		120.73	256.05	0.00	0.00
90.00		606.38	1264.41	0.00	0.00
95.00		600.17	1233.25	0.00	0.00
100.00		593.15	1202.09	0.00	0.00
105.00		585.38	1170.93	0.00	0.00
110.00		576.89	1139.77	0.00	0.00
115.00		567.74	1108.61	0.00	0.00
120.00		557.95	1077.45	0.00	0.00
124.08		447.51	857.07	0.00	0.00
125.00	(31) appurtenances	4869.95	3445.73	0.00	0.00
129.00		385.19	1200.11	0.00	0.00
130.00		94.80	152.29	0.00	0.00
135.00	(9) appurtenances	2200.85	2349.84	0.00	0.00
140.00		456.16	663.13	0.00	0.00
145.00	(7) appurtenances	2733.95	3241.81	0.00	0.00
150.00		429.59	589.29	0.00	0.00
152.50	(8) appurtenances	941.35	1225.00	0.00	0.00
155.00	(23) appurtenances	4136.69	3703.97	0.00	0.00
160.00		401.26	479.06	0.00	0.00
165.00	(7) appurtenances	2803.38	3234.74	0.00	0.00
170.00		371.31	405.23	0.00	0.00
175.00	(1) appurtenances	1526.26	1883.91	0.00	0.00
178.00		205.51	220.55	0.00	0.00
	Totals:	**36,339.28**	**62,559.30**	**0.00**	**0.00**

Resulting Forces and Deflections

Structure: CT00594-S-SB
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

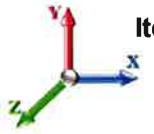
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/26/2015

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 25

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-36.424	-62.510	0.000	0.000	0.000	-4310.1	0.000	0.000	0.000	0.000	0.000
5.00	-35.976	-60.591	0.000	0.000	0.000	-4127.9	-0.082	0.000	0.082	-0.152	0.000
10.00	-35.505	-58.593	0.000	0.000	0.000	-3948.1	-0.323	0.000	0.323	-0.306	0.000
15.00	-35.038	-56.632	0.000	0.000	0.000	-3770.5	-0.728	0.000	0.728	-0.462	0.000
20.00	-34.575	-54.707	0.000	0.000	0.000	-3595.4	-1.298	0.000	1.298	-0.622	0.000
25.00	-34.116	-52.819	0.000	0.000	0.000	-3422.5	-2.036	0.000	2.036	-0.783	0.000
30.00	-33.629	-50.988	0.000	0.000	0.000	-3251.9	-2.945	0.000	2.945	-0.948	0.000
32.83	-33.365	-49.960	0.000	0.000	0.000	-3156.6	-3.537	0.000	3.537	-1.043	0.000
35.00	-33.192	-48.581	0.000	0.000	0.000	-3084.3	-4.028	0.000	4.028	-1.117	0.000
40.00	-32.671	-45.514	0.000	0.000	0.000	-2918.4	-5.289	0.000	5.289	-1.287	0.000
45.00	-32.164	-43.828	0.000	0.000	0.000	-2755.0	-6.728	0.000	6.728	-1.458	0.000
50.00	-31.644	-42.177	0.000	0.000	0.000	-2594.2	-8.349	0.000	8.349	-1.633	0.000
55.00	-31.114	-40.562	0.000	0.000	0.000	-2436.0	-10.154	0.000	10.154	-1.809	0.000
60.00	-30.574	-38.983	0.000	0.000	0.000	-2280.4	-12.144	0.000	12.144	-1.987	0.000
65.00	-30.027	-37.441	0.000	0.000	0.000	-2127.6	-14.321	0.000	14.321	-2.167	0.000
70.00	-29.474	-35.934	0.000	0.000	0.000	-1977.4	-16.687	0.000	16.687	-2.347	0.000
75.00	-28.893	-34.484	0.000	0.000	0.000	-1830.1	-19.243	0.000	19.243	-2.529	0.000
77.92	-28.559	-33.648	0.000	0.000	0.000	-1745.7	-20.823	0.000	20.823	-2.637	0.000
80.00	-28.323	-32.624	0.000	0.000	0.000	-1686.3	-21.990	0.000	21.990	-2.715	0.000
84.00	-27.793	-30.746	0.000	0.000	0.000	-1572.9	-24.329	0.000	24.329	-2.862	0.000
85.00	-27.719	-30.442	0.000	0.000	0.000	-1545.2	-24.930	0.000	24.930	-2.899	0.000
90.00	-27.139	-29.126	0.000	0.000	0.000	-1406.6	-28.063	0.000	28.063	-3.081	0.000
95.00	-26.558	-27.845	0.000	0.000	0.000	-1270.9	-31.385	0.000	31.385	-3.260	0.000
100.00	-25.977	-26.601	0.000	0.000	0.000	-1138.1	-34.893	0.000	34.893	-3.437	0.000
105.00	-25.396	-25.393	0.000	0.000	0.000	-1008.3	-38.584	0.000	38.584	-3.610	0.000
110.00	-24.817	-24.222	0.000	0.000	0.000	-881.33	-42.453	0.000	42.453	-3.777	0.000
115.00	-24.238	-23.088	0.000	0.000	0.000	-757.25	-46.494	0.000	46.494	-3.937	0.000
120.00	-23.657	-21.998	0.000	0.000	0.000	-636.06	-50.697	0.000	50.697	-4.088	0.000
124.08	-23.174	-21.147	0.000	0.000	0.000	-539.46	-54.242	0.000	54.242	-4.204	0.000
125.00	-18.085	-18.048	0.000	0.000	0.000	-518.22	-55.051	0.000	55.051	-4.229	0.000
129.00	-17.630	-16.861	0.000	0.000	0.000	-445.88	-58.637	0.000	58.637	-4.333	0.000
130.00	-17.553	-16.685	0.000	0.000	0.000	-428.25	-59.547	0.000	59.547	-4.359	0.000
135.00	-15.216	-14.472	0.000	0.000	0.000	-340.49	-64.200	0.000	64.200	-4.526	0.000
140.00	-14.742	-13.812	0.000	0.000	0.000	-264.41	-69.018	0.000	69.018	-4.674	0.000
145.00	-11.770	-10.784	0.000	0.000	0.000	-190.70	-73.978	0.000	73.978	-4.800	0.000
150.00	-11.305	-10.220	0.000	0.000	0.000	-131.85	-79.057	0.000	79.057	-4.901	0.000
152.50	-10.268	-9.073	0.000	0.000	0.000	-103.59	-81.632	0.000	81.632	-4.943	0.000
155.00	-5.830	-5.737	0.000	0.000	0.000	-77.929	-84.227	0.000	84.227	-4.977	0.000
160.00	-5.393	-5.290	0.000	0.000	0.000	-48.777	-89.462	0.000	89.462	-5.029	0.000
165.00	-2.317	-2.314	0.000	0.000	0.000	-21.813	-94.742	0.000	94.742	-5.062	0.000
170.00	-1.911	-1.943	0.000	0.000	0.000	-10.230	-100.04	0.000	100.047	-5.080	0.000
175.00	-0.224	-0.201	0.000	0.000	0.000	-0.673	-105.36	0.000	105.365	-5.087	0.000
178.00	-0.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	108.557	-5.087	0.000

Resulting Stresses

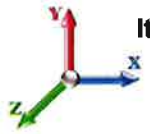
Structure:	CT00594-S-SBA	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 18	

TES Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 25

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.67	0.80	0.00	0.00	0.00	39.40	40.10	52.0	0.771
5.00	0.66	0.80	0.00	0.00	0.00	39.29	39.98	52.0	0.769
10.00	0.66	0.81	0.00	0.00	0.00	39.16	39.84	52.0	0.766
15.00	0.65	0.81	0.00	0.00	0.00	39.01	39.68	52.0	0.763
20.00	0.64	0.82	0.00	0.00	0.00	38.83	39.50	52.0	0.760
25.00	0.63	0.83	0.00	0.00	0.00	38.63	39.28	52.0	0.755
30.00	0.62	0.83	0.00	0.00	0.00	38.39	39.04	52.0	0.751
32.83	0.62	0.84	0.00	0.00	0.00	38.24	38.89	52.0	0.748
35.00	0.61	0.84	0.00	0.00	0.00	38.12	38.76	52.0	0.745
40.00	0.61	0.89	0.00	0.00	0.00	38.74	39.37	52.0	0.757
45.00	0.60	0.90	0.00	0.00	0.00	38.33	38.97	52.0	0.749
50.00	0.59	0.90	0.00	0.00	0.00	37.89	38.51	52.0	0.741
55.00	0.58	0.91	0.00	0.00	0.00	37.38	38.00	52.0	0.731
60.00	0.57	0.92	0.00	0.00	0.00	36.82	37.43	52.0	0.720
65.00	0.57	0.92	0.00	0.00	0.00	36.19	36.79	52.0	0.708
70.00	0.56	0.93	0.00	0.00	0.00	35.49	36.08	52.0	0.694
75.00	0.55	0.94	0.00	0.00	0.00	34.70	35.29	52.0	0.679
77.92	0.55	0.94	0.00	0.00	0.00	34.20	34.79	52.0	0.669
80.00	0.54	0.95	0.00	0.00	0.00	33.83	34.41	52.0	0.662
84.00	0.54	0.99	0.00	0.00	0.00	33.81	34.39	52.0	0.661
85.00	0.54	1.00	0.00	0.00	0.00	33.60	34.18	52.0	0.657
90.00	0.53	1.01	0.00	0.00	0.00	32.43	33.01	52.0	0.635
95.00	0.52	1.01	0.00	0.00	0.00	31.12	31.69	52.0	0.610
100.00	0.52	1.02	0.00	0.00	0.00	29.66	30.23	52.0	0.581
105.00	0.51	1.03	0.00	0.00	0.00	28.01	28.58	52.0	0.550
110.00	0.50	1.04	0.00	0.00	0.00	26.17	26.73	52.0	0.514
115.00	0.49	1.05	0.00	0.00	0.00	24.08	24.64	52.0	0.474
120.00	0.49	1.07	0.00	0.00	0.00	21.71	22.28	52.0	0.428
124.08	0.48	1.08	0.00	0.00	0.00	19.55	20.12	52.0	0.387
125.00	0.41	0.84	0.00	0.00	0.00	19.04	19.51	52.0	0.375
129.00	0.61	1.29	0.00	0.00	0.00	25.69	26.40	52.0	0.508
130.00	0.61	1.29	0.00	0.00	0.00	25.05	25.76	52.0	0.495
135.00	0.55	1.17	0.00	0.00	0.00	21.52	22.16	52.0	0.426
140.00	0.54	1.17	0.00	0.00	0.00	18.11	18.77	52.0	0.361
145.00	0.44	0.98	0.00	0.00	0.00	14.21	14.75	52.0	0.284
150.00	0.44	0.98	0.00	0.00	0.00	10.72	11.29	52.0	0.217
152.50	0.40	0.91	0.00	0.00	0.00	8.81	9.34	52.0	0.180
155.00	0.26	0.53	0.00	0.00	0.00	6.94	7.26	52.0	0.140
160.00	0.25	0.51	0.00	0.00	0.00	4.78	5.11	52.0	0.098
165.00	0.11	0.23	0.00	0.00	0.00	2.37	2.51	52.0	0.048
170.00	0.10	0.20	0.00	0.00	0.00	1.23	1.38	52.0	0.027
175.00	0.01	0.03	0.00	0.00	0.00	0.09	0.11	52.0	0.002
178.00	0.00	0.02	0.00	0.00	0.00	0.00	0.04	52.0	0.001

Wind Loading - Shaft

Structure: CT00594-S-SBA
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

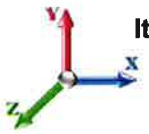
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/26/2015

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		0.00	1.00	6.400	10.82	242.71	1.030	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	237.92	1.030	0.000	5.00	24.031	24.75	267.7	0.0	1566.2
10.00		0.00	1.00	6.400	10.82	233.13	1.030	0.000	5.00	23.552	24.26	262.4	0.0	1534.7
15.00		0.00	1.00	6.400	10.82	228.34	1.030	0.000	5.00	23.073	23.77	257.0	0.0	1503.2
20.00		0.00	1.00	6.400	10.82	223.54	1.030	0.000	5.00	22.594	23.27	251.7	0.0	1471.7
25.00		0.00	1.00	6.400	10.82	218.75	1.030	0.000	5.00	22.115	22.78	246.4	0.0	1440.2
30.00		0.00	1.00	6.400	10.82	213.96	1.030	0.000	5.00	21.636	22.28	241.0	0.0	1408.7
32.83	Bot - Section 2	0.00	1.00	6.400	10.82	211.25	1.030	0.000	2.83	12.048	12.41	134.2	0.0	784.3
35.00		0.00	1.02	6.509	11.00	210.94	1.030	0.000	2.17	9.278	9.56	105.1	0.0	1159.5
40.00	Top - Section 1	0.00	1.06	6.762	11.43	210.07	1.030	0.000	5.00	21.068	21.70	248.0	0.0	2632.1
45.00		0.00	1.09	6.993	11.82	212.71	1.030	0.000	5.00	20.589	21.21	250.6	0.0	1256.9
50.00		0.00	1.13	7.207	12.18	210.86	1.030	0.000	5.00	20.110	20.71	252.3	0.0	1227.4
55.00		0.00	1.16	7.406	12.52	208.59	1.030	0.000	5.00	19.631	20.22	253.1	0.0	1197.9
60.00		0.00	1.19	7.592	12.83	205.98	1.030	0.000	5.00	19.152	19.73	253.1	0.0	1168.3
65.00		0.00	1.21	7.768	13.13	203.07	1.030	0.000	5.00	18.673	19.23	252.5	0.0	1138.8
70.00		0.00	1.24	7.934	13.41	199.90	1.030	0.000	5.00	18.193	18.74	251.3	0.0	1109.3
75.00		0.00	1.26	8.092	13.68	196.49	1.030	0.000	5.00	17.714	18.25	249.5	0.0	1079.8
77.92	Bot - Section 3	0.00	1.28	8.181	13.83	194.41	1.030	0.000	2.92	10.124	10.43	144.2	0.0	616.9
80.00		0.00	1.29	8.242	13.93	192.88	1.030	0.000	2.08	7.263	7.48	104.2	0.0	846.8
84.00	Top - Section 2	0.00	1.31	8.358	14.13	189.84	1.030	0.000	4.00	13.746	14.16	200.0	0.0	1601.9
85.00		0.00	1.31	8.387	14.17	193.24	1.030	0.000	1.00	3.375	3.48	49.3	0.0	192.0
90.00		0.00	1.33	8.525	14.41	189.30	1.030	0.000	5.00	16.642	17.14	246.9	0.0	946.8
95.00		0.00	1.35	8.657	14.63	185.19	1.030	0.000	5.00	16.163	16.65	243.6	0.0	919.2
100.00		0.00	1.37	8.785	14.85	180.94	1.030	0.000	5.00	15.683	16.15	239.8	0.0	891.7
105.00		0.00	1.39	8.908	15.06	176.56	1.030	0.000	5.00	15.204	15.66	235.8	0.0	864.1
110.00		0.00	1.41	9.028	15.26	172.04	1.030	0.000	5.00	14.725	15.17	231.4	0.0	836.6
115.00		0.00	1.43	9.143	15.45	167.41	1.030	0.000	5.00	14.246	14.67	226.7	0.0	809.0
120.00		0.00	1.45	9.255	15.64	162.67	1.030	0.000	5.00	13.767	14.18	221.8	0.0	781.4
124.08	Bot - Section 4	0.00	1.46	9.344	15.79	158.72	1.030	0.000	4.08	10.888	11.21	177.1	0.0	617.7
125.00	Appurtenance(s)	0.00	1.46	9.363	15.82	157.83	1.030	0.000	0.92	2.443	2.52	39.8	0.0	225.7
129.00	Top - Section 3	0.00	1.48	9.448	15.97	153.88	1.030	0.000	4.00	10.473	10.79	172.2	0.0	967.1
130.00		0.00	1.48	9.469	16.00	155.74	1.030	0.000	1.00	2.570	2.65	42.4	0.0	94.2
135.00	Appurtenance(s)	0.00	1.50	9.572	16.18	150.72	1.030	0.000	5.00	12.564	12.94	209.3	0.0	460.3
140.00		0.00	1.51	9.672	16.35	145.62	1.030	0.000	5.00	12.085	12.45	203.5	0.0	442.6
145.00	Appurtenance(s)	0.00	1.53	9.769	16.51	140.43	1.030	0.000	5.00	11.606	11.95	197.4	0.0	424.8
150.00		0.00	1.54	9.864	16.67	135.16	1.030	0.000	5.00	11.127	11.46	191.1	0.0	407.1
152.50	Appurtenance(s)	0.00	1.55	9.911	16.75	132.50	1.030	0.000	2.50	5.384	5.55	92.9	0.0	196.9
155.00	Appurtenance(s)	0.00	1.56	9.957	16.83	129.82	1.030	0.000	2.50	5.264	5.42	91.2	0.0	192.5
160.00		0.00	1.57	10.048	16.98	124.41	1.030	0.000	5.00	10.169	10.47	177.8	0.0	371.7
165.00	Appurtenance(s)	0.00	1.58	10.136	17.13	118.93	1.030	0.000	5.00	9.689	9.98	171.0	0.0	354.0
170.00		0.00	1.60	10.223	17.28	113.38	1.030	0.000	5.00	9.210	9.49	163.9	0.0	336.3
175.00	Appurtenance(s)	0.00	1.61	10.308	17.42	107.77	1.030	0.000	5.00	8.731	8.99	156.7	0.0	318.5
178.00		0.00	1.62	10.358	17.51	104.37	1.030	0.000	3.00	5.009	5.16	90.3	0.0	182.6
								Totals:	**178.00**			**8,096.1**		**36,577.3**

Discrete Appurtenance Forces

Structure: CT00594-S-SB
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

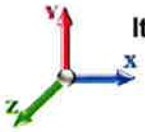
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/26/2015

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 24

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	175.00	Low Profile Platform	1	10.308	17.421	1.00	25.00	1200.00	0.000	0.000	435.53	0.00	0.00
2	165.00	TMAs	3	10.136	17.131	0.67	1.41	29.70	0.000	0.000	24.10	0.00	0.00
3	165.00	Platform w/ Hand Rails	1	10.136	17.131	1.00	40.00	2000.00	0.000	0.000	685.22	0.00	0.00
4	165.00	EMS RR90-18-02DP	3	10.136	17.131	0.78	13.71	48.00	0.000	0.000	234.90	0.00	0.00
5	155.00	Platform w/ Hand Rails	1	9.957	16.827	1.00	40.00	2000.00	0.000	0.000	673.09	0.00	0.00
6	155.00	Kathrein 800 10764	1	9.957	16.827	0.77	4.87	40.80	0.000	0.000	82.02	0.00	0.00
7	155.00	KMW AM-X-CD-17-65-00T	1	9.957	16.827	0.78	4.30	30.80	0.000	0.000	72.32	0.00	0.00
8	155.00	Nokia CS72188.01	1	9.957	16.827	0.67	0.88	19.80	0.000	0.000	14.88	0.00	0.00
9	155.00	Powerwave LGP21401 TMAs	6	9.957	16.827	0.67	5.19	84.60	0.000	0.000	87.26	0.00	0.00
10	155.00	Powerwave 7770	6	9.957	16.827	0.78	27.71	162.00	0.000	0.000	466.21	0.00	0.00
11	155.00	Powerwave LGP21903	6	9.957	16.827	0.67	1.09	33.00	0.000	0.000	18.26	0.00	0.00
12	155.00	Powerwave P65-17-XLH-RR	1	9.957	16.827	0.81	9.28	59.00	0.000	0.000	156.20	0.00	0.00
13	152.50	Ring Mount (Part No LWRM)	1	9.911	16.749	0.75	3.75	150.00	0.000	0.000	62.81	0.00	0.00
14	152.50	Raycap DC2-48-60-18-8F	1	9.911	16.749	0.67	0.98	32.80	0.000	0.000	16.50	0.00	0.00
15	152.50	Ericsson RRUS11 RRUs	6	9.911	16.749	0.67	13.11	306.00	0.000	0.000	219.50	0.00	0.00
16	145.00	Decibel DB908H90E-M	6	9.769	16.510	0.79	13.79	42.00	0.000	0.000	227.72	0.00	0.00
17	145.00	Platform w/ Hand Rails	1	9.769	16.510	1.00	40.00	2000.00	0.000	0.000	660.39	0.00	0.00
18	135.00	T-Arms	3	9.572	16.176	0.75	18.00	1050.00	0.000	0.000	291.17	0.00	0.00
19	135.00	Kathrein 742-351	6	9.572	16.176	0.66	23.28	178.80	0.000	0.000	376.66	0.00	0.00
20	125.00	Antel	6	9.363	15.824	0.73	26.54	72.00	0.000	0.000	420.02	0.00	0.00
21	125.00	ALU RRH2x60-700	3	9.363	15.824	0.67	7.96	180.00	0.000	0.000	125.95	0.00	0.00
22	125.00	ALU RRH2x60-AWS	3	9.363	15.824	0.67	7.96	180.00	0.000	0.000	125.95	0.00	0.00
23	125.00	ALU RRH2X60-PCS	3	9.363	15.824	0.67	5.17	165.00	0.000	0.000	81.74	0.00	0.00
24	125.00	Low Profile Platform	1	9.363	15.824	1.00	25.00	1200.00	0.000	0.000	395.61	0.00	0.00
25	125.00	Commscope SBNHH-1D65B	6	9.363	15.824	0.83	41.33	304.26	0.000	0.000	654.08	0.00	0.00
26	125.00	GPS	1	9.363	15.824	0.67	0.67	10.00	0.000	0.000	10.60	0.00	0.00
27	125.00	RFS DB-T1-6Z-8AB-0Z	2	9.363	15.824	0.67	7.50	88.00	0.000	0.000	118.75	0.00	0.00
28	125.00	RFS FD9R6004/2C-3L	6	9.363	15.824	0.67	1.49	18.60	0.000	0.000	23.54	0.00	0.00
						Totals:		**11,685.16**			**6,760.99**		

Total Applied Force Summary

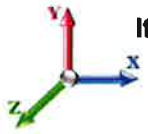
Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 21	

TES Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 24

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		267.72	1670.88	0.00	0.00
10.00		262.38	1796.46	0.00	0.00
15.00		257.04	1764.97	0.00	0.00
20.00		251.71	1733.47	0.00	0.00
25.00		246.37	1701.97	0.00	0.00
30.00		241.03	1670.47	0.00	0.00
32.83		134.22	932.62	0.00	0.00
35.00		105.12	1272.99	0.00	0.00
40.00		247.97	2893.93	0.00	0.00
45.00		250.63	1518.72	0.00	0.00
50.00		252.27	1489.19	0.00	0.00
55.00		253.06	1459.67	0.00	0.00
60.00		253.10	1430.14	0.00	0.00
65.00		252.48	1400.61	0.00	0.00
70.00		251.26	1371.08	0.00	0.00
75.00		249.52	1341.55	0.00	0.00
77.92		144.16	769.81	0.00	0.00
80.00		104.21	955.67	0.00	0.00
84.00		200.00	1811.55	0.00	0.00
85.00		49.26	244.21	0.00	0.00
90.00		246.94	1208.61	0.00	0.00
95.00		243.57	1181.05	0.00	0.00
100.00		239.83	1153.49	0.00	0.00
105.00		235.77	1125.93	0.00	0.00
110.00		231.40	1098.37	0.00	0.00
115.00		226.73	1070.81	0.00	0.00
120.00		221.79	1043.25	0.00	0.00
124.08		177.08	831.54	0.00	0.00
125.00	(31) appurtenances	1996.06	2491.56	0.00	0.00
129.00		172.24	1121.32	0.00	0.00
130.00		42.37	132.74	0.00	0.00
135.00	(9) appurtenances	877.16	1881.88	0.00	0.00
140.00		203.45	572.56	0.00	0.00
145.00	(7) appurtenances	1085.47	2596.85	0.00	0.00
150.00		191.05	505.93	0.00	0.00
152.50	(8) appurtenances	391.69	735.12	0.00	0.00
155.00	(23) appurtenances	1661.49	2671.89	0.00	0.00
160.00		177.85	402.89	0.00	0.00
165.00	(7) appurtenances	1115.19	2462.88	0.00	0.00
170.00		163.90	336.26	0.00	0.00
175.00	(1) appurtenances	592.19	1518.54	0.00	0.00
178.00		90.31	182.62	0.00	0.00
	Totals:	**14,857.06**	**55,556.03**	**0.00**	**0.00**

Resulting Forces and Deflections

Structure: CT00594-S-SB
Site Name: Plainfield North
Height: 178.00 (ft)
Base Elev: 0.000 (ft)

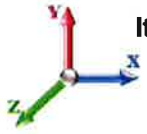
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

8/26/2015

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 24

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	-14.887	-55.548	0.000	0.000	0.000	-1737.6	0.000	0.000	0.000	0.000	0.000
5.00	-14.676	-53.861	0.000	0.000	0.000	-1663.1	-0.033	0.000	0.033	-0.061	0.000
10.00	-14.468	-52.050	0.000	0.000	0.000	-1589.8	-0.130	0.000	0.130	-0.123	0.000
15.00	-14.262	-50.270	0.000	0.000	0.000	-1517.4	-0.293	0.000	0.293	-0.186	0.000
20.00	-14.058	-48.521	0.000	0.000	0.000	-1446.1	-0.523	0.000	0.523	-0.250	0.000
25.00	-13.857	-46.805	0.000	0.000	0.000	-1375.8	-0.820	0.000	0.820	-0.315	0.000
30.00	-13.647	-45.123	0.000	0.000	0.000	-1306.5	-1.186	0.000	1.186	-0.381	0.000
32.83	-13.532	-44.184	0.000	0.000	0.000	-1267.9	-1.424	0.000	1.424	-0.420	0.000
35.00	-13.454	-42.900	0.000	0.000	0.000	-1238.6	-1.622	0.000	1.622	-0.450	0.000
40.00	-13.229	-39.992	0.000	0.000	0.000	-1171.3	-2.129	0.000	2.129	-0.517	0.000
45.00	-13.011	-38.460	0.000	0.000	0.000	-1105.1	-2.708	0.000	2.708	-0.586	0.000
50.00	-12.788	-36.958	0.000	0.000	0.000	-1040.1	-3.360	0.000	3.360	-0.656	0.000
55.00	-12.561	-35.486	0.000	0.000	0.000	-976.19	-4.085	0.000	4.085	-0.727	0.000
60.00	-12.332	-34.044	0.000	0.000	0.000	-913.39	-4.885	0.000	4.885	-0.798	0.000
65.00	-12.100	-32.632	0.000	0.000	0.000	-851.73	-5.760	0.000	5.760	-0.870	0.000
70.00	-11.866	-31.250	0.000	0.000	0.000	-791.23	-6.710	0.000	6.710	-0.943	0.000
75.00	-11.624	-29.902	0.000	0.000	0.000	-731.90	-7.736	0.000	7.736	-1.015	0.000
77.92	-11.485	-29.127	0.000	0.000	0.000	-697.96	-8.371	0.000	8.371	-1.058	0.000
80.00	-11.385	-28.165	0.000	0.000	0.000	-674.07	-8.839	0.000	8.839	-1.089	0.000
84.00	-11.166	-26.350	0.000	0.000	0.000	-628.49	-9.778	0.000	9.778	-1.148	0.000
85.00	-11.132	-26.099	0.000	0.000	0.000	-617.37	-10.020	0.000	10.020	-1.163	0.000
90.00	-10.892	-24.882	0.000	0.000	0.000	-561.70	-11.277	0.000	11.277	-1.236	0.000
95.00	-10.651	-23.693	0.000	0.000	0.000	-507.25	-12.610	0.000	12.610	-1.307	0.000
100.00	-10.412	-22.533	0.000	0.000	0.000	-453.99	-14.017	0.000	14.017	-1.378	0.000
105.00	-10.174	-21.401	0.000	0.000	0.000	-401.93	-15.497	0.000	15.497	-1.447	0.000
110.00	-9.937	-20.298	0.000	0.000	0.000	-351.07	-17.049	0.000	17.049	-1.513	0.000
115.00	-9.702	-19.223	0.000	0.000	0.000	-301.38	-18.669	0.000	18.669	-1.577	0.000
120.00	-9.468	-18.178	0.000	0.000	0.000	-252.87	-20.353	0.000	20.353	-1.637	0.000
124.08	-9.275	-17.347	0.000	0.000	0.000	-214.21	-21.774	0.000	21.774	-1.683	0.000
125.00	-7.214	-14.912	0.000	0.000	0.000	-205.71	-22.098	0.000	22.098	-1.693	0.000
129.00	-7.014	-13.794	0.000	0.000	0.000	-176.85	-23.535	0.000	23.535	-1.734	0.000
130.00	-6.977	-13.657	0.000	0.000	0.000	-169.84	-23.899	0.000	23.899	-1.745	0.000
135.00	-6.055	-11.797	0.000	0.000	0.000	-134.95	-25.763	0.000	25.763	-1.811	0.000
140.00	-5.844	-11.226	0.000	0.000	0.000	-104.68	-27.692	0.000	27.692	-1.870	0.000
145.00	-4.680	-8.663	0.000	0.000	0.000	-75.467	-29.678	0.000	29.678	-1.919	0.000
150.00	-4.475	-8.161	0.000	0.000	0.000	-52.070	-31.711	0.000	31.711	-1.959	0.000
152.50	-4.061	-7.439	0.000	0.000	0.000	-40.881	-32.741	0.000	32.741	-1.976	0.000
155.00	-2.309	-4.826	0.000	0.000	0.000	-30.730	-33.780	0.000	33.780	-1.990	0.000
160.00	-2.119	-4.428	0.000	0.000	0.000	-19.184	-35.875	0.000	35.875	-2.010	0.000
165.00	-0.918	-2.006	0.000	0.000	0.000	-8.591	-37.987	0.000	37.987	-2.023	0.000
170.00	-0.742	-1.676	0.000	0.000	0.000	-4.002	-40.110	0.000	40.110	-2.030	0.000
175.00	-0.097	-0.179	0.000	0.000	0.000	-0.290	-42.237	0.000	42.237	-2.033	0.000
178.00	-0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	43.514	-2.033	0.000

Resulting Stresses

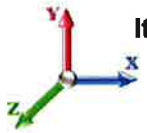
Structure:	CT00594-S-SBA	**Code:**	EIA/TIA-222-F	8/26/2015
Site Name:	Plainfield North	**Exposure:**	C	
Height:	178.00 (ft)	**Gh:**	1.69	
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 23

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 24

	Applied Stresses								
Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.60	0.33	0.00	0.00	0.00	15.89	16.49	52.0	0.317
5.00	0.59	0.33	0.00	0.00	0.00	15.83	16.43	52.0	0.316
10.00	0.58	0.33	0.00	0.00	0.00	15.77	16.36	52.0	0.315
15.00	0.58	0.33	0.00	0.00	0.00	15.70	16.28	52.0	0.313
20.00	0.57	0.33	0.00	0.00	0.00	15.62	16.20	52.0	0.311
25.00	0.56	0.34	0.00	0.00	0.00	15.53	16.10	52.0	0.310
30.00	0.55	0.34	0.00	0.00	0.00	15.42	15.99	52.0	0.307
32.83	0.55	0.34	0.00	0.00	0.00	15.36	15.92	52.0	0.306
35.00	0.54	0.34	0.00	0.00	0.00	15.31	15.86	52.0	0.305
40.00	0.54	0.36	0.00	0.00	0.00	15.55	16.09	52.0	0.310
45.00	0.53	0.36	0.00	0.00	0.00	15.38	15.92	52.0	0.306
50.00	0.52	0.36	0.00	0.00	0.00	15.19	15.72	52.0	0.302
55.00	0.51	0.37	0.00	0.00	0.00	14.98	15.50	52.0	0.298
60.00	0.50	0.37	0.00	0.00	0.00	14.75	15.26	52.0	0.294
65.00	0.49	0.37	0.00	0.00	0.00	14.49	15.00	52.0	0.288
70.00	0.49	0.37	0.00	0.00	0.00	14.20	14.70	52.0	0.283
75.00	0.48	0.38	0.00	0.00	0.00	13.88	14.37	52.0	0.276
77.92	0.47	0.38	0.00	0.00	0.00	13.67	14.16	52.0	0.272
80.00	0.46	0.38	0.00	0.00	0.00	13.52	14.00	52.0	0.269
84.00	0.46	0.40	0.00	0.00	0.00	13.51	13.99	52.0	0.269
85.00	0.46	0.40	0.00	0.00	0.00	13.42	13.90	52.0	0.267
90.00	0.45	0.40	0.00	0.00	0.00	12.95	13.42	52.0	0.258
95.00	0.45	0.41	0.00	0.00	0.00	12.42	12.89	52.0	0.248
100.00	0.44	0.41	0.00	0.00	0.00	11.83	12.29	52.0	0.236
105.00	0.43	0.41	0.00	0.00	0.00	11.17	11.62	52.0	0.223
110.00	0.42	0.42	0.00	0.00	0.00	10.42	10.87	52.0	0.209
115.00	0.41	0.42	0.00	0.00	0.00	9.58	10.02	52.0	0.193
120.00	0.40	0.43	0.00	0.00	0.00	8.63	9.07	52.0	0.174
124.08	0.40	0.43	0.00	0.00	0.00	7.76	8.19	52.0	0.158
125.00	0.34	0.34	0.00	0.00	0.00	7.56	7.92	52.0	0.152
129.00	0.50	0.51	0.00	0.00	0.00	10.19	10.72	52.0	0.206
130.00	0.50	0.51	0.00	0.00	0.00	9.94	10.47	52.0	0.201
135.00	0.44	0.46	0.00	0.00	0.00	8.53	9.01	52.0	0.173
140.00	0.44	0.47	0.00	0.00	0.00	7.17	7.65	52.0	0.147
145.00	0.35	0.39	0.00	0.00	0.00	5.62	6.01	52.0	0.116
150.00	0.35	0.39	0.00	0.00	0.00	4.23	4.63	52.0	0.089
152.50	0.33	0.36	0.00	0.00	0.00	3.48	3.85	52.0	0.074
155.00	0.22	0.21	0.00	0.00	0.00	2.74	2.98	52.0	0.057
160.00	0.21	0.20	0.00	0.00	0.00	1.88	2.12	52.0	0.041
165.00	0.10	0.09	0.00	0.00	0.00	0.93	1.04	52.0	0.020
170.00	0.09	0.08	0.00	0.00	0.00	0.48	0.59	52.0	0.011
175.00	0.01	0.01	0.00	0.00	0.00	0.04	0.05	52.0	0.001
178.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	52.0	0.000

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	t MZ (ft-kips)
85 mph Wind with 0" Ice	43.0	0.00	55.49	0.00	0.00	5015.22
73.61 mph Wind with 0.5" Ice	36.4	0.00	62.51	0.00	0.00	4310.11
50 mph Wind with 0" Ice	14.9	0.00	55.55	0.00	0.00	1737.62

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
85 mph Wind with 0" Ice	0.60	0.94	0.00	0.00	0.00	45.85	46.47	52.0	0.00	0.894
73.61 mph Wind with 0.5" Ice	0.67	0.80	0.00	0.00	0.00	39.40	40.10	52.0	0.00	0.771
50 mph Wind with 0" Ice	0.60	0.33	0.00	0.00	0.00	15.89	16.49	52.0	0.00	0.317

Base Plate Summary

Structure:	CT00594-S-SB	**Code:**	EIA/TIA-222-F	8/26/2015	
Site Name:	Plainfield North	**Exposure:**	C		
Height:	178.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 25	

TES Tower Engineering Solutions

Reactions		Base Plate		Anchor Bolts	
Original Design		**Yield (ksi):**	60.00	**Bolt Circle:**	66.81
Moment (kip-ft):	5595.92	**Width (in):**	72.81	**Number Bolts:**	24.00
Axial (kip):	50.66	**Style:**	Polygon	**Bolt Type:**	2.25" 18J
Shear (kip):	45.22	**Polygon Sides:**	12.00	**Bolt Diameter (in):**	2.25
Analysis		**Clip Length (in):**	0.00	**Yield (ksi):**	75.00
Moment (kip-ft):	5015.22	**Effective Len (in):**	13.27	**Ultimate (ksi):**	100.00
Axial (kip):	62.51	**Moment (kip-in):**	653.72	**Arrangement:**	Radial
Shear (kip):	43.02	**Allow Stress (ksi):**	60.00	**Cluster Dist (in):**	0.00
		Applied Stress (ksi):	32.84	**Start Angle (deg):**	15.00
Moment Design %:	89.62	**Stress Ratio:**	0.55	Compression	
				Force (kip):	152.74
				Allowable (kip):	195.00
				Ratio:	0.78
				Tension	
				Force (kip):	147.53
				Allowable (kip):	195.00
				Ratio:	0.76