

October 31, 2016

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

Re: **Notice of Exempt Modification – Facility Modification
26 Mell Road, Lisbon, Connecticut**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 159-foot level of the existing 195-foot tower at 26 Mell Road in Lisbon, Connecticut (the “Property”). The tower is owned by SBA Communications Corporation (“SBA”). The Council approved Cellco’s use of the tower in 2000. Cellco now intends to modify its facility by replacing six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/1900 MHz antennas and three (3) model SBNHH-1D65B, 2100 MHz antennas, all at the same level on the tower. Cellco also intends to replace three (3) remote radio heads (“RRHs”) and install three (3) new RRHs and one (1) HYBRIFLEX™ fiber optic antenna cable. Included in Attachment 1 are specifications for Cellco’s replacement antennas, RRHs and HYBRIFLEX™ cable.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Thomas W. Sparkman, First Selectman for the Town of Lisbon. A copy of this letter is also being sent to Stanley Wildowsky, Jr., the owner of the Property and to 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).


14502231-v1

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1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be located at the 159-foot level on the 195-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/or local criteria.
4. The operation of the modified facility 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 behind 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:

Thomas W. Sparkman, Lisbon First Selectman
Stanley Wildowsky, Jr.
SBA
Tim Parks

ATTACHMENT 1

POWERED BY



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
	0° 14.6	0° 14.5	0° 17.4	0° 17.8	0° 18.1	0° 18.2
Gain by Beam Tilt, average, dBi	7° 14.6	7° 14.4	3° 17.5	3° 17.9	3° 18.3	3° 18.4
	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

SBNHH-1D65B

POWERED BY



Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 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

COMMSCOPE®

SBNHH-1D65B

POWERED BY



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 B66A RRH4X45

The Alcatel-Lucent B66a Remote Radio Head 4x45 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. Its operational range covers beyond that of B4 (AWS) and B10 (AWS+).

Supporting 2Tx/4Tx MIMO and 2-way/4-way Rx diversity, the Alcatel-Lucent B66a RRH4x45 allows operators to have a compact radio solution to deploy LTE in the 2100 band (3GPP band 4, 10, and 66), providing them with the means to achieve high capacity, high quality, high reliability, large instantaneous bandwidth, and high coverage with minimum site requirements.

The Alcatel-Lucent B66a RRH4x45 product has four transmit RF paths, offering the possibility to **select, via software only, 2Tx or 4Tx MIMO configurations** with either 2x90W or 4x45W RF output power. It also supports 4-way Rx diversity at the 70 MHz instantaneous bandwidth.



The Alcatel-Lucent B66a RRH4x45 is a compact (near zero-footprint) solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts.

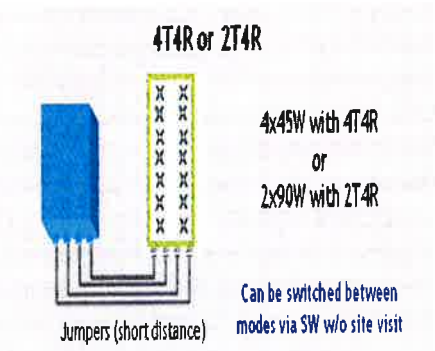
Its compactness and slim design makes the Alcatel-Lucent B66a RRH4x45 easy to install close to the antenna: operators can therefore locate this Remote Radio Head where RF design conditions are deemed ideal, minimizing trade-offs between available sites and RF optimum sites, together with reducing the RF feeder needs and installation costs.

FEATURES

- Supporting LTE in 2110 - 2180 MHz band/DL, 1710-1780MHz/UL (3GPP band 4, 10, and 66a)
- LTE 2Tx or 4Tx MIMO (SW selectable)
- Configuration: 2T2R/2T4R/4T4R
- Output power: Up to 2x90W or 4x45W (SW configurable)
- 70MHz 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 AWS 1-3 band
- Selection of MIMO configuration (2Tx or 4Tx) by software only
- Improves downlink spectral efficiency through 4Tx MIMO
- Increases LTE coverage thanks to 4Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options: Pole or Wall



TECHNICAL SPECIFICATIONS

Features & Performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R selectable by SW)
Frequency band	AWS 1-3, B4/B66a DL: 2110-2180 MHz / UL: 1710-1780 MHz
Instantaneous bandwidth - #carriers	70 MHz – 4 LTE MIMO carriers (in 70 MHz occupied bandwidth)
LTE carrier bandwidth	5, 10, 15, 20 MHz
RF output power	2x90W or 4x45W (selectable by SW)
Noise figure – RX Diversity scheme Receiver Sensivity (FRC A1-3)	2 dB typical (<2.5 dB max) – 2 or 4 way Rx diversity -104.5 dBm maximum
Sizes (HxWxD) in mm (in.)	655x299x182 (25.8x11.8x7.2) (with solar shield) 640x290x160 (25.2x11.4x6.3) (without solar shield)
Volume in Liters	35.5 (with solar shield) 29.7 (without solar shield)
Weight in kg (lb) (w/o mounting HW)	25.8kg (56.8lb) (with solar shield)
DC voltage range	Nominal: -48V, -40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption
DC power consumption	750W typical @100% RF load (in 2Tx or 4Tx mode); Add 58W for 2A*29V for AISG
Environmental conditions	-40°C (-40°F) / +55°C (+131°F) UL50E Type 4 Enclosure
Wind load (@150km/h or 93mph)	250N (56lb) Frontal/150N (34lb) Lateral
Antenna ports	4 ports 4.3-10 female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (HW ready for Rate 7, 9.8 Gbps) SFP: SMDF (HW supports also SMSF and MMDF)
AISG Interfaces	1 AISG 2.0 output (RS485) Integrated Smart Bias Tees (x2)
Misc. Interfaces	4 external alarms (1 connector) 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-487 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27 / FCC Part 15 / GR-3178-CORE

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ALCATEL-LUCENT B25 RRH4X30

Alcatel-Lucent Band 25 Remote Radio Head 4x30W is the new 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 B25 RRH4x30 allows operators to have a compact radio solution to deploy LTE in the PCS band (1.9 GHz, 3GPP band 25), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent B25 RRH4x30 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, LTE carriers from 3 MHz up to 20 MHz and up to 65 MHz instantaneous bandwidth.

The Alcatel-Lucent B25 RRH4x30 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 B25 RRH4x30 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.

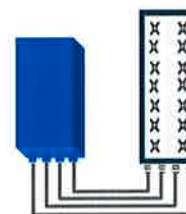


FEATURES

- Supporting LTE in 1.9 GHz band (PCS, 3GPP band 2 & 25)
- LTE 2Tx or 4Tx MIMO (SW switchable)
- Output power: Up to 2x60W or 4x30W
- Ready for 3, 5, 10, 15 or 20MHz LTE carrier operation with 4Rx Diversity
- Ready to support up to 4 carriers anywhere in 65MHz instantaneous bandwidth
- Convection-cooled (fan-less)
- Supports AISG 2.0 devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in PCS band
- MIMO scheme operation selection (2Tx or 4Tx) by software only
- Full flexibility for multiple carriers operation over entire PCS spectrum
- Improves downlink spectral efficiency and cell edge throughput through MIMO4
- Increases LTE coverage thanks to 4-way Rx diversity capability and best in class Rx sensitivity
- Flexible mounting options (Pole or Wall)



4x30W with 4T4R
or
2x60W with 2T4R

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

TECHNICAL SPECIFICATIONS

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	3GPP bands 2 & 25 (PCS-G) DL: 1930 - 1995 MHz UL: 1850 - 1915 MHz
Instantaneous bandwidth - #carriers	65MHz – Up to 4 LTE carriers (in 40MHz occupied bandwidth)
LTE carrier bandwidth	3, 5, 10, 15 or 20 MHz
RF output power	2x60W or 4x30W (by SW)
Noise figure (3GPP band 2) RX Diversity scheme	2.0 dB typ. (<2.5 dB max) 2 or 4 way Rx diversity
Sizes (HxWxD)(w/ solar shield) in mm (in.) Volume (w/ solar shield) in L Weight (w/ solar shield) in kg (lb)	538 x 304 x 182 (21.2" x 12.0" x 7.2") 30 24 (53)
DC voltage range DC power consumption	-40.5 to -57V at full performance, -38 to -57V with relaxation on power consumption 580W typical @100% RF load
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 (> 14dB)
CPRI ports	2 CPRI ports (HW ready for Rate7 / 9.8 Gbps)
AISG interfaces	1 AISG2.0 output (RS485), +24V/2A DC power Integrated Smart Bias Tees (x2)
Misc. Interfaces	1 external alarms connector (4 alarms) 4 RF Tx & 4 RF Rx monitor ports 1 DC connector (2 pins)
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / GR-3108-CORE / UL 60950-1 / FCC Part 27

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B25 RRH4x30

ALCATEL-LUCENT DATA SHEET REV1.1 – JANUARY 2015



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

Product Description

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

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

Features/Benefits

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



Figure 1: HYBRIFLEX Series

Technical Specifications

Outer Conductor Armor	Corrugated Aluminum	[mm (in)]	46.5 (1.83)
Jacket	Polyethylene, PE	[mm (in)]	50.3 (1.98)
UV-Protection	Individual and External Jacket		Yes
Physical Properties			
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)
Electrical Properties			
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	068 (0.205)
DC-Resistance Power Cable, 8.4mm ² (8AWG)		[Ω/km (Ω/1000ft)]	2.1 (0.307)
Optical Properties			
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, UL1665 RoHS Compliant
Power Cable Properties			
Size (Power)		[mm (AWG)]	8.4 (8)
Quantity, Wire Count (Power)			16 (8 pairs)
Size (Alarm)		[mm (AWG)]	0.8 (18)
Quantity, Wire Count (Alarm)			4 (2 pairs)
Type			UV protected
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	6.8 (0.27)
Standards (Meets or exceeds)			NFPA 130, ICEA S-95-658 UL Type XHHW-2, UL 44 UL-LS Limited Smoke, UL VW-1 IEEE-383 (1974), IEEE1202/FT4 RoHS Compliant
Environmental Properties			
Installation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to 149)

* This data is provisional and subject to change

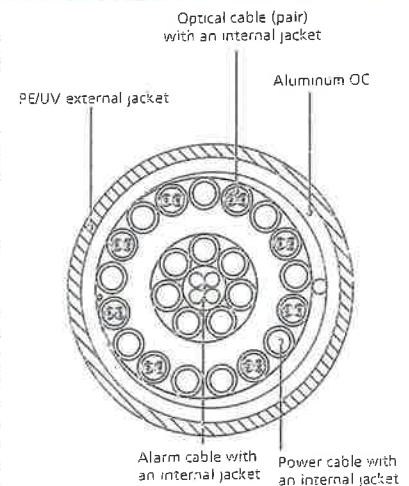


Figure 2: Construction Detail

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

ATTACHMENT 2

Site Name: Lisbon Tower Height: 195'		General		Power		Density							
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*Sprint	3	778	173	1900	0.0301	1.0000	0.30%						
*Sprint	1	438	173	850	0.0056	0.5667	0.10%						
*Nextel			183	0.0027	851	0.5673	0.05%						
*MetroPCS	3	444	145	0.0248	2140	1.0000	0.25%						
*T-Mobile	1	865	195	0.0087	700	0.4667	0.19%						
*T-Mobile	2	2334	195	0.0470	1900	1.0000	0.47%						
*T-Mobile	4	1167	195	0.0470	2100	1.0000	0.47%						
Verizon	11	411	159	0.0643	1970	1.0000	6.43%						
Verizon	9	227	159	0.0291	869	0.5793	5.02%						
Verizon	1	6907	159	0.0982	2145	1.0000	9.82%						
Verizon	1	1610	159	0.0229	746	0.4973	4.60%						
													27.7%
* 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 195 ft Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT00167-S

Customer Site Name: Lisbon

Carrier Name: Verizon

Carrier Site ID / Name: Lisbon

Site Location: 26 Mell Road

Lisbon, Connecticut

New London County

Latitude: 41.591033

Longitude: -72.016960

Analysis Result:

Max Structural Usage: 86.0% [Pass]

Max Foundation Usage: 40.0% [Pass]

Report Prepared by: Tawfeeq.alajaj



Introduction

The purpose of this report is to summarize the analysis results on the 195 ft Nudd Corporation 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	Fred A. Nudd Corporation Project #6531, dated February 4, 1999. Semaan Engineering solutions site #CT00167S Modification package, dated May 7, 2002.
Foundation Drawing	Fred A. Nudd Corporation Project #6531, dated February 4, 1999.
Geotechnical Report	Jaworski Geotech Inc., project #C98343G, dated August 5, 1998.

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed $V_{ult} = 135.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 105.0$ mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	$S_s = 0.169$, $S_1 = 0.06$

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	195.0	3	Ericsson - AIR 21, B2A B4P - Panel	(3) T-Arms w/ Walkways	(12) 1 5/8" (1) 1 5/8" Fiber	T-Mobile
2		3	Ericsson - AIR 21, B4A B2P - Panel			
3		3	Commscope - LNX-6515DS - Panel			
4		3	Ericsson KRY 112 144/1			
5		3	Ericsson S11B12			
6	173.0	3	RFS - APXVSP18-C-A20 - Panel	(3) Sector Frames	(3) 1 1/4"	Sprint
7		3	Alcatel Lucent 1900MHz RRU			
8		3	Alcatel Lucent 800 MHz RRU			
9		3	Alcatel Lucent 800 MHz Filter			
10		4	RFS ACU-A20-N			
-	159.0	3	Antel - WBX065X19R050 - Panel	Low Profile Platform	(12) 1 5/8" (1) 1 5/8" Fiber	Verizon
-		3	Antel - BXA-70063-6CF-2 - Panel			
-		3	Antel - BXA-70080-4BF - Panel			
-		3	Antel - BXA-171085-8BF-EDIN-2 - Panel			
-		3	Alcatel Lucent RRH2X40-AWS - RRH			
-		6	RFS FD9R6004/2CL-3CL Diplexer			
-		1	RFS Celwave DB-T1-6Z-8AB-OZ			
-	153.0	3	-	Standoff Mounts	-	-
18	143.0	6	Kathrein - 742 351 - Panel	(3) T-Arms	(12) 1 5/8" (1) 3/8"	Metro PCS

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
11	159.0	6	Commscope - SBNHH-1D65B - Panel	Low Profile Platform	(10) 1 5/8" (2) 1 5/8" Hybrids	Verizon
12		3	Antel - BXA-70063-6CF-2 - Panel			
13		3	Antel - BXA-70080-4BF - Panel			
14		3	Alcatel Lucent B66 RRH4X45 AWS RRH			
15		3	Alcatel Lucent B25 RRH4X30 RRH			
16		6	RFs FD9R6004/2CL-3CL Diplexer			
17		2	Rfs Celwave DB-T1-6Z-8AB-OZ ODU			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	74.4%	85.0%	86.0%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	6014.0	46.0
Analysis Reactions	5524.3	42.7
Factored Reactions*	8118.9	62.1
% of Design Reactions	68.0%	68.8%

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.3835 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

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

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.
3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.
4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.
5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.
6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 64.86% at 0.0ft

Structure: CT00167-S-SBA
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-G
Exposure: C
Gh: 1.1

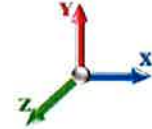
10/21/2016



Page: 1

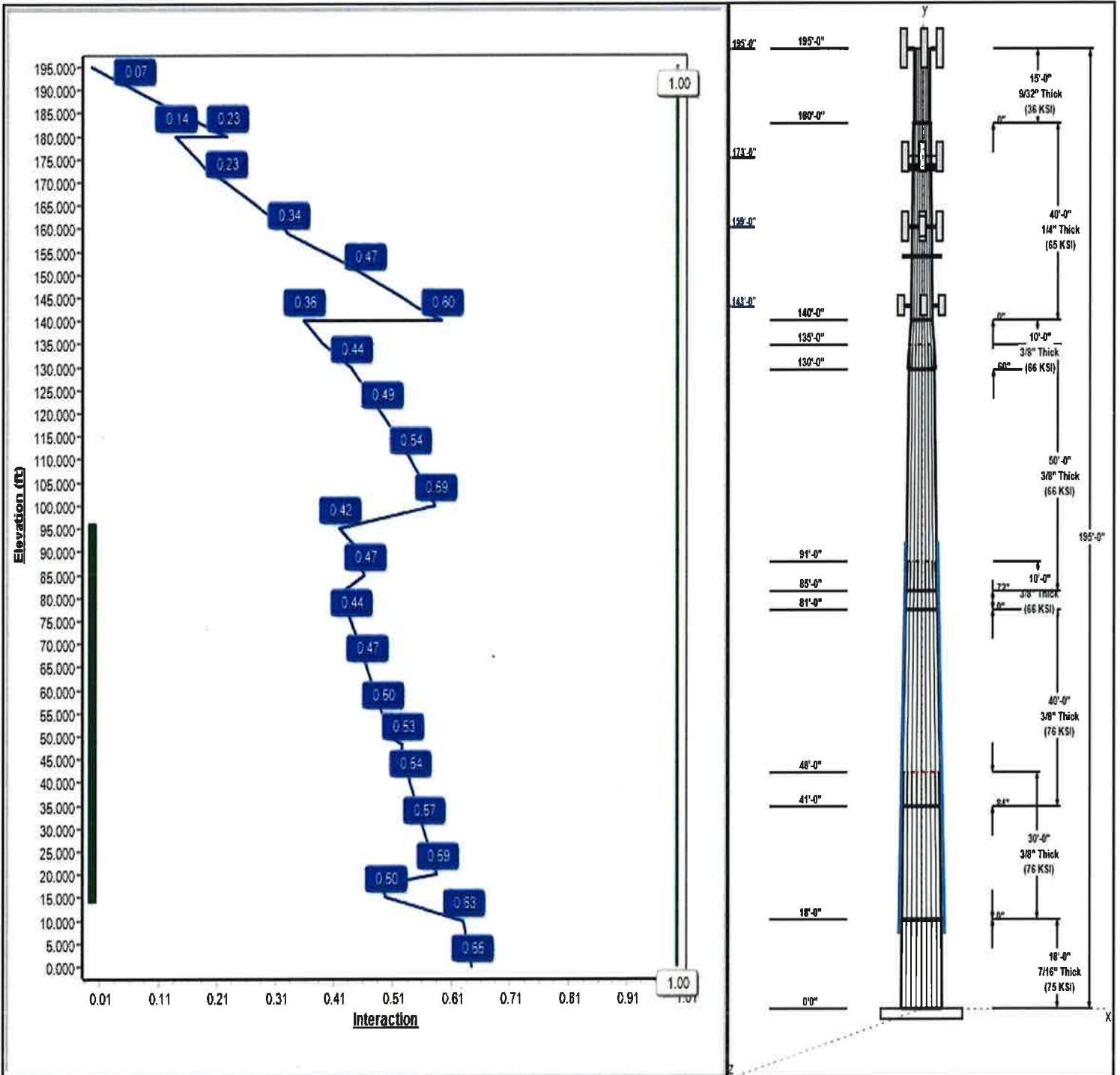
Dead Load Factor: 1.20
Wind Load Factor: 1.60

Load Case : 1.2D + 1.6W 105 mph Wind



Iterations: 25

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Structure: CT00167-S-SBA

Type: Custom
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.23750

10/21/2016



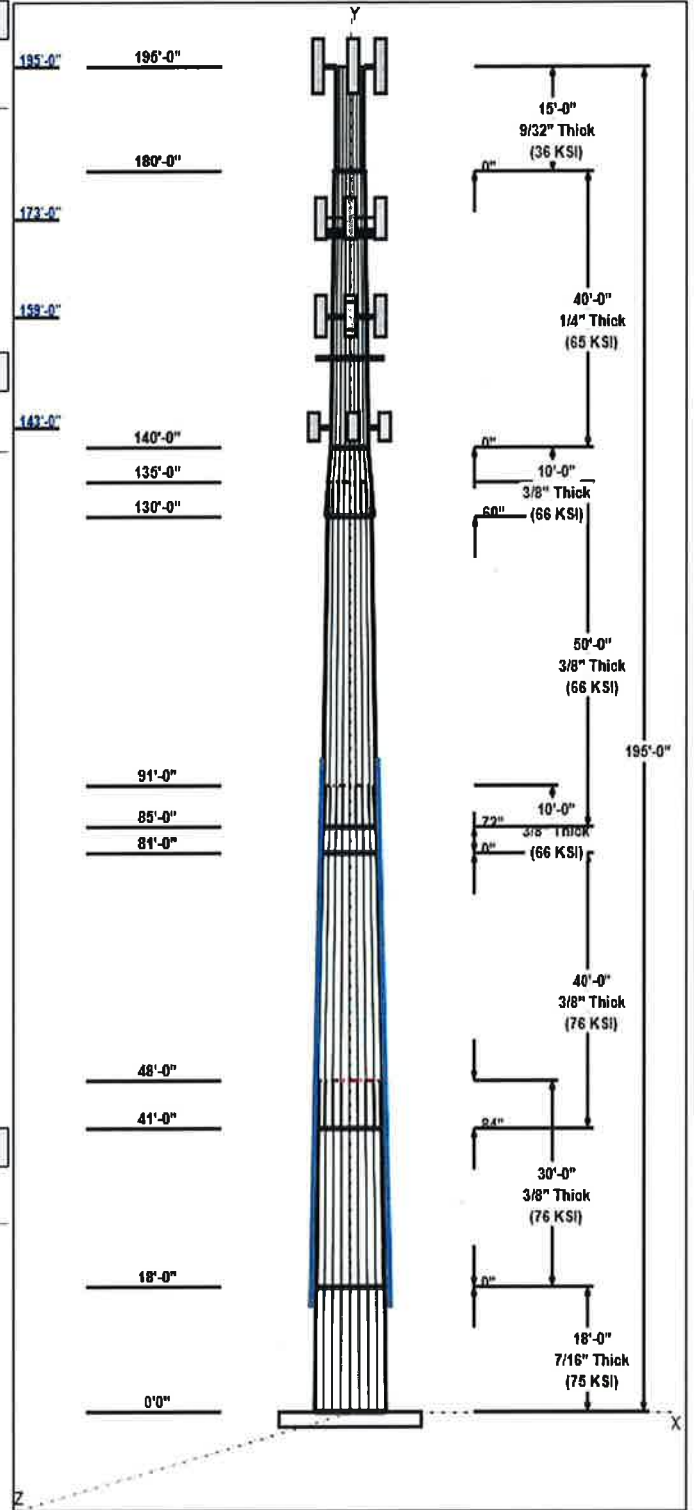
Page: 2

Shaft Properties							
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	18.00	60.23	64.50	0.438			75
2	30.00	53.10	60.23	0.375	Butt	0.23750	76
3	40.00	46.01	55.51	0.375	Slip	0.23750	76
4	10.00	43.64	46.01	0.375	Butt	0.23750	66
5	50.00	33.94	45.81	0.375	Slip	0.23750	66
6	10.00	33.50	35.88	0.375	Slip	0.23750	66
7	40.00	24.00	33.50	0.250	Butt	0.23750	65
8	15.00	24.00	24.00	0.281	Butt	0.00000	36

Discrete Appurtenances				
Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
195.00	195.00	3	T-Arm (Flat)	T-Mobile
195.00	195.00	3	AIR 21, 1.3M, B2A B4P	T-Mobile
195.00	195.00	3	AIR 21, 1.3M, B4A B2P	T-Mobile
195.00	195.00	3	KRY 112 144/1	T-Mobile
195.00	195.00	3	LNx-6515DS-A1M	T-Mobile
195.00	195.00	3	S11B12	T-Mobile
173.00	173.00	3	Sector Frame-Pipe/Rod	Sprint
173.00	173.00	3	APXVSP18-C-A20	Sprint
173.00	173.00	3	1900MHz RRH	Sprint
173.00	173.00	3	800 MHz RRH	Sprint
173.00	173.00	3	800 MHz ESMR Filter	Sprint
173.00	173.00	4	ACU-A20-N	Sprint
159.00	159.00	1	Low Profile Platform-flat	Verizon
159.00	159.00	6	SBNHH-1D65B	Verizon
159.00	159.00	3	BXA-70080-4BF	Verizon
159.00	159.00	6	RFs FD9R6004/2CL-3CL	Verizon
159.00	159.00	2	Rfs Celwave	Verizon
159.00	159.00	3	BXA-70063-6CF-2	Verizon
159.00	159.00	3	Alcatel Lucent B66	Verizon
159.00	159.00	3	Alcatel Lucent B25	Verizon
153.00	153.00	3	Standoff Mount	Unknown
143.00	143.00	3	T-Arm (Flat)	Metro PCS
143.00	143.00	6	742 351	Metro PCS

Linear Appurtenances				
Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	195.00	Inside	1 5/8" Coax	T-Mobile
0.00	195.00	Inside	1 5/8" Fiber	T-Mobile
0.00	195.00	Outside	Safety Cable	
0.00	195.00	Outside	Step bolts (ladder)	
0.00	173.00	Inside	1 1/4" Coax	Sprint
0.00	159.00	Inside	1 5/8" Coax	Verizon
0.00	159.00	Inside	1 5/8" Hybrids	Verizon
0.00	143.00	Inside	1 5/8" Coax	Metro PCS
0.00	143.00	Inside	3/8" Coax	Metro PCS
90.00	105.00	Outside	Reinforcing channels	
60.00	90.00	Outside	Reinforcing channels	
15.00	60.00	Outside	Reinforcing channels	

Anchor Bolts



Type: Custom
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.00000

10/21/2016

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Qty	Specifications	Grade (ksi)	Arrangement
26	2.00" A687	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.7500	52.0	50.0	Round

Reactions

Load Case	Moment	Shear	Axial
1.2D + 1.6W 105 mph Wind	5478.9	42.7	61.0
0.9D + 1.6W 105 mph Wind	5423.4	42.7	45.8
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1355.9	10.7	89.3
1.2D + 1.0E	141.7	1.1	61.1
0.9D + 1.0E	140.1	1.1	45.8
1.0D + 1.0W 60 mph Wind	1112.1	8.7	50.9

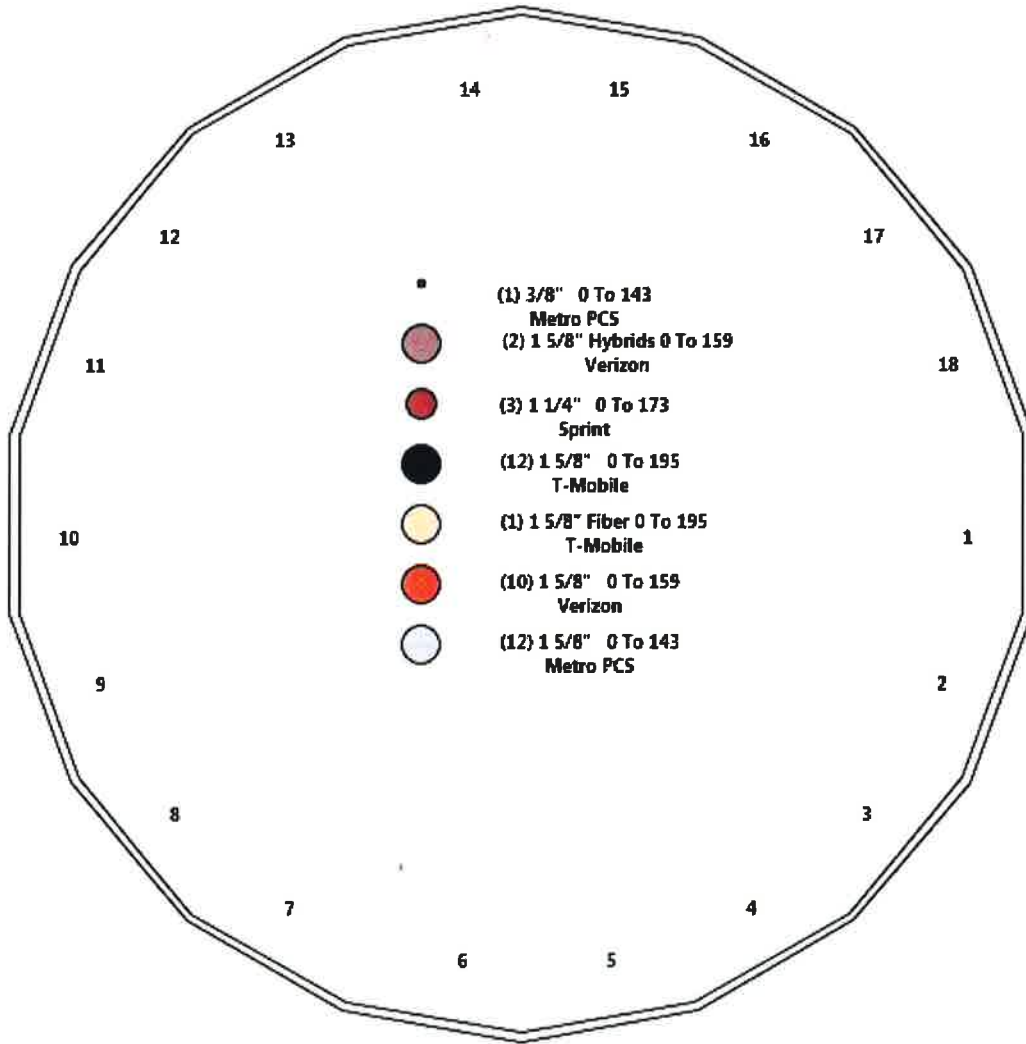
Structure: CT00167-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Lisbon
Height: 195.00 (ft)

10/21/2016



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Shaft Properties

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	18.000	0.4375	75		0.00	5,267
2	18	30.000	0.3750	76	Flange	0.00	6,839
3	18	40.000	0.3750	76	Slip	84.00	8,163
4	18	10.000	0.3750	66	Flange	0.00	1,800
5	18	50.000	0.3750	66	Slip	72.00	7,999
6	18	10.000	0.3750	66	Slip	60.00	1,390
7	18	40.000	0.2500	65	Flange	0.00	3,078
8	R	15.000	0.2813	36	Flange	0.00	1,081
Total Shaft Weight:							35,616

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	64.50	0.00	88.96	46124.76	24.59	147.43	60.23	18.00	83.02	37493.3	22.86	137.6	0.237500
2	60.23	18.00	71.23	32238.00	26.91	160.60	53.10	48.00	62.75	22040.7	23.56	141.6	0.237500
3	55.51	41.00	65.63	25206.75	24.69	148.03	46.01	81.00	54.32	14293.5	20.22	122.7	0.237500
4	46.01	81.00	54.32	14293.59	20.22	122.70	43.64	91.00	51.49	12176.1	19.11	116.3	0.237500
5	45.81	85.00	54.08	14106.49	20.13	122.17	33.94	135.00	39.95	5685.11	14.55	90.50	0.237500
6	35.88	130.0	42.25	6727.61	15.46	95.67	33.50	140.00	39.43	5465.67	14.34	89.33	0.237500
7	33.50	140.0	26.38	3685.19	22.22	134.00	24.00	180.00	18.84	1343.00	15.52	96.00	0.237500
8	24.00	180.0	21.18	1505.17	13.63	85.32	24.00	195.00	21.18	1505.17	13.63	85.32	0.000000

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Fu (ksi)	Offset (in)	Intermediate Connectors	Termination Connectors	Spacing (in)	Description	Spacing (in)	Lower Qty	Upper Qty
15.00	95.00	6	PLT C6x10.5 (no hole)	65	80	1.00	5/8" Hollo Bolt		0.00	AJM20&sleeve	24.00	3	3

Load Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	195.00	T-Arm (Flat)	3	400.00	10.00	0.75	686.66	18.958	0.75	0.00	0.00
2	195.00	AIR 21, 1.3M, B2A B4P	3	91.50	6.09	0.86	265.77	7.218	0.86	0.00	0.00
3	195.00	AIR 21, 1.3M, B4A B2P	3	90.40	6.09	0.86	264.67	7.218	0.87	0.00	0.00
4	195.00	KRY 112 144/1	3	11.00	0.41	0.50	22.07	0.898	0.50	0.00	0.00
5	195.00	LNx-6515DS-A1M	3	49.80	11.47	0.80	285.45	14.824	0.80	0.00	0.00
6	195.00	S11B12	3	51.00	2.83	0.50	122.45	3.520	0.50	0.00	0.00
7	173.00	Sector Frame-Pipe/Rod	3	450.00	14.00	0.75	806.89	21.138	0.75	0.00	0.00
8	173.00	APXVSP18-C-A20	3	57.00	8.02	0.83	232.34	10.854	0.83	0.00	0.00
9	173.00	1900MHz RRH	3	44.00	3.80	0.50	154.73	5.210	0.50	0.00	0.00
10	173.00	800 MHz RRH	3	53.00	2.49	0.50	128.02	3.650	0.50	0.00	0.00
11	173.00	800 MHz ESMR Filter	3	10.00	0.42	0.50	33.46	0.751	0.50	0.00	0.00
12	173.00	ACU-A20-N	4	1.00	0.14	0.50	5.36	0.441	0.50	0.00	0.00
13	159.00	Low Profile Platform-flat	1	1200.00	25.00	1.00	2253.25	46.065	1.00	0.00	0.00
14	159.00	SBNHH-1D65B	6	40.00	8.16	0.83	244.55	9.468	0.83	0.00	0.00
15	159.00	BXA-70080-4BF	3	12.00	3.56	0.88	100.88	5.417	0.89	0.00	0.00
16	159.00	RFs FD9R6004/2CL-3CL Diplexer	6	3.10	0.36	1.00	11.17	0.806	1.00	0.00	0.00
17	159.00	Rfs Celwave DB-T1-6Z-8AB-0Z ODU	2	18.90	4.80	0.71	163.62	5.679	0.71	0.00	0.00
18	159.00	BXA-70063-6CF-2	3	17.00	7.57	0.73	192.42	8.838	0.73	0.00	0.00
19	159.00	Alcatel Lucent B66 RRH4X45 AWS	3	56.80	2.54	0.82	141.54	3.239	0.82	0.00	0.00
20	159.00	Alcatel Lucent B25 RRH4X30 RRH	3	51.00	2.14	0.81	109.08	2.752	0.81	0.00	0.00
21	153.00	Standoff Mount	3	350.00	5.00	0.75	643.78	8.497	0.75	0.00	0.00
22	143.00	T-Arm (Flat)	3	400.00	10.00	0.75	677.90	18.684	0.75	0.00	0.00
23	143.00	742 351	6	29.80	5.38	0.61	124.64	7.357	0.61	0.00	0.00
Totals:			76	8,262.70			19,488.49				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	195.00	(12) 1 5/8" Coax	0.00	Inside
0.00	195.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	195.00	(1) Safety Cable	0.00	Outside
0.00	195.00	(1) Step bolts (ladder)	0.00	Outside
0.00	173.00	(3) 1 1/4" Coax	0.00	Inside
0.00	159.00	(10) 1 5/8" Coax	0.00	Inside
0.00	159.00	(2) 1 5/8" Hybrids	0.00	Inside
0.00	143.00	(12) 1 5/8" Coax	0.00	Inside
0.00	143.00	(1) 3/8" Coax	0.00	Inside
90.00	105.00	(2) Reinforcing channels	0.00	Outside
60.00	90.00	(2) Reinforcing channels	2.00	Outside
15.00	60.00	(2) Reinforcing channels	2.00	Outside

Shaft Section Properties

Structure: CT00167-S-SBA

Site Name: Lisbon

Height: 195.00 (ft)

Base Elev: 0.000 (ft)

Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G

Exposure: C

Crest Height: 0.00

Site Class: B - Competent Rock

Struct Class: II

10/21/2016



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Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Additional Reinforcing			
											Area (in ²)	Ixp (in ⁴)	Iyp (in ⁴)	Weight (lb)
0.00		0.4375	64.500	88.956	46124.8	24.59	147.43	75	81	0.0				
5.00		0.4375	63.313	87.307	43607.0	24.11	144.71	75	82	1499.5				
10.00		0.4375	62.125	85.658	41182.6	23.63	142.00	75	83	1471.4				
15.00	RB1	0.4375	60.938	84.009	38849.8	23.15	139.29	75	83	1443.3	18.54	9762.2	9762.2	246.0
18.00	Top - Section 1	0.4375	60.225	83.019	37493.3	22.86	137.66	75	84	852.5	18.54	9549.1	9549.1	147.6
18.00	Bot - Section 2	0.3750	60.225	71.234	32238.0	26.67	160.60	76	79					
20.00		0.3750	59.750	70.669	31476.5	26.68	159.33	76	79	482.9	18.54	9408.4	9408.4	98.4
25.00		0.3750	58.563	69.255	29625.4	26.13	156.17	76	80	1190.3	18.54	9061.0	9061.0	246.0
30.00		0.3750	57.375	67.842	27848.4	25.57	153.00	76	81	1166.3	18.54	8720.2	8720.2	246.0
35.00		0.3750	56.188	66.428	26143.9	25.01	149.83	76	81	1142.2	18.54	8385.9	8385.9	246.0
40.00		0.3750	55.000	65.015	24510.4	24.45	146.67	76	82	1118.2	18.54	8058.2	8058.2	246.0
41.00	Bot - Section 3	0.3750	54.763	64.732	24192.1	24.34	146.03	76	82	220.8	18.54	7993.5	7993.5	49.2
45.00		0.3750	53.813	63.602	22946.4	23.89	143.50	76	83	1758.9	18.54	7939.1	7939.1	196.8
48.00	Top - Section 2	0.3750	53.850	63.646	22994.7	23.91	143.60	76	83	1299.0	18.54	7747.1	7747.1	147.6
50.00		0.3750	53.375	63.081	22387.4	23.69	142.33	76	83	431.2	18.54	7620.3	7620.3	98.4
55.00		0.3750	52.188	61.668	20916.0	23.13	139.17	76	84	1061.2	18.54	7308.1	7308.1	246.0
60.00		0.3750	51.000	60.254	19510.6	22.57	136.00	76	85	1037.2	18.54	7002.4	7002.4	246.0
65.00		0.3750	49.813	58.841	18169.6	22.01	132.83	76	86	1013.1	18.54	6703.2	6703.2	246.0
70.00		0.3750	48.625	57.427	16891.5	21.45	129.67	76	87	989.1	18.54	6410.6	6410.6	246.0
75.00		0.3750	47.438	56.014	15674.7	20.89	126.50	76	87	965.0	18.54	6124.4	6124.4	246.0
80.00		0.3750	46.250	54.601	14517.9	20.34	123.33	76	88	941.0	18.54	5844.9	5844.9	246.0
81.00	Top - Section 3	0.3750	46.013	54.318	14293.6	20.22	122.70	76	88	185.3	18.54	5789.7	5789.7	49.2
81.00	Bot - Section 4	0.3750	46.013	54.318	14293.6	20.22	122.70	66	79					
85.00	Bot - Section 5	0.3750	45.063	53.187	13419.4	19.78	120.17	66	79	731.6	18.54	5571.8	5571.8	196.8
90.00		0.3750	43.875	51.774	12377.8	19.22	117.00	66	80	1801.0	18.54	5472.9	5472.9	246.0
91.00	Top - Section 4	0.3750	44.388	52.384	12820.5	19.46	118.37	66	80	354.4	18.54	5419.6	5419.6	49.2
95.00	RT1	0.3750	43.438	51.253	12008.1	19.01	115.83	66	80	705.3	18.54	5208.8	5208.8	196.8
100.00		0.3750	42.250	49.840	11041.8	18.46	112.67	66	81	860.0				
105.00		0.3750	41.063	48.427	10128.8	17.90	109.50	66	81	835.9				
110.00		0.3750	39.875	47.013	9267.6	17.34	106.33	66	82	811.9				
115.00		0.3750	38.688	45.600	8456.6	16.78	103.17	66	83	787.9				
120.00		0.3750	37.500	44.186	7694.4	16.22	100.00	66	83	763.8				
125.00		0.3750	36.313	42.773	6979.4	15.66	96.83	66	84	739.8				
130.00	Bot - Section 6	0.3750	35.125	41.360	6310.2	15.11	93.67	66	84	715.7				
135.00	Top - Section 5	0.3750	34.688	40.839	6074.8	14.90	92.50	66	84	1398.5				
140.00	Top - Section 6	0.3750	33.500	39.426	5465.7	14.34	89.33	66	84	682.8				
140.00	Bot - Section 7	0.2500	33.500	26.383	3685.2	21.51	134.00	65	75					
143.00		0.2500	32.788	25.818	3453.3	21.71	131.15	65	76	266.4				
145.00		0.2500	32.313	25.441	3304.3	21.38	129.25	65	76	174.4				
150.00		0.2500	31.125	24.498	2950.6	20.54	124.50	65	77	424.8				
153.00		0.2500	30.413	23.933	2751.0	20.04	121.65	65	78	247.2				
155.00		0.2500	29.938	23.556	2623.0	19.70	119.75	65	78	161.6				
159.00		0.2500	28.988	22.802	2379.2	19.03	115.95	65	79	315.5				
160.00		0.2500	28.750	22.614	2320.7	18.87	115.00	65	79	77.3				
165.00		0.2500	27.563	21.672	2042.5	18.03	110.25	65	80	376.7				
170.00		0.2500	26.375	20.729	1787.5	17.19	105.50	65	81	360.7				
173.00		0.2500	25.663	20.164	1645.2	16.69	102.65	65	82	208.7				
175.00		0.2500	25.188	19.787	1554.7	16.35	100.75	65	82	135.9				
180.00	Top - Section 7	0.2500	24.000	18.845	1343.0	15.52	96.00	65	83	328.6				
180.00	Bot - Section 8	0.2813	24.000	21.176	1505.2	13.79	85.32	36	46					

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Additional Reinforcing			
											Area (in ²)	Ixp (in ⁴)	Iyp (in ⁴)	Weight (lb)
185.00		0.2813	24.000	21.176	1505.2	13.63	85.32	36	46	360.3				
190.00		0.2813	24.000	21.176	1505.2	13.63	85.32	36	46	360.3				
195.00		0.2813	24.000	21.176	1505.2	13.63	85.32	36	46	360.3				
Total Weight										35616.0				4182.0

Wind Loading - Shaft

Structure: CT00167-S-SBA

Code: EIA/TIA-222-G

10/21/2016

Site Name: Lisbon

Exposure: C

Height: 195.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: B - Competent Rock

Gh: 1.1

Topography: 1

Struct Class: II

Page: 9

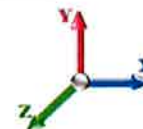


Load Case: 1.2D + 1.6W 105 mph Wind

Iterations 25

Dead Load Factor 1.20

Wind Load Factor 1.60



Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	22.791	25.07	528.35	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	22.791	25.07	518.63	0.650	0.000	5.00	27.038	17.57	705.0	0.0	1799.3
10.00		1.00	0.85	22.791	25.07	508.90	0.650	0.000	5.00	26.536	17.25	691.9	0.0	1765.7
15.00	RB1	1.00	0.85	22.791	25.07	499.17	0.650	0.000	5.00	26.034	16.92	678.8	0.0	1732.0
18.00	Top - Section 1	1.00	0.88	23.652	26.02	502.57	0.650	0.000	3.00	15.379	10.00	416.1	0.0	1023.0
20.00		1.00	0.90	24.182	26.60	504.16	0.650	0.000	2.00	10.152	6.60	280.9	0.0	579.4
25.00		1.00	0.95	25.345	27.88	505.89	0.650	0.000	5.00	25.029	16.27	725.7	0.0	1428.4
30.00		1.00	0.98	26.337	28.97	505.23	0.650	0.000	5.00	24.526	15.94	739.0	0.0	1399.5
35.00		1.00	1.01	27.206	29.93	502.87	0.650	0.000	5.00	24.024	15.62	747.7	0.0	1370.7
40.00		1.00	1.04	27.981	30.78	499.21	0.650	0.000	5.00	23.521	15.29	752.9	0.0	1341.8
41.00	Bot - Section 3	1.00	1.05	28.127	30.94	498.35	0.650	0.000	1.00	4.644	3.02	149.4	0.0	264.9
45.00		1.00	1.07	28.684	31.55	494.52	0.650	0.000	4.00	18.629	12.11	611.3	0.0	2110.7
48.00	Top - Section 2	1.00	1.08	29.076	31.98	491.30	0.650	0.000	3.00	13.761	8.94	457.7	0.0	1558.8
50.00		1.00	1.09	29.327	32.26	495.97	0.650	0.000	2.00	9.073	5.90	304.4	0.0	517.5
55.00		1.00	1.12	29.922	32.91	489.83	0.650	0.000	5.00	22.331	14.52	764.4	0.0	1273.5
60.00		1.00	1.14	30.475	33.52	483.09	0.650	0.000	5.00	21.829	14.19	761.0	0.0	1244.6
65.00		1.00	1.16	30.993	34.09	475.83	0.650	0.000	5.00	21.327	13.86	756.1	0.0	1215.8
70.00		1.00	1.17	31.480	34.63	468.13	0.650	0.000	5.00	20.824	13.54	749.9	0.0	1186.9
75.00		1.00	1.19	31.941	35.13	460.02	0.650	0.000	5.00	20.322	13.21	742.6	0.0	1158.0
80.00		1.00	1.21	32.377	35.62	451.56	0.650	0.000	5.00	19.819	12.88	734.1	0.0	1129.2
81.00	Top - Section 3	1.00	1.21	32.462	35.71	449.83	0.650	0.000	1.00	3.904	2.54	145.0	0.0	222.4
85.00	Bot - Section 5	1.00	1.22	32.793	36.07	442.79	0.650	0.000	4.00	15.413	10.02	578.2	0.0	878.0
90.00		1.00	1.24	33.190	36.51	433.72	0.650	0.000	5.00	19.132	12.44	726.4	0.0	2161.2
91.00	Top - Section 4	1.00	1.24	33.268	36.59	431.87	0.650	0.000	1.00	3.766	2.45	143.3	0.0	425.3
95.00	RT1	1.00	1.25	33.570	36.93	431.85	0.650	0.000	4.00	14.863	9.66	570.8	0.0	846.4
100.00		1.00	1.27	33.935	37.33	422.31	0.650	0.000	5.00	18.127	11.78	703.7	0.0	1032.0
105.00		1.00	1.28	34.285	37.71	412.56	0.650	0.000	5.00	17.625	11.46	691.3	0.0	1003.1
110.00		1.00	1.29	34.623	38.08	402.59	0.650	0.000	5.00	17.122	11.13	678.2	0.0	974.3
115.00		1.00	1.30	34.948	38.44	392.44	0.650	0.000	5.00	16.620	10.80	664.5	0.0	945.4
120.00		1.00	1.32	35.263	38.79	382.10	0.650	0.000	5.00	16.117	10.48	650.2	0.0	916.6
125.00		1.00	1.33	35.567	39.12	371.59	0.650	0.000	5.00	15.615	10.15	635.3	0.0	887.7
130.00	Bot - Section 6	1.00	1.34	35.862	39.45	360.93	0.650	0.000	5.00	15.112	9.82	620.0	0.0	858.9
135.00	Top - Section 5	1.00	1.35	36.148	39.76	350.11	0.650	0.000	5.00	14.927	9.70	617.3	0.0	1678.2
140.00	Top - Section 6	1.00	1.36	36.426	40.07	346.92	0.650	0.000	5.00	14.425	9.38	601.1	0.0	819.4
143.00	Appurtenance(s)	1.00	1.36	36.589	40.25	340.30	0.650	0.000	3.00	8.414	5.47	352.2	0.0	319.7
145.00		1.00	1.37	36.696	40.37	335.86	0.650	0.000	2.00	5.509	3.58	231.3	0.0	209.3
150.00		1.00	1.38	36.959	40.65	324.68	0.650	0.000	5.00	13.420	8.72	567.4	0.0	509.8
153.00	Appurtenance(s)	1.00	1.38	37.113	40.82	317.91	0.650	0.000	3.00	7.811	5.08	331.6	0.0	296.6
155.00		1.00	1.39	37.215	40.94	313.37	0.650	0.000	2.00	5.107	3.32	217.4	0.0	193.9
159.00	Appurtenance(s)	1.00	1.40	37.415	41.16	304.24	0.650	0.000	4.00	9.972	6.48	426.8	0.0	378.6
160.00		1.00	1.40	37.464	41.21	301.95	0.650	0.000	1.00	2.443	1.59	104.7	0.0	92.7
165.00		1.00	1.41	37.708	41.48	290.42	0.650	0.000	5.00	11.913	7.74	513.9	0.0	452.1
170.00		1.00	1.42	37.946	41.74	278.78	0.650	0.000	5.00	11.410	7.42	495.3	0.0	432.8
173.00	Appurtenance(s)	1.00	1.42	38.086	41.89	271.75	0.650	0.000	3.00	6.605	4.29	287.8	0.0	250.5
175.00		1.00	1.42	38.178	42.00	267.04	0.650	0.000	2.00	4.303	2.80	187.9	0.0	163.1
180.00	Top - Section 7	1.00	1.43	38.405	42.25	255.21	0.650	0.000	5.00	10.405	6.76	457.2	0.0	394.4
185.00		1.00	1.44	38.627	42.49	255.94	0.650	0.000	5.00	10.154	6.60	448.7	0.0	432.4

Wind Loading - Shaft

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 10
	Struct Class: II	



190.00	1.00	1.45	38.845	42.73	256.66	0.650	0.000	5.00	10.154	6.60	451.2	0.0	432.4
195.00 Appurtenance(s)	1.00	1.46	39.058	42.96	257.36	0.650	0.000	5.00	10.154	6.60	453.7	0.0	432.4
Totals:											195.00	25,321.4	42,739.2

Discrete Appurtenance Forces

Structure: CT00167-S-SBA
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: B - Competent Rock
Struct Class: II

10/21/2016

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Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60

Iterations 25



No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	AIR 21, 1.3M, B4A B2P	3	39.058	42.963	0.77	0.90	14.14	325.44	0.000	0.000	972.07	0.00	0.00
2	195.00	T-Arm (Flat)	3	39.058	42.963	0.56	0.75	16.88	1440.00	0.000	0.000	1160.01	0.00	0.00
3	195.00	AIR 21, 1.3M, B2A B4P	3	39.058	42.963	0.77	0.90	14.14	329.40	0.000	0.000	972.07	0.00	0.00
4	195.00	S11B12	3	39.058	42.963	0.45	0.90	3.82	183.60	0.000	0.000	262.63	0.00	0.00
5	195.00	KRY 112 144/1	3	39.058	42.963	0.45	0.90	0.55	39.60	0.000	0.000	38.05	0.00	0.00
6	195.00	LNx-6515DS-A1M	3	39.058	42.963	0.72	0.90	24.78	179.28	0.000	0.000	1703.08	0.00	0.00
7	173.00	ACU-A20-N	4	38.086	41.894	0.40	0.80	0.22	4.80	0.000	0.000	15.01	0.00	0.00
8	173.00	800 MHz ESMR Filter	3	38.086	41.894	0.40	0.80	0.50	36.00	0.000	0.000	33.78	0.00	0.00
9	173.00	800 MHz RRH	3	38.086	41.894	0.40	0.80	2.99	190.80	0.000	0.000	200.29	0.00	0.00
10	173.00	1900MHz RRH	3	38.086	41.894	0.40	0.80	4.56	158.40	0.000	0.000	305.66	0.00	0.00
11	173.00	APXVSP18-C-A20	3	38.086	41.894	0.66	0.80	15.98	205.20	0.000	0.000	1070.87	0.00	0.00
12	173.00	Sector Frame-Pipe/Rod	3	38.086	41.894	0.60	0.80	25.20	1620.00	0.000	0.000	1689.17	0.00	0.00
13	159.00	Rfs FD9R6004/2CL-3CL	6	37.415	41.156	0.80	0.80	1.73	22.32	0.000	0.000	113.79	0.00	0.00
14	159.00	Low Profile Platform-flat	1	37.415	41.156	1.00	1.00	25.00	1440.00	0.000	0.000	1646.26	0.00	0.00
15	159.00	SBNHH-1D65B	6	37.415	41.156	0.66	0.80	32.51	288.00	0.000	0.000	2140.75	0.00	0.00
16	159.00	BXA-70080-4BF	3	37.415	41.156	0.70	0.80	7.52	43.20	0.000	0.000	495.11	0.00	0.00
17	159.00	Alcatel Lucent B25	3	37.415	41.156	0.65	0.80	4.16	183.60	0.000	0.000	273.95	0.00	0.00
18	159.00	Rfs Celwave	2	37.415	41.156	0.57	0.80	5.45	45.36	0.000	0.000	359.07	0.00	0.00
19	159.00	BXA-70063-6CF-2	3	37.415	41.156	0.58	0.80	13.26	61.20	0.000	0.000	873.35	0.00	0.00
20	159.00	Alcatel Lucent B66	3	37.415	41.156	0.66	0.80	5.00	204.48	0.000	0.000	329.17	0.00	0.00
21	153.00	Standoff Mount	3	37.113	40.824	0.56	0.75	8.44	1260.00	0.000	0.000	551.13	0.00	0.00
22	143.00	742 351	6	36.589	40.248	0.49	0.80	15.75	214.56	0.000	0.000	1014.41	0.00	0.00
23	143.00	T-Arm (Flat)	3	36.589	40.248	0.56	0.75	16.88	1440.00	0.000	0.000	1086.69	0.00	0.00
Totals:								9,915.24				17,306.35		

Total Applied Force Summary

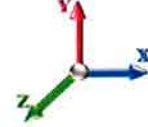
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 12
	Struct Class: II	



Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		704.97	2051.54	0.00	0.00
10.00		691.87	2017.88	0.00	0.00
15.00		678.77	1984.21	0.00	0.00
18.00		416.11	1174.37	0.00	0.00
20.00		280.85	680.31	0.00	0.00
25.00		725.70	1680.59	0.00	0.00
30.00		738.96	1651.73	0.00	0.00
35.00		747.70	1622.87	0.00	0.00
40.00		752.94	1594.02	0.00	0.00
41.00		149.43	315.34	0.00	0.00
45.00		611.29	2312.46	0.00	0.00
48.00		457.72	1710.11	0.00	0.00
50.00		304.41	618.35	0.00	0.00
55.00		764.41	1525.67	0.00	0.00
60.00		761.03	1496.82	0.00	0.00
65.00		756.15	1467.96	0.00	0.00
70.00		749.94	1439.10	0.00	0.00
75.00		742.56	1410.25	0.00	0.00
80.00		734.10	1381.39	0.00	0.00
81.00		144.97	272.82	0.00	0.00
85.00		578.24	1079.72	0.00	0.00
90.00		726.43	2413.38	0.00	0.00
91.00		143.33	475.75	0.00	0.00
95.00		570.82	1048.13	0.00	0.00
100.00		703.71	1284.19	0.00	0.00
105.00		691.27	1255.33	0.00	0.00
110.00		678.18	1226.48	0.00	0.00
115.00		664.47	1197.62	0.00	0.00
120.00		650.18	1168.77	0.00	0.00
125.00		635.35	1139.91	0.00	0.00
130.00		620.00	1111.05	0.00	0.00
135.00		617.29	1930.42	0.00	0.00
140.00		601.10	1071.57	0.00	0.00
143.00	(9) attachments	2453.27	2125.61	0.00	0.00
145.00		231.26	280.04	0.00	0.00
150.00		567.41	686.63	0.00	0.00
153.00	(3) attachments	882.76	1662.75	0.00	0.00
155.00		217.41	264.65	0.00	0.00
159.00	(27) attachments	6658.28	2808.23	0.00	0.00
160.00		104.70	112.97	0.00	0.00
165.00		513.89	553.32	0.00	0.00
170.00		495.32	534.08	0.00	0.00
173.00	(19) attachments	3602.56	2526.42	0.00	0.00
175.00		187.93	198.88	0.00	0.00
180.00		457.17	483.73	0.00	0.00
185.00		448.71	521.71	0.00	0.00

Total Applied Force Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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190.00		451.24	521.71	0.00	0.00
195.00	(18) attachments	5561.61	3019.03	0.00	0.00
	Totals:	42,627.76	61,109.86	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

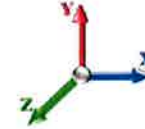
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 14
	Struct Class: II	



Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	1.64
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	6.24
10.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	1.64
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	6.24
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	1.64
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	6.24
18.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	23.652	0.00	0.98
18.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	23.652	0.00	3.74
18.00	Reinforcing channels	Yes	3.00	0.000	2.00	0.50	0.00	0.033	0.000	23.652	0.00	0.00
20.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	24.182	0.00	0.66
20.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	24.182	0.00	2.50
20.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.33	0.00	0.033	0.000	24.182	0.00	0.00
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	25.345	0.00	1.64
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	25.345	0.00	6.24
25.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	25.345	0.00	0.00
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	26.337	0.00	1.64
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	26.337	0.00	6.24
30.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.034	0.000	26.337	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.206	0.00	1.64
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.206	0.00	6.24
35.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	27.206	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.981	0.00	1.64
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.981	0.00	6.24
40.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	27.981	0.00	0.00
41.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	28.127	0.00	0.33
41.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	28.127	0.00	1.25
41.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.17	0.00	0.036	0.000	28.127	0.00	0.00
45.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	28.684	0.00	1.31
45.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	28.684	0.00	4.99
45.00	Reinforcing channels	Yes	4.00	0.000	2.00	0.67	0.00	0.036	0.000	28.684	0.00	0.00
48.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	29.076	0.00	0.98
48.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	29.076	0.00	3.74
48.00	Reinforcing channels	Yes	3.00	0.000	2.00	0.50	0.00	0.037	0.000	29.076	0.00	0.00
50.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	29.327	0.00	0.66
50.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	29.327	0.00	2.50
50.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.33	0.00	0.037	0.000	29.327	0.00	0.00
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	29.922	0.00	1.64
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	29.922	0.00	6.24
55.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.037	0.000	29.922	0.00	0.00
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	30.475	0.00	1.64
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	30.475	0.00	6.24
60.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	30.475	0.00	0.00
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	30.993	0.00	1.64
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	30.993	0.00	6.24
65.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.039	0.000	30.993	0.00	0.00
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	31.480	0.00	1.64
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	31.480	0.00	6.24

Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

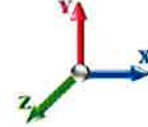


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Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60

Iterations 25



Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.040	0.000	31.480	0.00	0.00
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	31.941	0.00	1.64
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	31.941	0.00	6.24
75.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.041	0.000	31.941	0.00	0.00
80.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	32.377	0.00	1.64
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	32.377	0.00	6.24
80.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.042	0.000	32.377	0.00	0.00
81.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	32.462	0.00	0.33
81.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	32.462	0.00	1.25
81.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.17	0.00	0.043	0.000	32.462	0.00	0.00
85.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	32.793	0.00	1.31
85.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	32.793	0.00	4.99
85.00	Reinforcing channels	Yes	4.00	0.000	2.00	0.67	0.00	0.043	0.000	32.793	0.00	0.00
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	33.190	0.00	1.64
90.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	33.190	0.00	6.24
90.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.044	0.000	33.190	0.00	0.00
91.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.268	0.00	0.33
91.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.268	0.00	1.25
91.00	Reinforcing channels	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.268	0.00	0.00
95.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	33.570	0.00	1.31
95.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	33.570	0.00	4.99
95.00	Reinforcing channels	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	33.570	0.00	0.00
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.935	0.00	1.64
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.935	0.00	6.24
100.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.935	0.00	0.00
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.285	0.00	1.64
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.285	0.00	6.24
105.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.285	0.00	0.00
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.623	0.00	1.64
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.623	0.00	6.24
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.948	0.00	1.64
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.948	0.00	6.24
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.263	0.00	1.64
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.263	0.00	6.24
125.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.567	0.00	1.64
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.567	0.00	6.24
130.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.862	0.00	1.64
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.862	0.00	6.24
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.148	0.00	1.64
135.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.148	0.00	6.24
140.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.426	0.00	1.64
140.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.426	0.00	6.24
143.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	36.589	0.00	0.98
143.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	36.589	0.00	3.74
145.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	36.696	0.00	0.66
145.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	36.696	0.00	2.50
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.959	0.00	1.64

Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 16
	Struct Class: II	



Load Case: 1.2D + 1.6W 105 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.959	0.00	6.24
153.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	37.113	0.00	0.98
153.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	37.113	0.00	3.74
155.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	37.215	0.00	0.66
155.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	37.215	0.00	2.50
159.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	37.415	0.00	1.31
159.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	37.415	0.00	4.99
160.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	37.464	0.00	0.33
160.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	37.464	0.00	1.25
165.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.708	0.00	1.64
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.708	0.00	6.24
170.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.946	0.00	1.64
170.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.946	0.00	6.24
173.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	38.086	0.00	0.98
173.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	38.086	0.00	3.74
175.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	38.178	0.00	0.66
175.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	38.178	0.00	2.50
180.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.405	0.00	1.64
180.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.405	0.00	6.24
185.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.627	0.00	1.64
185.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.627	0.00	6.24
190.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.845	0.00	1.64
190.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.845	0.00	6.24
195.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	39.058	0.00	1.64
195.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	39.058	0.00	6.24
Totals:											0.0	307.2

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

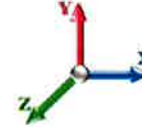


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Load Case: 1.2D + 1.6W 105 mph Wind

Iterations 25

Dead Load Factor 1.20
Wind Load Factor 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-61.05	-42.72	0.00	-5478.8	0.00	5478.89	6497.76	3248.88	17121.8	8573.64	0.00	0.000	0.000	0.649
5.00	-58.87	-42.18	0.00	-5265.3	0.00	5265.31	6432.14	3216.07	16632.6	8328.66	0.09	-0.166	0.000	0.642
10.00	-56.74	-41.65	0.00	-5054.4	0.00	5054.41	6364.44	3182.22	16144.5	8084.28	0.35	-0.334	0.000	0.634
15.00	-54.67	-41.08	0.00	-4846.1	0.00	4846.17	6294.68	3147.34	15658.0	7840.66	0.80	-0.505	0.000	0.501
18.00	-53.45	-40.71	0.00	-4722.9	0.00	4722.94	6251.82	3125.91	15366.9	7694.92	1.14	-0.589	0.000	0.496
18.00	-53.45	-40.71	0.00	-4722.9	0.00	4722.94	5035.78	2517.89	12403.8	6211.14	1.14	-0.589	0.000	0.529
20.00	-52.69	-40.53	0.00	-4641.5	0.00	4641.51	5016.94	2508.47	12258.7	6138.49	1.40	-0.646	0.000	0.591
25.00	-50.91	-39.92	0.00	-4438.8	0.00	4438.89	4968.35	2484.18	11895.7	5956.70	2.16	-0.804	0.000	0.579
30.00	-49.16	-39.29	0.00	-4239.2	0.00	4239.29	4917.65	2458.83	11532.4	5774.82	3.09	-0.963	0.000	0.567
35.00	-47.44	-38.65	0.00	-4042.8	0.00	4042.83	4864.84	2432.42	11169.4	5593.00	4.18	-1.124	0.000	0.555
40.00	-45.80	-37.94	0.00	-3849.5	0.00	3849.58	4809.92	2404.96	10806.7	5411.42	5.45	-1.287	0.000	0.543
41.00	-45.43	-37.85	0.00	-3811.6	0.00	3811.64	4798.68	2399.34	10734.3	5375.14	5.72	-1.320	0.000	0.541
45.00	-43.06	-37.27	0.00	-3660.2	0.00	3660.24	4752.88	2376.44	10444.9	5230.21	6.89	-1.452	0.000	0.527
48.00	-41.31	-36.83	0.00	-3548.4	0.00	3548.43	4754.71	2377.36	10456.3	5235.93	7.83	-1.552	0.000	0.530
50.00	-40.63	-36.59	0.00	-3474.7	0.00	3474.77	4731.34	2365.67	10311.8	5163.58	8.49	-1.619	0.000	0.509
55.00	-39.02	-35.89	0.00	-3291.8	0.00	3291.83	4671.41	2335.70	9951.50	4983.15	10.28	-1.779	0.000	0.496
60.00	-37.45	-35.19	0.00	-3112.3	0.00	3112.39	4609.37	2304.68	9592.67	4803.47	12.23	-1.941	0.000	0.483
65.00	-35.92	-34.48	0.00	-2936.4	0.00	2936.47	4545.22	2272.61	9235.65	4624.69	14.35	-2.103	0.000	0.470
70.00	-34.41	-33.77	0.00	-2764.0	0.00	2764.07	4478.96	2239.48	8880.76	4446.98	16.64	-2.266	0.000	0.457
75.00	-32.94	-33.07	0.00	-2595.2	0.00	2595.20	4410.58	2205.29	8528.29	4270.48	19.10	-2.430	0.000	0.443
80.00	-31.53	-32.33	0.00	-2429.8	0.00	2429.86	4340.09	2170.05	8178.57	4095.36	21.73	-2.594	0.000	0.429
81.00	-31.22	-32.22	0.00	-2397.5	0.00	2397.53	4325.74	2162.87	8108.99	4060.52	22.28	-2.627	0.000	0.426
81.00	-31.22	-32.22	0.00	-2397.5	0.00	2397.53	3843.52	1921.76	7205.03	3607.87	22.28	-2.627	0.000	0.479
85.00	-30.09	-31.67	0.00	-2268.6	0.00	2268.67	3789.25	1894.62	6954.21	3482.28	24.53	-2.760	0.000	0.467
90.00	-27.66	-30.87	0.00	-2110.3	0.00	2110.34	3719.86	1859.93	6643.95	3326.92	27.51	-2.924	0.000	0.446
91.00	-27.15	-30.74	0.00	-2079.4	0.00	2079.47	3750.02	1875.01	6777.40	3393.74	28.13	-2.957	0.000	0.452
95.00	-26.06	-30.18	0.00	-1956.5	0.00	1956.51	3693.87	1846.94	6530.61	3270.16	30.66	-3.087	0.000	0.423
100.00	-24.72	-29.49	0.00	-1805.6	0.00	1805.61	3622.15	1811.07	6225.69	3117.47	33.98	-3.243	0.000	0.586
105.00	-23.39	-28.82	0.00	-1658.1	0.00	1658.17	3548.72	1774.36	5924.97	2966.89	37.49	-3.466	0.000	0.566
110.00	-22.10	-28.15	0.00	-1514.0	0.00	1514.09	3473.57	1736.79	5628.70	2818.54	41.24	-3.689	0.000	0.544
115.00	-20.84	-27.49	0.00	-1373.3	0.00	1373.35	3396.72	1698.36	5337.14	2672.54	45.22	-3.910	0.000	0.520
120.00	-19.62	-26.83	0.00	-1235.9	0.00	1235.92	3318.16	1659.08	5050.54	2529.02	49.43	-4.130	0.000	0.495
125.00	-18.43	-26.18	0.00	-1101.7	0.00	1101.76	3226.71	1613.36	4752.68	2379.87	53.87	-4.346	0.000	0.469
130.00	-17.28	-25.54	0.00	-970.85	0.00	970.85	3120.09	1560.05	4442.21	2224.41	58.53	-4.557	0.000	0.442
135.00	-15.32	-24.82	0.00	-843.15	0.00	843.15	3080.81	1540.41	4330.47	2168.45	63.41	-4.762	0.000	0.394
140.00	-14.24	-24.17	0.00	-719.04	0.00	719.04	2974.19	1487.09	4034.35	2020.17	68.50	-4.957	0.000	0.361
140.00	-14.24	-24.17	0.00	-719.04	0.00	719.04	1787.24	893.62	2442.64	1223.14	68.50	-4.957	0.000	0.597
143.00	-12.30	-21.56	0.00	-646.53	0.00	646.53	1762.68	881.34	2357.06	1180.28	71.64	-5.064	0.000	0.555
145.00	-11.98	-21.34	0.00	-603.41	0.00	603.41	1745.97	872.98	2300.37	1151.90	73.78	-5.167	0.000	0.531
150.00	-11.28	-20.75	0.00	-496.69	0.00	496.69	1703.02	851.51	2160.05	1081.63	79.32	-5.403	0.000	0.466
153.00	-9.67	-19.73	0.00	-434.43	0.00	434.43	1676.45	838.23	2076.88	1039.98	82.75	-5.538	0.000	0.424
155.00	-9.39	-19.51	0.00	-394.97	0.00	394.97	1658.40	829.20	2021.90	1012.45	85.09	-5.624	0.000	0.396
159.00	-7.23	-12.62	0.00	-316.93	0.00	316.93	1621.51	810.75	1913.13	957.99	89.86	-5.778	0.000	0.336
160.00	-7.11	-12.52	0.00	-304.31	0.00	304.31	1612.12	806.06	1886.20	944.50	91.07	-5.815	0.000	0.327
165.00	-6.58	-11.97	0.00	-241.73	0.00	241.73	1564.16	782.08	1753.17	877.89	97.25	-5.983	0.000	0.280
170.00	-6.08	-11.43	0.00	-181.90	0.00	181.90	1514.53	757.27	1623.07	812.74	103.58	-6.130	0.000	0.228
173.00	-3.95	-7.58	0.00	-147.62	0.00	147.62	1483.95	741.98	1546.51	774.41	107.45	-6.209	0.000	0.193
175.00	-3.76	-7.38	0.00	-132.46	0.00	132.46	1463.23	731.62	1496.14	749.18	110.06	-6.257	0.000	0.179

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 18



180.00	-3.32	-6.87	0.00	-95.58	0.00	95.58	1400.09	700.04	1362.73	682.38	116.66	-6.362	0.000	0.143
180.00	-3.32	-6.87	0.00	-95.58	0.00	95.58	871.37	435.68	845.88	423.57	116.66	-6.362	0.000	0.230
185.00	-2.84	-6.37	0.00	-61.20	0.00	61.20	871.37	435.68	845.88	423.57	123.36	-6.445	0.000	0.148
190.00	-2.37	-5.87	0.00	-29.34	0.00	29.34	871.37	435.68	845.88	423.57	130.12	-6.488	0.000	0.072
195.00	0.00	-5.56	0.00	0.00	0.00	0.00	871.37	435.68	845.88	423.57	136.91	-6.501	0.000	0.000

Wind Loading - Shaft

Structure: CT00167-S-SBA

Site Name: Lisbon

Height: 195.00 (ft)

Base Elev: 0.000 (ft)

Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G

Exposure: C

Crest Height: 0.00

Site Class: B - Competent Rock

Struct Class: II

10/21/2016

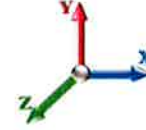
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Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	22.791	25.07	528.35	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	22.791	25.07	518.63	0.650	0.000	5.00	27.038	17.57	705.0	0.0	1349.5
10.00		1.00	0.85	22.791	25.07	508.90	0.650	0.000	5.00	26.536	17.25	691.9	0.0	1324.3
15.00	RB1	1.00	0.85	22.791	25.07	499.17	0.650	0.000	5.00	26.034	16.92	678.8	0.0	1299.0
18.00	Top - Section 1	1.00	0.88	23.652	26.02	502.57	0.650	0.000	3.00	15.379	10.00	416.1	0.0	767.3
20.00		1.00	0.90	24.182	26.60	504.16	0.650	0.000	2.00	10.152	6.60	280.9	0.0	434.6
25.00		1.00	0.95	25.345	27.88	505.89	0.650	0.000	5.00	25.029	16.27	725.7	0.0	1071.3
30.00		1.00	0.98	26.337	28.97	505.23	0.650	0.000	5.00	24.526	15.94	739.0	0.0	1049.6
35.00		1.00	1.01	27.206	29.93	502.87	0.650	0.000	5.00	24.024	15.62	747.7	0.0	1028.0
40.00		1.00	1.04	27.981	30.78	499.21	0.650	0.000	5.00	23.521	15.29	752.9	0.0	1006.4
41.00	Bot - Section 3	1.00	1.05	28.127	30.94	498.35	0.650	0.000	1.00	4.644	3.02	149.4	0.0	198.7
45.00		1.00	1.07	28.684	31.55	494.52	0.650	0.000	4.00	18.629	12.11	611.3	0.0	1583.0
48.00	Top - Section 2	1.00	1.08	29.076	31.98	491.30	0.650	0.000	3.00	13.761	8.94	457.7	0.0	1169.1
50.00		1.00	1.09	29.327	32.26	495.97	0.650	0.000	2.00	9.073	5.90	304.4	0.0	388.1
55.00		1.00	1.12	29.922	32.91	489.83	0.650	0.000	5.00	22.331	14.52	764.4	0.0	955.1
60.00		1.00	1.14	30.475	33.52	483.09	0.650	0.000	5.00	21.829	14.19	761.0	0.0	933.5
65.00		1.00	1.16	30.993	34.09	475.83	0.650	0.000	5.00	21.327	13.86	756.1	0.0	911.8
70.00		1.00	1.17	31.480	34.63	468.13	0.650	0.000	5.00	20.824	13.54	749.9	0.0	890.2
75.00		1.00	1.19	31.941	35.13	460.02	0.650	0.000	5.00	20.322	13.21	742.6	0.0	868.5
80.00		1.00	1.21	32.377	35.62	451.56	0.650	0.000	5.00	19.819	12.88	734.1	0.0	846.9
81.00	Top - Section 3	1.00	1.21	32.462	35.71	449.83	0.650	0.000	1.00	3.904	2.54	145.0	0.0	166.8
85.00	Bot - Section 5	1.00	1.22	32.793	36.07	442.79	0.650	0.000	4.00	15.413	10.02	578.2	0.0	658.5
90.00		1.00	1.24	33.190	36.51	433.72	0.650	0.000	5.00	19.132	12.44	726.4	0.0	1620.9
91.00	Top - Section 4	1.00	1.24	33.268	36.59	431.87	0.650	0.000	1.00	3.766	2.45	143.3	0.0	319.0
95.00	RT1	1.00	1.25	33.570	36.93	431.85	0.650	0.000	4.00	14.863	9.66	570.8	0.0	634.8
100.00		1.00	1.27	33.935	37.33	422.31	0.650	0.000	5.00	18.127	11.78	703.7	0.0	774.0
105.00		1.00	1.28	34.285	37.71	412.56	0.650	0.000	5.00	17.625	11.46	691.3	0.0	752.4
110.00		1.00	1.29	34.623	38.08	402.59	0.650	0.000	5.00	17.122	11.13	678.2	0.0	730.7
115.00		1.00	1.30	34.948	38.44	392.44	0.650	0.000	5.00	16.620	10.80	664.5	0.0	709.1
120.00		1.00	1.32	35.263	38.79	382.10	0.650	0.000	5.00	16.117	10.48	650.2	0.0	687.4
125.00		1.00	1.33	35.567	39.12	371.59	0.650	0.000	5.00	15.615	10.15	635.3	0.0	665.8
130.00	Bot - Section 6	1.00	1.34	35.862	39.45	360.93	0.650	0.000	5.00	15.112	9.82	620.0	0.0	644.1
135.00	Top - Section 5	1.00	1.35	36.148	39.76	350.11	0.650	0.000	5.00	14.927	9.70	617.3	0.0	1258.7
140.00	Top - Section 6	1.00	1.36	36.426	40.07	346.92	0.650	0.000	5.00	14.425	9.38	601.1	0.0	614.5
143.00	Appurtenance(s)	1.00	1.36	36.589	40.25	340.30	0.650	0.000	3.00	8.414	5.47	352.2	0.0	239.8
145.00		1.00	1.37	36.696	40.37	335.86	0.650	0.000	2.00	5.509	3.58	231.3	0.0	157.0
150.00		1.00	1.38	36.959	40.65	324.68	0.650	0.000	5.00	13.420	8.72	567.4	0.0	382.3
153.00	Appurtenance(s)	1.00	1.38	37.113	40.82	317.91	0.650	0.000	3.00	7.811	5.08	331.6	0.0	222.5
155.00		1.00	1.39	37.215	40.94	313.37	0.650	0.000	2.00	5.107	3.32	217.4	0.0	145.4
159.00	Appurtenance(s)	1.00	1.40	37.415	41.16	304.24	0.650	0.000	4.00	9.972	6.48	426.8	0.0	283.9
160.00		1.00	1.40	37.464	41.21	301.95	0.650	0.000	1.00	2.443	1.59	104.7	0.0	69.5
165.00		1.00	1.41	37.708	41.48	290.42	0.650	0.000	5.00	11.913	7.74	513.9	0.0	339.1
170.00		1.00	1.42	37.946	41.74	278.78	0.650	0.000	5.00	11.410	7.42	495.3	0.0	324.6
173.00	Appurtenance(s)	1.00	1.42	38.086	41.89	271.75	0.650	0.000	3.00	6.605	4.29	287.8	0.0	187.9
175.00		1.00	1.42	38.178	42.00	267.04	0.650	0.000	2.00	4.303	2.80	187.9	0.0	122.4
180.00	Top - Section 7	1.00	1.43	38.405	42.25	255.21	0.650	0.000	5.00	10.405	6.76	457.2	0.0	295.8
185.00		1.00	1.44	38.627	42.49	255.94	0.650	0.000	5.00	10.154	6.60	448.7	0.0	324.3

Wind Loading - Shaft

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 20



190.00	1.00	1.45	38.845	42.73	256.66	0.650	0.000	5.00	10.154	6.60	451.2	0.0	324.3
195.00 Appurtenance(s)	1.00	1.46	39.058	42.96	257.36	0.650	0.000	5.00	10.154	6.60	453.7	0.0	324.3
Totals:											195.00	25,321.4	32,054.4

Discrete Appurtenance Forces

Structure: CT00167-S-SBA
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: B - Competent Rock
Struct Class: II

10/21/2016

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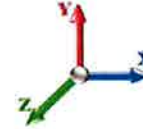


Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60

Iterations 25



No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	AIR 21, 1.3M, B4A B2P	3	39.058	42.963	0.77	0.90	14.14	244.08	0.000	0.000	972.07	0.00	0.00
2	195.00	T-Arm (Flat)	3	39.058	42.963	0.56	0.75	16.88	1080.00	0.000	0.000	1160.01	0.00	0.00
3	195.00	AIR 21, 1.3M, B2A B4P	3	39.058	42.963	0.77	0.90	14.14	247.05	0.000	0.000	972.07	0.00	0.00
4	195.00	S11B12	3	39.058	42.963	0.45	0.90	3.82	137.70	0.000	0.000	262.63	0.00	0.00
5	195.00	KRY 112 144/1	3	39.058	42.963	0.45	0.90	0.55	29.70	0.000	0.000	38.05	0.00	0.00
6	195.00	LNx-6515DS-A1M	3	39.058	42.963	0.72	0.90	24.78	134.46	0.000	0.000	1703.08	0.00	0.00
7	173.00	ACU-A20-N	4	38.086	41.894	0.40	0.80	0.22	3.60	0.000	0.000	15.01	0.00	0.00
8	173.00	800 MHz ESMR Filter	3	38.086	41.894	0.40	0.80	0.50	27.00	0.000	0.000	33.78	0.00	0.00
9	173.00	800 MHz RRH	3	38.086	41.894	0.40	0.80	2.99	143.10	0.000	0.000	200.29	0.00	0.00
10	173.00	1900MHz RRH	3	38.086	41.894	0.40	0.80	4.56	118.80	0.000	0.000	305.66	0.00	0.00
11	173.00	APXVSP18-C-A20	3	38.086	41.894	0.66	0.80	15.98	153.90	0.000	0.000	1070.87	0.00	0.00
12	173.00	Sector Frame-Pipe/Rod	3	38.086	41.894	0.60	0.80	25.20	1215.00	0.000	0.000	1689.17	0.00	0.00
13	159.00	RFs FD9R6004/2CL-3CL	6	37.415	41.156	0.80	0.80	1.73	16.74	0.000	0.000	113.79	0.00	0.00
14	159.00	Low Profile Platform-flat	1	37.415	41.156	1.00	1.00	25.00	1080.00	0.000	0.000	1646.26	0.00	0.00
15	159.00	SBNHH-1D65B	6	37.415	41.156	0.66	0.80	32.51	216.00	0.000	0.000	2140.75	0.00	0.00
16	159.00	BXA-70080-4BF	3	37.415	41.156	0.70	0.80	7.52	32.40	0.000	0.000	495.11	0.00	0.00
17	159.00	Alcatel Lucent B25	3	37.415	41.156	0.65	0.80	4.16	137.70	0.000	0.000	273.95	0.00	0.00
18	159.00	Rfs Celwave	2	37.415	41.156	0.57	0.80	5.45	34.02	0.000	0.000	359.07	0.00	0.00
19	159.00	BXA-70063-6CF-2	3	37.415	41.156	0.58	0.80	13.26	45.90	0.000	0.000	873.35	0.00	0.00
20	159.00	Alcatel Lucent B66	3	37.415	41.156	0.66	0.80	5.00	153.36	0.000	0.000	329.17	0.00	0.00
21	153.00	Standoff Mount	3	37.113	40.824	0.56	0.75	8.44	945.00	0.000	0.000	551.13	0.00	0.00
22	143.00	742 351	6	36.589	40.248	0.49	0.80	15.75	160.92	0.000	0.000	1014.41	0.00	0.00
23	143.00	T-Arm (Flat)	3	36.589	40.248	0.56	0.75	16.88	1080.00	0.000	0.000	1086.69	0.00	0.00
Totals:									7,436.43			17,306.35		

Total Applied Force Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 22
	Struct Class: II	



Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		704.97	1538.66	0.00	0.00
10.00		691.87	1513.41	0.00	0.00
15.00		678.77	1488.16	0.00	0.00
18.00		416.11	880.77	0.00	0.00
20.00		280.85	510.24	0.00	0.00
25.00		725.70	1260.44	0.00	0.00
30.00		738.96	1238.80	0.00	0.00
35.00		747.70	1217.16	0.00	0.00
40.00		752.94	1195.51	0.00	0.00
41.00		149.43	236.51	0.00	0.00
45.00		611.29	1734.35	0.00	0.00
48.00		457.72	1282.58	0.00	0.00
50.00		304.41	463.76	0.00	0.00
55.00		764.41	1144.25	0.00	0.00
60.00		761.03	1122.61	0.00	0.00
65.00		756.15	1100.97	0.00	0.00
70.00		749.94	1079.33	0.00	0.00
75.00		742.56	1057.69	0.00	0.00
80.00		734.10	1036.04	0.00	0.00
81.00		144.97	204.61	0.00	0.00
85.00		578.24	809.79	0.00	0.00
90.00		726.43	1810.04	0.00	0.00
91.00		143.33	356.81	0.00	0.00
95.00		570.82	786.10	0.00	0.00
100.00		703.71	963.14	0.00	0.00
105.00		691.27	941.50	0.00	0.00
110.00		678.18	919.86	0.00	0.00
115.00		664.47	898.22	0.00	0.00
120.00		650.18	876.57	0.00	0.00
125.00		635.35	854.93	0.00	0.00
130.00		620.00	833.29	0.00	0.00
135.00		617.29	1447.82	0.00	0.00
140.00		601.10	803.67	0.00	0.00
143.00	(9) attachments	2453.27	1594.21	0.00	0.00
145.00		231.26	210.03	0.00	0.00
150.00		567.41	514.97	0.00	0.00
153.00	(3) attachments	882.76	1247.06	0.00	0.00
155.00		217.41	198.49	0.00	0.00
159.00	(27) attachments	6658.28	2106.17	0.00	0.00
160.00		104.70	84.73	0.00	0.00
165.00		513.89	414.99	0.00	0.00
170.00		495.32	400.56	0.00	0.00
173.00	(19) attachments	3602.56	1894.81	0.00	0.00
175.00		187.93	149.16	0.00	0.00
180.00		457.17	362.80	0.00	0.00
185.00		448.71	391.28	0.00	0.00

Total Applied Force Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 23



190.00		451.24	391.28	0.00	0.00
195.00	(18) attachments	<u>5561.61</u>	<u>2264.27</u>	<u>0.00</u>	<u>0.00</u>
	Totals:	42,627.76	45,832.39	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

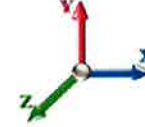


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Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	1.23
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	4.68
10.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	1.23
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	4.68
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	1.23
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.791	0.00	4.68
18.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	23.652	0.00	0.74
18.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	23.652	0.00	2.81
18.00	Reinforcing channels	Yes	3.00	0.000	2.00	0.50	0.00	0.033	0.000	23.652	0.00	0.00
20.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	24.182	0.00	0.49
20.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	24.182	0.00	1.87
20.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.33	0.00	0.033	0.000	24.182	0.00	0.00
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	25.345	0.00	1.23
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	25.345	0.00	4.68
25.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	25.345	0.00	0.00
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	26.337	0.00	1.23
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	26.337	0.00	4.68
30.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.034	0.000	26.337	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.206	0.00	1.23
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.206	0.00	4.68
35.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	27.206	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.981	0.00	1.23
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	27.981	0.00	4.68
40.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	27.981	0.00	0.00
41.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	28.127	0.00	0.25
41.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	28.127	0.00	0.94
41.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.17	0.00	0.036	0.000	28.127	0.00	0.00
45.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	28.684	0.00	0.98
45.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	28.684	0.00	3.74
45.00	Reinforcing channels	Yes	4.00	0.000	2.00	0.67	0.00	0.036	0.000	28.684	0.00	0.00
48.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	29.076	0.00	0.74
48.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	29.076	0.00	2.81
48.00	Reinforcing channels	Yes	3.00	0.000	2.00	0.50	0.00	0.037	0.000	29.076	0.00	0.00
50.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	29.327	0.00	0.49
50.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	29.327	0.00	1.87
50.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.33	0.00	0.037	0.000	29.327	0.00	0.00
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	29.922	0.00	1.23
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	29.922	0.00	4.68
55.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.037	0.000	29.922	0.00	0.00
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	30.475	0.00	1.23
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	30.475	0.00	4.68
60.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	30.475	0.00	0.00
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	30.993	0.00	1.23
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	30.993	0.00	4.68
65.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.039	0.000	30.993	0.00	0.00
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	31.480	0.00	1.23
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	31.480	0.00	4.68

Linear Appurtenance Segment Forces (Factored)

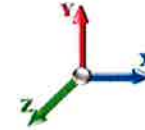
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.040	0.000	31.480	0.00	0.00
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	31.941	0.00	1.23
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	31.941	0.00	4.68
75.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.041	0.000	31.941	0.00	0.00
80.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	32.377	0.00	1.23
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	32.377	0.00	4.68
80.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.042	0.000	32.377	0.00	0.00
81.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	32.462	0.00	0.25
81.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	32.462	0.00	0.94
81.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.17	0.00	0.043	0.000	32.462	0.00	0.00
85.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	32.793	0.00	0.98
85.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	32.793	0.00	3.74
85.00	Reinforcing channels	Yes	4.00	0.000	2.00	0.67	0.00	0.043	0.000	32.793	0.00	0.00
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	33.190	0.00	1.23
90.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	33.190	0.00	4.68
90.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.044	0.000	33.190	0.00	0.00
91.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.268	0.00	0.25
91.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.268	0.00	0.94
91.00	Reinforcing channels	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.268	0.00	0.00
95.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	33.570	0.00	0.98
95.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	33.570	0.00	3.74
95.00	Reinforcing channels	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	33.570	0.00	0.00
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.935	0.00	1.23
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.935	0.00	4.68
100.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.935	0.00	0.00
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.285	0.00	1.23
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.285	0.00	4.68
105.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.285	0.00	0.00
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.623	0.00	1.23
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.623	0.00	4.68
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.948	0.00	1.23
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.948	0.00	4.68
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.263	0.00	1.23
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.263	0.00	4.68
125.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.567	0.00	1.23
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.567	0.00	4.68
130.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.862	0.00	1.23
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	35.862	0.00	4.68
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.148	0.00	1.23
135.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.148	0.00	4.68
140.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.426	0.00	1.23
140.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.426	0.00	4.68
143.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	36.589	0.00	0.74
143.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	36.589	0.00	2.81
145.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	36.696	0.00	0.49
145.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	36.696	0.00	1.87
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.959	0.00	1.23

Linear Appurtenance Segment Forces (Factored)

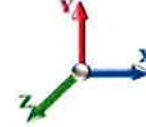
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 26
	Struct Class: II	



Load Case: 0.9D + 1.6W 105 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	36.959	0.00	4.68
153.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	37.113	0.00	0.74
153.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	37.113	0.00	2.81
155.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	37.215	0.00	0.49
155.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	37.215	0.00	1.87
159.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	37.415	0.00	0.98
159.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	37.415	0.00	3.74
160.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	37.464	0.00	0.25
160.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	37.464	0.00	0.94
165.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.708	0.00	1.23
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.708	0.00	4.68
170.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.946	0.00	1.23
170.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	37.946	0.00	4.68
173.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	38.086	0.00	0.74
173.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	38.086	0.00	2.81
175.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	38.178	0.00	0.49
175.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	38.178	0.00	1.87
180.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.405	0.00	1.23
180.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.405	0.00	4.68
185.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.627	0.00	1.23
185.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.627	0.00	4.68
190.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.845	0.00	1.23
190.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	38.845	0.00	4.68
195.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	39.058	0.00	1.23
195.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	39.058	0.00	4.68
Totals:											0.0	230.4

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



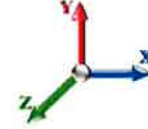
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Load Case: 0.9D + 1.6W 105 mph Wind

Iterations 25

Dead Load Factor 0.90

Wind Load Factor 1.60



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-45.77	-42.69	0.00	-5423.3	0.00	5423.38	6497.76	3248.88	17121.8	8573.64	0.00	0.000	0.000	0.640
5.00	-44.11	-42.11	0.00	-5209.9	0.00	5209.91	6432.14	3216.07	16632.6	8328.66	0.09	-0.164	0.000	0.633
10.00	-42.48	-41.54	0.00	-4999.3	0.00	4999.35	6364.44	3182.22	16144.5	8084.28	0.35	-0.330	0.000	0.625
15.00	-40.91	-40.94	0.00	-4791.6	0.00	4791.65	6294.68	3147.34	15658.0	7840.66	0.79	-0.500	0.000	0.494
18.00	-39.98	-40.56	0.00	-4668.8	0.00	4668.83	6251.82	3125.91	15366.9	7694.92	1.13	-0.583	0.000	0.489
18.00	-39.98	-40.56	0.00	-4668.8	0.00	4668.83	5035.78	2517.89	12403.8	6211.14	1.13	-0.583	0.000	0.521
20.00	-39.40	-40.35	0.00	-4587.7	0.00	4587.70	5016.94	2508.47	12258.7	6138.49	1.38	-0.639	0.000	0.582
25.00	-38.04	-39.71	0.00	-4385.9	0.00	4385.94	4968.35	2484.18	11895.7	5956.70	2.14	-0.795	0.000	0.570
30.00	-36.70	-39.06	0.00	-4187.3	0.00	4187.37	4917.65	2458.83	11532.4	5774.82	3.05	-0.952	0.000	0.558
35.00	-35.39	-38.39	0.00	-3992.0	0.00	3992.09	4864.84	2432.42	11169.4	5593.00	4.14	-1.111	0.000	0.546
40.00	-34.15	-37.67	0.00	-3800.1	0.00	3800.15	4809.92	2404.96	10806.7	5411.42	5.39	-1.272	0.000	0.534
41.00	-33.86	-37.56	0.00	-3762.4	0.00	3762.48	4798.68	2399.34	10734.3	5375.14	5.66	-1.305	0.000	0.532
45.00	-32.07	-36.97	0.00	-3612.2	0.00	3612.24	4752.88	2376.44	10444.9	5230.21	6.81	-1.435	0.000	0.519
48.00	-30.75	-36.53	0.00	-3501.3	0.00	3501.33	4754.71	2377.36	10456.3	5235.93	7.74	-1.534	0.000	0.522
50.00	-30.22	-36.27	0.00	-3428.2	0.00	3428.28	4731.34	2365.67	10311.8	5163.58	8.40	-1.600	0.000	0.501
55.00	-29.00	-35.55	0.00	-3246.9	0.00	3246.94	4671.41	2335.70	9951.50	4983.15	10.16	-1.758	0.000	0.488
60.00	-27.81	-34.83	0.00	-3069.1	0.00	3069.18	4609.37	2304.68	9592.67	4803.47	12.09	-1.917	0.000	0.475
65.00	-26.64	-34.11	0.00	-2895.0	0.00	2895.02	4545.22	2272.61	9235.65	4624.69	14.18	-2.077	0.000	0.462
70.00	-25.49	-33.39	0.00	-2724.4	0.00	2724.46	4478.96	2239.48	8880.76	4446.98	16.44	-2.238	0.000	0.449
75.00	-24.37	-32.68	0.00	-2557.4	0.00	2557.49	4410.58	2205.29	8528.29	4270.48	18.87	-2.399	0.000	0.435
80.00	-23.32	-31.94	0.00	-2394.1	0.00	2394.10	4340.09	2170.05	8178.57	4095.36	21.47	-2.561	0.000	0.421
81.00	-23.07	-31.82	0.00	-2362.1	0.00	2362.17	4325.74	2162.87	8108.99	4060.52	22.01	-2.594	0.000	0.418
81.00	-23.07	-31.82	0.00	-2362.1	0.00	2362.17	3843.52	1921.76	7205.03	3607.87	22.01	-2.594	0.000	0.471
85.00	-22.21	-31.26	0.00	-2234.8	0.00	2234.89	3789.25	1894.62	6954.21	3482.28	24.24	-2.724	0.000	0.458
90.00	-20.39	-30.48	0.00	-2078.5	0.00	2078.59	3719.86	1859.93	6643.95	3326.92	27.18	-2.886	0.000	0.438
91.00	-20.00	-30.35	0.00	-2048.1	0.00	2048.11	3750.02	1875.01	6777.40	3393.74	27.79	-2.919	0.000	0.444
95.00	-19.17	-29.78	0.00	-1926.7	0.00	1926.72	3693.87	1846.94	6530.61	3270.16	30.29	-3.047	0.000	0.415
100.00	-18.15	-29.09	0.00	-1777.8	0.00	1777.81	3622.15	1811.07	6225.69	3117.47	33.56	-3.200	0.000	0.576
105.00	-17.14	-28.41	0.00	-1632.3	0.00	1632.37	3548.72	1774.36	5924.97	2966.89	37.03	-3.420	0.000	0.555
110.00	-16.16	-27.74	0.00	-1490.3	0.00	1490.32	3473.57	1736.79	5628.70	2818.54	40.72	-3.639	0.000	0.534
115.00	-15.20	-27.07	0.00	-1351.6	0.00	1351.63	3396.72	1698.36	5337.14	2672.54	44.65	-3.857	0.000	0.510
120.00	-14.28	-26.42	0.00	-1216.2	0.00	1216.27	3318.16	1659.08	5050.54	2529.02	48.80	-4.073	0.000	0.485
125.00	-13.37	-25.77	0.00	-1084.1	0.00	1084.18	3226.71	1613.36	4752.68	2379.87	53.18	-4.286	0.000	0.460
130.00	-12.50	-25.13	0.00	-955.32	0.00	955.32	3120.09	1560.05	4442.21	2224.41	57.78	-4.494	0.000	0.434
135.00	-11.02	-24.44	0.00	-829.65	0.00	829.65	3080.81	1540.41	4330.47	2168.45	62.59	-4.695	0.000	0.386
140.00	-10.21	-23.80	0.00	-707.45	0.00	707.45	2974.19	1487.09	4034.35	2020.17	67.61	-4.887	0.000	0.354
140.00	-10.21	-23.80	0.00	-707.45	0.00	707.45	1787.24	893.62	2442.64	1223.14	67.61	-4.887	0.000	0.585
143.00	-8.80	-21.24	0.00	-636.04	0.00	636.04	1762.68	881.34	2357.06	1180.28	70.71	-4.992	0.000	0.544
145.00	-8.55	-21.01	0.00	-593.57	0.00	593.57	1745.97	872.98	2300.37	1151.90	72.82	-5.093	0.000	0.521
150.00	-8.02	-20.43	0.00	-488.51	0.00	488.51	1703.02	851.51	2160.05	1081.63	78.27	-5.326	0.000	0.457
153.00	-6.82	-19.44	0.00	-427.23	0.00	427.23	1676.45	838.23	2076.88	1039.98	81.66	-5.459	0.000	0.415
155.00	-6.61	-19.22	0.00	-388.35	0.00	388.35	1658.40	829.20	2021.90	1012.45	83.96	-5.543	0.000	0.388
159.00	-5.14	-12.40	0.00	-311.47	0.00	311.47	1621.51	810.75	1913.13	957.99	88.67	-5.695	0.000	0.329
160.00	-5.05	-12.29	0.00	-299.07	0.00	299.07	1612.12	806.06	1886.20	944.50	89.86	-5.731	0.000	0.320
165.00	-4.66	-11.75	0.00	-237.60	0.00	237.60	1564.16	782.08	1753.17	877.89	95.95	-5.896	0.000	0.274
170.00	-4.29	-11.23	0.00	-178.84	0.00	178.84	1514.53	757.27	1623.07	812.74	102.19	-6.041	0.000	0.223
173.00	-2.78	-7.45	0.00	-145.16	0.00	145.16	1483.95	741.98	1546.51	774.41	106.01	-6.118	0.000	0.189
175.00	-2.64	-7.25	0.00	-130.27	0.00	130.27	1463.23	731.62	1496.14	749.18	108.57	-6.166	0.000	0.176

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 28
	Struct Class: II	



180.00	-2.32	-6.76	0.00	-94.03	0.00	94.03	1400.09	700.04	1362.73	682.38	115.08	-6.269	0.000	0.140
180.00	-2.32	-6.76	0.00	-94.03	0.00	94.03	871.37	435.68	845.88	423.57	115.08	-6.269	0.000	0.225
185.00	-1.97	-6.27	0.00	-60.25	0.00	60.25	871.37	435.68	845.88	423.57	121.67	-6.350	0.000	0.145
190.00	-1.63	-5.78	0.00	-28.90	0.00	28.90	871.37	435.68	845.88	423.57	128.34	-6.392	0.000	0.070
195.00	0.00	-5.56	0.00	0.00	0.00	0.00	871.37	435.68	845.88	423.57	135.03	-6.406	0.000	0.000

Wind Loading - Shaft

Structure: CT00167-S-SBA
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: B - Competent Rock
Struct Class: II

10/21/2016

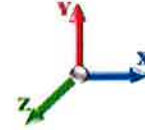
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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20
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		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	28.073	33.69	191.5	502.3	2301.7
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	27.645	33.17	188.6	529.2	2294.9
15.00	RB1	1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	27.189	32.63	185.5	541.2	2273.3
18.00	Top - Section 1	1.00	0.88	5.363	5.90	0.00	1.200	1.412	3.00	16.085	19.30	113.9	327.1	1350.1
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	2.00	10.628	12.75	76.9	218.7	798.1
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	26.244	31.49	199.1	548.5	1976.9
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	25.764	30.92	203.1	547.8	1947.4
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	25.281	30.34	205.9	545.3	1916.0
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	24.796	29.75	207.7	541.5	1883.3
41.00	Bot - Section 3	1.00	1.05	6.378	7.02	0.00	1.200	1.533	1.00	4.899	5.88	41.2	108.1	373.0
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	4.00	19.660	23.59	168.8	435.1	2545.8
48.00	Top - Section 2	1.00	1.08	6.593	7.25	0.00	1.200	1.557	3.00	14.539	17.45	126.5	324.3	1883.1
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	2.00	9.594	11.51	84.2	215.2	732.7
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	5.00	23.647	28.38	211.8	531.7	1805.1
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	23.156	27.79	211.2	524.6	1769.2
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	22.664	27.20	210.2	517.0	1732.7
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	22.172	26.61	208.9	508.9	1695.8
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	21.679	26.01	207.3	500.4	1658.5
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	21.185	25.42	205.3	491.6	1620.8
81.00	Top - Section 3	1.00	1.21	7.361	8.10	0.00	1.200	1.641	1.00	4.177	5.01	40.6	98.0	320.3
85.00	Bot - Section 5	1.00	1.22	7.436	8.18	0.00	1.200	1.649	4.00	16.513	19.82	162.1	385.9	1263.9
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	20.514	24.62	203.8	480.7	2641.9
91.00	Top - Section 4	1.00	1.24	7.544	8.30	0.00	1.200	1.660	1.00	4.043	4.85	40.3	95.8	521.1
95.00	RT1	1.00	1.25	7.612	8.37	0.00	1.200	1.667	4.00	15.975	19.17	160.5	376.8	1223.2
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	5.00	19.524	23.43	198.3	461.0	1493.0
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	19.028	22.83	195.3	450.9	1454.0
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	5.00	18.532	22.24	192.1	440.4	1414.7
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	18.036	21.64	188.7	429.8	1375.3
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	17.540	21.05	185.1	419.1	1335.6
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	17.043	20.45	181.4	408.1	1295.8
130.00	Bot - Section 6	1.00	1.34	8.132	8.95	0.00	1.200	1.720	5.00	16.546	19.86	177.6	397.0	1255.8
135.00	Top - Section 5	1.00	1.35	8.197	9.02	0.00	1.200	1.727	5.00	16.366	19.64	177.1	393.8	2072.0
140.00	Top - Section 6	1.00	1.36	8.260	9.09	0.00	1.200	1.733	5.00	15.869	19.04	173.0	382.4	1201.8
143.00	Appurtenance(s)	1.00	1.36	8.297	9.13	0.00	1.200	1.737	3.00	9.282	11.14	101.7	225.3	545.0
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	2.00	6.088	7.31	66.9	148.3	357.7
150.00		1.00	1.38	8.381	9.22	0.00	1.200	1.745	5.00	14.874	17.85	164.5	359.2	869.0
153.00	Appurtenance(s)	1.00	1.38	8.416	9.26	0.00	1.200	1.749	3.00	8.685	10.42	96.5	211.3	507.9
155.00		1.00	1.39	8.439	9.28	0.00	1.200	1.751	2.00	5.690	6.83	63.4	139.0	332.9
159.00	Appurtenance(s)	1.00	1.40	8.484	9.33	0.00	1.200	1.755	4.00	11.143	13.37	124.8	270.3	648.9
160.00		1.00	1.40	8.495	9.34	0.00	1.200	1.757	1.00	2.736	3.28	30.7	67.1	159.8
165.00		1.00	1.41	8.551	9.41	0.00	1.200	1.762	5.00	13.381	16.06	151.0	323.5	775.6
170.00		1.00	1.42	8.604	9.46	0.00	1.200	1.767	5.00	12.883	15.46	146.3	311.4	744.2
173.00	Appurtenance(s)	1.00	1.42	8.636	9.50	0.00	1.200	1.770	3.00	7.490	8.99	85.4	182.4	432.9
175.00		1.00	1.42	8.657	9.52	0.00	1.200	1.772	2.00	4.894	5.87	55.9	119.7	282.8
180.00	Top - Section 7	1.00	1.43	8.709	9.58	0.00	1.200	1.777	5.00	11.887	14.26	136.6	286.8	681.2
185.00		1.00	1.44	8.759	9.63	0.00	1.200	1.782	5.00	11.639	13.97	134.6	287.6	720.0

Wind Loading - Shaft

Structure: CT00167-S-SBA

Code: EIA/TIA-222-G

10/21/2016

Site Name: Lisbon

Exposure: C

Height: 195.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: B - Competent Rock

Gh: 1.1

Topography: 1

Struct Class: II

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190.00	1.00	1.45	8.808	9.69	0.00	1.200	1.787	5.00	11.643	13.97	135.4	288.5	720.8
195.00 Appurtenance(s)	1.00	1.46	8.857	9.74	0.00	1.200	1.792	5.00	11.647	13.98	136.2	289.3	721.6
								Totals:	195.00			7,153.3	59,927.0

Discrete Appurtenance Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 31
	Struct Class: II	



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

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	AIR 21, 1.3M, B4A B2P	3	8.857	9.742	0.78	0.90	16.91	848.26	0.000	0.000	164.72	0.00	0.00
2	195.00	T-Arm (Flat)	3	8.857	9.742	0.56	0.75	31.99	2059.97	0.000	0.000	311.67	0.00	0.00
3	195.00	AIR 21, 1.3M, B2A B4P	3	8.857	9.742	0.78	0.90	16.86	852.22	0.000	0.000	164.24	0.00	0.00
4	195.00	S11B12	3	8.857	9.742	0.45	0.90	4.75	349.66	0.000	0.000	46.29	0.00	0.00
5	195.00	KRY 112 144/1	3	8.857	9.742	0.45	0.90	1.21	63.50	0.000	0.000	11.81	0.00	0.00
6	195.00	LNx-6515DS-A1M	3	8.857	9.742	0.72	0.90	32.02	688.84	0.000	0.000	311.94	0.00	0.00
7	173.00	ACU-A20-N	4	8.636	9.500	0.40	0.80	0.71	17.03	0.000	0.000	6.70	0.00	0.00
8	173.00	800 MHz ESMR Filter	3	8.636	9.500	0.40	0.80	0.90	106.39	0.000	0.000	8.56	0.00	0.00
9	173.00	800 MHz RRH	3	8.636	9.500	0.40	0.80	4.38	352.57	0.000	0.000	41.61	0.00	0.00
10	173.00	1900MHz RRH	3	8.636	9.500	0.40	0.80	6.25	397.00	0.000	0.000	59.39	0.00	0.00
11	173.00	APXVSP18-C-A20	3	8.636	9.500	0.66	0.80	21.62	582.71	0.000	0.000	205.39	0.00	0.00
12	173.00	Sector Frame-Pipe/Rod	3	8.636	9.500	0.60	0.80	38.05	2390.67	0.000	0.000	361.45	0.00	0.00
13	159.00	Rfs FD9R6004/2CL-3CL	6	8.484	9.333	0.80	0.80	3.87	56.96	0.000	0.000	36.10	0.00	0.00
14	159.00	Low Profile Platform-flat	1	8.484	9.333	1.00	1.00	46.06	2193.25	0.000	0.000	429.90	0.00	0.00
15	159.00	SBNHH-1D65B	6	8.484	9.333	0.66	0.80	37.72	1515.29	0.000	0.000	352.03	0.00	0.00
16	159.00	BXA-70080-4BF	3	8.484	9.333	0.71	0.80	11.51	233.93	0.000	0.000	107.38	0.00	0.00
17	159.00	Alcatel Lucent B25	3	8.484	9.333	0.65	0.80	5.35	316.15	0.000	0.000	49.92	0.00	0.00
18	159.00	Rfs Celwave	2	8.484	9.333	0.57	0.80	6.45	334.80	0.000	0.000	60.21	0.00	0.00
19	159.00	BXA-70063-6CF-2	3	8.484	9.333	0.58	0.80	15.48	587.47	0.000	0.000	144.51	0.00	0.00
20	159.00	Alcatel Lucent B66	3	8.484	9.333	0.66	0.80	6.37	458.69	0.000	0.000	59.48	0.00	0.00
21	153.00	Standoff Mount	3	8.416	9.257	0.56	0.75	14.34	1841.33	0.000	0.000	132.74	0.00	0.00
22	143.00	742 351	6	8.297	9.126	0.49	0.80	21.54	619.82	0.000	0.000	196.60	0.00	0.00
23	143.00	T-Arm (Flat)	3	8.297	9.126	0.56	0.75	31.53	2033.71	0.000	0.000	287.76	0.00	0.00
Totals:								18,900.23				3,550.42		

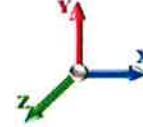
Total Applied Force Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 32
	Struct Class: II	



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

Dead Load Factor 1.20
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		191.51	2577.75	0.00	0.00
10.00		188.59	2574.11	0.00	0.00
15.00		185.48	2554.54	0.00	0.00
18.00		113.87	1533.87	0.00	0.00
20.00		76.93	921.03	0.00	0.00
25.00		199.10	2286.22	0.00	0.00
30.00		203.11	2258.41	0.00	0.00
35.00		205.87	2228.58	0.00	0.00
40.00		207.67	2197.23	0.00	0.00
41.00		41.25	435.85	0.00	0.00
45.00		168.80	2797.90	0.00	0.00
48.00		126.54	2072.60	0.00	0.00
50.00		84.22	859.23	0.00	0.00
55.00		211.79	2122.47	0.00	0.00
60.00		211.22	2087.50	0.00	0.00
65.00		210.25	2051.94	0.00	0.00
70.00		208.92	2015.86	0.00	0.00
75.00		207.26	1979.32	0.00	0.00
80.00		205.31	1942.37	0.00	0.00
81.00		40.59	384.68	0.00	0.00
85.00		162.08	1521.73	0.00	0.00
90.00		203.79	2964.90	0.00	0.00
91.00		40.26	582.95	0.00	0.00
95.00		160.52	1471.05	0.00	0.00
100.00		198.31	1803.44	0.00	0.00
105.00		195.27	1764.93	0.00	0.00
110.00		192.05	1708.70	0.00	0.00
115.00		188.67	1669.58	0.00	0.00
120.00		185.13	1630.26	0.00	0.00
125.00		181.44	1590.76	0.00	0.00
130.00		177.61	1551.09	0.00	0.00
135.00		177.08	2367.59	0.00	0.00
140.00		173.02	1497.63	0.00	0.00
143.00	(9) attachments	586.02	3376.18	0.00	0.00
145.00		66.87	445.96	0.00	0.00
150.00		164.55	1090.05	0.00	0.00
153.00	(3) attachments	229.22	2481.99	0.00	0.00
155.00		63.39	421.41	0.00	0.00
159.00	(27) attachments	1364.32	6522.69	0.00	0.00
160.00		30.68	189.02	0.00	0.00
165.00		151.03	921.81	0.00	0.00
170.00		146.32	890.69	0.00	0.00
173.00	(19) attachments	768.50	4367.24	0.00	0.00
175.00		55.92	336.73	0.00	0.00
180.00		136.64	816.26	0.00	0.00
185.00		134.57	855.31	0.00	0.00

Total Applied Force Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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190.00		135.38	856.36	0.00	0.00
195.00	(18) attachments	1146.83	5719.83	0.00	0.00
	Totals:	10,703.71	89,297.61	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

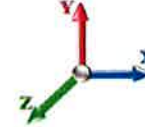


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	12.93
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	18.85
10.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	14.46
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	20.46
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	15.46
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	21.51
18.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	5.363	0.00	9.56
18.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	5.363	0.00	13.21
18.00	Reinforcing channels	Yes	3.00	0.000	2.00	1.21	0.00	0.033	0.000	5.363	0.00	14.39
20.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	5.483	0.00	6.48
20.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	5.483	0.00	8.92
20.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.81	0.00	0.033	0.000	5.483	0.00	9.75
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	5.747	0.00	16.83
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	5.747	0.00	22.95
25.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.05	0.00	0.033	0.000	5.747	0.00	25.18
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	5.972	0.00	17.35
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	5.972	0.00	23.50
30.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.07	0.00	0.034	0.000	5.972	0.00	25.88
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	6.169	0.00	17.80
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	6.169	0.00	23.98
35.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.09	0.00	0.035	0.000	6.169	0.00	26.48
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	6.345	0.00	18.21
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	6.345	0.00	24.40
40.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.11	0.00	0.035	0.000	6.345	0.00	27.01
41.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	6.378	0.00	3.66
41.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	6.378	0.00	4.90
41.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.42	0.00	0.036	0.000	6.378	0.00	5.42
45.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	6.504	0.00	14.86
45.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	6.504	0.00	19.83
45.00	Reinforcing channels	Yes	4.00	0.000	2.00	1.70	0.00	0.036	0.000	6.504	0.00	21.99
48.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	6.593	0.00	11.27
48.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	6.593	0.00	15.00
48.00	Reinforcing channels	Yes	3.00	0.000	2.00	1.28	0.00	0.037	0.000	6.593	0.00	16.66
50.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	6.650	0.00	7.56
50.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	6.650	0.00	10.06
50.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.85	0.00	0.037	0.000	6.650	0.00	11.17
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	6.785	0.00	19.22
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	6.785	0.00	25.46
55.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.15	0.00	0.037	0.000	6.785	0.00	28.34
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	6.910	0.00	19.51
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	6.910	0.00	25.76
60.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.16	0.00	0.038	0.000	6.910	0.00	28.71
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	7.028	0.00	19.78
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	7.028	0.00	26.04
65.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.17	0.00	0.039	0.000	7.028	0.00	29.06
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	7.138	0.00	20.03
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	7.138	0.00	26.31

Linear Appurtenance Segment Forces (Factored)

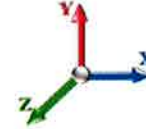
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.18	0.00	0.040	0.000	7.138	0.00	29.39
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	7.243	0.00	20.27
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	7.243	0.00	26.56
75.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.19	0.00	0.041	0.000	7.243	0.00	29.70
80.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	7.342	0.00	20.49
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	7.342	0.00	26.79
80.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.20	0.00	0.042	0.000	7.342	0.00	29.99
81.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	7.361	0.00	4.11
81.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	7.361	0.00	5.37
81.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.44	0.00	0.043	0.000	7.361	0.00	6.01
85.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	7.436	0.00	16.57
85.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	7.436	0.00	21.61
85.00	Reinforcing channels	Yes	4.00	0.000	2.00	1.77	0.00	0.043	0.000	7.436	0.00	24.21
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	7.526	0.00	20.91
90.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	7.526	0.00	27.23
90.00	Reinforcing channels	Yes	5.00	0.000	2.00	2.22	0.00	0.044	0.000	7.526	0.00	30.53
91.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	7.544	0.00	4.19
91.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	7.544	0.00	5.45
91.00	Reinforcing channels	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	7.544	0.00	3.37
95.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	7.612	0.00	16.89
95.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	7.612	0.00	21.95
95.00	Reinforcing channels	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	7.612	0.00	13.59
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.695	0.00	21.30
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.695	0.00	27.63
100.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.695	0.00	17.16
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.774	0.00	21.48
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.774	0.00	27.82
105.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.774	0.00	17.32
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.851	0.00	21.65
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.851	0.00	28.00
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.925	0.00	21.82
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.925	0.00	28.18
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.996	0.00	21.98
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.996	0.00	28.34
125.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.065	0.00	22.14
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.065	0.00	28.51
130.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.132	0.00	22.29
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.132	0.00	28.67
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.197	0.00	22.43
135.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.197	0.00	28.82
140.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.260	0.00	22.57
140.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.260	0.00	28.97
143.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.297	0.00	13.59
143.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.297	0.00	17.43
145.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.321	0.00	9.09
145.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.321	0.00	11.64
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.381	0.00	22.85

Linear Appurtenance Segment Forces (Factored)

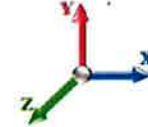
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.381	0.00	29.25
153.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.416	0.00	13.76
153.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.416	0.00	17.60
155.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.439	0.00	9.19
155.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.439	0.00	11.75
159.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	8.484	0.00	18.46
159.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	8.484	0.00	23.59
160.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	8.495	0.00	4.62
160.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	8.495	0.00	5.90
165.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.551	0.00	23.23
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.551	0.00	29.65
170.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.604	0.00	23.35
170.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.604	0.00	29.78
173.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.636	0.00	14.05
173.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.636	0.00	17.91
175.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.657	0.00	9.39
175.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.657	0.00	11.96
180.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.709	0.00	23.59
180.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.709	0.00	30.02
185.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.759	0.00	23.70
185.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.759	0.00	30.14
190.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.808	0.00	23.81
190.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.808	0.00	30.25
195.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.857	0.00	23.92
195.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.857	0.00	30.37
Totals:											0.0	2,322.2

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

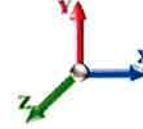


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 24

Dead Load Factor 1.20
Wind Load Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-89.29	-10.74	0.00	-1355.9	0.00	1355.92	6497.76	3248.88	17121.8	8573.64	0.00	0.000	0.000	0.172
5.00	-86.71	-10.61	0.00	-1302.2	0.00	1302.25	6432.14	3216.07	16632.6	8328.66	0.02	-0.041	0.000	0.170
10.00	-84.13	-10.48	0.00	-1249.2	0.00	1249.22	6364.44	3182.22	16144.5	8084.28	0.09	-0.083	0.000	0.168
15.00	-81.57	-10.33	0.00	-1196.8	0.00	1196.85	6294.68	3147.34	15658.0	7840.66	0.20	-0.125	0.000	0.133
18.00	-80.03	-10.24	0.00	-1165.8	0.00	1165.86	6251.82	3125.91	15366.9	7694.92	0.28	-0.146	0.000	0.131
18.00	-80.03	-10.24	0.00	-1165.8	0.00	1165.86	5035.78	2517.89	12403.8	6211.14	0.28	-0.146	0.000	0.140
20.00	-79.10	-10.19	0.00	-1145.3	0.00	1145.38	5016.94	2508.47	12258.7	6138.49	0.35	-0.160	0.000	0.156
25.00	-76.81	-10.04	0.00	-1094.4	0.00	1094.41	4968.35	2484.18	11895.7	5956.70	0.53	-0.199	0.000	0.153
30.00	-74.55	-9.88	0.00	-1044.2	0.00	1044.21	4917.65	2458.83	11532.4	5774.82	0.76	-0.238	0.000	0.150
35.00	-72.31	-9.71	0.00	-994.81	0.00	994.81	4864.84	2432.42	11169.4	5593.00	1.03	-0.278	0.000	0.146
40.00	-70.11	-9.52	0.00	-946.24	0.00	946.24	4809.92	2404.96	10806.7	5411.42	1.35	-0.317	0.000	0.143
41.00	-69.67	-9.51	0.00	-936.72	0.00	936.72	4798.68	2399.34	10734.3	5375.14	1.41	-0.326	0.000	0.142
45.00	-66.87	-9.35	0.00	-898.70	0.00	898.70	4752.88	2376.44	10444.9	5230.21	1.70	-0.358	0.000	0.139
48.00	-64.80	-9.24	0.00	-870.64	0.00	870.64	4754.71	2377.36	10456.3	5235.93	1.93	-0.383	0.000	0.139
50.00	-63.93	-9.18	0.00	-852.16	0.00	852.16	4731.34	2365.67	10311.8	5163.58	2.10	-0.399	0.000	0.134
55.00	-61.81	-8.99	0.00	-806.28	0.00	806.28	4671.41	2335.70	9951.50	4983.15	2.54	-0.438	0.000	0.130
60.00	-59.72	-8.81	0.00	-761.31	0.00	761.31	4609.37	2304.68	9592.67	4803.47	3.02	-0.478	0.000	0.127
65.00	-57.66	-8.62	0.00	-717.28	0.00	717.28	4545.22	2272.61	9235.65	4624.69	3.54	-0.518	0.000	0.123
70.00	-55.64	-8.43	0.00	-674.19	0.00	674.19	4478.96	2239.48	8880.76	4446.98	4.10	-0.557	0.000	0.119
75.00	-53.66	-8.24	0.00	-632.05	0.00	632.05	4410.58	2205.29	8528.29	4270.48	4.71	-0.597	0.000	0.116
80.00	-51.71	-8.03	0.00	-590.85	0.00	590.85	4340.09	2170.05	8178.57	4095.36	5.35	-0.637	0.000	0.112
81.00	-51.33	-8.01	0.00	-582.82	0.00	582.82	4325.74	2162.87	8108.99	4060.52	5.49	-0.645	0.000	0.111
81.00	-51.33	-8.01	0.00	-582.82	0.00	582.82	3843.52	1921.76	7205.03	3607.87	5.49	-0.645	0.000	0.125
85.00	-49.80	-7.86	0.00	-550.79	0.00	550.79	3789.25	1894.62	6954.21	3482.28	6.04	-0.677	0.000	0.122
90.00	-46.84	-7.64	0.00	-511.49	0.00	511.49	3719.86	1859.93	6643.95	3326.92	6.77	-0.717	0.000	0.116
91.00	-46.25	-7.61	0.00	-503.85	0.00	503.85	3750.02	1875.01	6777.40	3393.74	6.93	-0.725	0.000	0.117
95.00	-44.78	-7.46	0.00	-473.42	0.00	473.42	3693.87	1846.94	6530.61	3270.16	7.55	-0.757	0.000	0.110
100.00	-42.97	-7.27	0.00	-436.15	0.00	436.15	3622.15	1811.07	6225.69	3117.47	8.36	-0.794	0.000	0.152
105.00	-41.20	-7.09	0.00	-399.81	0.00	399.81	3548.72	1774.36	5924.97	2966.89	9.22	-0.848	0.000	0.146
110.00	-39.49	-6.90	0.00	-364.39	0.00	364.39	3473.57	1736.79	5628.70	2818.54	10.14	-0.902	0.000	0.141
115.00	-37.82	-6.72	0.00	-329.87	0.00	329.87	3396.72	1698.36	5337.14	2672.54	11.11	-0.955	0.000	0.135
120.00	-36.19	-6.54	0.00	-296.25	0.00	296.25	3318.16	1659.08	5050.54	2529.02	12.14	-1.008	0.000	0.128
125.00	-34.59	-6.36	0.00	-263.54	0.00	263.54	3226.71	1613.36	4752.68	2379.87	13.22	-1.060	0.000	0.121
130.00	-33.04	-6.19	0.00	-231.72	0.00	231.72	3120.09	1560.05	4442.21	2224.41	14.36	-1.110	0.000	0.115
135.00	-30.67	-5.99	0.00	-200.80	0.00	200.80	3080.81	1540.41	4330.47	2168.45	15.55	-1.159	0.000	0.103
140.00	-29.17	-5.80	0.00	-170.86	0.00	170.86	2974.19	1487.09	4034.35	2020.17	16.79	-1.205	0.000	0.094
140.00	-29.17	-5.80	0.00	-170.86	0.00	170.86	1787.24	893.62	2442.64	1223.14	16.79	-1.205	0.000	0.156
143.00	-25.81	-5.16	0.00	-153.46	0.00	153.46	1762.68	881.34	2357.06	1180.28	17.56	-1.231	0.000	0.145
145.00	-25.36	-5.10	0.00	-143.15	0.00	143.15	1745.97	872.98	2300.37	1151.90	18.08	-1.255	0.000	0.139
150.00	-24.27	-4.93	0.00	-117.66	0.00	117.66	1703.02	851.51	2160.05	1081.63	19.42	-1.311	0.000	0.123
153.00	-21.79	-4.65	0.00	-102.89	0.00	102.89	1676.45	838.23	2076.88	1039.98	20.26	-1.343	0.000	0.112
155.00	-21.37	-4.59	0.00	-93.59	0.00	93.59	1658.40	829.20	2021.90	1012.45	20.82	-1.364	0.000	0.105
159.00	-14.88	-3.07	0.00	-75.24	0.00	75.24	1621.51	810.75	1913.13	957.99	21.98	-1.400	0.000	0.088
160.00	-14.69	-3.04	0.00	-72.17	0.00	72.17	1612.12	806.06	1886.20	944.50	22.28	-1.409	0.000	0.086
165.00	-13.77	-2.88	0.00	-56.96	0.00	56.96	1564.16	782.08	1753.17	877.89	23.77	-1.449	0.000	0.074
170.00	-12.89	-2.71	0.00	-42.57	0.00	42.57	1514.53	757.27	1623.07	812.74	25.31	-1.483	0.000	0.061
173.00	-8.54	-1.83	0.00	-34.43	0.00	34.43	1483.95	741.98	1546.51	774.41	26.25	-1.502	0.000	0.050
175.00	-8.20	-1.77	0.00	-30.76	0.00	30.76	1463.23	731.62	1496.14	749.18	26.88	-1.513	0.000	0.047

Calculated Forces

Structure: CT00167-S-SBA

Code: EIA/TIA-222-G

10/21/2016

Site Name: Lisbon

Exposure: C

Height: 195.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: B - Competent Rock

Gh: 1.1

Topography: 1

Struct Class: II

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180.00	-7.39	-1.62	0.00	-21.90	0.00	21.90	1400.09	700.04	1362.73	682.38	28.48	-1.537	0.000	0.037
180.00	-7.39	-1.62	0.00	-21.90	0.00	21.90	871.37	435.68	845.88	423.57	28.48	-1.537	0.000	0.060
185.00	-6.54	-1.46	0.00	-13.82	0.00	13.82	871.37	435.68	845.88	423.57	30.10	-1.556	0.000	0.040
190.00	-5.69	-1.30	0.00	-6.51	0.00	6.51	871.37	435.68	845.88	423.57	31.73	-1.565	0.000	0.022
195.00	0.00	-1.15	0.00	0.00	0.00	0.00	871.37	435.68	845.88	423.57	33.37	-1.569	0.000	0.000

Seismic Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E

Iterations 22

Gust Response Factor 1.10	Sds 0.11	Ss 0.17	
Dead Load Factor 1.20	Seismic Load Factor 1.00	Sd1 0.04	
Wind Load Factor 0.00	Structure Frequency 0.31	SA 0.01	
Seismic Importance Factor 1.00			

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1499.4	0.00	0.03	0.01	18.33	
10.00		1471.4	0.00	0.04	0.03	25.59	
15.00	RB1	1443.3	0.01	0.06	0.03	29.03	
18.00	Top - Section 1	852.54	0.02	0.06	0.04	18.01	
20.00		482.86	0.02	0.06	0.04	10.45	
25.00		1190.3	0.03	0.07	0.04	26.81	
30.00		1166.2	0.04	0.07	0.04	26.94	
35.00		1142.2	0.06	0.07	0.04	26.91	
40.00		1118.1	0.08	0.07	0.04	26.83	
41.00	Bot - Section 3	220.75	0.08	0.07	0.04	5.32	
45.00		1758.9	0.10	0.07	0.04	43.06	
48.00	Top - Section 2	1298.9	0.11	0.07	0.04	32.21	
50.00		431.22	0.12	0.07	0.03	10.79	
55.00		1061.2	0.15	0.07	0.03	27.10	
60.00		1037.1	0.18	0.07	0.03	26.94	
65.00		1013.1	0.21	0.06	0.02	26.49	
70.00		989.09	0.24	0.06	0.02	25.55	
75.00		965.04	0.28	0.05	0.01	23.84	
80.00		940.99	0.32	0.04	0.01	21.04	
81.00	Top - Section 3	185.31	0.33	0.04	0.01	4.02	
85.00	Bot - Section 5	731.63	0.36	0.03	0.01	13.40	
90.00		1800.9	0.40	0.02	0.01	22.03	
91.00	Top - Section 4	354.43	0.41	0.01	0.01	3.81	
95.00	RT1	705.31	0.45	0.00	0.01	2.95	
100.00		859.99	0.50	-0.02	0.01	-4.31	
105.00		835.95	0.55	-0.03	0.01	-11.65	
110.00		811.90	0.60	-0.05	0.01	-17.32	
115.00		787.85	0.66	-0.07	0.02	-20.90	
120.00		763.81	0.72	-0.09	0.03	-22.48	
125.00		739.76	0.78	-0.11	0.05	-22.36	
130.00	Bot - Section 6	715.71	0.84	-0.12	0.07	-20.81	
135.00	Top - Section 5	1398.5	0.91	-0.12	0.09	-36.58	
140.00	Top - Section 6	682.81	0.97	-0.12	0.12	-14.72	
143.00	Appurtenance(s)	1645.2	1.02	-0.11	0.14	-29.64	
145.00		174.42	1.05	-0.10	0.15	-2.67	
150.00		424.83	1.12	-0.06	0.20	-3.18	
153.00	Appurtenance(s)	1297.2	1.16	-0.03	0.23	-2.60	
155.00		161.60	1.19	0.00	0.25	0.32	
159.00	Appurtenance(s)	2222.3	1.26	0.06	0.30	23.86	
160.00		77.27	1.27	0.08	0.31	1.01	
165.00		376.74	1.35	0.20	0.39	9.75	
170.00		360.70	1.44	0.36	0.47	14.57	
173.00	Appurtenance(s)	2054.7	1.49	0.47	0.53	102.63	
175.00		135.95	1.52	0.56	0.57	7.70	
180.00	Top - Section 7	328.64	1.61	0.81	0.68	24.56	

Seismic Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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185.00	360.29	1.70	1.13	0.82	34.10	
190.00	360.29	1.79	1.51	0.97	41.95	
195.00 Appurtenance(s)	2441.3	1.89	1.98	1.14	342.14	
Totals:	43,878.7				890.9	Total Wind: 42,627.8

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

Calculated Forces

Structure: CT00167-S-SBA
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: B - Competent Rock
Struct Class: II

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Load Case: 1.2D + 1.0E

Gust Response Factor 1.10

Sds 0.11

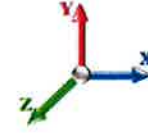
Iterations 22

Dead Load Factor 1.20 **Seismic Load Factor** 1.00 **Sd1** 0.04

Ss 0.17

Wind Load Factor 0.00 **Structure Frequency** 0.31 **SA** 0.01 **Seismic Importance Factor** 1.00

S1 0.06



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-61.11	-1.10	0.00	-141.70	0.00	141.70	6497.76	3248.88	17121.8	8573.64	0.00	0.00	0.00	0.026
5.00	-59.06	-1.09	0.00	-136.19	0.00	136.19	6432.14	3216.07	16632.6	8328.66	0.00	0.00	0.00	0.026
10.00	-57.04	-1.07	0.00	-130.76	0.00	130.76	6364.44	3182.22	16144.5	8084.28	0.01	-0.01	0.025	0.025
15.00	-55.06	-1.04	0.00	-125.43	0.00	125.43	6294.68	3147.34	15658.0	7840.66	0.02	-0.01	0.020	0.020
18.00	-53.88	-1.02	0.00	-122.31	0.00	122.31	6251.82	3125.91	15366.9	7694.92	0.03	-0.02	0.020	0.020
18.00	-53.88	-1.02	0.00	-122.31	0.00	122.31	5035.78	2517.89	12403.8	6211.14	0.03	-0.02	0.021	0.021
20.00	-53.20	-1.02	0.00	-120.26	0.00	120.26	5016.94	2508.47	12258.7	6138.49	0.04	-0.02	0.023	0.023
25.00	-51.52	-0.99	0.00	-115.19	0.00	115.19	4968.35	2484.18	11895.7	5956.70	0.06	-0.02	0.023	0.023
30.00	-49.87	-0.97	0.00	-110.23	0.00	110.23	4917.65	2458.83	11532.4	5774.82	0.08	-0.02	0.023	0.023
35.00	-48.25	-0.94	0.00	-105.39	0.00	105.39	4864.84	2432.42	11169.4	5593.00	0.11	-0.03	0.022	0.022
40.00	-46.65	-0.92	0.00	-100.68	0.00	100.68	4809.92	2404.96	10806.7	5411.42	0.14	-0.03	0.022	0.022
41.00	-46.34	-0.91	0.00	-99.76	0.00	99.76	4798.68	2399.34	10734.3	5375.14	0.15	-0.03	0.021	0.021
45.00	-44.02	-0.87	0.00	-96.10	0.00	96.10	4752.88	2376.44	10444.9	5230.21	0.18	-0.04	0.021	0.021
48.00	-42.31	-0.84	0.00	-93.49	0.00	93.49	4754.71	2377.36	10456.3	5235.93	0.20	-0.04	0.021	0.021
50.00	-41.70	-0.83	0.00	-91.81	0.00	91.81	4731.34	2365.67	10311.8	5163.58	0.22	-0.04	0.020	0.020
55.00	-40.17	-0.81	0.00	-87.65	0.00	87.65	4671.41	2335.70	9951.50	4983.15	0.27	-0.05	0.020	0.020
60.00	-38.67	-0.78	0.00	-83.63	0.00	83.63	4609.37	2304.68	9592.67	4803.47	0.32	-0.05	0.019	0.019
65.00	-37.20	-0.76	0.00	-79.72	0.00	79.72	4545.22	2272.61	9235.65	4624.69	0.37	-0.06	0.019	0.019
70.00	-35.77	-0.73	0.00	-75.95	0.00	75.95	4478.96	2239.48	8880.76	4446.98	0.43	-0.06	0.018	0.018
75.00	-34.36	-0.71	0.00	-72.29	0.00	72.29	4410.58	2205.29	8528.29	4270.48	0.50	-0.06	0.018	0.018
80.00	-32.97	-0.69	0.00	-68.75	0.00	68.75	4340.09	2170.05	8178.57	4095.36	0.57	-0.07	0.018	0.018
81.00	-32.70	-0.68	0.00	-68.06	0.00	68.06	4325.74	2162.87	8108.99	4060.52	0.58	-0.07	0.018	0.018
81.00	-32.70	-0.68	0.00	-68.06	0.00	68.06	3843.52	1921.76	7205.03	3607.87	0.58	-0.07	0.020	0.020
85.00	-31.62	-0.67	0.00	-65.32	0.00	65.32	3789.25	1894.62	6954.21	3482.28	0.64	-0.07	0.019	0.019
90.00	-29.21	-0.65	0.00	-61.96	0.00	61.96	3719.86	1859.93	6643.95	3326.92	0.72	-0.08	0.019	0.019
91.00	-28.73	-0.65	0.00	-61.31	0.00	61.31	3750.02	1875.01	6777.40	3393.74	0.74	-0.08	0.019	0.019
95.00	-27.68	-0.64	0.00	-58.73	0.00	58.73	3693.87	1846.94	6530.61	3270.16	0.81	-0.08	0.018	0.018
100.00	-26.40	-0.64	0.00	-55.52	0.00	55.52	3622.15	1811.07	6225.69	3117.47	0.89	-0.09	0.025	0.025
105.00	-25.14	-0.64	0.00	-52.30	0.00	52.30	3548.72	1774.36	5924.97	2966.89	0.99	-0.09	0.025	0.025
110.00	-23.92	-0.65	0.00	-49.07	0.00	49.07	3473.57	1736.79	5628.70	2818.54	1.09	-0.10	0.024	0.024
115.00	-22.72	-0.65	0.00	-45.84	0.00	45.84	3396.72	1698.36	5337.14	2672.54	1.20	-0.11	0.024	0.024
120.00	-21.55	-0.65	0.00	-42.61	0.00	42.61	3318.16	1659.08	5050.54	2529.02	1.32	-0.12	0.023	0.023
125.00	-20.41	-0.65	0.00	-39.38	0.00	39.38	3226.71	1613.36	4752.68	2379.87	1.45	-0.12	0.023	0.023
130.00	-19.30	-0.65	0.00	-36.14	0.00	36.14	3120.09	1560.05	4442.21	2224.41	1.58	-0.13	0.022	0.022
135.00	-17.37	-0.65	0.00	-32.90	0.00	32.90	3080.81	1540.41	4330.47	2168.45	1.72	-0.14	0.021	0.021
140.00	-16.30	-0.64	0.00	-29.67	0.00	29.67	2974.19	1487.09	4034.35	2020.17	1.88	-0.15	0.020	0.020
140.00	-16.30	-0.64	0.00	-29.67	0.00	29.67	1787.24	893.62	2442.64	1223.14	1.88	-0.15	0.033	0.033
143.00	-14.17	-0.64	0.00	-27.74	0.00	27.74	1762.68	881.34	2357.06	1180.28	1.97	-0.15	0.032	0.032
145.00	-13.89	-0.64	0.00	-26.46	0.00	26.46	1745.97	872.98	2300.37	1151.90	2.03	-0.16	0.031	0.031
150.00	-13.21	-0.64	0.00	-23.26	0.00	23.26	1703.02	851.51	2160.05	1081.63	2.20	-0.17	0.029	0.029
153.00	-11.54	-0.64	0.00	-21.33	0.00	21.33	1676.45	838.23	2076.88	1039.98	2.31	-0.17	0.027	0.027
155.00	-11.28	-0.64	0.00	-20.06	0.00	20.06	1658.40	829.20	2021.90	1012.45	2.38	-0.18	0.027	0.027
159.00	-8.47	-0.61	0.00	-17.51	0.00	17.51	1621.51	810.75	1913.13	957.99	2.54	-0.19	0.023	0.023
160.00	-8.36	-0.61	0.00	-16.90	0.00	16.90	1612.12	806.06	1886.20	944.50	2.58	-0.19	0.023	0.023
165.00	-7.80	-0.59	0.00	-13.88	0.00	13.88	1564.16	782.08	1753.17	877.89	2.78	-0.20	0.021	0.021
170.00	-7.27	-0.58	0.00	-10.90	0.00	10.90	1514.53	757.27	1623.07	812.74	2.99	-0.21	0.018	0.018
173.00	-4.74	-0.47	0.00	-9.16	0.00	9.16	1483.95	741.98	1546.51	774.41	3.12	-0.21	0.015	0.015

Calculated Forces

Structure: CT00167-S-SBA

Site Name: Lisbon

Height: 195.00 (ft)

Base Elev: 0.000 (ft)

Gh: 1.1

Topography: 1

Code: EIA/TIA-222-G

Exposure: C

Crest Height: 0.00

Site Class: B - Competent Rock

Struct Class: II

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175.00	-4.54	-0.46	0.00	-8.23	0.00	8.23	1463.23	731.62	1496.14	749.18	3.21	-0.21	0.014
180.00	-4.06	-0.43	0.00	-5.93	0.00	5.93	1400.09	700.04	1362.73	682.38	3.44	-0.22	0.012
180.00	-4.06	-0.43	0.00	-5.93	0.00	5.93	871.37	435.68	845.88	423.57	3.44	-0.22	0.019
185.00	-3.54	-0.40	0.00	-3.76	0.00	3.76	871.37	435.68	845.88	423.57	3.67	-0.23	0.013
190.00	-3.02	-0.35	0.00	-1.77	0.00	1.77	871.37	435.68	845.88	423.57	3.91	-0.23	0.008
195.00	0.00	-0.34	0.00	0.00	0.00	0.00	871.37	435.68	845.88	423.57	4.15	-0.23	0.000

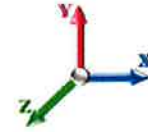
Seismic Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E				Iterations 22
Gust Response Factor	1.10	Sds	0.11	Ss 0.17
Dead Load Factor	0.90	Seismic Load Factor	1.00	Sd1 0.04
Wind Load Factor	0.00	Structure Frequency	0.31	SA 0.01
				Seismic Importance Factor 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1499.4	0.00	0.03	0.01	18.33	
10.00		1471.4	0.00	0.04	0.03	25.59	
15.00	RB1	1443.3	0.01	0.06	0.03	29.03	
18.00	Top - Section 1	852.54	0.02	0.06	0.04	18.01	
20.00		482.86	0.02	0.06	0.04	10.45	
25.00		1190.3	0.03	0.07	0.04	26.81	
30.00		1166.2	0.04	0.07	0.04	26.94	
35.00		1142.2	0.06	0.07	0.04	26.91	
40.00		1118.1	0.08	0.07	0.04	26.83	
41.00	Bot - Section 3	220.75	0.08	0.07	0.04	5.32	
45.00		1758.9	0.10	0.07	0.04	43.06	
48.00	Top - Section 2	1298.9	0.11	0.07	0.04	32.21	
50.00		431.22	0.12	0.07	0.03	10.79	
55.00		1061.2	0.15	0.07	0.03	27.10	
60.00		1037.1	0.18	0.07	0.03	26.94	
65.00		1013.1	0.21	0.06	0.02	26.49	
70.00		989.09	0.24	0.06	0.02	25.55	
75.00		965.04	0.28	0.05	0.01	23.84	
80.00		940.99	0.32	0.04	0.01	21.04	
81.00	Top - Section 3	185.31	0.33	0.04	0.01	4.02	
85.00	Bot - Section 5	731.63	0.36	0.03	0.01	13.40	
90.00		1800.9	0.40	0.02	0.01	22.03	
91.00	Top - Section 4	354.43	0.41	0.01	0.01	3.81	
95.00	RT1	705.31	0.45	0.00	0.01	2.95	
100.00		859.99	0.50	-0.02	0.01	-4.31	
105.00		835.95	0.55	-0.03	0.01	-11.65	
110.00		811.90	0.60	-0.05	0.01	-17.32	
115.00		787.85	0.66	-0.07	0.02	-20.90	
120.00		763.81	0.72	-0.09	0.03	-22.48	
125.00		739.76	0.78	-0.11	0.05	-22.36	
130.00	Bot - Section 6	715.71	0.84	-0.12	0.07	-20.81	
135.00	Top - Section 5	1398.5	0.91	-0.12	0.09	-36.58	
140.00	Top - Section 6	682.81	0.97	-0.12	0.12	-14.72	
143.00	Appurtenance(s)	1645.2	1.02	-0.11	0.14	-29.64	
145.00		174.42	1.05	-0.10	0.15	-2.67	
150.00		424.83	1.12	-0.06	0.20	-3.18	
153.00	Appurtenance(s)	1297.2	1.16	-0.03	0.23	-2.60	
155.00		161.60	1.19	0.00	0.25	0.32	
159.00	Appurtenance(s)	2222.3	1.26	0.06	0.30	23.86	
160.00		77.27	1.27	0.08	0.31	1.01	
165.00		376.74	1.35	0.20	0.39	9.75	
170.00		360.70	1.44	0.36	0.47	14.57	
173.00	Appurtenance(s)	2054.7	1.49	0.47	0.53	102.63	
175.00		135.95	1.52	0.56	0.57	7.70	
180.00	Top - Section 7	328.64	1.61	0.81	0.68	24.56	

Seismic Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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185.00	360.29	1.70	1.13	0.82	34.10	
190.00	360.29	1.79	1.51	0.97	41.95	
195.00 Appurtenance(s)	2441.3	1.89	1.98	1.14	342.14	
Totals:	43,878.7				890.9	Total Wind: 42,627.8

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

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E

Gust Response Factor 1.10	Sds 0.11	Iterations 22
Dead Load Factor 0.90	Seismic Load Factor 1.00	Ss 0.17
Wind Load Factor 0.00	Structure Frequency 0.31	S1 0.06
	SA 0.01	Seismic Importance Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-45.83	-1.10	0.00	-140.14	0.00	140.14	6497.76	3248.88	17121.8	8573.64	0.00	0.00	0.00	0.023
5.00	-44.29	-1.09	0.00	-134.64	0.00	134.64	6432.14	3216.07	16632.6	8328.66	0.00	0.00	0.00	0.023
10.00	-42.78	-1.06	0.00	-129.21	0.00	129.21	6364.44	3182.22	16144.5	8084.28	0.01	-0.01	0.00	0.023
15.00	-41.29	-1.04	0.00	-123.89	0.00	123.89	6294.68	3147.34	15658.0	7840.66	0.02	-0.01	0.00	0.018
18.00	-40.41	-1.02	0.00	-120.78	0.00	120.78	6251.82	3125.91	15366.9	7694.92	0.03	-0.02	0.00	0.018
18.00	-40.41	-1.02	0.00	-120.78	0.00	120.78	5035.78	2517.89	12403.8	6211.14	0.03	-0.02	0.00	0.019
20.00	-39.90	-1.01	0.00	-118.75	0.00	118.75	5016.94	2508.47	12258.7	6138.49	0.04	-0.02	0.00	0.021
25.00	-38.64	-0.99	0.00	-113.69	0.00	113.69	4968.35	2484.18	11895.7	5956.70	0.06	-0.02	0.00	0.021
30.00	-37.40	-0.96	0.00	-108.76	0.00	108.76	4917.65	2458.83	11532.4	5774.82	0.08	-0.02	0.00	0.020
35.00	-36.18	-0.94	0.00	-103.96	0.00	103.96	4864.84	2432.42	11169.4	5593.00	0.11	-0.03	0.00	0.020
40.00	-34.99	-0.91	0.00	-99.27	0.00	99.27	4809.92	2404.96	10806.7	5411.42	0.14	-0.03	0.00	0.019
41.00	-34.75	-0.91	0.00	-98.36	0.00	98.36	4798.68	2399.34	10734.3	5375.14	0.15	-0.03	0.00	0.019
45.00	-33.02	-0.86	0.00	-94.74	0.00	94.74	4752.88	2376.44	10444.9	5230.21	0.18	-0.04	0.00	0.019
48.00	-31.74	-0.83	0.00	-92.14	0.00	92.14	4754.71	2377.36	10456.3	5235.93	0.20	-0.04	0.00	0.019
50.00	-31.27	-0.82	0.00	-90.48	0.00	90.48	4731.34	2365.67	10311.8	5163.58	0.22	-0.04	0.00	0.018
55.00	-30.13	-0.80	0.00	-86.37	0.00	86.37	4671.41	2335.70	9951.50	4983.15	0.26	-0.05	0.00	0.018
60.00	-29.00	-0.77	0.00	-82.38	0.00	82.38	4609.37	2304.68	9592.67	4803.47	0.31	-0.05	0.00	0.017
65.00	-27.90	-0.75	0.00	-78.53	0.00	78.53	4545.22	2272.61	9235.65	4624.69	0.37	-0.05	0.00	0.017
70.00	-26.82	-0.72	0.00	-74.80	0.00	74.80	4478.96	2239.48	8880.76	4446.98	0.43	-0.06	0.00	0.017
75.00	-25.77	-0.70	0.00	-71.19	0.00	71.19	4410.58	2205.29	8528.29	4270.48	0.49	-0.06	0.00	0.016
80.00	-24.73	-0.68	0.00	-67.70	0.00	67.70	4340.09	2170.05	8178.57	4095.36	0.56	-0.07	0.00	0.016
81.00	-24.53	-0.67	0.00	-67.02	0.00	67.02	4325.74	2162.87	8108.99	4060.52	0.57	-0.07	0.00	0.016
81.00	-24.53	-0.67	0.00	-67.02	0.00	67.02	3843.52	1921.76	7205.03	3607.87	0.57	-0.07	0.00	0.018
85.00	-23.72	-0.66	0.00	-64.33	0.00	64.33	3789.25	1894.62	6954.21	3482.28	0.63	-0.07	0.00	0.018
90.00	-21.91	-0.64	0.00	-61.02	0.00	61.02	3719.86	1859.93	6643.95	3326.92	0.71	-0.08	0.00	0.017
91.00	-21.55	-0.63	0.00	-60.38	0.00	60.38	3750.02	1875.01	6777.40	3393.74	0.73	-0.08	0.00	0.017
95.00	-20.76	-0.63	0.00	-57.84	0.00	57.84	3693.87	1846.94	6530.61	3270.16	0.79	-0.08	0.00	0.016
100.00	-19.80	-0.63	0.00	-54.68	0.00	54.68	3622.15	1811.07	6225.69	3117.47	0.88	-0.09	0.00	0.023
105.00	-18.86	-0.63	0.00	-51.52	0.00	51.52	3548.72	1774.36	5924.97	2966.89	0.98	-0.09	0.00	0.023
110.00	-17.94	-0.63	0.00	-48.35	0.00	48.35	3473.57	1736.79	5628.70	2818.54	1.08	-0.10	0.00	0.022
115.00	-17.04	-0.63	0.00	-45.18	0.00	45.18	3396.72	1698.36	5337.14	2672.54	1.19	-0.11	0.00	0.022
120.00	-16.16	-0.64	0.00	-42.00	0.00	42.00	3318.16	1659.08	5050.54	2529.02	1.30	-0.11	0.00	0.021
125.00	-15.31	-0.64	0.00	-38.83	0.00	38.83	3226.71	1613.36	4752.68	2379.87	1.43	-0.12	0.00	0.021
130.00	-14.47	-0.64	0.00	-35.65	0.00	35.65	3120.09	1560.05	4442.21	2224.41	1.56	-0.13	0.00	0.021
135.00	-13.03	-0.63	0.00	-32.47	0.00	32.47	3080.81	1540.41	4330.47	2168.45	1.70	-0.14	0.00	0.019
140.00	-12.22	-0.63	0.00	-29.30	0.00	29.30	2974.19	1487.09	4034.35	2020.17	1.85	-0.15	0.00	0.019
140.00	-12.22	-0.63	0.00	-29.30	0.00	29.30	1787.24	893.62	2442.64	1223.14	1.85	-0.15	0.00	0.031
143.00	-10.63	-0.63	0.00	-27.40	0.00	27.40	1762.68	881.34	2357.06	1180.28	1.94	-0.15	0.00	0.029
145.00	-10.42	-0.63	0.00	-26.14	0.00	26.14	1745.97	872.98	2300.37	1151.90	2.01	-0.15	0.00	0.029
150.00	-9.90	-0.63	0.00	-22.98	0.00	22.98	1703.02	851.51	2160.05	1081.63	2.17	-0.16	0.00	0.027
153.00	-8.66	-0.63	0.00	-21.09	0.00	21.09	1676.45	838.23	2076.88	1039.98	2.28	-0.17	0.00	0.025
155.00	-8.46	-0.63	0.00	-19.83	0.00	19.83	1658.40	829.20	2021.90	1012.45	2.35	-0.18	0.00	0.025
159.00	-6.35	-0.60	0.00	-17.32	0.00	17.32	1621.51	810.75	1913.13	957.99	2.50	-0.18	0.00	0.022
160.00	-6.27	-0.60	0.00	-16.72	0.00	16.72	1612.12	806.06	1886.20	944.50	2.54	-0.19	0.00	0.022
165.00	-5.85	-0.59	0.00	-13.73	0.00	13.73	1564.16	782.08	1753.17	877.89	2.74	-0.19	0.00	0.019
170.00	-5.45	-0.57	0.00	-10.80	0.00	10.80	1514.53	757.27	1623.07	812.74	2.95	-0.20	0.00	0.017
173.00	-3.56	-0.46	0.00	-9.08	0.00	9.08	1483.95	741.98	1546.51	774.41	3.08	-0.21	0.00	0.014

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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175.00	-3.41	-0.46	0.00	-8.15	0.00	8.15	1463.23	731.62	1496.14	749.18	3.17	-0.21	0.013
180.00	-3.05	-0.43	0.00	-5.88	0.00	5.88	1400.09	700.04	1362.73	682.38	3.39	-0.22	0.011
180.00	-3.05	-0.43	0.00	-5.88	0.00	5.88	871.37	435.68	845.88	423.57	3.39	-0.22	0.017
185.00	-2.65	-0.39	0.00	-3.73	0.00	3.73	871.37	435.68	845.88	423.57	3.62	-0.22	0.012
190.00	-2.26	-0.35	0.00	-1.75	0.00	1.75	871.37	435.68	845.88	423.57	3.86	-0.23	0.007
195.00	0.00	-0.34	0.00	0.00	0.00	0.00	871.37	435.68	845.88	423.57	4.09	-0.23	0.000

Wind Loading - Shaft

Structure: CT00167-S-SBA
Site Name: Lisbon
Height: 195.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1

Topography: 1

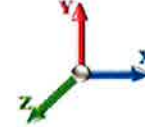
Code: EIA/TIA-222-G 10/21/2016
Exposure: C
Crest Height: 0.00
Site Class: B - Competent Rock
Struct Class: II

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Load Case: 1.0D + 1.0W 60 mph Wind

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		1.00	0.85	7.442	8.19	301.92	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	296.36	0.650	0.000	5.00	27.038	17.57	143.9	0.0	1499.5
10.00		1.00	0.85	7.442	8.19	290.80	0.650	0.000	5.00	26.536	17.25	141.2	0.0	1471.4
15.00	RB1	1.00	0.85	7.442	8.19	285.24	0.650	0.000	5.00	26.034	16.92	138.5	0.0	1443.3
18.00	Top - Section 1	1.00	0.88	7.723	8.50	287.18	0.650	0.000	3.00	15.379	10.00	84.9	0.0	852.5
20.00		1.00	0.90	7.896	8.69	288.09	0.650	0.000	2.00	10.152	6.60	57.3	0.0	482.9
25.00		1.00	0.95	8.276	9.10	289.08	0.650	0.000	5.00	25.029	16.27	148.1	0.0	1190.3
30.00		1.00	0.98	8.600	9.46	288.70	0.650	0.000	5.00	24.526	15.94	150.8	0.0	1166.3
35.00		1.00	1.01	8.883	9.77	287.35	0.650	0.000	5.00	24.024	15.62	152.6	0.0	1142.2
40.00		1.00	1.04	9.137	10.05	285.26	0.650	0.000	5.00	23.521	15.29	153.7	0.0	1118.2
41.00	Bot - Section 3	1.00	1.05	9.184	10.10	284.77	0.650	0.000	1.00	4.644	3.02	30.5	0.0	220.8
45.00		1.00	1.07	9.366	10.30	282.59	0.650	0.000	4.00	18.629	12.11	124.8	0.0	1758.9
48.00	Top - Section 2	1.00	1.08	9.494	10.44	280.74	0.650	0.000	3.00	13.761	8.94	93.4	0.0	1299.0
50.00		1.00	1.09	9.576	10.53	283.41	0.650	0.000	2.00	9.073	5.90	62.1	0.0	431.2
55.00		1.00	1.12	9.770	10.75	279.90	0.650	0.000	5.00	22.331	14.52	156.0	0.0	1061.2
60.00		1.00	1.14	9.951	10.95	276.05	0.650	0.000	5.00	21.829	14.19	155.3	0.0	1037.2
65.00		1.00	1.16	10.120	11.13	271.90	0.650	0.000	5.00	21.327	13.86	154.3	0.0	1013.1
70.00		1.00	1.17	10.279	11.31	267.50	0.650	0.000	5.00	20.824	13.54	153.0	0.0	989.1
75.00		1.00	1.19	10.430	11.47	262.87	0.650	0.000	5.00	20.322	13.21	151.5	0.0	965.0
80.00		1.00	1.21	10.572	11.63	258.04	0.650	0.000	5.00	19.819	12.88	149.8	0.0	941.0
81.00	Top - Section 3	1.00	1.21	10.600	11.66	257.05	0.650	0.000	1.00	3.904	2.54	29.6	0.0	185.3
85.00	Bot - Section 5	1.00	1.22	10.708	11.78	253.02	0.650	0.000	4.00	15.413	10.02	118.0	0.0	731.6
90.00		1.00	1.24	10.838	11.92	247.84	0.650	0.000	5.00	19.132	12.44	148.3	0.0	1801.0
91.00	Top - Section 4	1.00	1.24	10.863	11.95	246.78	0.650	0.000	1.00	3.766	2.45	29.3	0.0	354.4
95.00	RT1	1.00	1.25	10.962	12.06	246.77	0.650	0.000	4.00	14.863	9.66	116.5	0.0	705.3
100.00		1.00	1.27	11.081	12.19	241.32	0.650	0.000	5.00	18.127	11.78	143.6	0.0	860.0
105.00		1.00	1.28	11.195	12.31	235.75	0.650	0.000	5.00	17.625	11.46	141.1	0.0	835.9
110.00		1.00	1.29	11.305	12.44	230.05	0.650	0.000	5.00	17.122	11.13	138.4	0.0	811.9
115.00		1.00	1.30	11.412	12.55	224.25	0.650	0.000	5.00	16.620	10.80	135.6	0.0	787.9
120.00		1.00	1.32	11.514	12.67	218.34	0.650	0.000	5.00	16.117	10.48	132.7	0.0	763.8
125.00		1.00	1.33	11.614	12.78	212.34	0.650	0.000	5.00	15.615	10.15	129.7	0.0	739.8
130.00	Bot - Section 6	1.00	1.34	11.710	12.88	206.24	0.650	0.000	5.00	15.112	9.82	126.5	0.0	715.7
135.00	Top - Section 5	1.00	1.35	11.803	12.98	200.06	0.650	0.000	5.00	14.927	9.70	126.0	0.0	1398.5
140.00	Top - Section 6	1.00	1.36	11.894	13.08	198.24	0.650	0.000	5.00	14.425	9.38	122.7	0.0	682.8
143.00	Appurtenance(s)	1.00	1.36	11.947	13.14	194.46	0.650	0.000	3.00	8.414	5.47	71.9	0.0	266.4
145.00		1.00	1.37	11.982	13.18	191.92	0.650	0.000	2.00	5.509	3.58	47.2	0.0	174.4
150.00		1.00	1.38	12.068	13.27	185.53	0.650	0.000	5.00	13.420	8.72	115.8	0.0	424.8
153.00	Appurtenance(s)	1.00	1.38	12.119	13.33	181.66	0.650	0.000	3.00	7.811	5.08	67.7	0.0	247.2
155.00		1.00	1.39	12.152	13.37	179.07	0.650	0.000	2.00	5.107	3.32	44.4	0.0	161.6
159.00	Appurtenance(s)	1.00	1.40	12.217	13.44	173.85	0.650	0.000	4.00	9.972	6.48	87.1	0.0	315.5
160.00		1.00	1.40	12.233	13.46	172.54	0.650	0.000	1.00	2.443	1.59	21.4	0.0	77.3
165.00		1.00	1.41	12.313	13.54	165.95	0.650	0.000	5.00	11.913	7.74	104.9	0.0	376.7
170.00		1.00	1.42	12.390	13.63	159.30	0.650	0.000	5.00	11.410	7.42	101.1	0.0	360.7
173.00	Appurtenance(s)	1.00	1.42	12.436	13.68	155.28	0.650	0.000	3.00	6.605	4.29	58.7	0.0	208.7
175.00		1.00	1.42	12.466	13.71	152.59	0.650	0.000	2.00	4.303	2.80	38.4	0.0	135.9
180.00	Top - Section 7	1.00	1.43	12.540	13.79	145.83	0.650	0.000	5.00	10.405	6.76	93.3	0.0	328.6
185.00		1.00	1.44	12.613	13.87	146.25	0.650	0.000	5.00	10.154	6.60	91.6	0.0	360.3

Wind Loading - Shaft

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 48



190.00	1.00	1.45	12.684	13.95	146.66	0.650	0.000	5.00	10.154	6.60	92.1	0.0	360.3
195.00 Appurtenance(s)	1.00	1.46	12.753	14.03	147.07	0.650	0.000	5.00	10.154	6.60	92.6	0.0	360.3
Totals:											195.00	5,167.6	35,616.0

Discrete Appurtenance Forces

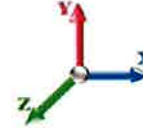
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	AIR 21, 1.3M, B4A B2P	3	12.753	14.029	0.77	0.90	14.14	271.20	0.000	0.000	198.38	0.00	0.00
2	195.00	T-Arm (Flat)	3	12.753	14.029	0.56	0.75	16.88	1200.00	0.000	0.000	236.74	0.00	0.00
3	195.00	AIR 21, 1.3M, B2A B4P	3	12.753	14.029	0.77	0.90	14.14	274.50	0.000	0.000	198.38	0.00	0.00
4	195.00	S11B12	3	12.753	14.029	0.45	0.90	3.82	153.00	0.000	0.000	53.60	0.00	0.00
5	195.00	KRY 112 144/1	3	12.753	14.029	0.45	0.90	0.55	33.00	0.000	0.000	7.76	0.00	0.00
6	195.00	LNx-6515DS-A1M	3	12.753	14.029	0.72	0.90	24.78	149.40	0.000	0.000	347.57	0.00	0.00
7	173.00	ACU-A20-N	4	12.436	13.680	0.40	0.80	0.22	4.00	0.000	0.000	3.06	0.00	0.00
8	173.00	800 MHz ESMR Filter	3	12.436	13.680	0.40	0.80	0.50	30.00	0.000	0.000	6.89	0.00	0.00
9	173.00	800 MHz RRH	3	12.436	13.680	0.40	0.80	2.99	159.00	0.000	0.000	40.87	0.00	0.00
10	173.00	1900MHz RRH	3	12.436	13.680	0.40	0.80	4.56	132.00	0.000	0.000	62.38	0.00	0.00
11	173.00	APXVSP18-C-A20	3	12.436	13.680	0.66	0.80	15.98	171.00	0.000	0.000	218.54	0.00	0.00
12	173.00	Sector Frame-Pipe/Rod	3	12.436	13.680	0.60	0.80	25.20	1350.00	0.000	0.000	344.73	0.00	0.00
13	159.00	RFs FD9R6004/2CL-3CL	6	12.217	13.439	0.80	0.80	1.73	18.60	0.000	0.000	23.22	0.00	0.00
14	159.00	Low Profile Platform-flat	1	12.217	13.439	1.00	1.00	25.00	1200.00	0.000	0.000	335.97	0.00	0.00
15	159.00	SBNHH-1D65B	6	12.217	13.439	0.66	0.80	32.51	240.00	0.000	0.000	436.89	0.00	0.00
16	159.00	BXA-70080-4BF	3	12.217	13.439	0.70	0.80	7.52	36.00	0.000	0.000	101.04	0.00	0.00
17	159.00	Alcatel Lucent B25	3	12.217	13.439	0.65	0.80	4.16	153.00	0.000	0.000	55.91	0.00	0.00
18	159.00	Rfs Celwave	2	12.217	13.439	0.57	0.80	5.45	37.80	0.000	0.000	73.28	0.00	0.00
19	159.00	BXA-70063-6CF-2	3	12.217	13.439	0.58	0.80	13.26	51.00	0.000	0.000	178.23	0.00	0.00
20	159.00	Alcatel Lucent B66	3	12.217	13.439	0.66	0.80	5.00	170.40	0.000	0.000	67.18	0.00	0.00
21	153.00	Standoff Mount	3	12.119	13.330	0.56	0.75	8.44	1050.00	0.000	0.000	112.48	0.00	0.00
22	143.00	742 351	6	11.947	13.142	0.49	0.80	15.75	178.80	0.000	0.000	207.02	0.00	0.00
23	143.00	T-Arm (Flat)	3	11.947	13.142	0.56	0.75	16.88	1200.00	0.000	0.000	221.77	0.00	0.00
Totals:								8,262.70				3,531.91		

Total Applied Force Summary

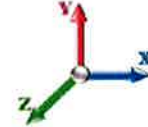
Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II
		Page: 50



Load Case: 1.0D + 1.0W 60 mph Wind

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		143.87	1709.62	0.00	0.00
10.00		141.20	1681.56	0.00	0.00
15.00		138.52	1653.51	0.00	0.00
18.00		84.92	978.64	0.00	0.00
20.00		57.32	566.93	0.00	0.00
25.00		148.10	1400.49	0.00	0.00
30.00		150.81	1376.44	0.00	0.00
35.00		152.59	1352.39	0.00	0.00
40.00		153.66	1328.35	0.00	0.00
41.00		30.50	262.78	0.00	0.00
45.00		124.75	1927.05	0.00	0.00
48.00		93.41	1425.09	0.00	0.00
50.00		62.12	515.29	0.00	0.00
55.00		156.00	1271.39	0.00	0.00
60.00		155.31	1247.35	0.00	0.00
65.00		154.32	1223.30	0.00	0.00
70.00		153.05	1199.25	0.00	0.00
75.00		151.54	1175.21	0.00	0.00
80.00		149.82	1151.16	0.00	0.00
81.00		29.58	227.35	0.00	0.00
85.00		118.01	899.77	0.00	0.00
90.00		148.25	2011.15	0.00	0.00
91.00		29.25	396.46	0.00	0.00
95.00		116.49	873.44	0.00	0.00
100.00		143.61	1070.16	0.00	0.00
105.00		141.08	1046.11	0.00	0.00
110.00		138.40	1022.07	0.00	0.00
115.00		135.61	998.02	0.00	0.00
120.00		132.69	973.97	0.00	0.00
125.00		129.66	949.92	0.00	0.00
130.00		126.53	925.88	0.00	0.00
135.00		125.98	1608.68	0.00	0.00
140.00		122.67	892.97	0.00	0.00
143.00	(9) attachments	500.67	1771.34	0.00	0.00
145.00		47.19	233.37	0.00	0.00
150.00		115.80	572.19	0.00	0.00
153.00	(3) attachments	180.15	1385.62	0.00	0.00
155.00		44.37	220.54	0.00	0.00
159.00	(27) attachments	1358.83	2340.19	0.00	0.00
160.00		21.37	94.14	0.00	0.00
165.00		104.88	461.10	0.00	0.00
170.00		101.09	445.07	0.00	0.00
173.00	(19) attachments	735.22	2105.35	0.00	0.00
175.00		38.35	165.73	0.00	0.00
180.00		93.30	403.11	0.00	0.00
185.00		91.57	434.76	0.00	0.00

Total Applied Force Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 51
	Struct Class: II	



190.00		92.09	434.76	0.00	0.00
195.00	(18) attachments	1135.02	2515.86	0.00	0.00
	Totals:	8,699.54	50,924.88	0.00	0.00

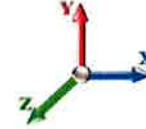
Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 52
	Struct Class: II	



Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	1.37
5.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	5.20
10.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	1.37
10.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	5.20
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	1.37
15.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	5.20
18.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	7.723	0.00	0.82
18.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.033	0.000	7.723	0.00	3.12
18.00	Reinforcing channels	Yes	3.00	0.000	2.00	0.50	0.00	0.033	0.000	7.723	0.00	0.00
20.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	7.896	0.00	0.55
20.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.033	0.000	7.896	0.00	2.08
20.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.33	0.00	0.033	0.000	7.896	0.00	0.00
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	8.276	0.00	1.37
25.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.033	0.000	8.276	0.00	5.20
25.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	8.276	0.00	0.00
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	8.600	0.00	1.37
30.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.034	0.000	8.600	0.00	5.20
30.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.034	0.000	8.600	0.00	0.00
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	8.883	0.00	1.37
35.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	8.883	0.00	5.20
35.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	8.883	0.00	0.00
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	9.137	0.00	1.37
40.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.035	0.000	9.137	0.00	5.20
40.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	9.137	0.00	0.00
41.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	9.184	0.00	0.27
41.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.036	0.000	9.184	0.00	1.04
41.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.17	0.00	0.036	0.000	9.184	0.00	0.00
45.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	9.366	0.00	1.09
45.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.036	0.000	9.366	0.00	4.16
45.00	Reinforcing channels	Yes	4.00	0.000	2.00	0.67	0.00	0.036	0.000	9.366	0.00	0.00
48.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	9.494	0.00	0.82
48.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.037	0.000	9.494	0.00	3.12
48.00	Reinforcing channels	Yes	3.00	0.000	2.00	0.50	0.00	0.037	0.000	9.494	0.00	0.00
50.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	9.576	0.00	0.55
50.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.037	0.000	9.576	0.00	2.08
50.00	Reinforcing channels	Yes	2.00	0.000	2.00	0.33	0.00	0.037	0.000	9.576	0.00	0.00
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	9.770	0.00	1.37
55.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.037	0.000	9.770	0.00	5.20
55.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.037	0.000	9.770	0.00	0.00
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	9.951	0.00	1.37
60.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.038	0.000	9.951	0.00	5.20
60.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	9.951	0.00	0.00
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	10.120	0.00	1.37
65.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.039	0.000	10.120	0.00	5.20
65.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.039	0.000	10.120	0.00	0.00
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	10.279	0.00	1.37
70.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.040	0.000	10.279	0.00	5.20

Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II

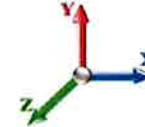


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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
70.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.040	0.000	10.279	0.00	0.00
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	10.430	0.00	1.37
75.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.041	0.000	10.430	0.00	5.20
75.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.041	0.000	10.430	0.00	0.00
80.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	10.572	0.00	1.37
80.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.042	0.000	10.572	0.00	5.20
80.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.042	0.000	10.572	0.00	0.00
81.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	10.600	0.00	0.27
81.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.043	0.000	10.600	0.00	1.04
81.00	Reinforcing channels	Yes	1.00	0.000	2.00	0.17	0.00	0.043	0.000	10.600	0.00	0.00
85.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	10.708	0.00	1.09
85.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.043	0.000	10.708	0.00	4.16
85.00	Reinforcing channels	Yes	4.00	0.000	2.00	0.67	0.00	0.043	0.000	10.708	0.00	0.00
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	10.838	0.00	1.37
90.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.044	0.000	10.838	0.00	5.20
90.00	Reinforcing channels	Yes	5.00	0.000	2.00	0.83	0.00	0.044	0.000	10.838	0.00	0.00
91.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	10.863	0.00	0.27
91.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	10.863	0.00	1.04
91.00	Reinforcing channels	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	10.863	0.00	0.00
95.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	10.962	0.00	1.09
95.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	10.962	0.00	4.16
95.00	Reinforcing channels	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	10.962	0.00	0.00
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.081	0.00	1.37
100.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.081	0.00	5.20
100.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.081	0.00	0.00
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.195	0.00	1.37
105.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.195	0.00	5.20
105.00	Reinforcing channels	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.195	0.00	0.00
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.305	0.00	1.37
110.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.305	0.00	5.20
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.412	0.00	1.37
115.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.412	0.00	5.20
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.514	0.00	1.37
120.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.514	0.00	5.20
125.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.614	0.00	1.37
125.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.614	0.00	5.20
130.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.710	0.00	1.37
130.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.710	0.00	5.20
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.803	0.00	1.37
135.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.803	0.00	5.20
140.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.894	0.00	1.37
140.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.894	0.00	5.20
143.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	11.947	0.00	0.82
143.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	11.947	0.00	3.12
145.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	11.982	0.00	0.55
145.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	11.982	0.00	2.08
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.068	0.00	1.37

Linear Appurtenance Segment Forces (Factored)

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 54
	Struct Class: II	



Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
150.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.068	0.00	5.20
153.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	12.119	0.00	0.82
153.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	12.119	0.00	3.12
155.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	12.152	0.00	0.55
155.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	12.152	0.00	2.08
159.00	Safety Cable	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	12.217	0.00	1.09
159.00	Step bolts (ladder)	Yes	4.00	0.000	0.00	0.00	0.00	0.000	0.000	12.217	0.00	4.16
160.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	12.233	0.00	0.27
160.00	Step bolts (ladder)	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	12.233	0.00	1.04
165.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.313	0.00	1.37
165.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.313	0.00	5.20
170.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.390	0.00	1.37
170.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.390	0.00	5.20
173.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	12.436	0.00	0.82
173.00	Step bolts (ladder)	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	12.436	0.00	3.12
175.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	12.466	0.00	0.55
175.00	Step bolts (ladder)	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	12.466	0.00	2.08
180.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.540	0.00	1.37
180.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.540	0.00	5.20
185.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.613	0.00	1.37
185.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.613	0.00	5.20
190.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.684	0.00	1.37
190.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.684	0.00	5.20
195.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.753	0.00	1.37
195.00	Step bolts (ladder)	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.753	0.00	5.20
Totals:											0.0	256.0

Calculated Forces

Structure: CT00167-S-SBA **Code:** EIA/TIA-222-G 10/21/2016
Site Name: Lisbon **Exposure:** C
Height: 195.00 (ft) **Crest Height:** 0.00
Base Elev: 0.000 (ft) **Site Class:** B - Competent Rock
Gh: 1.1 **Topography:** 1 **Struct Class:** II Page: 55

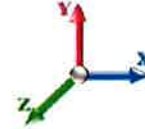


Load Case: 1.0D + 1.0W 60 mph Wind

Iterations 24

Dead Load Factor 1.00

Wind Load Factor 1.00



Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-50.92	-8.71	0.00	-1112.0	0.00	1112.07	6497.76	3248.88	17121.8	8573.64	0.00	0.000	0.000	0.138
5.00	-49.21	-8.60	0.00	-1068.5	0.00	1068.50	6432.14	3216.07	16632.6	8328.66	0.02	-0.034	0.000	0.136
10.00	-47.52	-8.48	0.00	-1025.5	0.00	1025.51	6364.44	3182.22	16144.5	8084.28	0.07	-0.068	0.000	0.134
15.00	-45.86	-8.36	0.00	-983.09	0.00	983.09	6294.68	3147.34	15658.0	7840.66	0.16	-0.102	0.000	0.106
18.00	-44.88	-8.29	0.00	-957.99	0.00	957.99	6251.82	3125.91	15366.9	7694.92	0.23	-0.120	0.000	0.105
18.00	-44.88	-8.29	0.00	-957.99	0.00	957.99	5035.78	2517.89	12403.8	6211.14	0.23	-0.120	0.000	0.112
20.00	-44.31	-8.25	0.00	-941.42	0.00	941.42	5016.94	2508.47	12258.7	6138.49	0.28	-0.131	0.000	0.125
25.00	-42.91	-8.12	0.00	-900.18	0.00	900.18	4968.35	2484.18	11895.7	5956.70	0.44	-0.163	0.000	0.123
30.00	-41.53	-7.99	0.00	-859.59	0.00	859.59	4917.65	2458.83	11532.4	5774.82	0.63	-0.195	0.000	0.120
35.00	-40.17	-7.85	0.00	-819.65	0.00	819.65	4864.84	2432.42	11169.4	5593.00	0.85	-0.228	0.000	0.117
40.00	-38.84	-7.71	0.00	-780.38	0.00	780.38	4809.92	2404.96	10806.7	5411.42	1.11	-0.261	0.000	0.115
41.00	-38.58	-7.69	0.00	-772.67	0.00	772.67	4798.68	2399.34	10734.3	5375.14	1.16	-0.268	0.000	0.114
45.00	-36.65	-7.57	0.00	-741.93	0.00	741.93	4752.88	2376.44	10444.9	5230.21	1.40	-0.295	0.000	0.111
48.00	-35.22	-7.48	0.00	-719.22	0.00	719.22	4754.71	2377.36	10456.3	5235.93	1.59	-0.315	0.000	0.112
50.00	-34.70	-7.43	0.00	-704.27	0.00	704.27	4731.34	2365.67	10311.8	5163.58	1.72	-0.328	0.000	0.107
55.00	-33.43	-7.28	0.00	-667.14	0.00	667.14	4671.41	2335.70	9951.50	4983.15	2.08	-0.361	0.000	0.105
60.00	-32.18	-7.14	0.00	-630.73	0.00	630.73	4609.37	2304.68	9592.67	4803.47	2.48	-0.394	0.000	0.102
65.00	-30.95	-6.99	0.00	-595.05	0.00	595.05	4545.22	2272.61	9235.65	4624.69	2.91	-0.426	0.000	0.099
70.00	-29.75	-6.85	0.00	-560.10	0.00	560.10	4478.96	2239.48	8880.76	4446.98	3.37	-0.459	0.000	0.096
75.00	-28.57	-6.70	0.00	-525.87	0.00	525.87	4410.58	2205.29	8528.29	4270.48	3.87	-0.493	0.000	0.093
80.00	-27.42	-6.55	0.00	-492.36	0.00	492.36	4340.09	2170.05	8178.57	4095.36	4.41	-0.526	0.000	0.090
81.00	-27.19	-6.53	0.00	-485.81	0.00	485.81	4325.74	2162.87	8108.99	4060.52	4.52	-0.533	0.000	0.090
81.00	-27.19	-6.53	0.00	-485.81	0.00	485.81	3843.52	1921.76	7205.03	3607.87	4.52	-0.533	0.000	0.101
85.00	-26.29	-6.41	0.00	-459.70	0.00	459.70	3789.25	1894.62	6954.21	3482.28	4.98	-0.559	0.000	0.098
90.00	-24.28	-6.25	0.00	-427.63	0.00	427.63	3719.86	1859.93	6643.95	3326.92	5.58	-0.593	0.000	0.094
91.00	-23.88	-6.23	0.00	-421.38	0.00	421.38	3750.02	1875.01	6777.40	3393.74	5.71	-0.599	0.000	0.095
95.00	-23.00	-6.11	0.00	-396.47	0.00	396.47	3693.87	1846.94	6530.61	3270.16	6.22	-0.626	0.000	0.089
100.00	-21.93	-5.97	0.00	-365.90	0.00	365.90	3622.15	1811.07	6225.69	3117.47	6.89	-0.657	0.000	0.123
105.00	-20.88	-5.84	0.00	-336.03	0.00	336.03	3548.72	1774.36	5924.97	2966.89	7.60	-0.703	0.000	0.119
110.00	-19.86	-5.70	0.00	-306.85	0.00	306.85	3473.57	1736.79	5628.70	2818.54	8.36	-0.748	0.000	0.115
115.00	-18.86	-5.57	0.00	-278.35	0.00	278.35	3396.72	1698.36	5337.14	2672.54	9.17	-0.793	0.000	0.110
120.00	-17.88	-5.43	0.00	-250.53	0.00	250.53	3318.16	1659.08	5050.54	2529.02	10.03	-0.837	0.000	0.104
125.00	-16.93	-5.30	0.00	-223.36	0.00	223.36	3226.71	1613.36	4752.68	2379.87	10.93	-0.881	0.000	0.099
130.00	-16.00	-5.17	0.00	-196.85	0.00	196.85	3120.09	1560.05	4442.21	2224.41	11.87	-0.924	0.000	0.094
135.00	-14.39	-5.03	0.00	-170.99	0.00	170.99	3080.81	1540.41	4330.47	2168.45	12.86	-0.965	0.000	0.084
140.00	-13.50	-4.90	0.00	-145.83	0.00	145.83	2974.19	1487.09	4034.35	2020.17	13.90	-1.005	0.000	0.077
140.00	-13.50	-4.90	0.00	-145.83	0.00	145.83	1787.24	893.62	2442.64	1223.14	13.90	-1.005	0.000	0.127
143.00	-11.73	-4.37	0.00	-131.14	0.00	131.14	1762.68	881.34	2357.06	1180.28	14.53	-1.027	0.000	0.118
145.00	-11.50	-4.33	0.00	-122.39	0.00	122.39	1745.97	872.98	2300.37	1151.90	14.97	-1.047	0.000	0.113
150.00	-10.93	-4.21	0.00	-100.75	0.00	100.75	1703.02	851.51	2160.05	1081.63	16.09	-1.095	0.000	0.100
153.00	-9.54	-4.01	0.00	-88.13	0.00	88.13	1676.45	838.23	2076.88	1039.98	16.79	-1.123	0.000	0.090
155.00	-9.32	-3.96	0.00	-80.12	0.00	80.12	1658.40	829.20	2021.90	1012.45	17.26	-1.140	0.000	0.085
159.00	-7.01	-2.56	0.00	-64.28	0.00	64.28	1621.51	810.75	1913.13	957.99	18.23	-1.171	0.000	0.071
160.00	-6.91	-2.54	0.00	-61.72	0.00	61.72	1612.12	806.06	1886.20	944.50	18.48	-1.179	0.000	0.070
165.00	-6.45	-2.43	0.00	-49.04	0.00	49.04	1564.16	782.08	1753.17	877.89	19.73	-1.213	0.000	0.060
170.00	-6.01	-2.32	0.00	-36.91	0.00	36.91	1514.53	757.27	1623.07	812.74	21.02	-1.243	0.000	0.049
173.00	-3.92	-1.54	0.00	-29.96	0.00	29.96	1483.95	741.98	1546.51	774.41	21.81	-1.259	0.000	0.041
175.00	-3.76	-1.50	0.00	-26.89	0.00	26.89	1463.23	731.62	1496.14	749.18	22.34	-1.269	0.000	0.038

Calculated Forces

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Page: 56
	Struct Class: II	



180.00	-3.35	-1.39	0.00	-19.41	0.00	19.41	1400.09	700.04	1362.73	682.38	23.68	-1.290	0.000	0.031
180.00	-3.35	-1.39	0.00	-19.41	0.00	19.41	871.37	435.68	845.88	423.57	23.68	-1.290	0.000	0.050
185.00	-2.92	-1.29	0.00	-12.43	0.00	12.43	871.37	435.68	845.88	423.57	25.04	-1.307	0.000	0.033
190.00	-2.49	-1.19	0.00	-5.96	0.00	5.96	871.37	435.68	845.88	423.57	26.41	-1.315	0.000	0.017
195.00	0.00	-1.13	0.00	0.00	0.00	0.00	871.37	435.68	845.88	423.57	27.79	-1.318	0.000	0.000

Final Analysis Summary

Structure: CT00167-S-SBA	Code: EIA/TIA-222-G	10/21/2016
Site Name: Lisbon	Exposure: C	
Height: 195.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: B - Competent Rock	
Gh: 1.1	Topography: 1	Struct Class: II



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Reactions

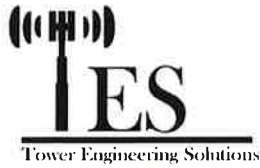
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 105 mph Wind	42.7	0.00	61.05	0.00	0.00	5478.89
0.9D + 1.6W 105 mph Wind	42.7	0.00	45.77	0.00	0.00	5423.38
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.7	0.00	89.29	0.00	0.00	1355.92
1.2D + 1.0E	1.1	0.00	61.11	0.00	0.00	141.70
0.9D + 1.0E	1.1	0.00	45.83	0.00	0.00	140.14
1.0D + 1.0W 60 mph Wind	8.7	0.00	50.92	0.00	0.00	1112.07

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 105 mph Wind	-61.05	-42.72	0.00	-5478.8	0.00	-5478.8	6497.76	3248.8	17121.8	8573.64	0.00	0.649
0.9D + 1.6W 105 mph Wind	-45.77	-42.69	0.00	-5423.3	0.00	-5423.3	6497.76	3248.8	17121.8	8573.64	0.00	0.640
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-89.29	-10.74	0.00	-1355.9	0.00	-1355.9	6497.76	3248.8	17121.8	8573.64	0.00	0.172
1.2D + 1.0E	-16.30	-0.64	0.00	-29.67	0.00	-29.67	2974.19	1487.0	4034.35	2020.17	140.00	0.033
0.9D + 1.0E	-12.22	-0.63	0.00	-29.30	0.00	-29.30	2974.19	1487.0	4034.35	2020.17	140.00	0.031
1.0D + 1.0W 60 mph Wind	-50.92	-8.71	0.00	-1112.0	0.00	-1112.0	6497.76	3248.8	17121.8	8573.64	0.00	0.138

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors			Lower Termination		Upper Termination				Max Member				
			VQ/I (lb/in)	Vu (kips)	phi Vn (kips)	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	Pu (kips)	phi Pn (kips)	phi Tn (kips)
15.0	95.0	(6) PLT-C6x10.5 (no hole)	130.5	0.00	37.1	119.9	0.0	3	99.8	37.1	3	3	134.07	180.8	180.17	0.744



Monopole Mat Foundation Design

Date
12/8/2015

Customer Name:	Verizon	EIA/TIA Standard:	EIA-222-F
Site Name:		Structure Height (Ft.):	195
Site Number:	CT00167-S-SBA	Engineer Name:	T. Alajaj
Engr. Number:	27030	Engineer Login ID:	TES

Foundation Info Obtained from:

Drawings/Calculations

Structure Type:

Monopole

Analysis or Design?

Analysis

Base Reactions (Unfactored)

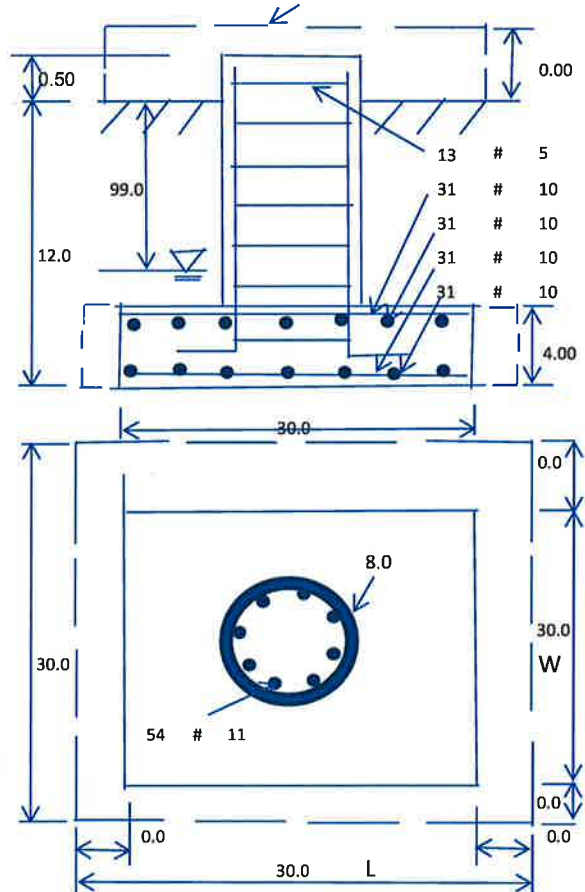
Axial Load (Kips):	61.1	Shear Force (Kips):	42.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5524.3

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	8.0	Depth of Base BG (ft.):	12.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	30	Width of Pad (ft.):	30
Final Length of pad (ft)	30.0	Final width of pad (ft):	30.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0

Material Properties and Rebar Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	54	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	10	
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):	31	Qty. of Rebar in Pad (W):	31	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	31	Qty. of Rebar in Pad (W):	31	



Soil Design Parameters:

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf
Allowable Net Soil Bearing (psf):	8000	Allowable Skin Friction:	0	Psf
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No	Angle from Botm of Pad:
Consider soil hori. force for O.T.M.:	No	Reduction factor on the maximum soil bearing pressure:	1.00	25

Foundation Analysis and Design:

Total Dry Soil Volume (cu. Ft.):	6797.88	Total Dry Soil Weight (Kips):	849.73
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	849.73	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	4027.26	Total Dry Concrete Weight (Kips):	604.09
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	604.09	Total Vertical Load on Base (Kips):	1514.87

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	2012	<	Allowable Soil Bearing (psf):	8000	0.25	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	15148.7	>	Applied Momont (kips-ft):	6058	0.40	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	3.75					OK!

Load/
Capacity
Ratio

Check the capacities of Reinforcing Concrete:

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

Load/
Capacity
Ratio

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.56	Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	15197.3	> Design Factored Moment (Mu, Kips-Ft)	5887.2	0.39	OK!
Calculated Shear Capacity (Kips):	832.8	> Design Factored Shear (Kips):	55.5	0.07	OK!
Calculated Tension Capacity (Tn, Kips):	4549.0	> Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9486.2	> Design Factored Axial Load (Pu Kips):	79.4	0.01	OK!
Moment & Axial Strength Combination:	0.39	OK! Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.012	Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1312.5	> One-Way Factored Shear (L-D. Kips):	322.2	0.25	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1312.5	> One-Way Factored Shear (W-D., Kips)	322.2	0.25	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1506.1	> One-Way Factored Shear (C-C, Kips):	547.5	0.36	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0025	OK! Lower Steel Pad Reinf. Ratio (W-Direct	0.0025		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	7633.8	> Moment at Bottom (L-Direct. K-Ft):	904.9	0.12	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	7633.8	> Moment at Bottom (W-Direct. K-Ft):	904.9	0.12	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	10720.9	> Moment at Bottom (C-C Dir. K-Ft):	1279.8	0.12	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0025	OK! Upper Steel Reinf. Ratio (W-Direct.):	0.0025		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	7633.8	> Moment at the top (L-Dir Kips-Ft):	949.4	0.12	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	7633.8	> Moment at the top (W-Dir Kips-Ft):	949.4	0.12	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	10720.9	> Moment at the top (C-C Direc. K-Ft):	1414.1	0.13	OK!