Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

January 15, 2016

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

Re: **Notice of Exempt Modification – Facility Modification**
146 Brown Road, Brooklyn, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 127-foot level on an existing 150-foot tower at 146 Brown Road in Brooklyn, Connecticut (the "Property"). The tower is owned by SBA. Cellco's use of the tower was approved by the Council in 2007. Cellco now intends to modify its facility by removing all of its antennas and replacing them with six (6) LPA-80080-6CF, 850 MHz antennas; three (3) model SBNHH-1D65B, 1900 MHz antennas; and three (3) model SBNHH-1D65B, 700/2100 MHz antennas. Cellco also intends to install nine (9) remote radio heads ("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 notice is being sent to Richard Ives, First Selectman of the Town of Brooklyn. A copy of this letter is also being sent to Ralph G. Ingalls, 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 at the 127-foot level on the existing 150-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:
Richard Ives, Brooklyn First Selectman
Ralph G. Ingalls
SBA
Tim Parks

ATTACHMENT 1

Vertically Polarized, Log-Periodic 80° / 14 dBd
806-960 MHz

Mechanical specifications

Length	1800	mm	70.9	in
Width	140	mm	5.5	in
Depth	335	mm	13.2	in
Depth with z-bracket	375	mm	14.8	in
Weight [4]	9.5	kg	21.0	lbs
Wind Area Fore/Aft [6]	0.25	m^2	2.7	ft^2
Wind Area Side [6]	0.61	m^2	6.6	ft^2
Max Wind Survivability [6]	>201	km/hr	>125	mph
Wind Load @ 100 mph (161 km/hr) [6]				
Fore/Aft	415	N	93	lbf
Side	878	N	198	lbf

Antenna consisting of aluminum alloy with brass feedlines covered by a gray, UV safe fiberglass radome. RoHS compliant.

Mounting & Downtilting

Mounting hardware attaches to pipe diameter Ø50-102 mm; Ø2.0-4.0 in. If the lock-down brace is used, the maximum diameter is Ø88.9 mm (3.5 in).

Mechanical downtilt angle 0-22°
Mounting & Downtilt Bracket Kit 21700000

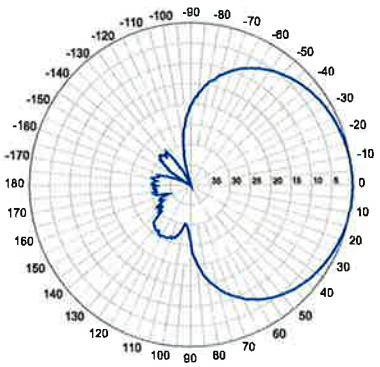
Electrical specifications

Frequency Range	806-960 MHz
Impedance	50Ω
Connector [3]	NE or E-DIN Female 1 port / Center
VSWR [1]	≤ 1.4:1
Polarization	Vertical
Gain [1]	14 dBd
Power Rating [2]	500 W
Half Power Angle [1]	
Horizontal Beamwidth	80°
Vertical Beamwidth	10°
Electrical downtilt [5]	0°
Null fill [1]	10%
Lightning protection	Direct ground

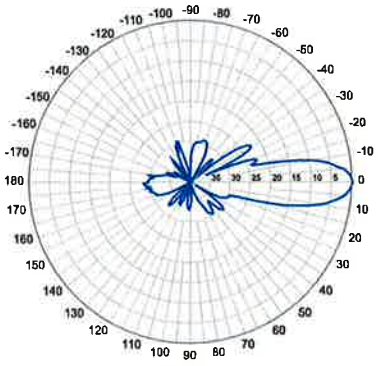
1) Typical values.
2) Power rating limited by connector only.
3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.
4) Antenna weight does not include brackets.
5) Add'l downtilts may be available. Check website for details.
6) Values reflect installation with all three brackets utilized.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation-pattern[1]



Horizontal



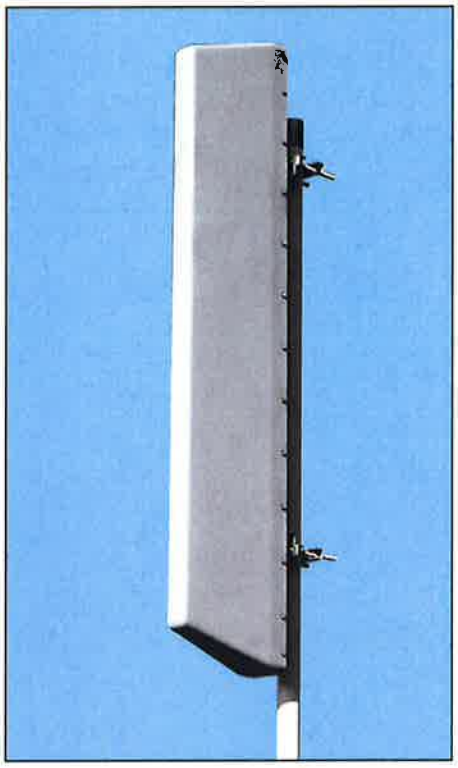
Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the front-to-back ratio.

LPA-80080/6CF __

When ordering replace "__" with connector type.



Featuring our Exclusive 3T Technology™ Antenna Design:

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

Warranty:
This antenna is under a five-year limited warranty for repair or replacement.

Revision Date: 08/18/08

806-960 MHz

815.399.0001 • antel@antelinc.com • www.antelinc.com

Amphenol Antel, Inc. The Antenna Technology Company

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 (First Lobe), 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, beampeak to 20° above beampeak, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

General Specifications

Antenna 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 km/h | 150 mph

Dimensions

Depth	180.0 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight	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.

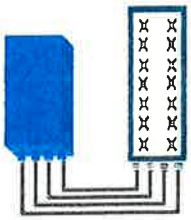
Its compactness and slim design makes the Alcatel-Lucent B13 RRH4x30-4R easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the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

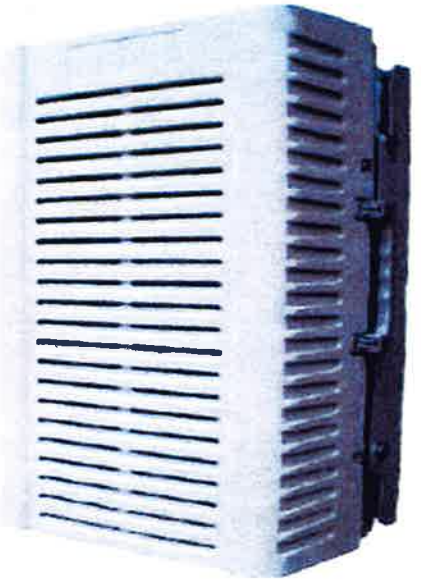
Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	U700 (C) (3GPP bands 13): DL: 746 - 756 MHz / UL: 777 - 787 MHz
Instantaneous bandwidth - #carriers	10MHz – 1 LTE carrier (in 10MHz occupied bandwidth)
LTE carrier bandwidth	10 MHz
RF output power	2x60W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

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 1900A HW version	2 Branch RX – LA6.0.1 4 Branch RX – LR13.3
Features	AISG 2.0 for RET/TMA
	Internal Smart Bias-T
Power	-48VDC
CPRI Ports	2 CPRI Rate 3 Ports
External Alarms	4 External User Alarms
Monitor Ports	TX
Environmental	GR487 Compliance
RF Connectors	7/16 DIN (top mounted)



** Not a Verizon Wireless deployed product

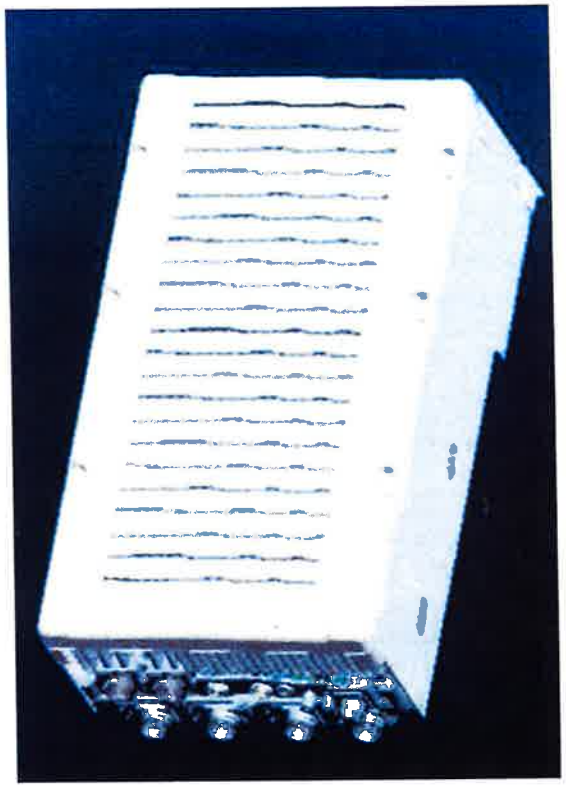
Alcatel·Lucent

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.)

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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.

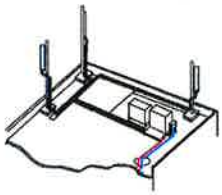
EASY INSTALLATION

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.

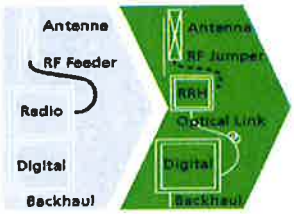
The limited space available in some sites may prevent the installation of traditional single-cabinet BTS equipment. However, many of these sites can host an Alcatel-Lucent RRH2x60-AWS installation, providing more flexible site selection and improved network quality along with greatly reduced installation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

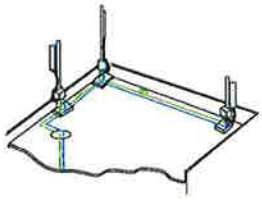
Installation can easily be done by a single person as the Alcatel–Lucent RRH2x60-AWS is compact and weighs about 20 kg, eliminating the need for a crane to hoist the BTS cabinet to the rooftop. A site can be in operation in less than one day.



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)

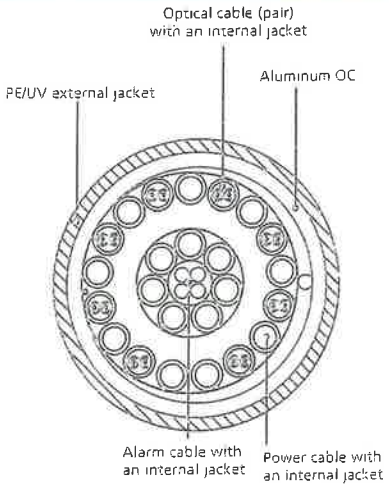


Figure 2: Construction Detail

* This data is provisional and subject to change

ATTACHMENT 2

	General	Power	Density					
Site Name: Danielson W (Brooklyn)								
Tower Height: 150'								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T	16	250	147	0.0724	1945	1.0000	0.72%	
*T-Mobile	2	1750	137.5	0.0728	2100	1.0000	0.73%	
*T-Mobile	1	703	137.5	0.0146	700	0.4667	0.31%	
*T-Mobile	2	875	137.5	0.0364	1900	1.0000	0.36%	
*T-Mobile	2	875	137.5	0.0364	2100	1.0000	0.36%	
Verizon	**11**	**444**	**127**	**0.1089**	**1970**	**1.0000**	**10.89%**	
Verizon	**9**	**336**	**127**	**0.0674**	**869**	**0.5793**	**11.64%**	
Verizon	**1**	**2302**	**127**	**0.0513**	**2145**	**1.0000**	**5.13%**	
Verizon	**1**	**840**	**127**	**0.0187**	**746**	**0.4973**	**3.77%**	
								33.9%
* 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 150 ft. Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13612-A-03

Customer Site Name: Ingalls

Carrier Name: Verizon

Carrier Site ID / Name: Danielson West

Site Location: 146 Brown Rd

Brooklyn, CT

Windham County

Latitude: 41.798361

Longitude: -71.935889

Analysis Result:

Max Structural Usage: 92.0% [Pass]

Max Foundation Usage: 54.0% [Pass]

Report Prepared By : Delu Zhou

Introduction

The purpose of this report is to summarize the analysis results on the 150 ft. 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	Engineered Endeavors Incorporated, Project # 12401, Drawing # GS55101, dated 03/18/2004
Foundation Drawing	Engineered Endeavors Incorporated, Project # 12401, Drawing # S12401-150.0, dated 03/18/2004
Geotechnical Report	Jaworski Geotech Inc. Geotechnical Report, dated 04/19/2004
Modification Drawings	N/A

Analysis Criteria

The analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-F. In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Basic Wind Speed Used in the Analysis:	85.0 mph (fastest mile)
Basic 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/EIA 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	137.5	3	RFS / APX16PV-16PVL - Panel	(3) WiMax Style T-Frame (Site Pro P/N RMV5-3096)	(18) 1-5/8"	T-Mobile
2		3	Commscope / LNX-6515DS-VTM - Panel			
3		3	EMS / RR90-19-XXDPQ - Panel			
4		6	Ericsson / KRY 112 144/1			
5		3	Kathrein / 782 11056			
-	128.8	3	Antel / BXA-70063-6CF - Panel	(1) Low Profile Platform	(12) 1 5/8" (1) 1 5/8" Fiber	Verizon
-		3	Antel / BXA-70080-6CF - Panel			
-		3	Antel / BXA-171085-12BF - Panel			
-		3	Antel / WBX065X19R050 - Panel			
-		3	ALU / RRH-2x40-AWS			
-		6	RFS / FD9R6004/2C-3L			
-		1	RFS / DB-B1-6C-12AB-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
6	128.0	6	Commscope / SBNHH-1D65B - Panel	(1) Low Profile Platform	(12) 1 5/8" (2) 1 5/8" Fiber	Verizon
7		6	Antel / LPA-80080-6CF - Panel			
8	127.0	3	ALU / RRH4x45-AWS			
9		3	ALU / RRH2X60-700			
10		3	ALU / RRH2X60-PCS			
11		6	RFS / FD9R6004/2C-3L			
12		2	RFS / DB-T1-6Z-8AB-0Z			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**63.2%**	**60.0%**	**92.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	2275.3	22.2	33.3

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Maximum twist and sway of the microwave dishes under the operational wind speed as specified in the Analysis Criteria are listed in the table below:

Elevation (ft.)	Dish	Carrier	Twist (deg.)	Sway (deg.)
128.0	LPA-80080-6CF - Panel	Verizon	0.000	1.305
128.0	SBNHH-1D65B - Panel	Verizon	0.000	1.305

It is recommended that the carriers review the twist and sway values of the microwave dishes.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-F Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

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

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

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

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

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

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

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

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

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

Usage Diagram - Max Stress 63.2% at 49.1ft

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-F	12/15/2015
Site Name:	Ingalls	**Exposure:**	C	
Height:	150.00 (ft)	**Gh:**	1.69	
Base Elev:	1.500 (ft)			Page: 1

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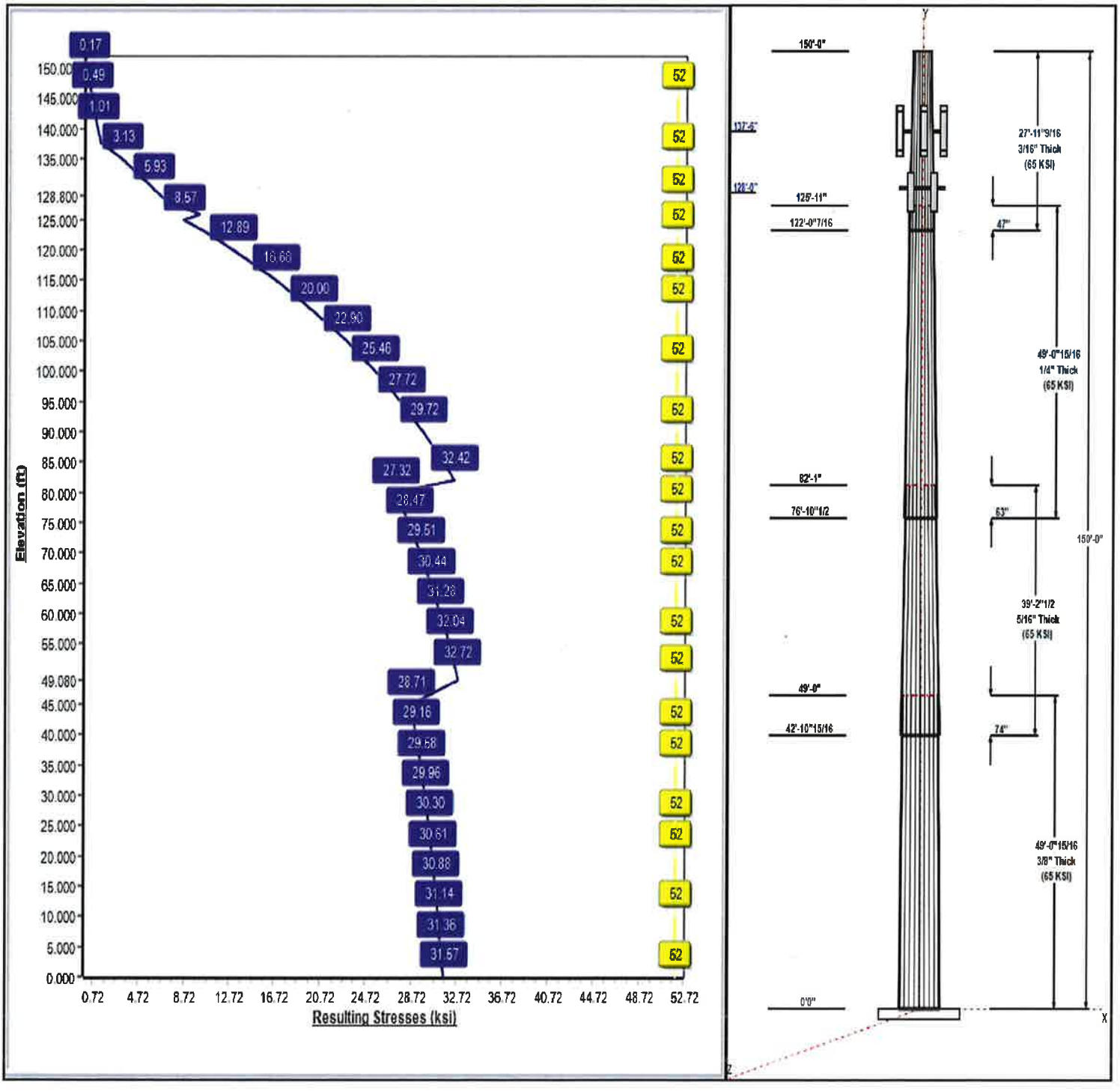
Dead Load Factor:	1.00
Wind Load Factor:	1.00

52 Alllowable Stress

33 Resulting Stress

Load Case : 85 mph Wind with 0 in Ice

Iterations: 24



Structure: CT13612-A-SBA

Type: Tapered
Site Name: Ingalls
Height: 150.00 (ft)
Base Elev: 1.50 (ft)

Base Shape: 18 Sided
Taper: 0.23521

12/15/2015

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	49.08	43.46	55.00	0.375		0.23521	65
2	39.21	36.31	45.53	0.313	Slip	0.23521	65
3	49.08	26.50	38.04	0.250	Slip	0.23521	65
4	27.96	21.22	27.80	0.188	Slip	0.23521	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
150.00	156.00	1	Lightning Rod 1"x10'	
137.50	137.50	3	Kathrein 782 11056	T-Mobile
137.50	137.50	6	KRY 112 144/1	T-Mobile
137.50	137.50	3	LNX-6515DS-VTM	T-Mobile
137.50	137.50	3	RFS APX16PV-16PVL	T-Mobile
137.50	137.50	3	RR90-19-XXDPQ	T-Mobile
137.50	137.50	3	T-Frame RMV5-3096	T-Mobile
128.80	128.80	1	Low Profile Platform	Verizon
128.00	128.00	6	LPA-80080-6CF	Verizon
128.00	128.00	6	SBNHH-1D65B	Verizon
127.00	127.00	2	DB-T1-6Z-8AB-0Z	Verizon
127.00	127.00	6	RFS FD9R6004/2C-3L	Verizon
127.00	127.00	3	RRH2X60-700	Verizon
127.00	127.00	3	RRH2X60-PCS	Verizon
127.00	127.00	3	RRH4x45-AWS	Verizon

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
8.00	150.00	Outside	Safety Cable	
8.00	150.00	Outside	Safety Cable	
8.00	128.00	Inside	1 5/8" Coax	Verizon
8.00	128.00	Inside	1 5/8" Coax	T-Mobile
8.00	127.00	Inside	1 5/8" Fiber	Verizon

Anchor Bolts

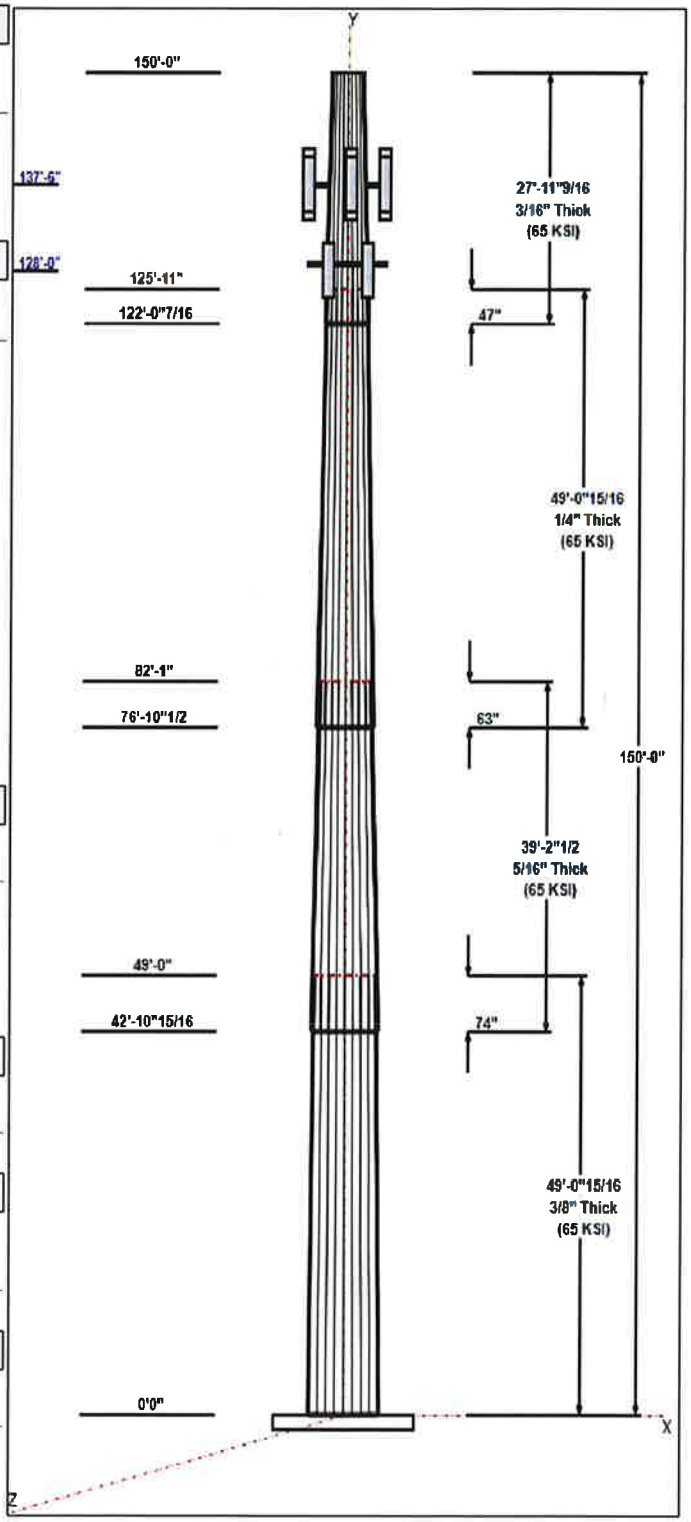
Qty	Specifications	Grade (ksi)	Arrangement
16	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.0000	70.0	60.0	Round

Reactions

Load Case	Moment	Shear	Axial
85 mph Wind with 0" Ice	2275.3	22.2	28.7
73.61 mph Wind with 0.5" Ice	1879.0	18.0	33.3
50 mph Wind with 0" Ice	787.7	7.7	28.7



Structure: CT13612-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Ingalls
Height: 150.00 (ft)

12/15/2015

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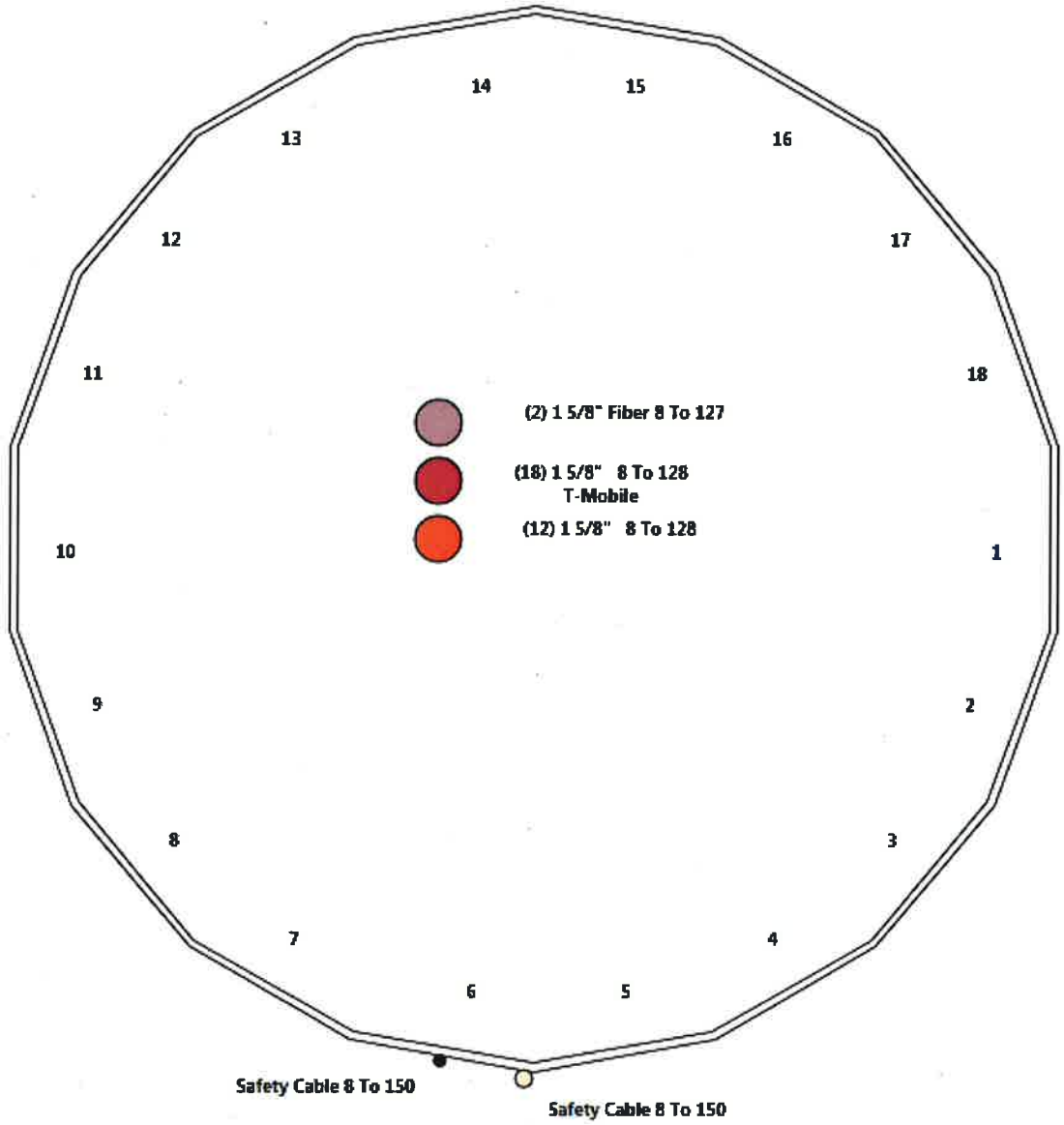

Shaft Properties

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 4	

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	49.080	0.3750	65		0.00	9,711
2	18	39.210	0.3125	65	Slip	74.00	5,374
3	18	49.080	0.2500	65	Slip	63.00	4,243
4	18	27.963	0.1875	65	Slip	47.00	1,377
					Total Shaft Weight:		**20,705**

	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	55.00	0.00	65.02	24510.38	24.45	146.6	43.46	49.08	51.27	12023.3	19.02	115.8	0.235213
2	45.53	42.91	44.85	11586.41	24.28	145.6	36.31	82.12	35.70	5844.63	19.07	116.1	0.235213
3	38.04	76.87	29.99	5411.66	25.42	152.1	26.50	125.9	20.83	1813.12	17.27	105.9	0.235213
4	27.80	122.0	16.43	1582.13	24.72	148.2	21.22	150.0	12.52	699.35	18.54	113.1	0.235213

Loading Summary

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 5	

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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	150.0	Lightning Rod 1"x10'	1	62.00	2.32	1.00	80.00	3.550	1.00	0.00	6.00
2	137.5	Kathrein 782 11056	3	5.30	0.28	0.87	8.00	0.390	0.88	0.00	0.00
3	137.5	KRY 112 144/1	6	11.00	0.41	0.70	14.10	0.550	0.71	0.00	0.00
4	137.5	LNX-6515DS-VTM	3	51.30	11.43	0.80	117.10	12.36	0.81	0.00	0.00
5	137.5	RFS APX16PV-16PVL	3	39.60	6.65	0.62	0.00	7.300	0.63	0.00	0.00
6	137.5	RR90-19-XXDPQ	3	16.00	5.87	0.68	0.00	6.560	0.69	0.00	0.00
7	137.5	T-Frame RMV5-3096	3	350.00	10.00	0.75	420.00	12.50	0.75	0.00	0.00
8	128.8	Low Profile Platform	1	1400.00	22.00	1.00	1700.00	27.00	1.00	0.00	0.00
9	128.0	LPA-80080-6CF	6	21.00	9.09	0.92	69.30	9.920	0.93	0.00	0.00
10	128.0	SBNHH-1D65B	6	50.71	8.33	0.83	87.00	8.800	0.84	0.00	0.00
11	127.0	DB-T1-6Z-8AB-0Z	2	44.00	5.60	0.71	53.00	5.870	0.71	0.00	0.00
12	127.0	RFS FD9R6004/2C-3L	6	3.00	0.36	0.86	5.40	0.500	0.87	0.00	0.00
13	127.0	RRH2X60-700	3	60.00	3.96	0.76	80.10	4.230	0.77	0.00	0.00
14	127.0	RRH2X60-PCS	3	55.00	2.57	0.89	70.90	2.760	0.90	0.00	0.00
15	127.0	RRH4x45-AWS	3	62.00	2.52	0.82	74.00	2.870	0.83	0.00	0.00
		Totals:	**52**	**3,981.86**			**5,251.10**				

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
8.00	150.0	(1) Safety Cable	1.04	0.00	0.00	0.00	Outside
8.00	150.0	(1) Safety Cable	0.27	0.00	0.00	0.00	Outside
8.00	128.0	(12) 1 5/8" Coax	12.48	0.00	0.00	0.00	Inside
8.00	128.0	(18) 1 5/8" Coax	18.72	0.00	0.00	0.00	Inside
8.00	127.0	(2) 1 5/8" Fiber	1.10	0.00	0.00	0.00	Inside
		Totals:	**4,061.35**		**0.00**		

Shaft Section Properties

Structure: CT13612-A-SBA
Site Name: Ingalls
Height: 150.00 (ft)
Base Elev: 1.500 (ft)
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II
12/15/2015

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		0.3750	55.000	65.015	24510.4	24.45	146.67	65	52	0.0
5.00		0.3750	53.824	63.615	22961.1	23.90	143.53	65	52	1094.3
10.00		0.3750	52.648	62.216	21478.5	23.34	140.39	65	52	1070.4
15.00		0.3750	51.472	60.816	20061.2	22.79	137.26	65	52	1046.6
20.00		0.3750	50.296	59.416	18707.6	22.24	134.12	65	52	1022.8
25.00		0.3750	49.120	58.016	17416.3	21.69	130.99	65	52	999.0
30.00		0.3750	47.944	56.616	16185.9	21.13	127.85	65	52	975.2
35.00		0.3750	46.768	55.217	15014.8	20.58	124.71	65	52	951.4
40.00		0.3750	45.591	53.817	13901.6	20.03	121.58	65	52	927.5
42.91	Bot - Section 2	0.3750	44.906	53.001	13279.1	19.70	119.75	65	52	529.5
45.00		0.3750	44.415	52.417	12844.9	19.47	118.44	65	52	691.0
49.08	Top - Section 1	0.3125	44.081	43.411	10506.8	23.46	141.06	65	52	1329.1
50.00		0.3125	43.864	43.196	10351.7	23.34	140.37	65	52	135.6
55.00		0.3125	42.688	42.030	9535.6	22.68	136.60	65	52	725.0
60.00		0.3125	41.512	40.863	8763.5	22.01	132.84	65	52	705.2
65.00		0.3125	40.336	39.697	8034.2	21.35	129.08	65	52	685.3
70.00		0.3125	39.160	38.531	7346.6	20.69	125.31	65	52	665.5
75.00		0.3125	37.984	37.364	6699.4	20.02	121.55	65	52	645.6
76.87	Bot - Section 3	0.3125	37.543	36.927	6467.0	19.77	120.14	65	52	236.8
80.00		0.3125	36.808	36.198	6091.3	19.36	117.79	65	52	704.9
82.12	Top - Section 2	0.2500	36.808	29.008	4898.3	24.55	147.23	65	52	470.8
85.00		0.2500	36.132	28.471	4631.4	24.07	144.53	65	52	281.3
90.00		0.2500	34.956	27.538	4190.7	23.24	139.82	65	52	476.5
95.00		0.2500	33.780	26.605	3779.0	22.41	135.12	65	52	460.6
100.00		0.2500	32.604	25.672	3395.1	21.59	130.41	65	52	444.7
105.00		0.2500	31.428	24.739	3038.2	20.76	125.71	65	52	428.8
110.00		0.2500	30.252	23.805	2707.2	19.93	121.01	65	52	413.0
115.00		0.2500	29.075	22.872	2401.1	19.10	116.30	65	52	397.1
120.00		0.2500	27.899	21.939	2119.0	18.27	111.60	65	52	381.2
122.04	Bot - Section 4	0.2500	27.420	21.559	2010.8	17.93	109.68	65	52	150.7
125.00		0.2500	26.723	21.006	1860.0	17.44	106.89	65	52	378.2
125.95	Top - Section 3	0.1875	26.874	15.881	1429.0	23.86	143.33	65	52	119.6
127.00		0.1875	26.628	15.735	1389.8	23.63	142.02	65	52	56.3
128.00		0.1875	26.393	15.595	1353.0	23.41	140.76	65	52	53.3
128.80		0.1875	26.205	15.483	1324.1	23.23	139.76	65	52	42.3
130.00		0.1875	25.922	15.315	1281.5	22.97	138.25	65	52	62.9
135.00		0.1875	24.746	14.615	1113.7	21.86	131.98	65	52	254.6
137.50		0.1875	24.158	14.265	1035.6	21.31	128.84	65	52	122.8
140.00		0.1875	23.570	13.915	961.2	20.75	125.71	65	52	119.9
145.00		0.1875	22.394	13.215	823.4	19.65	119.43	65	52	230.8
150.00		0.1875	21.218	12.515	699.3	18.54	113.16	65	52	218.9
										20704.9

Wind Loading - Shaft

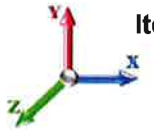
Structure: CT13612-A-SBA
Site Name: Ingalls
Height: 150.00 (ft)
Base Elev: 1.500 (ft)

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

12/15/2015

TES Tower Engineering Solutions

Load Case: 85 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	18.496	31.26	389.58	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	18.496	31.26	381.25	0.650	0.000	5.00	22.672	14.74	460.6	0.0	1094.3
10.00		0.00	1.00	18.496	31.26	372.92	0.650	0.000	5.00	22.182	14.42	450.7	0.0	1070.4
15.00		0.00	1.00	18.496	31.26	364.59	0.650	0.000	5.00	21.692	14.10	440.7	0.0	1046.6
20.00		0.00	1.00	18.496	31.26	356.26	0.650	0.000	5.00	21.202	13.78	430.8	0.0	1022.8
25.00		0.00	1.00	18.496	31.26	347.93	0.650	0.000	5.00	20.712	13.46	420.8	0.0	999.0
30.00		0.00	1.00	18.496	31.26	339.60	0.650	0.000	5.00	20.222	13.14	410.9	0.0	975.2
35.00		0.00	1.03	19.036	32.17	336.08	0.650	0.000	5.00	19.731	12.83	412.6	0.0	951.4
40.00		0.00	1.07	19.748	33.37	333.69	0.650	0.000	5.00	19.241	12.51	417.4	0.0	927.5
42.91 Bot - Section 2		0.00	1.09	20.134	34.03	331.87	0.650	0.000	2.91	10.985	7.14	243.0	0.0	529.5
45.00		0.00	1.10	20.400	34.48	330.41	0.650	0.000	2.09	7.875	5.12	176.5	0.0	691.0
49.08 Top - Section 1		0.00	1.13	20.896	35.31	327.17	0.650	0.000	4.08	15.151	9.85	347.8	0.0	1329.1
50.00		0.00	1.14	21.004	35.50	331.10	0.650	0.000	0.92	3.371	2.19	77.8	0.0	135.6
55.00		0.00	1.17	21.568	36.45	326.52	0.650	0.000	5.00	18.032	11.72	427.2	0.0	725.0
60.00		0.00	1.19	22.097	37.34	321.39	0.650	0.000	5.00	17.542	11.40	425.8	0.0	705.2
65.00		0.00	1.22	22.596	38.19	315.79	0.650	0.000	5.00	17.052	11.08	423.2	0.0	685.3
70.00		0.00	1.25	23.068	38.99	309.78	0.650	0.000	5.00	16.562	10.77	419.7	0.0	665.5
75.00		0.00	1.27	23.518	39.75	303.39	0.650	0.000	5.00	16.072	10.45	415.2	0.0	645.6
76.87 Bot - Section 3		0.00	1.28	23.681	40.02	300.91	0.650	0.000	1.87	5.895	3.83	153.4	0.0	236.8
80.00		0.00	1.29	23.948	40.47	296.67	0.650	0.000	3.13	9.817	6.38	258.2	0.0	704.9
82.12 Top - Section 2		0.00	1.30	24.124	40.77	293.72	0.650	0.000	2.12	6.557	4.26	173.8	0.0	470.8
85.00		0.00	1.32	24.358	41.17	293.71	0.650	0.000	2.88	8.743	5.68	233.9	0.0	281.3
90.00		0.00	1.34	24.753	41.83	286.44	0.650	0.000	5.00	14.810	9.63	402.7	0.0	476.5
95.00		0.00	1.36	25.132	42.47	278.91	0.650	0.000	5.00	14.320	9.31	395.3	0.0	460.6
100.00		0.00	1.38	25.497	43.09	271.15	0.650	0.000	5.00	13.830	8.99	387.4	0.0	444.7
105.00		0.00	1.40	25.850	43.69	263.17	0.650	0.000	5.00	13.340	8.67	378.8	0.0	428.8
110.00		0.00	1.42	26.191	44.26	254.99	0.650	0.000	5.00	12.850	8.35	369.7	0.0	413.0
115.00		0.00	1.43	26.521	44.82	246.62	0.650	0.000	5.00	12.360	8.03	360.1	0.0	397.1
120.00		0.00	1.45	26.842	45.36	238.07	0.650	0.000	5.00	11.870	7.72	350.0	0.0	381.2
122.04 Bot - Section 4		0.00	1.46	26.969	45.58	234.54	0.650	0.000	2.04	4.694	3.05	139.1	0.0	150.7
125.00		0.00	1.47	27.153	45.89	229.35	0.650	0.000	2.96	6.778	4.41	202.2	0.0	378.2
125.95 Top - Section 3		0.00	1.47	27.211	45.99	227.67	0.650	0.000	0.95	2.144	1.39	64.1	0.0	119.6
127.00 Appurtenance(s)		0.00	1.47	27.275	46.09	229.04	0.650	0.000	1.05	2.333	1.52	69.9	0.0	56.3
128.00 Appurtenance(s)		0.00	1.48	27.335	46.20	227.27	0.650	0.000	1.00	2.209	1.44	66.3	0.0	53.3
128.80 Appurtenance(s)		0.00	1.48	27.383	46.28	225.85	0.650	0.000	0.80	1.753	1.14	52.7	0.0	42.3
130.00		0.00	1.48	27.455	46.40	223.71	0.650	0.000	1.20	2.606	1.69	78.6	0.0	62.9
135.00		0.00	1.50	27.749	46.90	214.70	0.650	0.000	5.00	10.556	6.86	321.8	0.0	254.6
137.50 Appurtenance(s)		0.00	1.51	27.894	47.14	210.14	0.650	0.000	2.50	5.094	3.31	156.1	0.0	122.8
140.00		0.00	1.52	28.036	47.38	205.55	0.650	0.000	2.50	4.972	3.23	153.1	0.0	119.9
145.00		0.00	1.53	28.316	47.85	196.27	0.650	0.000	5.00	9.576	6.22	297.9	0.0	230.8
150.00 Appurtenance(s)		0.00	1.55	28.589	48.31	186.85	0.650	0.000	5.00	9.086	5.91	285.3	0.0	218.9
								Totals:	**150.00**			**11,751.0**		**20,704.9**

Discrete Appurtenance Forces

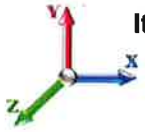
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 8	

TES Tower Engineering Solutions

Load Case: 85 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	150.00	Lightning Rod 1"x10'	1	28.908	48.854	1.00	2.32	62.00	0.000	6.000	113.34	0.00	680.04
2	137.50	T-Frame RMV5-3096	3	27.894	47.140	0.75	22.50	1050.00	0.000	0.000	1060.66	0.00	0.00
3	137.50	RR90-19-XXDPQ	3	27.894	47.140	0.68	11.97	48.00	0.000	0.000	564.50	0.00	0.00
4	137.50	RFS APX16PV-16PVL	3	27.894	47.140	0.62	12.37	118.80	0.000	0.000	583.08	0.00	0.00
5	137.50	LNX-6515DS-VTM	3	27.894	47.140	0.80	27.43	153.90	0.000	0.000	1293.16	0.00	0.00
6	137.50	KRY 112 144/1	6	27.894	47.140	0.70	1.72	66.00	0.000	0.000	81.18	0.00	0.00
7	137.50	Kathrein 782 11056	3	27.894	47.140	0.87	0.73	15.90	0.000	0.000	34.45	0.00	0.00
8	128.80	Low Profile Platform	1	27.383	46.278	1.00	22.00	1400.00	0.000	0.000	1018.11	0.00	0.00
9	128.00	SBNHH-1D65B	6	27.335	46.196	0.83	41.48	304.26	0.000	0.000	1916.39	0.00	0.00
10	128.00	LPA-80080-6CF	6	27.335	46.196	0.92	50.18	126.00	0.000	0.000	2317.99	0.00	0.00
11	127.00	RRH4x45-AWS	3	27.275	46.094	0.82	6.20	186.00	0.000	0.000	285.75	0.00	0.00
12	127.00	RRH2X60-PCS	3	27.275	46.094	0.89	6.86	165.00	0.000	0.000	316.29	0.00	0.00
13	127.00	RRH2X60-700	3	27.275	46.094	0.76	9.03	180.00	0.000	0.000	416.18	0.00	0.00
14	127.00	RFS FD9R6004/2C-3L	6	27.275	46.094	0.86	1.86	18.00	0.000	0.000	85.62	0.00	0.00
15	127.00	DB-T1-6Z-8AB-0Z	2	27.275	46.094	0.71	7.95	88.00	0.000	0.000	366.54	0.00	0.00
						Totals:		**3,981.86**			**10,453.24**		

Total Applied Force Summary

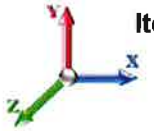
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 85 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		460.64	1094.25	0.00	0.00
10.00		450.68	1137.66	0.00	0.00
15.00		440.73	1214.69	0.00	0.00
20.00		430.77	1190.87	0.00	0.00
25.00		420.81	1167.05	0.00	0.00
30.00		410.86	1143.24	0.00	0.00
35.00		412.62	1119.42	0.00	0.00
40.00		417.40	1095.61	0.00	0.00
42.91		242.97	627.39	0.00	0.00
45.00		176.47	761.12	0.00	0.00
49.08		347.77	1466.23	0.00	0.00
50.00		77.78	166.49	0.00	0.00
55.00		427.21	893.08	0.00	0.00
60.00		425.79	873.23	0.00	0.00
65.00		423.24	853.39	0.00	0.00
70.00		419.69	833.54	0.00	0.00
75.00		415.21	813.70	0.00	0.00
76.87		153.36	299.75	0.00	0.00
80.00		258.24	810.04	0.00	0.00
82.12		173.77	542.14	0.00	0.00
85.00		233.94	378.02	0.00	0.00
90.00		402.69	644.53	0.00	0.00
95.00		395.33	628.66	0.00	0.00
100.00		387.36	612.78	0.00	0.00
105.00		378.80	596.90	0.00	0.00
110.00		369.70	581.03	0.00	0.00
115.00		360.09	565.15	0.00	0.00
120.00		349.99	549.27	0.00	0.00
122.04		139.08	219.19	0.00	0.00
125.00		202.16	477.79	0.00	0.00
125.95		64.08	151.63	0.00	0.00
127.00	(17) appurtenances	1540.29	728.48	0.00	0.00
128.00	(12) appurtenances	4300.72	516.08	0.00	0.00
128.80	(1) appurtenances	1070.85	1443.35	0.00	0.00
130.00		78.61	64.45	0.00	0.00
135.00		321.77	261.18	0.00	0.00
137.50	(21) appurtenances	3773.11	1578.72	0.00	0.00
140.00		153.12	123.15	0.00	0.00
145.00		297.86	237.36	0.00	0.00
150.00	(1) appurtenances	398.68	287.45	0.00	680.04
	Totals:	**22,204.24**	**28,748.08**	**0.00**	**680.04**

Resulting Forces and Deflections

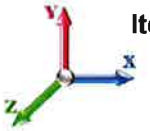
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 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	-22.236	-28.722	0.000	0.000	0.000	-2275.3	0.000	0.000	0.000	0.000	0.000
5.00	-21.837	-27.579	0.000	0.000	0.000	-2164.1	-0.069	0.000	0.069	-0.129	0.000
10.00	-21.443	-26.394	0.000	0.000	0.000	-2054.9	-0.275	0.000	0.275	-0.260	0.000
15.00	-21.054	-25.133	0.000	0.000	0.000	-1947.7	-0.618	0.000	0.618	-0.392	0.000
20.00	-20.670	-23.897	0.000	0.000	0.000	-1842.4	-1.101	0.000	1.101	-0.526	0.000
25.00	-20.292	-22.686	0.000	0.000	0.000	-1739.1	-1.726	0.000	1.726	-0.663	0.000
30.00	-19.918	-21.500	0.000	0.000	0.000	-1637.6	-2.494	0.000	2.494	-0.801	0.000
35.00	-19.539	-20.339	0.000	0.000	0.000	-1538.0	-3.407	0.000	3.407	-0.940	0.000
40.00	-19.140	-19.213	0.000	0.000	0.000	-1440.3	-4.468	0.000	4.468	-1.081	0.000
42.91	-18.908	-18.567	0.000	0.000	0.000	-1384.6	-5.154	0.000	5.154	-1.165	0.000
45.00	-18.744	-17.780	0.000	0.000	0.000	-1345.1	-5.678	0.000	5.678	-1.226	0.000
49.08	-18.383	-16.299	0.000	0.000	0.000	-1268.7	-6.778	0.000	6.778	-1.345	0.000
50.00	-18.329	-16.103	0.000	0.000	0.000	-1251.7	-7.040	0.000	7.040	-1.372	0.000
55.00	-17.924	-15.169	0.000	0.000	0.000	-1160.1	-8.566	0.000	8.566	-1.538	0.000
60.00	-17.515	-14.258	0.000	0.000	0.000	-1070.5	-10.266	0.000	10.266	-1.704	0.000
65.00	-17.104	-13.368	0.000	0.000	0.000	-982.95	-12.140	0.000	12.140	-1.871	0.000
70.00	-16.692	-12.501	0.000	0.000	0.000	-897.43	-14.189	0.000	14.189	-2.037	0.000
75.00	-16.271	-11.671	0.000	0.000	0.000	-813.97	-16.412	0.000	16.412	-2.203	0.000
76.87	-16.122	-11.354	0.000	0.000	0.000	-783.49	-17.289	0.000	17.289	-2.266	0.000
80.00	-15.848	-10.531	0.000	0.000	0.000	-733.08	-18.809	0.000	18.809	-2.371	0.000
82.12	-15.666	-9.974	0.000	0.000	0.000	-699.43	-19.879	0.000	19.879	-2.442	0.000
85.00	-15.440	-9.567	0.000	0.000	0.000	-654.37	-21.380	0.000	21.380	-2.537	0.000
90.00	-15.037	-8.893	0.000	0.000	0.000	-577.17	-24.138	0.000	24.138	-2.726	0.000
95.00	-14.637	-8.239	0.000	0.000	0.000	-501.99	-27.092	0.000	27.092	-2.909	0.000
100.00	-14.241	-7.605	0.000	0.000	0.000	-428.80	-30.233	0.000	30.233	-3.084	0.000
105.00	-13.849	-6.992	0.000	0.000	0.000	-357.60	-33.552	0.000	33.552	-3.249	0.000
110.00	-13.462	-6.400	0.000	0.000	0.000	-288.36	-37.036	0.000	37.036	-3.400	0.000
115.00	-13.081	-5.829	0.000	0.000	0.000	-221.05	-40.670	0.000	40.670	-3.534	0.000
120.00	-12.704	-5.287	0.000	0.000	0.000	-155.64	-44.432	0.000	44.432	-3.645	0.000
122.04	-12.555	-5.068	0.000	0.000	0.000	-129.77	-45.996	0.000	45.996	-3.684	0.000
125.00	-12.325	-4.598	0.000	0.000	0.000	-92.571	-48.298	0.000	48.298	-3.731	0.000
125.95	-12.252	-4.448	0.000	0.000	0.000	-80.822	-49.044	0.000	49.044	-3.744	0.000
127.00	-10.668	-3.819	0.000	0.000	0.000	-67.998	-49.866	0.000	49.866	-3.756	0.000
128.00	-6.343	-3.586	0.000	0.000	0.000	-57.330	-50.654	0.000	50.654	-3.769	0.000
128.80	-5.180	-2.215	0.000	0.000	0.000	-52.255	-51.286	0.000	51.286	-3.778	0.000
130.00	-5.099	-2.154	0.000	0.000	0.000	-46.039	-52.237	0.000	52.237	-3.791	0.000
135.00	-4.761	-1.913	0.000	0.000	0.000	-20.545	-56.226	0.000	56.226	-3.828	0.000
137.50	-0.891	-0.590	0.000	0.000	0.000	-8.643	-58.233	0.000	58.233	-3.837	0.000
140.00	-0.730	-0.477	0.000	0.000	0.000	-6.415	-60.242	0.000	60.242	-3.842	0.000
145.00	-0.417	-0.260	0.000	0.000	0.000	-2.765	-64.266	0.000	64.266	-3.849	0.000
150.00	-0.399	0.000	0.000	0.000	0.000	-0.680	0.000	0.000	68.296	-3.852	0.000

Resulting Stresses

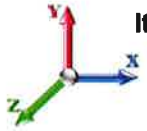
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 11	

TES Tower Engineering Solutions

Load Case: 85 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.44	0.69	0.00	0.00	0.00	31.11	31.57	52.0	0.607
5.00	0.43	0.69	0.00	0.00	0.00	30.91	31.36	52.0	0.603
10.00	0.42	0.69	0.00	0.00	0.00	30.69	31.14	52.0	0.599
15.00	0.41	0.70	0.00	0.00	0.00	30.45	30.88	52.0	0.594
20.00	0.40	0.70	0.00	0.00	0.00	30.18	30.61	52.0	0.589
25.00	0.39	0.70	0.00	0.00	0.00	29.88	30.30	52.0	0.583
30.00	0.38	0.71	0.00	0.00	0.00	29.55	29.96	52.0	0.576
35.00	0.37	0.71	0.00	0.00	0.00	29.19	29.58	52.0	0.569
40.00	0.36	0.72	0.00	0.00	0.00	28.78	29.16	52.0	0.561
42.91	0.35	0.72	0.00	0.00	0.00	28.53	28.91	52.0	0.556
45.00	0.34	0.72	0.00	0.00	0.00	28.34	28.71	52.0	0.552
49.08	0.38	0.85	0.00	0.00	0.00	32.43	32.84	52.0	0.632
50.00	0.37	0.86	0.00	0.00	0.00	32.32	32.72	52.0	0.630
55.00	0.36	0.86	0.00	0.00	0.00	31.64	32.04	52.0	0.616
60.00	0.35	0.86	0.00	0.00	0.00	30.90	31.28	52.0	0.602
65.00	0.34	0.87	0.00	0.00	0.00	30.07	30.44	52.0	0.586
70.00	0.32	0.87	0.00	0.00	0.00	29.14	29.51	52.0	0.568
75.00	0.31	0.88	0.00	0.00	0.00	28.12	28.47	52.0	0.548
76.87	0.31	0.88	0.00	0.00	0.00	27.71	28.06	52.0	0.540
80.00	0.29	0.88	0.00	0.00	0.00	26.99	27.32	52.0	0.526
82.12	0.34	1.09	0.00	0.00	0.00	32.02	32.42	52.0	0.624
85.00	0.34	1.09	0.00	0.00	0.00	31.10	31.50	52.0	0.606
90.00	0.32	1.10	0.00	0.00	0.00	29.33	29.72	52.0	0.572
95.00	0.31	1.11	0.00	0.00	0.00	27.34	27.72	52.0	0.533
100.00	0.30	1.12	0.00	0.00	0.00	25.09	25.46	52.0	0.490
105.00	0.28	1.13	0.00	0.00	0.00	22.54	22.90	52.0	0.441
110.00	0.27	1.14	0.00	0.00	0.00	19.63	20.00	52.0	0.385
115.00	0.25	1.15	0.00	0.00	0.00	16.31	16.68	52.0	0.321
120.00	0.24	1.17	0.00	0.00	0.00	12.49	12.89	52.0	0.248
122.04	0.24	1.17	0.00	0.00	0.00	10.78	11.20	52.0	0.216
125.00	0.22	1.18	0.00	0.00	0.00	8.10	8.57	52.0	0.165
125.95	0.28	1.55	0.00	0.00	0.00	9.26	9.91	52.0	0.191
127.00	0.24	1.37	0.00	0.00	0.00	7.94	8.52	52.0	0.164
128.00	0.23	0.82	0.00	0.00	0.00	6.81	7.18	52.0	0.138
128.80	0.14	0.67	0.00	0.00	0.00	6.30	6.55	52.0	0.126
130.00	0.14	0.67	0.00	0.00	0.00	5.67	5.93	52.0	0.114
135.00	0.13	0.66	0.00	0.00	0.00	2.78	3.13	52.0	0.060
137.50	0.04	0.13	0.00	0.00	0.00	1.23	1.29	52.0	0.025
140.00	0.03	0.11	0.00	0.00	0.00	0.96	1.01	52.0	0.019
145.00	0.02	0.06	0.00	0.00	0.00	0.46	0.49	52.0	0.009
150.00	0.00	0.06	0.00	0.00	0.00	0.13	0.17	52.0	0.003

Wind Loading - Shaft

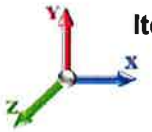
Structure: CT13612-A-SBA
Site Name: Ingalls
Height: 150.00 (ft)
Base Elev: 1.500 (ft)

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

12/15/2015
Page: 12

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: 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	13.871	23.44	337.38	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	13.871	23.44	330.16	0.650	0.500	5.00	23.088	15.01	351.8	167.6	1261.9
10.00		0.00	1.00	13.871	23.44	322.95	0.650	0.500	5.00	22.598	14.69	344.3	164.0	1234.4
15.00		0.00	1.00	13.871	23.44	315.74	0.650	0.500	5.00	22.108	14.37	336.9	160.4	1207.0
20.00		0.00	1.00	13.871	23.44	308.52	0.650	0.500	5.00	21.618	14.05	329.4	156.7	1179.5
25.00		0.00	1.00	13.871	23.44	301.31	0.650	0.500	5.00	21.128	13.73	321.9	153.1	1152.1
30.00		0.00	1.00	13.871	23.44	294.09	0.650	0.500	5.00	20.638	13.41	314.5	149.5	1124.7
35.00		0.00	1.03	14.277	24.13	291.04	0.650	0.500	5.00	20.148	13.10	316.0	145.9	1097.2
40.00		0.00	1.07	14.810	25.03	288.97	0.650	0.500	5.00	19.658	12.78	319.8	142.2	1069.8
42.91	Bot - Section 2	0.00	1.09	15.100	25.52	287.40	0.650	0.500	2.91	11.228	7.30	186.2	81.6	611.1
45.00		0.00	1.10	15.299	25.86	286.13	0.650	0.500	2.09	8.049	5.23	135.3	58.6	749.6
49.08	Top - Section 1	0.00	1.13	15.671	26.48	283.33	0.650	0.500	4.08	15.491	10.07	266.7	112.3	1441.3
50.00		0.00	1.14	15.752	26.62	286.73	0.650	0.500	0.92	3.448	2.24	59.7	25.2	160.8
55.00		0.00	1.17	16.175	27.34	282.77	0.650	0.500	5.00	18.448	11.99	327.8	133.3	858.3
60.00		0.00	1.19	16.571	28.01	278.33	0.650	0.500	5.00	17.958	11.67	326.9	129.6	834.8
65.00		0.00	1.22	16.946	28.64	273.48	0.650	0.500	5.00	17.468	11.35	325.2	126.0	811.3
70.00		0.00	1.25	17.300	29.24	268.27	0.650	0.500	5.00	16.978	11.04	322.7	122.4	787.9
75.00		0.00	1.27	17.638	29.81	262.74	0.650	0.500	5.00	16.488	10.72	319.5	118.8	764.4
76.87	Bot - Section 3	0.00	1.28	17.760	30.01	260.59	0.650	0.500	1.87	6.051	3.93	118.1	44.0	280.8
80.00		0.00	1.29	17.960	30.35	256.91	0.650	0.500	3.13	10.077	6.55	198.8	73.0	777.9
82.12	Top - Section 2	0.00	1.30	18.092	30.58	254.36	0.650	0.500	2.12	6.734	4.38	133.8	48.9	519.7
85.00		0.00	1.32	18.268	30.87	254.35	0.650	0.500	2.88	8.982	5.84	180.3	65.0	346.4
90.00		0.00	1.34	18.563	31.37	248.05	0.650	0.500	5.00	15.227	9.90	310.5	109.4	585.9
95.00		0.00	1.36	18.848	31.85	241.54	0.650	0.500	5.00	14.737	9.58	305.1	105.8	566.4
100.00		0.00	1.38	19.122	32.32	234.82	0.650	0.500	5.00	14.247	9.26	299.3	102.1	546.9
105.00		0.00	1.40	19.386	32.76	227.91	0.650	0.500	5.00	13.757	8.94	293.0	98.5	527.4
110.00		0.00	1.42	19.642	33.20	220.82	0.650	0.500	5.00	13.266	8.62	286.2	94.9	507.9
115.00		0.00	1.43	19.890	33.61	213.57	0.650	0.500	5.00	12.776	8.30	279.2	91.3	488.3
120.00		0.00	1.45	20.130	34.02	206.17	0.650	0.500	5.00	12.286	7.99	271.7	87.6	468.8
122.04	Bot - Section 4	0.00	1.46	20.226	34.18	203.11	0.650	0.500	2.04	4.864	3.16	108.1	35.1	185.8
125.00		0.00	1.47	20.363	34.41	198.62	0.650	0.500	2.96	7.025	4.57	157.1	50.5	428.7
125.95	Top - Section 3	0.00	1.47	20.407	34.49	197.16	0.650	0.500	0.95	2.223	1.45	49.8	16.1	135.7
127.00	Appurtenance(s)	0.00	1.47	20.455	34.57	198.35	0.650	0.500	1.05	2.421	1.57	54.4	17.5	73.8
128.00	Appurtenance(s)	0.00	1.48	20.500	34.65	196.82	0.650	0.500	1.00	2.293	1.49	51.6	16.6	69.9
128.80	Appurtenance(s)	0.00	1.48	20.536	34.71	195.59	0.650	0.500	0.80	1.820	1.18	41.1	13.2	55.5
130.00		0.00	1.48	20.590	34.80	193.73	0.650	0.500	1.20	2.706	1.76	61.2	19.6	82.4
135.00		0.00	1.50	20.811	35.17	185.93	0.650	0.500	5.00	10.973	7.13	250.8	77.9	332.5
137.50	Appurtenance(s)	0.00	1.51	20.919	35.35	181.98	0.650	0.500	2.50	5.303	3.45	121.9	38.0	160.9
140.00		0.00	1.52	21.026	35.53	178.01	0.650	0.500	2.50	5.180	3.37	119.6	37.1	157.0
145.00		0.00	1.53	21.236	35.89	169.97	0.650	0.500	5.00	9.993	6.50	233.1	70.6	301.4
150.00	Appurtenance(s)	0.00	1.55	21.440	36.23	161.81	0.650	0.500	5.00	9.503	6.18	223.8	67.0	285.9
								Totals:	**150.00**			**9,052.9**		**24,231.8**

Discrete Appurtenance Forces

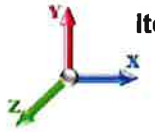
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 13	

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: 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	150.00	Lightning Rod 1"x10'	1	21.679	36.638	1.00	3.55	80.00	0.000	6.000	130.07	0.00	780.39
2	137.50	T-Frame RMV5-3096	3	20.919	35.353	0.75	28.13	1260.00	0.000	0.000	994.31	0.00	0.00
3	137.50	RR90-19-XXDPQ	3	20.919	35.353	0.69	13.58	0.00	0.000	0.000	480.07	0.00	0.00
4	137.50	RFS APX16PV-16PVL	3	20.919	35.353	0.63	13.80	0.00	0.000	0.000	487.77	0.00	0.00
5	137.50	LNX-6515DS-VTM	3	20.919	35.353	0.81	30.03	351.30	0.000	0.000	1061.83	0.00	0.00
6	137.50	KRY 112 144/1	6	20.919	35.353	0.71	2.34	84.60	0.000	0.000	82.83	0.00	0.00
7	137.50	Kathrein 782 11056	3	20.919	35.353	0.88	1.03	24.00	0.000	0.000	36.40	0.00	0.00
8	128.80	Low Profile Platform	1	20.536	34.706	1.00	27.00	1700.00	0.000	0.000	937.07	0.00	0.00
9	128.00	SBNHH-1D65B	6	20.500	34.645	0.84	44.35	522.00	0.000	0.000	1536.59	0.00	0.00
10	128.00	LPA-80080-6CF	6	20.500	34.645	0.93	55.35	415.80	0.000	0.000	1917.74	0.00	0.00
11	127.00	RRH4x45-AWS	3	20.455	34.569	0.83	7.15	222.00	0.000	0.000	247.04	0.00	0.00
12	127.00	RRH2X60-PCS	3	20.455	34.569	0.90	7.45	212.70	0.000	0.000	257.61	0.00	0.00
13	127.00	RRH2X60-700	3	20.455	34.569	0.77	9.77	240.30	0.000	0.000	337.78	0.00	0.00
14	127.00	RFS FD9R6004/2C-3L	6	20.455	34.569	0.87	2.61	32.40	0.000	0.000	90.22	0.00	0.00
15	127.00	DB-T1-6Z-8AB-0Z	2	20.455	34.569	0.71	8.34	106.00	0.000	0.000	288.14	0.00	0.00
						Totals:		**5,251.10**			**8,885.47**		

Total Applied Force Summary

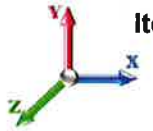
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 73.61 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 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		351.81	1261.88	0.00	0.00
10.00		344.34	1299.04	0.00	0.00
15.00		336.87	1368.49	0.00	0.00
20.00		329.41	1341.05	0.00	0.00
25.00		321.94	1313.60	0.00	0.00
30.00		314.47	1286.16	0.00	0.00
35.00		315.98	1258.71	0.00	0.00
40.00		319.81	1231.27	0.00	0.00
42.91		186.24	705.21	0.00	0.00
45.00		135.27	817.03	0.00	0.00
49.08		266.67	1573.13	0.00	0.00
50.00		59.66	190.47	0.00	0.00
55.00		327.79	1019.78	0.00	0.00
60.00		326.91	996.31	0.00	0.00
65.00		325.17	972.83	0.00	0.00
70.00		322.66	949.36	0.00	0.00
75.00		319.46	925.88	0.00	0.00
76.87		118.06	341.28	0.00	0.00
80.00		198.81	878.89	0.00	0.00
82.12		133.84	588.24	0.00	0.00
85.00		180.25	439.27	0.00	0.00
90.00		310.50	747.37	0.00	0.00
95.00		305.11	727.87	0.00	0.00
100.00		299.25	708.36	0.00	0.00
105.00		292.96	688.86	0.00	0.00
110.00		286.25	669.35	0.00	0.00
115.00		279.15	649.84	0.00	0.00
120.00		271.69	630.34	0.00	0.00
122.04		108.07	251.61	0.00	0.00
125.00		157.14	524.37	0.00	0.00
125.95		49.84	166.49	0.00	0.00
127.00	(17) appurtenances	1275.18	921.03	0.00	0.00
128.00	(12) appurtenances	3505.96	1038.90	0.00	0.00
128.80	(1) appurtenances	978.13	1755.48	0.00	0.00
130.00		61.21	82.45	0.00	0.00
135.00		250.84	332.51	0.00	0.00
137.50	(21) appurtenances	3265.06	1880.78	0.00	0.00
140.00		119.64	157.00	0.00	0.00
145.00		233.10	301.44	0.00	0.00
150.00	(1) appurtenances	353.87	365.90	0.00	780.39
	Totals:	**17,938.38**	**33,357.84**	**0.00**	**780.39**

Resulting Forces and Deflections

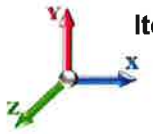
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 15	

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: 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	-17.969	-33.341	0.000	0.000	0.000	-1878.9	0.000	0.000	0.000	0.000	0.000
5.00	-17.676	-32.046	0.000	0.000	0.000	-1789.1	-0.057	0.000	0.057	-0.106	0.000
10.00	-17.387	-30.715	0.000	0.000	0.000	-1700.7	-0.227	0.000	0.227	-0.215	0.000
15.00	-17.100	-29.315	0.000	0.000	0.000	-1613.8	-0.511	0.000	0.511	-0.324	0.000
20.00	-16.817	-27.943	0.000	0.000	0.000	-1528.3	-0.910	0.000	0.910	-0.436	0.000
25.00	-16.536	-26.600	0.000	0.000	0.000	-1444.2	-1.428	0.000	1.428	-0.549	0.000
30.00	-16.259	-25.284	0.000	0.000	0.000	-1361.5	-2.064	0.000	2.064	-0.663	0.000
35.00	-15.976	-23.997	0.000	0.000	0.000	-1280.2	-2.821	0.000	2.821	-0.779	0.000
40.00	-15.676	-22.745	0.000	0.000	0.000	-1200.3	-3.701	0.000	3.701	-0.897	0.000
42.91	-15.501	-22.027	0.000	0.000	0.000	-1154.6	-4.270	0.000	4.270	-0.967	0.000
45.00	-15.379	-21.192	0.000	0.000	0.000	-1122.3	-4.704	0.000	4.704	-1.018	0.000
49.08	-15.104	-19.608	0.000	0.000	0.000	-1059.6	-5.618	0.000	5.618	-1.117	0.000
50.00	-15.068	-19.398	0.000	0.000	0.000	-1045.7	-5.835	0.000	5.835	-1.140	0.000
55.00	-14.764	-18.349	0.000	0.000	0.000	-970.37	-7.103	0.000	7.103	-1.278	0.000
60.00	-14.456	-17.326	0.000	0.000	0.000	-896.55	-8.517	0.000	8.517	-1.417	0.000
65.00	-14.145	-16.327	0.000	0.000	0.000	-824.27	-10.077	0.000	10.077	-1.557	0.000
70.00	-13.833	-15.354	0.000	0.000	0.000	-753.55	-11.782	0.000	11.782	-1.697	0.000
75.00	-13.509	-14.416	0.000	0.000	0.000	-684.38	-13.634	0.000	13.634	-1.836	0.000
76.87	-13.398	-14.062	0.000	0.000	0.000	-659.08	-14.366	0.000	14.366	-1.889	0.000
80.00	-13.186	-13.173	0.000	0.000	0.000	-617.19	-15.633	0.000	15.633	-1.977	0.000
82.12	-13.047	-12.574	0.000	0.000	0.000	-589.19	-16.526	0.000	16.526	-2.037	0.000
85.00	-12.877	-12.115	0.000	0.000	0.000	-551.66	-17.778	0.000	17.778	-2.117	0.000
90.00	-12.569	-11.345	0.000	0.000	0.000	-487.27	-20.081	0.000	20.081	-2.276	0.000
95.00	-12.262	-10.598	0.000	0.000	0.000	-424.43	-22.549	0.000	22.549	-2.431	0.000
100.00	-11.957	-9.873	0.000	0.000	0.000	-363.12	-25.175	0.000	25.175	-2.579	0.000
105.00	-11.654	-9.172	0.000	0.000	0.000	-303.33	-27.952	0.000	27.952	-2.719	0.000
110.00	-11.354	-8.493	0.000	0.000	0.000	-245.06	-30.870	0.000	30.870	-2.847	0.000
115.00	-11.056	-7.838	0.000	0.000	0.000	-188.29	-33.915	0.000	33.915	-2.961	0.000
120.00	-10.760	-7.211	0.000	0.000	0.000	-133.01	-37.069	0.000	37.069	-3.056	0.000
122.04	-10.643	-6.959	0.000	0.000	0.000	-111.10	-38.380	0.000	38.380	-3.090	0.000
125.00	-10.460	-6.439	0.000	0.000	0.000	-79.564	-40.311	0.000	40.311	-3.130	0.000
125.95	-10.403	-6.274	0.000	0.000	0.000	-69.592	-40.937	0.000	40.937	-3.141	0.000
127.00	-9.080	-5.422	0.000	0.000	0.000	-58.703	-41.627	0.000	41.627	-3.151	0.000
128.00	-5.523	-4.577	0.000	0.000	0.000	-49.623	-42.288	0.000	42.288	-3.162	0.000
128.80	-4.450	-2.878	0.000	0.000	0.000	-45.205	-42.818	0.000	42.818	-3.170	0.000
130.00	-4.385	-2.797	0.000	0.000	0.000	-39.866	-43.616	0.000	43.616	-3.181	0.000
135.00	-4.117	-2.478	0.000	0.000	0.000	-17.939	-46.966	0.000	46.966	-3.213	0.000
137.50	-0.752	-0.783	0.000	0.000	0.000	-7.647	-48.651	0.000	48.651	-3.221	0.000
140.00	-0.624	-0.633	0.000	0.000	0.000	-5.767	-50.338	0.000	50.338	-3.226	0.000
145.00	-0.374	-0.345	0.000	0.000	0.000	-2.650	-53.718	0.000	53.718	-3.232	0.000
150.00	-0.354	0.000	0.000	0.000	0.000	-0.780	0.000	0.000	57.103	-3.235	0.000

Resulting Stresses

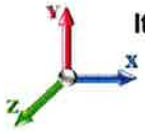
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 16	

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: 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)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.51	0.56	0.00	0.00	0.00	25.69	26.22	52.0	0.504
5.00	0.50	0.56	0.00	0.00	0.00	25.55	26.07	52.0	0.502
10.00	0.49	0.56	0.00	0.00	0.00	25.40	25.91	52.0	0.498
15.00	0.48	0.57	0.00	0.00	0.00	25.23	25.73	52.0	0.495
20.00	0.47	0.57	0.00	0.00	0.00	25.03	25.52	52.0	0.491
25.00	0.46	0.57	0.00	0.00	0.00	24.82	25.29	52.0	0.487
30.00	0.45	0.58	0.00	0.00	0.00	24.57	25.04	52.0	0.482
35.00	0.43	0.58	0.00	0.00	0.00	24.30	24.75	52.0	0.476
40.00	0.42	0.59	0.00	0.00	0.00	23.98	24.43	52.0	0.470
42.91	0.42	0.59	0.00	0.00	0.00	23.79	24.23	52.0	0.466
45.00	0.40	0.59	0.00	0.00	0.00	23.64	24.07	52.0	0.463
49.08	0.45	0.70	0.00	0.00	0.00	27.08	27.56	52.0	0.530
50.00	0.45	0.70	0.00	0.00	0.00	27.00	27.47	52.0	0.529
55.00	0.44	0.71	0.00	0.00	0.00	26.47	26.93	52.0	0.518
60.00	0.42	0.71	0.00	0.00	0.00	25.87	26.33	52.0	0.506
65.00	0.41	0.72	0.00	0.00	0.00	25.21	25.65	52.0	0.494
70.00	0.40	0.72	0.00	0.00	0.00	24.47	24.90	52.0	0.479
75.00	0.39	0.73	0.00	0.00	0.00	23.64	24.06	52.0	0.463
76.87	0.38	0.73	0.00	0.00	0.00	23.31	23.73	52.0	0.456
80.00	0.36	0.73	0.00	0.00	0.00	22.72	23.12	52.0	0.445
82.12	0.43	0.91	0.00	0.00	0.00	26.97	27.45	52.0	0.528
85.00	0.43	0.91	0.00	0.00	0.00	26.22	26.69	52.0	0.514
90.00	0.41	0.92	0.00	0.00	0.00	24.76	25.23	52.0	0.485
95.00	0.40	0.93	0.00	0.00	0.00	23.11	23.57	52.0	0.453
100.00	0.38	0.94	0.00	0.00	0.00	21.25	21.69	52.0	0.417
105.00	0.37	0.95	0.00	0.00	0.00	19.12	19.56	52.0	0.376
110.00	0.36	0.96	0.00	0.00	0.00	16.68	17.12	52.0	0.329
115.00	0.34	0.97	0.00	0.00	0.00	13.89	14.33	52.0	0.276
120.00	0.33	0.99	0.00	0.00	0.00	10.67	11.13	52.0	0.214
122.04	0.32	0.99	0.00	0.00	0.00	9.23	9.71	52.0	0.187
125.00	0.31	1.00	0.00	0.00	0.00	6.96	7.48	52.0	0.144
125.95	0.40	1.32	0.00	0.00	0.00	7.97	8.68	52.0	0.167
127.00	0.34	1.16	0.00	0.00	0.00	6.85	7.47	52.0	0.144
128.00	0.29	0.71	0.00	0.00	0.00	5.90	6.31	52.0	0.121
128.80	0.19	0.58	0.00	0.00	0.00	5.45	5.73	52.0	0.110
130.00	0.18	0.58	0.00	0.00	0.00	4.91	5.19	52.0	0.100
135.00	0.17	0.57	0.00	0.00	0.00	2.43	2.78	52.0	0.053
137.50	0.05	0.11	0.00	0.00	0.00	1.09	1.16	52.0	0.022
140.00	0.05	0.09	0.00	0.00	0.00	0.86	0.92	52.0	0.018
145.00	0.03	0.06	0.00	0.00	0.00	0.44	0.48	52.0	0.009
150.00	0.00	0.06	0.00	0.00	0.00	0.14	0.17	52.0	0.003

Wind Loading - Shaft

Structure: CT13612-A-SBA
Site Name: Ingalls
Height: 150.00 (ft)
Base Elev: 1.500 (ft)

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

12/15/2015
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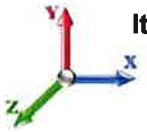
Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 23

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	229.17	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	224.27	0.650	0.000	5.00	22.672	14.74	159.4	0.0	1094.3
10.00		0.00	1.00	6.400	10.82	219.37	0.650	0.000	5.00	22.182	14.42	155.9	0.0	1070.4
15.00		0.00	1.00	6.400	10.82	214.47	0.650	0.000	5.00	21.692	14.10	152.5	0.0	1046.6
20.00		0.00	1.00	6.400	10.82	209.57	0.650	0.000	5.00	21.202	13.78	149.1	0.0	1022.8
25.00		0.00	1.00	6.400	10.82	204.67	0.650	0.000	5.00	20.712	13.46	145.6	0.0	999.0
30.00		0.00	1.00	6.400	10.82	199.76	0.650	0.000	5.00	20.222	13.14	142.2	0.0	975.2
35.00		0.00	1.03	6.587	11.13	197.69	0.650	0.000	5.00	19.731	12.83	142.8	0.0	951.4
40.00		0.00	1.07	6.833	11.55	196.29	0.650	0.000	5.00	19.241	12.51	144.4	0.0	927.5
42.91	Bot - Section 2	0.00	1.09	6.967	11.77	195.22	0.650	0.000	2.91	10.985	7.14	84.1	0.0	529.5
45.00		0.00	1.10	7.059	11.93	194.36	0.650	0.000	2.09	7.875	5.12	61.1	0.0	691.0
49.08	Top - Section 1	0.00	1.13	7.231	12.22	192.46	0.650	0.000	4.08	15.151	9.85	120.3	0.0	1329.1
50.00		0.00	1.14	7.268	12.28	194.77	0.650	0.000	0.92	3.371	2.19	26.9	0.0	135.6
55.00		0.00	1.17	7.463	12.61	192.07	0.650	0.000	5.00	18.032	11.72	147.8	0.0	725.0
60.00		0.00	1.19	7.646	12.92	189.05	0.650	0.000	5.00	17.542	11.40	147.3	0.0	705.2
65.00		0.00	1.22	7.819	13.21	185.76	0.650	0.000	5.00	17.052	11.08	146.5	0.0	685.3
70.00		0.00	1.25	7.982	13.49	182.22	0.650	0.000	5.00	16.562	10.77	145.2	0.0	665.5
75.00		0.00	1.27	8.138	13.75	178.47	0.650	0.000	5.00	16.072	10.45	143.7	0.0	645.6
76.87	Bot - Section 3	0.00	1.28	8.194	13.85	177.01	0.650	0.000	1.87	5.895	3.83	53.1	0.0	236.8
80.00		0.00	1.29	8.286	14.00	174.51	0.650	0.000	3.13	9.817	6.38	89.4	0.0	704.9
82.12	Top - Section 2	0.00	1.30	8.347	14.11	172.78	0.650	0.000	2.12	6.557	4.26	60.1	0.0	470.8
85.00		0.00	1.32	8.429	14.24	172.77	0.650	0.000	2.88	8.743	5.68	80.9	0.0	281.3
90.00		0.00	1.34	8.565	14.47	168.49	0.650	0.000	5.00	14.810	9.63	139.3	0.0	476.5
95.00		0.00	1.36	8.696	14.70	164.07	0.650	0.000	5.00	14.320	9.31	136.8	0.0	460.6
100.00		0.00	1.38	8.823	14.91	159.50	0.650	0.000	5.00	13.830	8.99	134.0	0.0	444.7
105.00		0.00	1.40	8.945	15.12	154.81	0.650	0.000	5.00	13.340	8.67	131.1	0.0	428.8
110.00		0.00	1.42	9.063	15.32	149.99	0.650	0.000	5.00	12.850	8.35	127.9	0.0	413.0
115.00		0.00	1.43	9.177	15.51	145.07	0.650	0.000	5.00	12.360	8.03	124.6	0.0	397.1
120.00		0.00	1.45	9.288	15.70	140.04	0.650	0.000	5.00	11.870	7.72	121.1	0.0	381.2
122.04	Bot - Section 4	0.00	1.46	9.332	15.77	137.96	0.650	0.000	2.04	4.694	3.05	48.1	0.0	150.7
125.00		0.00	1.47	9.395	15.88	134.91	0.650	0.000	2.96	6.778	4.41	70.0	0.0	378.2
125.95	Top - Section 3	0.00	1.47	9.416	15.91	133.92	0.650	0.000	0.95	2.144	1.39	22.2	0.0	119.6
127.00	Appurtenance(s)	0.00	1.47	9.438	15.95	134.73	0.650	0.000	1.05	2.333	1.52	24.2	0.0	56.3
128.00	Appurtenance(s)	0.00	1.48	9.459	15.98	133.69	0.650	0.000	1.00	2.209	1.44	23.0	0.0	53.3
128.80	Appurtenance(s)	0.00	1.48	9.475	16.01	132.85	0.650	0.000	0.80	1.753	1.14	18.2	0.0	42.3
130.00		0.00	1.48	9.500	16.06	131.59	0.650	0.000	1.20	2.606	1.69	27.2	0.0	62.9
135.00		0.00	1.50	9.602	16.23	126.29	0.650	0.000	5.00	10.556	6.86	111.3	0.0	254.6
137.50	Appurtenance(s)	0.00	1.51	9.652	16.31	123.61	0.650	0.000	2.50	5.094	3.31	54.0	0.0	122.8
140.00		0.00	1.52	9.701	16.39	120.91	0.650	0.000	2.50	4.972	3.23	53.0	0.0	119.9
145.00		0.00	1.53	9.798	16.56	115.45	0.650	0.000	5.00	9.576	6.22	103.1	0.0	230.8
150.00	Appurtenance(s)	0.00	1.55	9.892	16.72	109.91	0.650	0.000	5.00	9.086	5.91	98.7	0.0	218.9
								Totals:	**150.00**			**4,066.1**		**20,704.9**

Discrete Appurtenance Forces

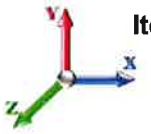
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 18	

TES Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	Lightning Rod 1"x10'	1	10.003	16.904	1.00	2.32	62.00	0.000	6.000	39.22	0.00	235.31
2	137.50	T-Frame RMV5-3096	3	9.652	16.312	0.75	22.50	1050.00	0.000	0.000	367.01	0.00	0.00
3	137.50	RR90-19-XXDPQ	3	9.652	16.312	0.68	11.97	48.00	0.000	0.000	195.33	0.00	0.00
4	137.50	RFS APX16PV-16PVL	3	9.652	16.312	0.62	12.37	118.80	0.000	0.000	201.76	0.00	0.00
5	137.50	LNX-6515DS-VTM	3	9.652	16.312	0.80	27.43	153.90	0.000	0.000	447.46	0.00	0.00
6	137.50	KRY 112 144/1	6	9.652	16.312	0.70	1.72	66.00	0.000	0.000	28.09	0.00	0.00
7	137.50	Kathrein 782 11056	3	9.652	16.312	0.87	0.73	15.90	0.000	0.000	11.92	0.00	0.00
8	128.80	Low Profile Platform	1	9.475	16.013	1.00	22.00	1400.00	0.000	0.000	352.29	0.00	0.00
9	128.00	SBNHH-1D65B	6	9.459	15.985	0.83	41.48	304.26	0.000	0.000	663.11	0.00	0.00
10	128.00	LPA-80080-6CF	6	9.459	15.985	0.92	50.18	126.00	0.000	0.000	802.07	0.00	0.00
11	127.00	RRH4x45-AWS	3	9.438	15.950	0.82	6.20	186.00	0.000	0.000	98.87	0.00	0.00
12	127.00	RRH2X60-PCS	3	9.438	15.950	0.89	6.86	165.00	0.000	0.000	109.44	0.00	0.00
13	127.00	RRH2X60-700	3	9.438	15.950	0.76	9.03	180.00	0.000	0.000	144.01	0.00	0.00
14	127.00	RFS FD9R6004/2C-3L	6	9.438	15.950	0.86	1.86	18.00	0.000	0.000	29.63	0.00	0.00
15	127.00	DB-T1-6Z-8AB-0Z	2	9.438	15.950	0.71	7.95	88.00	0.000	0.000	126.83	0.00	0.00
						Totals:		**3,981.86**			**3,617.04**		

Total Applied Force Summary

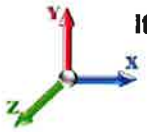
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		159.39	1094.25	0.00	0.00
10.00		155.95	1137.66	0.00	0.00
15.00		152.50	1214.69	0.00	0.00
20.00		149.06	1190.87	0.00	0.00
25.00		145.61	1167.05	0.00	0.00
30.00		142.17	1143.24	0.00	0.00
35.00		142.77	1119.42	0.00	0.00
40.00		144.43	1095.61	0.00	0.00
42.91		84.07	627.39	0.00	0.00
45.00		61.06	761.12	0.00	0.00
49.08		120.34	1466.23	0.00	0.00
50.00		26.92	166.49	0.00	0.00
55.00		147.82	893.08	0.00	0.00
60.00		147.33	873.23	0.00	0.00
65.00		146.45	853.39	0.00	0.00
70.00		145.22	833.54	0.00	0.00
75.00		143.67	813.70	0.00	0.00
76.87		53.07	299.75	0.00	0.00
80.00		89.36	810.04	0.00	0.00
82.12		60.13	542.14	0.00	0.00
85.00		80.95	378.02	0.00	0.00
90.00		139.34	644.53	0.00	0.00
95.00		136.79	628.66	0.00	0.00
100.00		134.03	612.78	0.00	0.00
105.00		131.07	596.90	0.00	0.00
110.00		127.92	581.03	0.00	0.00
115.00		124.60	565.15	0.00	0.00
120.00		121.10	549.27	0.00	0.00
122.04		48.12	219.19	0.00	0.00
125.00		69.95	477.79	0.00	0.00
125.95		22.17	151.63	0.00	0.00
127.00	(17) appurtenances	532.97	728.48	0.00	0.00
128.00	(12) appurtenances	1488.14	516.08	0.00	0.00
128.80	(1) appurtenances	370.54	1443.35	0.00	0.00
130.00		27.20	64.45	0.00	0.00
135.00		111.34	261.18	0.00	0.00
137.50	(21) appurtenances	1305.57	1578.72	0.00	0.00
140.00		52.98	123.15	0.00	0.00
145.00		103.06	237.36	0.00	0.00
150.00	(1) appurtenances	137.95	287.45	0.00	235.31
	Totals:	**7,683.13**	**28,748.08**	**0.00**	**235.31**

Resulting Forces and Deflections

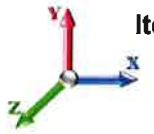
Structure:	CT13612-A-SB	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 23

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-7.693	-28.745	0.000	0.000	0.000	-787.68	0.000	0.000	0.000	0.000	0.000
5.00	-7.555	-27.645	0.000	0.000	0.000	-749.21	-0.024	0.000	0.024	-0.045	0.000
10.00	-7.419	-26.501	0.000	0.000	0.000	-711.43	-0.095	0.000	0.095	-0.090	0.000
15.00	-7.285	-25.281	0.000	0.000	0.000	-674.34	-0.214	0.000	0.214	-0.136	0.000
20.00	-7.152	-24.085	0.000	0.000	0.000	-637.92	-0.381	0.000	0.381	-0.182	0.000
25.00	-7.021	-22.913	0.000	0.000	0.000	-602.16	-0.597	0.000	0.597	-0.229	0.000
30.00	-6.892	-21.764	0.000	0.000	0.000	-567.05	-0.863	0.000	0.863	-0.277	0.000
35.00	-6.761	-20.640	0.000	0.000	0.000	-532.59	-1.180	0.000	1.180	-0.325	0.000
40.00	-6.623	-19.541	0.000	0.000	0.000	-498.79	-1.547	0.000	1.547	-0.374	0.000
42.91	-6.543	-18.911	0.000	0.000	0.000	-479.49	-1.785	0.000	1.785	-0.404	0.000
45.00	-6.486	-18.147	0.000	0.000	0.000	-465.84	-1.966	0.000	1.966	-0.425	0.000
49.08	-6.362	-16.679	0.000	0.000	0.000	-439.38	-2.347	0.000	2.347	-0.466	0.000
50.00	-6.343	-16.509	0.000	0.000	0.000	-433.52	-2.437	0.000	2.437	-0.475	0.000
55.00	-6.203	-15.611	0.000	0.000	0.000	-401.81	-2.966	0.000	2.966	-0.532	0.000
60.00	-6.062	-14.733	0.000	0.000	0.000	-370.79	-3.555	0.000	3.555	-0.590	0.000
65.00	-5.921	-13.875	0.000	0.000	0.000	-340.48	-4.204	0.000	4.204	-0.648	0.000
70.00	-5.779	-13.038	0.000	0.000	0.000	-310.88	-4.913	0.000	4.913	-0.705	0.000
75.00	-5.633	-12.222	0.000	0.000	0.000	-281.98	-5.683	0.000	5.683	-0.763	0.000
76.87	-5.582	-11.920	0.000	0.000	0.000	-271.43	-5.987	0.000	5.987	-0.785	0.000
80.00	-5.487	-11.109	0.000	0.000	0.000	-253.98	-6.513	0.000	6.513	-0.821	0.000
82.12	-5.425	-10.565	0.000	0.000	0.000	-242.33	-6.884	0.000	6.884	-0.846	0.000
85.00	-5.347	-10.183	0.000	0.000	0.000	-226.72	-7.404	0.000	7.404	-0.878	0.000
90.00	-5.208	-9.535	0.000	0.000	0.000	-199.99	-8.360	0.000	8.360	-0.944	0.000
95.00	-5.070	-8.903	0.000	0.000	0.000	-173.95	-9.383	0.000	9.383	-1.007	0.000
100.00	-4.934	-8.288	0.000	0.000	0.000	-148.60	-10.471	0.000	10.471	-1.068	0.000
105.00	-4.798	-7.689	0.000	0.000	0.000	-123.93	-11.621	0.000	11.621	-1.125	0.000
110.00	-4.665	-7.107	0.000	0.000	0.000	-99.944	-12.829	0.000	12.829	-1.178	0.000
115.00	-4.534	-6.541	0.000	0.000	0.000	-76.619	-14.088	0.000	14.088	-1.224	0.000
120.00	-4.403	-5.993	0.000	0.000	0.000	-53.951	-15.392	0.000	15.392	-1.263	0.000
122.04	-4.352	-5.773	0.000	0.000	0.000	-44.984	-15.934	0.000	15.934	-1.276	0.000
125.00	-4.272	-5.297	0.000	0.000	0.000	-32.088	-16.732	0.000	16.732	-1.292	0.000
125.95	-4.247	-5.145	0.000	0.000	0.000	-28.015	-16.991	0.000	16.991	-1.297	0.000
127.00	-3.698	-4.429	0.000	0.000	0.000	-23.570	-17.275	0.000	17.275	-1.301	0.000
128.00	-2.199	-3.947	0.000	0.000	0.000	-19.872	-17.549	0.000	17.549	-1.305	0.000
128.80	-1.796	-2.512	0.000	0.000	0.000	-18.113	-17.768	0.000	17.768	-1.309	0.000
130.00	-1.767	-2.448	0.000	0.000	0.000	-15.958	-18.097	0.000	18.097	-1.313	0.000
135.00	-1.650	-2.189	0.000	0.000	0.000	-7.121	-19.480	0.000	19.480	-1.326	0.000
137.50	-0.309	-0.641	0.000	0.000	0.000	-2.995	-20.176	0.000	20.176	-1.329	0.000
140.00	-0.253	-0.519	0.000	0.000	0.000	-2.223	-20.872	0.000	20.872	-1.331	0.000
145.00	-0.145	-0.284	0.000	0.000	0.000	-0.958	-22.267	0.000	22.267	-1.333	0.000
150.00	-0.138	0.000	0.000	0.000	0.000	-0.235	0.000	0.000	23.664	-1.334	0.000

Resulting Stresses

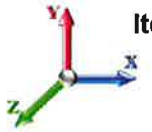
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-F	12/15/2015	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Gh:**	1.69		
Base Elev:	1.500 (ft)	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations: 23

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Allow Stress (ksi)	f/Fb Stress Ratio
0.00	0.44	0.24	0.00	0.00	0.00	10.77	11.22	52.0	0.216
5.00	0.43	0.24	0.00	0.00	0.00	10.70	11.14	52.0	0.214
10.00	0.43	0.24	0.00	0.00	0.00	10.62	11.06	52.0	0.213
15.00	0.42	0.24	0.00	0.00	0.00	10.54	10.96	52.0	0.211
20.00	0.41	0.24	0.00	0.00	0.00	10.45	10.86	52.0	0.209
25.00	0.39	0.24	0.00	0.00	0.00	10.35	10.75	52.0	0.207
30.00	0.38	0.25	0.00	0.00	0.00	10.23	10.63	52.0	0.204
35.00	0.37	0.25	0.00	0.00	0.00	10.11	10.49	52.0	0.202
40.00	0.36	0.25	0.00	0.00	0.00	9.97	10.34	52.0	0.199
42.91	0.36	0.25	0.00	0.00	0.00	9.88	10.25	52.0	0.197
45.00	0.35	0.25	0.00	0.00	0.00	9.81	10.17	52.0	0.196
49.08	0.38	0.30	0.00	0.00	0.00	11.23	11.63	52.0	0.224
50.00	0.38	0.30	0.00	0.00	0.00	11.19	11.59	52.0	0.223
55.00	0.37	0.30	0.00	0.00	0.00	10.96	11.34	52.0	0.218
60.00	0.36	0.30	0.00	0.00	0.00	10.70	11.07	52.0	0.213
65.00	0.35	0.30	0.00	0.00	0.00	10.41	10.78	52.0	0.207
70.00	0.34	0.30	0.00	0.00	0.00	10.10	10.45	52.0	0.201
75.00	0.33	0.30	0.00	0.00	0.00	9.74	10.08	52.0	0.194
76.87	0.32	0.30	0.00	0.00	0.00	9.60	9.94	52.0	0.191
80.00	0.31	0.31	0.00	0.00	0.00	9.35	9.67	52.0	0.186
82.12	0.36	0.38	0.00	0.00	0.00	11.09	11.48	52.0	0.221
85.00	0.36	0.38	0.00	0.00	0.00	10.78	11.15	52.0	0.215
90.00	0.35	0.38	0.00	0.00	0.00	10.16	10.53	52.0	0.203
95.00	0.33	0.38	0.00	0.00	0.00	9.47	9.83	52.0	0.189
100.00	0.32	0.39	0.00	0.00	0.00	8.69	9.04	52.0	0.174
105.00	0.31	0.39	0.00	0.00	0.00	7.81	8.15	52.0	0.157
110.00	0.30	0.39	0.00	0.00	0.00	6.80	7.14	52.0	0.137
115.00	0.29	0.40	0.00	0.00	0.00	5.65	5.98	52.0	0.115
120.00	0.27	0.40	0.00	0.00	0.00	4.33	4.65	52.0	0.090
122.04	0.27	0.41	0.00	0.00	0.00	3.74	4.07	52.0	0.078
125.00	0.25	0.41	0.00	0.00	0.00	2.81	3.14	52.0	0.060
125.95	0.32	0.54	0.00	0.00	0.00	3.21	3.66	52.0	0.070
127.00	0.28	0.47	0.00	0.00	0.00	2.75	3.14	52.0	0.060
128.00	0.25	0.28	0.00	0.00	0.00	2.36	2.66	52.0	0.051
128.80	0.16	0.23	0.00	0.00	0.00	2.18	2.38	52.0	0.046
130.00	0.16	0.23	0.00	0.00	0.00	1.97	2.16	52.0	0.042
135.00	0.15	0.23	0.00	0.00	0.00	0.96	1.18	52.0	0.023
137.50	0.04	0.04	0.00	0.00	0.00	0.43	0.48	52.0	0.009
140.00	0.04	0.04	0.00	0.00	0.00	0.33	0.37	52.0	0.007
145.00	0.02	0.02	0.00	0.00	0.00	0.16	0.18	52.0	0.004
150.00	0.00	0.02	0.00	0.00	0.00	0.04	0.06	52.0	0.001

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	22.2	0.00	28.72	0.00	0.00	2275.33
73.61 mph Wind with 0.5" Ice	18.0	0.00	33.34	0.00	0.00	1878.96
50 mph Wind with 0" Ice	7.7	0.00	28.74	0.00	0.00	787.68

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	0.38	0.85	0.00	0.00	0.00	32.43	32.84	52.0	49.08	0.632
73.61 mph Wind with 0.5" Ice	0.45	0.70	0.00	0.00	0.00	27.08	27.56	52.0	49.08	0.530
50 mph Wind with 0" Ice	0.38	0.30	0.00	0.00	0.00	11.23	11.63	52.0	49.08	0.224

TES Tower Engineering Solutions	Monopole Mat Foundation Design			Date 12/15/2015
	Customer Name:	Verizon	EIA/TIA Standard:	EIA-222-F
	Site Name:		Structure Height (Ft.):	150
	Site Number:	CT13612-A-SBA	Engineer Name:	D. Zhou
	Engr. Number:	19364	Engineer Login ID:	TES

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

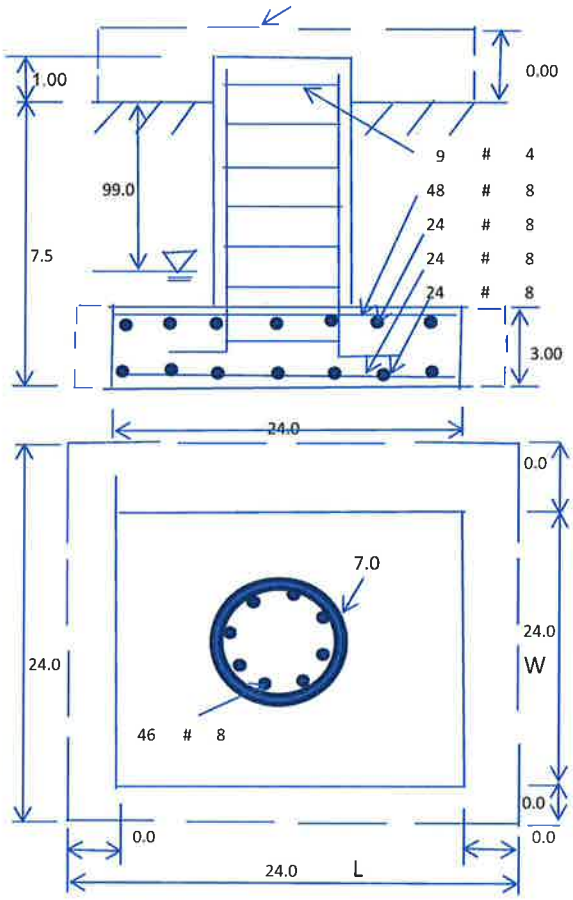
Analysis or Design? Analysis

Base Reactions (Unfactored)

Axial Load (Kips):	33.3	Shear Force (Kips):	22.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2275.3

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	7.5
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	3.00
Length of Pad (ft.):	24	Width of Pad (ft.):	24
Final Length of pad (ft)	24.0	Final width of pad (ft):	24.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	46	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	48	Qty. of Rebar in Pad (W):	48	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	

Soil Design Parameters:

Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Allowable Net Soil Bearing (psf):	3200	Allowable Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:			1.00	

Foundation Analysis and Design:

Total Dry Soil Volume (cu. Ft.):	2418.82	Total Dry Soil Weight (Kips):	266.07
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	266.07	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1939.66	Total Dry Concrete Weight (Kips):	290.95
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	290.95	Total Vertical Load on Base (Kips):	590.32

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1717	<	Allowable Soil Bearing (psf):	3200	0.54	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	4722.6	>	Applied Momont (kips-ft):	2464	0.52	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.87	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75			
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.30			
				Load/ Capacity Ratio		
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	0.79	Tie / Stirrup Area (sq. in./each):	0.20			
Calculated Moment Capacity (Mn,Kips-Ft):	6072.6	>	Design Factored Moment (Mu, Kips-Ft	2397.4	0.39	OK!
Calculated Shear Capacity (Kips):	660.1	>	Design Factored Shear (Kips):	28.9	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	1962.4	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9733.6	>	Design Factored Axial Load (Pu Kips):	43.3	0.00	OK!
Moment & Axial Strength Combination:	0.39	OK!	Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.007	Reinforcement Ratio is satisfied per ACI				
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	888.0	>	One-Way Factored Shear (L-D. Kips):	179.3	0.20	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	888.0	>	One-Way Factored Shear (W-D., Kips):	179.3	0.20	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	996.8	>	One-Way Factored Shear (C-C, Kips):	289.0	0.29	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0041	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0041		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5347.6	>	Moment at Bottom (L-Direct. K-Ft):	399.4	0.07	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5347.6	>	Moment at Bottom (W-Direct. K-Ft):	399.4	0.07	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	7489.7	>	Moment at Bottom (C-C Dir. K-Ft):	564.8	0.08	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0020	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0020		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	2723.3	>	Moment at the top (L-Dir Kips-Ft):	571.4	0.21	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	2723.3	>	Moment at the top (W-Dir Kips-Ft):	571.4	0.21	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	3833.2	>	Moment at the top (C-C Direc. K-Ft):	522.2	0.14	OK!