Filed by:
Kri Pelletier, Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3804 - kpelletier@sbasite.com

June 29, 2018

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

Notice of Exempt Modification
154 Sayle Avenue, Putnam, CT 06260
41 55 46.02 N
-71 53 10.58 W
Sprint #: CT23XC409_DOMU

Dear Ms. Bachman:

Sprint currently maintains antennas at the 177-foot level of the existing 175-foot Monopole Tower at 154 Sayles Avenue, Putnam, CT. The tower is owned by SBA Towers, LLC. The property is owned by Ronald R. Blain / Blain & Moser. Sprint now intends to replace (6) existing cell antenna with (6) newer technology cell antennas at the 177-foot level of the tower. Sprint's proposed full scope of work is as follows:

Remove: N/A

Remove and Replace:

- Remove:
  - (6) KMW - ETCR-654L12H6 – Panel Antennas
- Replace with:
  - (3) Commscope NNVV-65B-R4 – Panel Antennas
  - (3) RFS APXVTM14-ALU-120 Panel Antennas

Install:

- (3) ALU - 1900MHz – RRUs
- (6) ALU - 800 MHz – RRUs
- (3) ALU - TD-RRH8x20-25 – RRUs
- (1) SitePro PRK-1245L kit
- (1) Sitepro PRK-SFS-L V-brace kit
- (3) 2" std. pipe x 12.5' horizontal rails
- (3) 2" std. pipe x 4' corner braces
- (6) puck brackets

Existing Equipment to Remain (Including entitlements):

- (3) T-arms
- (4) 1-1/4" fiber
- *At 55.5'*
  - (1) GPS
  - (1) standoff
  - (1) ½ line

This facility was approved prior to the Council's jurisdiction. Up to a 180' multi-tenant monopole was approved by the Town of Putnam Zoning Board of Appeals on September 15, 1998. The Special Use Permit did not put forth any further conditions and this modification is in full compliance.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §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 the Town of Putnam's Mayor, Barney Seney and Land Use Agent, Fredrick E. Wojick, as well as to the Property Owner. Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Kri Pelletier
Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581

508.251.0720 x3804 + T
508.366.2610 + F
203.446.7700 + C
kpelletier@sbasite.com

Attachments

cc: The Honorable Barney Seney / with attachments
Town of Putnam, Town Hall, 126 Church St, Putnam, CT 06260 860-963-6800
Fredrick E. Wojick, Land Use Agent / with attachments
Town of Putnam, Town Hall, 126 Church St, Putnam, CT 06260 860-963-6800
Ronald R. Blain / Blain & Moser / with attachments
587 Riverside Drive, North Grosvenordale, CT 06255
and
William F. Moser / with attachments
3210 Bent Pine Drive Fort Pierce FL 34951-2969

POWER DENSITY

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**177 feet**	Height (AGL):	**177 feet**	Height (AGL):	**177 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	**1.11 %**	Antenna B1 MPE%	**1.11 %**	Antenna C1 MPE%	**1.11 %**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-ALU- I20	Make / Model:	RFS APXVTM14-ALU- I20	Make / Model:	RFS APXVTM14-ALU- I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**177 feet**	Height (AGL):	**177 feet**	Height (AGL):	**177 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.77 %**	Antenna B2 MPE%	**0.77 %**	Antenna C2 MPE%	**0.77 %**

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	**1.88 %**
AT&T	3.17 %
MetroPCS	0.34 %
Nextel	0.24 %
Verizon Wireless	2.20 %
Voicestream (T-Mobile)	0.12 %
Site Total MPE %:	**7.95 %**

SPRINT Sector A Total:	1.88 %
SPRINT Sector B Total:	1.88 %
SPRINT Sector C Total:	1.88 %
Site Total:	7.95 %

SPRINT _ Frequency Band / Technology Max Power Values (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	177	0.46	850 MHz	567	0.08%
Sprint 850 MHz LTE	2	941.82	177	2.32	850 MHz	567	0.41%
Sprint 1900 MHz (PCS) CDMA	5	511.82	177	3.15	1900 MHz (PCS)	1000	0.31%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	177	3.15	1900 MHz (PCS)	1000	0.31%
Sprint 2500 MHz (BRS) LTE	8	778.09	177	7.65	2500 MHz (BRS)	1000	0.77%
						Total:	**1.88%**

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

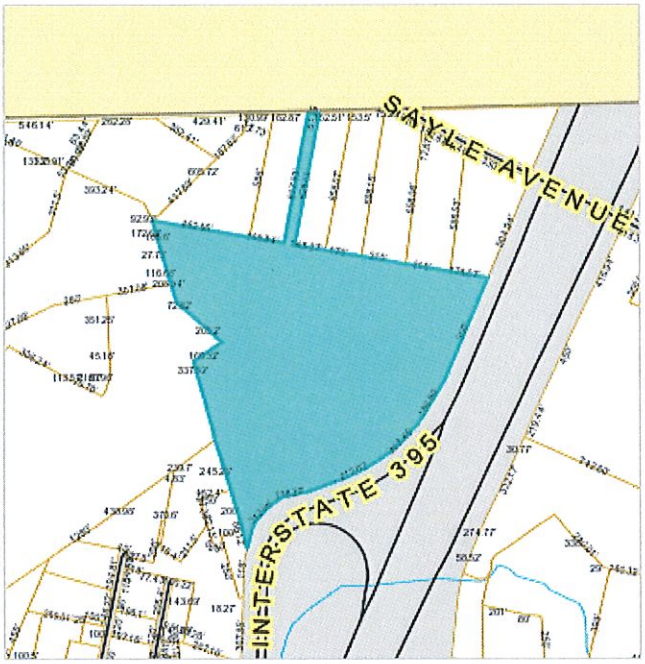
Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Property Record Card

Card 1 of 1

154 SAYLES AVE

ID: **021-023** Account #: **000301**



Owner: BLAIN & MOSER
Co-Owner:
Address: 587 RIVERSIDE DR
NO GROSVENORDALE CT 06255

Assessment: Total: 57400
Building: 0 Land: 57400 Yard: 0

Sales History

Grantor	Book / Page	Sale Date	Sale Price
BLAIN & MOSER	0146/0223	1986-11-14	63000

MainStreetGIS, LLC
www.mainstreetgis.com

Land Information
Land Area: 30.13 AC Zoning: SZD
Land Use: 6-3I - Open Space MDL-96
Neighborhood: 4

Building Information
Style:
Year Built: 0
Rooms: Bedrooms:
Baths: Half Baths:
Living Area:
Gross Area:
Stories:
Heat Fuel:
Heat Type:
AC Type:
Roof Structure:
Roof Covering:

Extra Features

Description	Area / Units	Assessment

Sub Areas

Description	Living Area	Gross Area

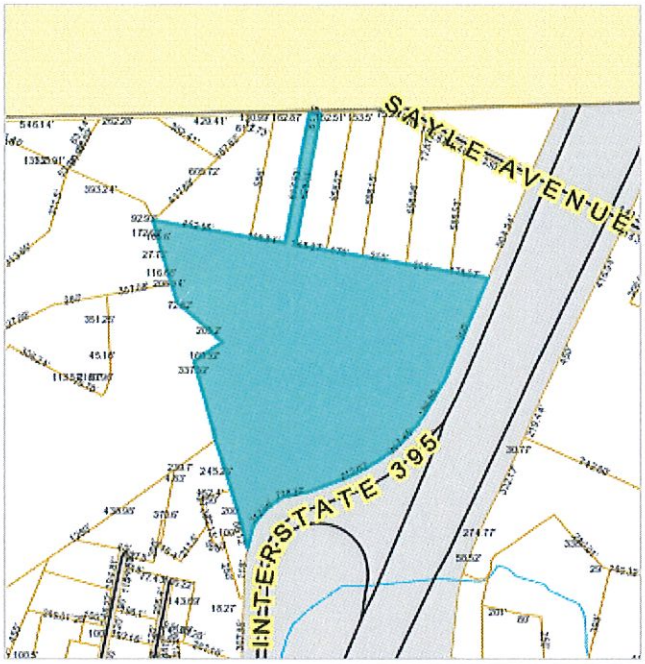
Printed from: http://www.mainstreetmaps.com/ct/putnam/

Property Record Card

Card 1 of 1

154 SAYLES AVE

ID: **021-023** Account #: **003961**



Owner: SBA TOWER INC
Co-Owner:
Address: ATTN TAX DEPT, CT 00680-S
BOCA RATAN FL 33487

Assessment: Total: 618000
Building: 0 Land: 0 Yard: 618000

Sales History

Grantor	Book / Page	Sale Date	Sale Price
SBA TOWER INC	0/ 0	2001-01-01	

MainStreetGIS, LLC
www.mainstreetgis.com

Land Information
Land Area: 0 AC Zoning: SZD
Land Use: 5-1 - Res. Land MDL-00
Neighborhood: 0040

Building Information
Style:
Year Built:
Rooms: Bedrooms:
Baths: Half Baths:
Living Area:
Gross Area:
Stories:
Heat Fuel:
Heat Type:
AC Type:
Roof Structure:
Roof Covering:

Extra Features

Description	Area / Units	Assessment
Cell Tower		618000

Sub Areas

Description	Living Area	Gross Area

Printed from: http://www.mainstreetmaps.com/ct/putnam/

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

SPRINT Existing Facility

Site ID: CT23XC409

Putnam
154 Sayle Avenue
Putnam, CT 06260

June 21, 2018

EBI Project Number: 6218004576

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.95 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

June 21, 2018

SPRINT
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Emissions Analysis for Site: **CT23XC409 – Putnam**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **154 Sayle Avenue, Putnam, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **154 Sayle Avenue, Putnam, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **177 feet** above ground level (AGL) for **Sector A**, **177 feet** above ground level (AGL) for **Sector B** and **177 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general population threshold limits.

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**177 feet**	Height (AGL):	**177 feet**	Height (AGL):	**177 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	**1.11 %**	Antenna B1 MPE%	**1.11 %**	Antenna C1 MPE%	**1.11 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**177 feet**	Height (AGL):	**177 feet**	Height (AGL):	**177 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.77 %**	Antenna B2 MPE%	**0.77 %**	Antenna C2 MPE%	**0.77 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.88 %**
AT&T	3.17 %
MetroPCS	0.34 %
Nextel	0.24 %
Verizon Wireless	2.20 %
Voicestream (T-Mobile)	0.12 %
Site Total MPE %:	**7.95 %**

SPRINT Sector A Total:	1.88 %
SPRINT Sector B Total:	1.88 %
SPRINT Sector C Total:	1.88 %
Site Total:	7.95 %

SPRINT _ Frequency Band / Technology Max Power Values (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	177	0.46	850 MHz	567	0.08%
Sprint 850 MHz LTE	2	941.82	177	2.32	850 MHz	567	0.41%
Sprint 1900 MHz (PCS) CDMA	5	511.82	177	3.15	1900 MHz (PCS)	1000	0.31%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	177	3.15	1900 MHz (PCS)	1000	0.31%
Sprint 2500 MHz (BRS) LTE	8	778.09	177	7.65	2500 MHz (BRS)	1000	0.77%
						Total:	**1.88%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	1.88 %
Sector B:	1.88 %
Sector C:	1.88 %
SPRINT Maximum Total (per sector):	1.88 %
Site Total:	7.95 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.95 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

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

Structural Analysis Report

Existing 175 ft Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT00680-S

Customer Site Name: Putnam

Carrier Name: Sprint Nextel

Carrier Site ID / Name: CT23XC409 / Putnam

Site Location: 154 Sayle Avenue

Putnam, Connecticut

Windham County

Latitude: 41.929449

Longitude: -71.886272

5/31/18

Analysis Result:

Max Structural Usage: 97.9% [Pass]

Max Foundation Usage: 48% [Pass]

Additional Usage Caused by Mount Modification: 5.0%

Report Prepared By: Mariana Franco

Introduction

The purpose of this report is to summarize the analysis results on the 175 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	Tower Drawing prepared by Fred A. Nudd, drawing #98-6220-1 dated 11/12/98
Foundation Drawing	Foundation Drawing prepared by Fred A. Nudd, drawing #98-6220-2 dated 11/12/98
Geotechnical Report	Geotechnical Report prepared by Jaworski Geotech, Project #C98291G dated 8/4/98
Modification Drawings	Modification Drawing prepared by o2wirelss Solutions, Job #2230-019 dated 5/30/02 Modification Drawing prepared by FDH, Project #12-01602E S2 dated 4/30/12 Modification Drawing prepared by TES, Job #17447 dated 12/21/15

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} = 130.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101.0 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:	B
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.172g, S_1 = 0.063g

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

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	191.5	6	EMS - DR65-18-02DPL2Q - Panel	(3) 24' x 4.5 Pipe Mounts	(12) 1 5/8"	T-Mobile
2	188.5	6	Andrew - E15S09P9402 - TMA/TTA			
-	177.0	3	KMW - ETCR-654L12H6 - Panel	(3) T-arms	(4) 1 1/4" Fiber	Sprint Nextel
-		3	ALU - 1900MHz - RRU			
-		6	ALU - 800 MHz - RRU			
-		3	ALU - TD-RRH8x20-25 - RRU			
8	148.0	3	Amphenol - BXA-80080/4CF - Panel	Low Profile Platform	(11) 1 5/8" (2) 1 5/8" Hybrid	Verizon
9		6	Commscope - SBNHH-1D65B - Panel			
10		3	Amphenol - BXA-70063-6CF-EDIN-X - Panel			
11		6	RFS - FD9R6004-2C-3L - Diplexer			
12		3	ALU - RRH2X60-AWS - RRU			
13		3	ALU - RRH2X60-PCS - RRU			
14		3	ALU - RRH2X60-700 - RRU			
15		2	RFS - DB-T1-6Z-8AB-0Z - Distribution Box			
16	137.5	3	Powerwave 7770 - Panel	Low Profile Platform	(12) 1 5/8" ** (4) 3/4" DC **(2) 7/16" Fiber	AT&T
17		3	KMW AM-X-CD-17-65-00T-RET - Panel			
18		6	Powerwave LGP21401 TMA			
19		3	Ericsson RRUS 11			
20		1	Raycap DC6-48-60-18-8F - Surge			
21		3	Cci Antennas TPA-65R-LCUUUU-H8 - Panel			
22		6	Ericsson RRUS-32			
23		3	Kaelus DBC0061F1V51-2- Combiner			
24		1	Raycap DC6-48-60-18-8C - Surge			
26	124.0	6	Kathrein - 742 351 - Panel	Low Profile Platform	(12) 1 5/8" (1) 3/8" RET	Metro PCS
27	55.5	1	Lucent - GPS	Standoff	(1) 1/2"	Sprint

**Existing (2) 3/4" DC and (1) 7/16" Fiber lines are routed in (1) 3" Flex Conduit.

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

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
3	177.0	3	ALU 1900 Mhz - RRUs	(3) T-Arms w/ (1) SitePro PRK-1245L reinforcement kit, (1) SitePro PRK-SFS-L V-brace kit, (3) 2" std. pipe x 12.5' horizontal rails, (3) 2" std. pipe x 4' corner braces, and (6) Puck Brackets	(4) 1 1/4" Fiber	Sprint Nextel
4		6	ALU 800 Mhz - RRUs			
5		3	ALU TD-RRH8x20-25 - RRUs			
6		3	RFS APXVTM14-C-I20 - Panel			
7		3	Commscope NNVV-65B-R4 - Panel			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**97.9%**	**72.0%**	**78.3%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	5353.5	43.1	56.0

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 1.7484 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 88.26% at 105.0ft

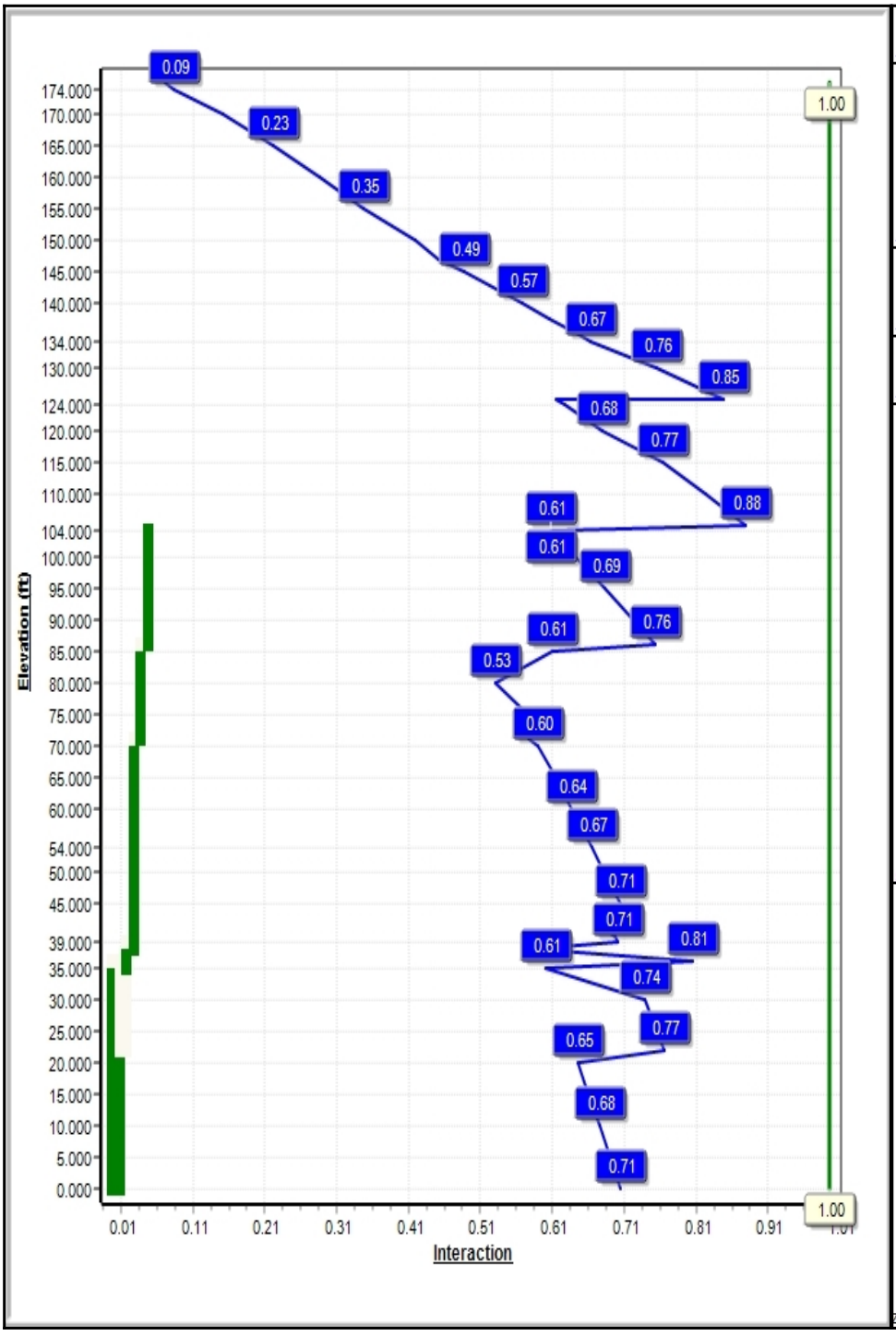
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam	**Exposure:**	B	
Height:	175.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

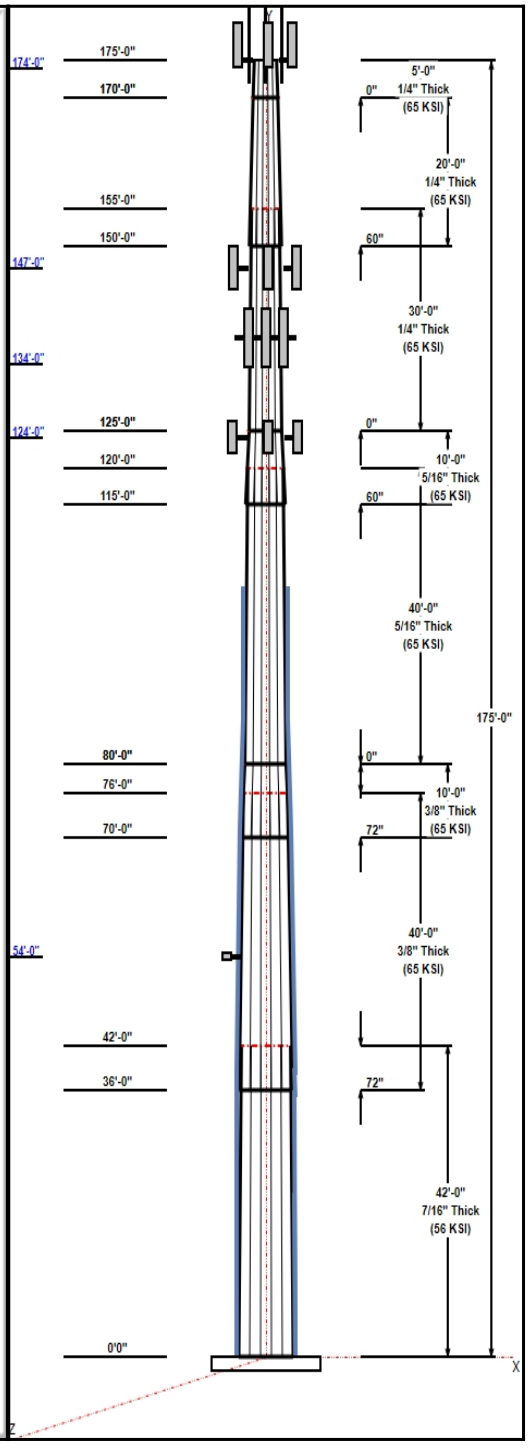
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 101 mph Wind

Iterations: 25





Structure: CT00680-S-SBA

Type: Custom
Site Name: Putnam
Height: 175.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.19338

5/31/2018

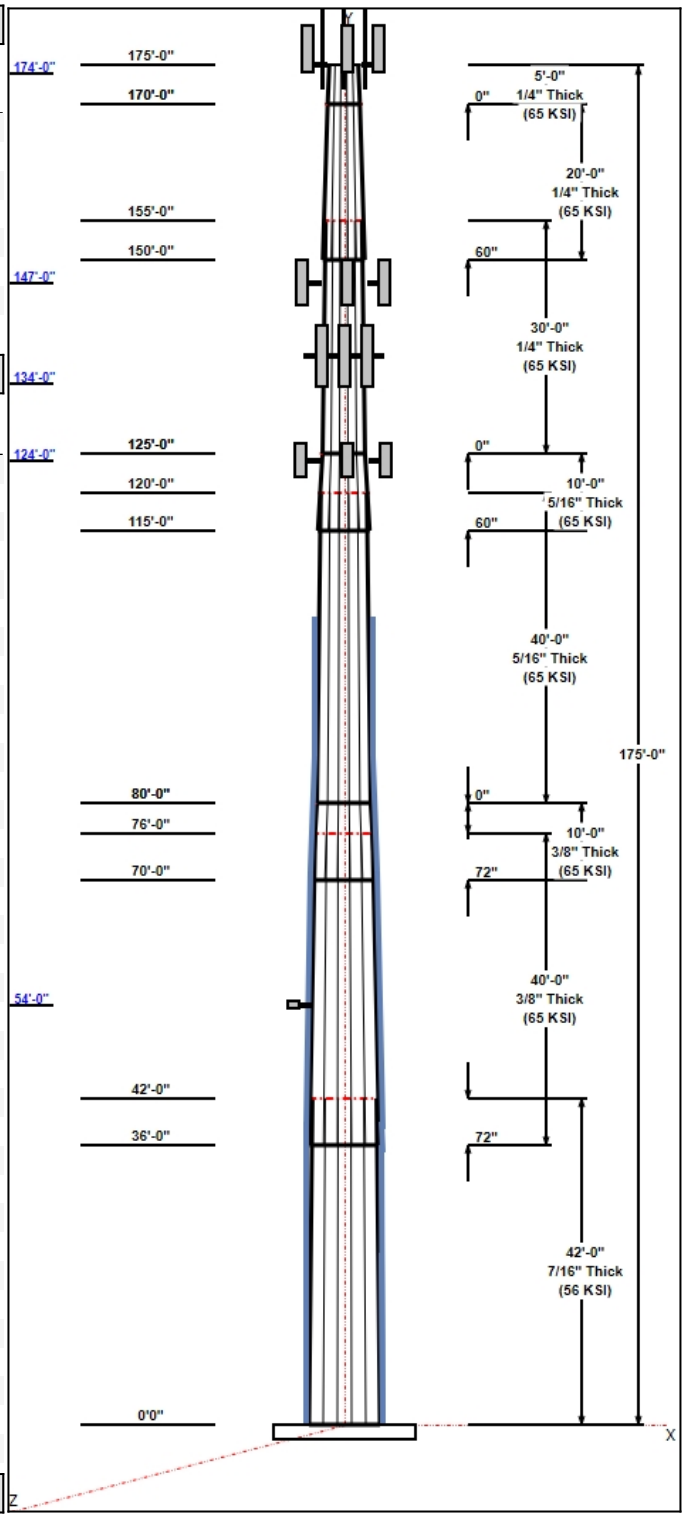
Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	42.00	45.88	54.00	0.438		0.19338	56
2	40.00	40.05	47.79	0.375	Slip	0.19338	65
3	10.00	40.03	41.96	0.375	Slip	0.19338	65
4	40.00	32.29	40.03	0.313	Butt	0.19338	65
5	10.00	31.95	33.89	0.313	Slip	0.19338	65
6	30.00	26.15	31.95	0.250	Butt	0.19338	65
7	20.00	23.75	27.62	0.250	Slip	0.19338	65
8	5.00	18.00	23.75	0.250	Butt	1.15000	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
175.00	191.50	6	DR65-18-02DPL2Q	T-Mobile
175.00	188.50	6	E15S09P94	T-Mobile
175.00	175.00	3	T-Arms	Sprint Nextel
175.00	177.00	3	1900MHz	Sprint Nextel
175.00	177.00	6	800 MHz	Sprint Nextel
175.00	177.00	3	TD-RRH8x20-25	Sprint Nextel
175.00	177.00	3	APXVTM14-C-I20	Sprint Nextel
175.00	177.00	3	NNVV-65B-R4	Sprint Nextel
175.00	175.00	1	PRK-SFS-L	Sprint Nextel
175.00	175.00	1	Handrail	Sprint Nextel
175.00	175.00	1	PRK-1245L	Sprint Nextel
174.00	184.00	3	4.5" x 24 FT Pipe	T-Mobile
147.00	147.00	3	BXA-70063-6CF-EDIN-X	Verizon
147.00	147.00	3	BXA-80080-4CF	Verizon
147.00	147.00	6	SBNHH-1D65B	Verizon
147.00	147.00	6	FD9R6004/2C-3L	Verizon
147.00	147.00	2	DB-T1-6Z-8AB-0Z	Verizon
147.00	144.00	3	RRH2X60-AWS	Verizon
147.00	144.00	3	RRH2X60-PCS	Verizon
147.00	144.00	3	RRH2X60-700	Verizon
147.00	147.00	3	T-Arms	Verizon
137.50	137.50	1	Low Profile	AT&T
134.00	137.50	3	TPA-65R-LCUUUU-H8	AT&T
134.00	137.50	6	RRUS-32	AT&T
134.00	137.50	3	DBC0061F1V51-2	AT&T
134.00	137.50	1	DC6-48-60-18-8C	AT&T
134.00	137.50	3	7770.00	AT&T
134.00	137.50	3	AM-X-CD-17-65-00T-RET	AT&T
134.00	137.50	6	LGP21401	AT&T
134.00	137.50	3	RRUS 11	AT&T
134.00	137.50	1	DC6-48-60-18-8F	AT&T
124.00	124.00	6	742 351	Metro PCS
124.00	124.00	3	T-Arms	Metro PCS
54.00	54.00	1	GPS	Sprint
54.00	54.00	1	Standoff	Sprint



Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	192.00	Inside	1 5/8" Coax	T-Mobile
0.00	177.00	Inside	1-1/4" Fiber	Sprint Nextel
0.00	147.00	Inside	1 5/8" Coax	Verizon

0.00	147.00	Inside	1 5/8" Hybrid	Verizon
0.00	134.00	Inside	1 5/8" Coax	AT&T
0.00	134.00	Inside	3/4" DC	AT&T
0.00	134.00	Inside	7/16" Fiber	AT&T
0.00	124.00	Inside	1 5/8" Coax	Metro PCS
0.00	124.00	Inside	3/8" RET	Metro PCS
0.00	105.00	Outside	3" Chanel	
0.00	54.00	Inside	1/2" Coax	Sprint

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
18	2.00" A687	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.5000	67.0	50.0	Round

Reactions

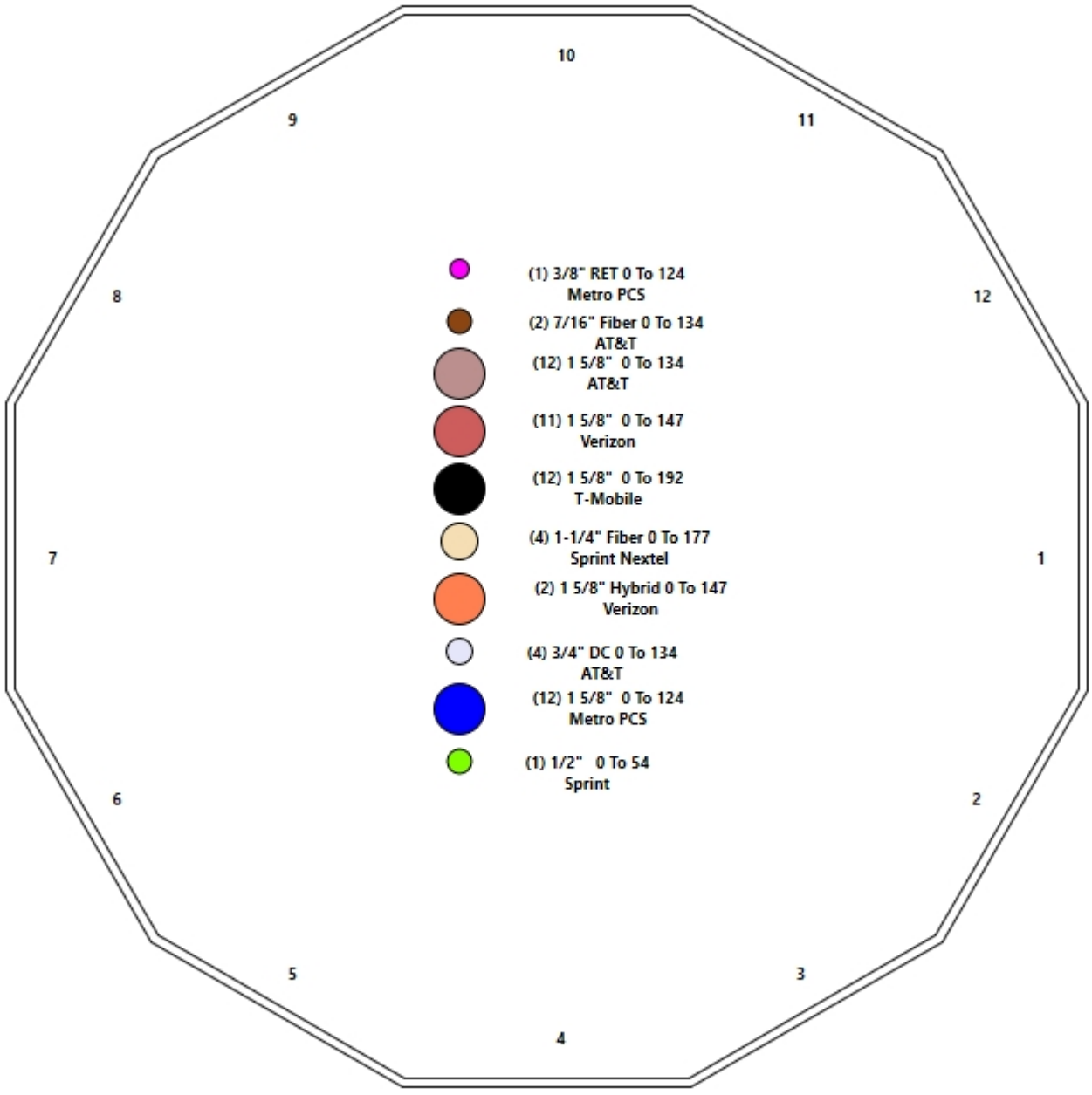
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	5353.5	43.1	56.0
0.9D + 1.6W 101 mph Wind	5298.3	43.0	42.0
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1222.6	9.3	83.5
1.2D + 1.0E	255.0	1.9	56.1
0.9D + 1.0E	252.1	1.9	42.1
1.0D + 1.0W 60 mph Wind	1174.8	9.5	46.7

Structure: CT00680-S-SBA - Coax Line Placement

Type: Monopole
Site Name: Putnam
Height: 175.00 (ft)

5/31/2018

Tower Engineering Solutions



Shaft Properties

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	12	42.000	0.4375	56		0.00	9,966
2	12	40.000	0.3750	65	Slip	72.00	7,157
3	12	10.000	0.3750	65	Slip	72.00	1,669
4	12	40.000	0.3125	65	Flange	0.00	4,910
5	12	10.000	0.3125	65	Slip	60.00	1,116
6	12	30.000	0.2500	65	Flange	0.00	2,367
7	12	20.000	0.2500	65	Slip	60.00	1,393
8	12	5.000	0.2500	65	Flange	0.00	282
					Total Shaft Weight:		**28,861**

	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	54.00	0.00	75.46	27631.37	30.93	123.43	45.88	42.00	64.01	16871.2	25.95	104.8	0.193382
2	47.79	36.00	57.25	16427.51	32.00	127.44	40.05	76.00	47.91	9627.65	26.48	106.8	0.193382
3	41.96	70.00	50.22	11086.25	27.84	111.90	40.03	80.00	47.88	9610.54	26.46	106.7	0.193382
4	40.03	80.00	39.97	8046.71	32.18	128.09	32.29	120.00	32.18	4201.39	25.55	103.3	0.193382
5	33.89	115.0	33.78	4860.52	26.91	108.44	31.95	125.00	31.84	4068.08	25.25	102.2	0.193382
6	31.95	125.0	25.52	3273.79	32.10	127.81	26.15	155.00	20.85	1785.33	25.88	104.6	0.193382
7	27.62	150.0	22.03	2106.17	27.46	110.47	23.75	170.00	18.92	1333.48	23.31	95.00	0.193382
8	23.75	170.0	18.92	1333.48	23.31	95.00	18.00	175.00	14.29	574.61	17.15	72.00	1.150000

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Fu (ksi)	Offset (in)	Description	Spacing (in)	Description	Spacing (in)	Lower Qty	Upper Qty
0.00	36.00	3	PLT C10x30(1.5" Hole)	65	80	0.00	AJM20&sleeve	0.00	AJM20&sleeve	3.00		
0.00	22.00	3	PLT C10x30(1.5" Hole)	65	80	0.00	AJM20&sleeve	24.00	AJM20&sleeve	3.00		
35.00	39.00	3	LNP LP6X100-G-10TT	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00	11	11
38.00	71.25	3	PLT C10x30(1.5" Hole)	65	80	0.00	AJM20&sleeve	24.00	AJM20&sleeve	3.00		
71.25	86.00	3	PLT C10x30(1.5" Hole)	65	80	0.00	AJM20&sleeve	24.00	AJM20&sleeve	3.00		
86.00	104.0	3	PLT C10x15.3(1.5" Hole)	65	80	0.00	AJM20&sleeve	24.00	AJM20&sleeve	3.00		

Load Summary

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	175.00	DR65-18-02DPL2Q	6	24.00	5.81	0.67	158.71	6.884	0.69	0.00	16.50
2	175.00	E15S09P94	6	14.60	0.66	0.75	32.11	1.273	0.75	0.00	13.50
3	175.00	T-Arms	3	242.00	11.00	0.75	451.13	24.997	0.75	0.00	0.00
4	175.00	1900MHz	3	60.00	2.77	0.67	144.73	4.058	0.67	0.00	2.00
5	175.00	800 MHz	6	53.00	2.49	0.67	128.11	3.651	0.67	0.00	2.00
6	175.00	TD-RRH8x20-25	3	70.00	4.05	0.67	182.54	4.877	0.67	0.00	2.00
7	175.00	APXVTM14-C-I20	3	56.20	6.34	0.77	219.62	7.472	0.77	0.00	2.00
8	175.00	NNVV-65B-R4	3	77.40	12.27	0.74	367.39	13.749	0.74	0.00	2.00
9	175.00	PRK-SFS-L	1	230.00	7.70	1.00	556.11	15.888	1.00	0.00	0.00
10	175.00	Handrail	1	415.06	9.85	1.00	827.01	22.419	1.00	0.00	0.00
11	175.00	PRK-1245L	1	464.91	9.50	1.00	794.50	19.602	1.00	0.00	0.00
12	174.00	4.5" x 24 FT Pipe	3	259.20	13.50	1.00	513.18	20.585	1.00	0.00	10.00
13	147.00	BXA-70063-6CF-EDIN-X	3	17.00	7.57	0.77	165.00	10.328	0.77	0.00	0.00
14	147.00	BXA-80080-4CF	3	12.00	3.56	0.88	100.05	5.398	0.88	0.00	0.00
15	147.00	SBNHH-1D65B	6	50.71	8.08	0.82	251.83	9.369	0.82	0.00	0.00
16	147.00	FD9R6004/2C-3L	6	3.10	0.36	0.63	11.11	0.802	0.66	0.00	0.00
17	147.00	DB-T1-6Z-8AB-0Z	2	44.00	4.80	1.00	187.39	5.672	1.00	0.00	0.00
18	147.00	RRH2X60-AWS	3	60.00	3.50	0.67	147.11	4.288	0.67	0.00	-3.00
19	147.00	RRH2X60-PCS	3	55.00	2.20	0.67	139.32	2.835	0.67	0.00	-3.00
20	147.00	RRH2X60-700	3	60.00	3.50	0.67	147.11	4.288	0.67	0.00	-3.00
21	147.00	T-Arms	3	242.00	11.00	0.75	447.52	24.755	0.75	0.00	0.00
22	137.50	Low Profile Platform-Round	1	1500.00	22.00	1.00	2797.57	39.509	1.00	0.00	0.00
23	134.00	TPA-65R-LCUUUU-H8	3	75.00	13.30	0.83	383.08	14.927	0.83	0.00	3.50
24	134.00	RRUS-32	6	77.00	3.87	0.67	189.06	4.097	0.67	0.00	3.50
25	134.00	DBC0061F1V51-2 Combiner	3	10.00	0.60	0.69	31.13	0.960	0.69	0.00	3.50
26	134.00	DC6-48-60-18-8C	1	11.80	3.17	1.00	61.48	3.864	1.00	0.00	3.50
27	134.00	7770.00	3	35.00	5.50	0.73	168.32	6.552	0.75	0.00	3.50
28	134.00	AM-X-CD-17-65-00T-RET	3	30.80	11.31	0.75	141.54	15.502	0.77	0.00	3.50
29	134.00	LGP21401	6	14.10	1.29	0.50	38.82	2.116	0.50	0.00	3.50
30	134.00	RRUS 11	3	50.70	2.52	0.67	138.67	3.163	0.67	0.00	3.50
31	134.00	DC6-48-60-18-8F	1	14.50	2.92	1.00	77.02	4.121	1.00	0.00	3.50
32	124.00	742 351	6	29.80	5.38	0.61	123.30	7.329	0.63	0.00	0.00
33	124.00	T-Arms	3	242.00	8.19	0.75	444.05	18.258	0.75	0.00	0.00
34	54.00	GPS	1	10.00	1.00	1.00	36.47	1.643	1.00	0.00	0.00
35	54.00	Standoff	1	40.00	2.63	1.00	112.48	8.019	1.00	0.00	0.00
		Totals:	**112**	**9,335.03**			**24,230.24**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	192.00	(12) 1 5/8" Coax	0.00	Inside
0.00	177.00	(4) 1-1/4" Fiber	0.00	Inside
0.00	147.00	(11) 1 5/8" Coax	0.00	Inside
0.00	147.00	(2) 1 5/8" Hybrid	0.00	Inside
0.00	134.00	(12) 1 5/8" Coax	0.00	Inside
0.00	134.00	(4) 3/4" DC	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	134.00	(2) 7/16" Fiber			0.00	Inside					
0.00	124.00	(12) 1 5/8" Coax			0.00	Inside					
0.00	124.00	(1) 3/8" RET			0.00	Inside					
0.00	105.00	(1) 3" Chanel			3.25	Outside					
0.00	54.00	(1) 1/2" Coax			0.00	Inside					

Shaft Section Properties

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Increment Length: **5 (ft)**

											Additional Reinforcing			
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)	Area (in^2)	Ixp (in^4)	Iyp (in^4)	Weight (lb)
0.00	RB1 RB2	0.4375	54.000	75.456	27631.4	30.93	123.43	56	63	0.0	52.92	24301.7	17345.4	
5.00		0.4375	53.033	74.094	26161.8	30.34	121.22	56	64	1272.2	52.92	23473.1	16754.3	900.0
10.00		0.4375	52.066	72.732	24745.3	29.74	119.01	56	64	1249.0	52.92	22658.9	16173.5	900.0
15.00		0.4375	51.099	71.370	23380.9	29.15	116.80	56	65	1225.9	52.92	21859.1	15603.0	900.0
20.00		0.4375	50.132	70.008	22067.5	28.56	114.59	56	65	1202.7	52.92	21073.7	15042.8	900.0
22.00	RT2	0.4375	49.746	69.463	21556.3	28.32	113.70	56	66	474.6	26.46	8941.3	8941.3	180.0
25.00		0.4375	49.165	68.645	20804.3	27.97	112.38	56	66	704.9	26.46	8743.1	8743.1	270.0
30.00		0.4375	48.199	67.283	19590.3	27.38	110.17	56	66	1156.3	26.46	8417.8	8417.8	450.0
35.00	RB3	0.4375	47.232	65.921	18424.4	26.78	107.96	56	67	1133.2	44.46	13360.5	13360.5	756.2
36.00	Bot - Section 2 RT1	0.4375	47.038	65.649	18196.9	26.67	107.52	56	67	223.9	18.00	5220.0	5220.0	61.2
38.00	RB4	0.4375	46.651	65.104	17747.6	26.43	106.63	56	67	833.0	44.46	13453.1	13453.1	302.5
39.00	RT3	0.4375	46.458	64.832	17525.7	26.31	106.19	56	67	413.9	26.46	8090.9	8090.9	90.0
40.00		0.4375	46.265	64.559	17305.7	26.19	105.75	56	67	412.2	26.46	8027.9	8027.9	90.0
42.00	Top - Section 1	0.3750	46.628	55.850	15250.7	31.17	124.34	65	71	819.2	26.46	7902.5	7902.5	180.0
45.00		0.3750	46.048	55.150	14684.0	30.76	122.79	65	71	566.6	26.46	7716.3	7716.3	270.0
50.00		0.3750	45.081	53.982	13771.1	30.07	120.22	65	72	928.4	26.46	7410.9	7410.9	450.0
54.00		0.3750	44.307	53.048	13068.5	29.52	118.15	65	73	728.4	26.46	7171.0	7171.0	360.0
55.00		0.3750	44.114	52.815	12896.7	29.38	117.64	65	73	180.1	26.46	7111.6	7111.6	90.0
60.00		0.3750	43.147	51.647	12060.2	28.69	115.06	65	73	888.7	26.46	6818.6	6818.6	450.0
65.00		0.3750	42.180	50.480	11260.6	28.00	112.48	65	74	868.8	26.46	6531.8	6531.8	450.0
70.00	Bot - Section 3	0.3750	41.213	49.312	10497.2	27.30	109.90	65	75	848.9	26.46	6251.1	6251.1	450.0
71.25	RT4 RB5	0.3750	40.972	49.020	10311.9	27.13	109.26	65	75	422.1	26.46	6397.9	6397.9	112.5
75.00		0.3750	40.246	48.145	9769.1	26.61	107.32	65	76	1251.4	26.46	6189.0	6189.0	337.5
76.00	Top - Section 2	0.3750	40.803	48.817	10184.0	27.01	108.81	65	75	329.9	26.46	6133.9	6133.9	90.0
80.00	Top - Section 3	0.3750	40.029	47.883	9610.5	26.46	106.75	65	76	658.1	26.46	5915.9	5915.9	360.0
80.00	Bot - Section 4	0.3125	40.029	39.965	8046.7	31.75	128.09	65	70					
85.00		0.3125	39.063	38.992	7473.2	31.35	125.00	65	71	671.7	26.46	5649.0	5649.0	450.0
86.00	RT5 RB6	0.3125	38.869	38.798	7361.9	31.18	124.38	65	71	132.4	13.47	3024.7	3024.7	45.9
90.00		0.3125	38.096	38.019	6927.6	30.52	121.91	65	71	522.8	13.47	2915.4	2915.4	183.6
95.00		0.3125	37.129	37.046	6409.3	29.69	118.81	65	72	638.6	13.47	2781.6	2781.6	229.5
100.00		0.3125	36.162	36.073	5917.4	28.86	115.72	65	73	622.0	13.47	2650.9	2650.9	229.5
104.00	RT6	0.3125	35.388	35.295	5542.6	28.20	113.24	65	74	485.7	13.47	2548.7	2548.7	183.6
105.00		0.3125	35.195	35.100	5451.4	28.03	112.62	65	74	119.8				
110.00		0.3125	34.228	34.127	5010.5	27.20	109.53	65	75	588.9				
115.00	Bot - Section 5	0.3125	33.261	33.154	4594.1	26.38	106.44	65	76	572.4				
120.00	Top - Section 4	0.3125	32.919	32.810	4452.6	26.08	105.34	65	76	1122.3				
124.00		0.3125	32.146	32.032	4143.1	25.42	102.87	65	77	441.3				
125.00	Top - Section 5	0.3125	31.952	31.837	4068.1	25.25	102.25	65	77	108.7				
125.00	Bot - Section 6	0.2500	31.952	25.520	3273.8	31.57	127.81	65	70					
130.00		0.2500	30.985	24.742	2983.3	31.07	123.94	65	71	427.6				
134.00		0.2500	30.212	24.119	2763.7	30.24	120.85	65	72	332.5				
135.00		0.2500	30.018	23.964	2710.5	30.03	120.07	65	72	81.8				
137.50		0.2500	29.535	23.574	2580.6	29.51	118.14	65	73	202.2				
140.00		0.2500	29.051	23.185	2454.9	28.99	116.21	65	73	198.9				
145.00		0.2500	28.085	22.407	2215.8	27.96	112.34	65	74	387.8				
147.00		0.2500	27.698	22.095	2124.7	27.54	110.79	65	75	151.4				
150.00	Bot - Section 7	0.2500	27.118	21.628	1992.8	26.92	108.47	65	75	223.2				
155.00	Top - Section 6	0.2500	26.651	21.253	1890.7	26.42	106.60	65	76	729.6				
160.00		0.2500	25.684	20.474	1690.5	25.38	102.74	65	77	355.0				
165.00		0.2500	24.717	19.696	1504.9	24.35	98.87	65	78	341.7				

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)	Additional Reinforcing Ixp (in^4)	Additional Reinforcing Iyp (in^4)	Additional Reinforcing Weight (lb)
170.00	Top - Section 7	0.2500	23.750	18.918	1333.5	23.31	95.00	65	79	328.5				
170.00	Bot - Section 8	0.2500	23.750	18.918	1333.5	23.31	95.00	65	79					
174.00		0.2500	19.150	15.214	693.7	18.38	76.60	65	82	232.3				
175.00		0.2500	18.000	14.289	574.6	17.15	72.00	65	82	50.2				
									Total Weight	**28861.4**				**10722.1**

Wind Loading - Shaft

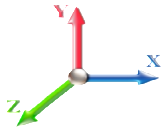
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

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	RB1 RB2	1.00	0.70	17.366	19.10	393.68	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	17.366	19.10	386.63	1.000	0.000	5.00	23.085	23.09	705.6	0.0	1526.7
10.00		1.00	0.70	17.366	19.10	379.58	1.000	0.000	5.00	22.668	22.67	692.8	0.0	1498.8
15.00		1.00	0.70	17.366	19.10	372.53	1.000	0.000	5.00	22.251	22.25	680.1	0.0	1471.0
20.00		1.00	0.70	17.366	19.10	365.48	1.000	0.000	5.00	21.834	21.83	667.3	0.0	1443.2
22.00	RT2	1.00	0.70	17.366	19.10	362.66	1.000	0.000	2.00	8.617	8.62	263.4	0.0	569.5
25.00		1.00	0.70	17.366	19.10	358.43	1.000	0.000	3.00	12.800	12.80	391.2	0.0	845.9
30.00		1.00	0.70	17.381	19.12	351.53	1.000	0.000	5.00	21.000	21.00	642.4	0.0	1387.6
35.00	RB3	1.00	0.73	18.163	19.98	352.15	1.000	0.000	5.00	20.583	20.58	658.0	0.0	1359.8
36.00	Bot - Section 2 RT1	1.00	0.74	18.310	20.14	352.12	1.000	0.000	1.00	4.066	4.07	131.0	0.0	268.6
38.00	RB4	1.00	0.75	18.595	20.45	351.93	1.000	0.000	2.00	8.212	8.21	268.8	0.0	999.6
39.00	RT3	1.00	0.76	18.734	20.61	351.78	1.000	0.000	1.00	4.081	4.08	134.6	0.0	496.7
40.00		1.00	0.76	18.870	20.76	351.58	1.000	0.000	1.00	4.064	4.06	135.0	0.0	494.6
42.00	Top - Section 1	1.00	0.77	19.135	21.05	351.08	1.000	0.000	2.00	8.079	8.08	272.1	0.0	983.0
45.00		1.00	0.79	19.516	21.47	355.87	1.000	0.000	3.00	11.993	11.99	411.9	0.0	679.9
50.00		1.00	0.81	20.112	22.12	353.68	1.000	0.000	5.00	19.655	19.65	695.7	0.0	1114.1
54.00	Appurtenance(s)	1.00	0.83	20.559	22.62	351.46	1.000	0.000	4.00	15.424	15.42	558.1	0.0	874.1
55.00		1.00	0.83	20.667	22.73	350.84	1.000	0.000	1.00	3.814	3.81	138.7	0.0	216.1
60.00		1.00	0.85	21.187	23.31	347.44	1.000	0.000	5.00	18.821	18.82	701.8	0.0	1066.4
65.00		1.00	0.87	21.678	23.85	343.56	1.000	0.000	5.00	18.404	18.40	702.1	0.0	1042.5
70.00	Bot - Section 3	1.00	0.89	22.142	24.36	339.26	1.000	0.000	5.00	17.986	17.99	700.9	0.0	1018.7
71.25	RT4 RB5	1.00	0.90	22.254	24.48	338.12	1.000	0.000	1.25	4.512	4.51	176.7	0.0	506.5
75.00		1.00	0.91	22.582	24.84	334.58	1.000	0.000	3.75	13.381	13.38	531.8	0.0	1501.7
76.00	Top - Section 2	1.00	0.91	22.668	24.93	333.61	1.000	0.000	1.00	3.529	3.53	140.8	0.0	395.9
80.00	Top - Section 3	1.00	0.93	23.003	25.30	335.86	1.000	0.000	4.00	13.947	13.95	564.6	0.0	789.7
85.00		1.00	0.94	23.404	25.74	330.60	1.000	0.000	5.00	17.059	17.06	702.7	0.0	806.0
86.00	RT5 RB6	1.00	0.95	23.483	25.83	329.51	1.000	0.000	1.00	3.362	3.36	138.9	0.0	158.8
90.00		1.00	0.96	23.790	26.17	325.06	1.000	0.000	4.00	13.280	13.28	556.0	0.0	627.3
95.00		1.00	0.97	24.160	26.58	319.27	1.000	0.000	5.00	16.225	16.22	689.9	0.0	766.3
100.00		1.00	0.99	24.517	26.97	313.24	1.000	0.000	5.00	15.807	15.81	682.1	0.0	746.4
104.00	RT6	1.00	1.00	24.793	27.27	308.26	1.000	0.000	4.00	12.346	12.35	538.7	0.0	582.8
105.00		1.00	1.00	24.861	27.35	307.00	1.000	0.000	1.00	3.045	3.04	133.2	0.0	143.7
110.00		1.00	1.02	25.194	27.71	300.55	1.000	0.000	5.00	14.973	14.97	663.9	0.0	706.7
115.00	Bot - Section 5	1.00	1.03	25.516	28.07	293.92	1.000	0.000	5.00	14.556	14.56	653.7	0.0	686.8
120.00	Top - Section 4	1.00	1.04	25.828	28.41	287.12	1.000	0.000	5.00	14.409	14.41	655.0	0.0	1346.8
124.00	Appurtenance(s)	1.00	1.05	26.071	28.68	287.14	1.000	0.000	4.00	11.227	11.23	515.1	0.0	529.5
125.00	Top - Section 5	1.00	1.05	26.131	28.74	285.74	1.000	0.000	1.00	2.765	2.76	127.2	0.0	130.4
130.00		1.00	1.07	26.425	29.07	278.65	1.000	0.000	5.00	13.575	13.57	631.3	0.0	513.1
134.00	Appurtenance(s)	1.00	1.07	26.655	29.32	272.87	1.000	0.000	4.00	10.559	10.56	495.4	0.0	399.0
135.00		1.00	1.08	26.712	29.38	271.41	1.000	0.000	1.00	2.598	2.60	122.1	0.0	98.2
137.50	Appurtenance(s)	1.00	1.08	26.852	29.54	267.74	1.000	0.000	2.50	6.422	6.42	303.5	0.0	242.6
140.00		1.00	1.09	26.991	29.69	264.04	1.000	0.000	2.50	6.318	6.32	300.1	0.0	238.7
145.00		1.00	1.10	27.263	29.99	256.53	1.000	0.000	5.00	12.323	12.32	591.3	0.0	465.4
147.00	Appurtenance(s)	1.00	1.10	27.370	30.11	253.50	1.000	0.000	2.00	4.813	4.81	231.8	0.0	181.7
150.00	Bot - Section 7	1.00	1.11	27.528	30.28	248.90	1.000	0.000	3.00	7.094	7.09	343.7	0.0	267.8
155.00	Top - Section 6	1.00	1.12	27.787	30.57	241.16	1.000	0.000	5.00	11.705	11.70	572.4	0.0	875.5
160.00		1.00	1.13	28.040	30.84	237.93	1.000	0.000	5.00	11.288	11.29	557.1	0.0	426.0

Wind Loading - Shaft

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

165.00		1.00	1.14	28.288	31.12	229.98	1.000	0.000	5.00	10.871	10.87	541.2	0.0	410.1
170.00	Top - Section 7	1.00	1.15	28.530	31.38	221.93	1.000	0.000	5.00	10.453	10.45	524.9	0.0	394.2
174.00	Appurtenance(s)	1.00	1.16	28.721	31.59	179.54	1.000	0.000	4.00	7.402	7.40	374.2	0.0	278.7
175.00	Appurtenance(s)	1.00	1.16	28.768	31.64	168.90	1.000	0.000	1.00	1.603	1.60	81.1	0.0	60.2
								Totals:	**175.00**			**22,692.3**		**34,633.7**

Discrete Appurtenance Forces

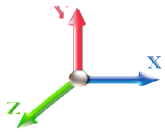
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 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	175.00	800 MHz	6	28.861	31.747	0.67	1.00	10.01	381.60	0.000	2.000	508.45	0.00	1016.91
2	175.00	DR65-18-02DPL2Q	6	29.518	32.470	0.67	1.00	23.36	172.80	0.000	16.500	1213.39	0.00	20020.89
3	175.00	E15S09P94	6	29.385	32.323	0.75	1.00	2.97	105.12	0.000	13.500	153.60	0.00	2073.62
4	175.00	T-Arms	3	28.768	31.644	0.75	1.00	24.75	871.20	0.000	0.000	1253.12	0.00	0.00
5	175.00	1900MHz	3	28.861	31.747	0.67	1.00	5.57	216.00	0.000	2.000	282.82	0.00	565.63
6	175.00	PRK-1245L	1	28.768	31.644	0.75	0.75	7.13	557.89	0.000	0.000	360.75	0.00	0.00
7	175.00	TD-RRH8x20-25	3	28.861	31.747	0.67	1.00	8.14	252.00	0.000	2.000	413.50	0.00	827.00
8	175.00	APXVTM14-C-I20	3	28.861	31.747	0.77	1.00	14.65	202.32	0.000	2.000	743.92	0.00	1487.85
9	175.00	NNVV-65B-R4	3	28.861	31.747	0.74	1.00	27.24	278.64	0.000	2.000	1383.64	0.00	2767.29
10	175.00	PRK-SFS-L	1	28.768	31.644	1.00	1.00	7.70	276.00	0.000	0.000	389.86	0.00	0.00
11	175.00	Handrail	1	28.768	31.644	1.00	1.00	9.85	498.07	0.000	0.000	498.72	0.00	0.00
12	174.00	4.5" x 24 FT Pipe	3	29.183	32.101	1.00	1.00	40.50	933.12	0.000	10.000	2080.15	0.00	20801.51
13	147.00	T-Arms	3	27.370	30.107	0.56	0.75	18.56	871.20	0.000	0.000	894.17	0.00	0.00
14	147.00	RRH2X60-700	3	27.209	29.930	0.54	0.80	5.63	216.00	0.000	-3.000	269.51	0.00	-808.54
15	147.00	RRH2X60-PCS	3	27.209	29.930	0.54	0.80	3.54	198.00	0.000	-3.000	169.41	0.00	-508.22
16	147.00	RRH2X60-AWS	3	27.209	29.930	0.54	0.80	5.63	216.00	0.000	-3.000	269.51	0.00	-808.54
17	147.00	DB-T1-6Z-8AB-0Z	2	27.370	30.107	0.80	0.80	7.68	105.60	0.000	0.000	369.95	0.00	0.00
18	147.00	FD9R6004/2C-3L	6	27.370	30.107	0.50	0.80	1.09	22.32	0.000	0.000	52.36	0.00	0.00
19	147.00	SBNHH-1D65B	6	27.370	30.107	0.66	0.80	31.88	365.11	0.000	0.000	1535.70	0.00	0.00
20	147.00	BXA-80080-4CF	3	27.370	30.107	0.70	0.80	7.50	43.20	0.000	0.000	361.36	0.00	0.00
21	147.00	BXA-70063-6CF-EDIN-X	3	27.370	30.107	0.62	0.80	13.97	61.20	0.000	0.000	673.00	0.00	0.00
22	137.50	Low Profile	1	26.852	29.537	1.00	1.00	22.00	1800.00	0.000	0.000	1039.72	0.00	0.00
23	134.00	TPA-65R-LCUUUU-H8	3	26.852	29.537	0.66	0.80	26.49	270.00	0.000	3.500	1252.08	0.00	4382.30
24	134.00	RRUS-32	6	26.852	29.537	0.54	0.80	12.45	554.40	0.000	3.500	588.19	0.00	2058.67
25	134.00	DBC0061F1V51-2	3	26.852	29.537	0.55	0.80	0.99	36.00	0.000	3.500	46.96	0.00	164.35
26	134.00	DC6-48-60-18-8C	1	26.852	29.537	0.80	0.80	2.54	14.16	0.000	3.500	119.85	0.00	419.48
27	134.00	7770.00	3	26.852	29.537	0.58	0.80	9.64	126.00	0.000	3.500	455.40	0.00	1593.89
28	134.00	AM-X-CD-17-65-00T-RET	3	26.852	29.537	0.60	0.80	20.36	110.88	0.000	3.500	962.12	0.00	3367.41
29	134.00	LGP21401	6	26.852	29.537	0.40	0.80	3.10	101.52	0.000	3.500	146.32	0.00	512.11
30	134.00	RRUS 11	3	26.852	29.537	0.54	0.80	4.05	182.52	0.000	3.500	191.50	0.00	670.27
31	134.00	DC6-48-60-18-8F	1	26.852	29.537	0.80	0.80	2.34	17.40	0.000	3.500	110.40	0.00	386.40
32	124.00	T-Arms	3	26.071	28.678	0.56	0.75	13.82	871.20	0.000	0.000	634.16	0.00	0.00
33	124.00	742 351	6	26.071	28.678	0.49	0.80	15.75	214.56	0.000	0.000	722.81	0.00	0.00
34	54.00	Standoff	1	20.559	22.615	1.00	1.00	2.63	48.00	0.000	0.000	95.16	0.00	0.00
35	54.00	GPS	1	20.559	22.615	1.00	1.00	1.00	12.00	0.000	0.000	36.18	0.00	0.00
							Totals:		**11,202.04**			**20,277.74**		

Total Applied Force Summary

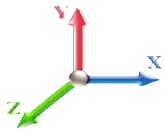
Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 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		705.59	1879.55	0.00	0.00
10.00		692.84	1851.74	0.00	0.00
15.00		680.09	1823.93	0.00	0.00
20.00		667.34	1796.12	0.00	0.00
22.00		263.37	710.66	0.00	0.00
25.00		391.23	1057.65	0.00	0.00
30.00		642.39	1740.50	0.00	0.00
35.00		657.98	1712.69	0.00	0.00
36.00		131.05	339.20	0.00	0.00
38.00		268.77	1140.71	0.00	0.00
39.00		134.56	567.26	0.00	0.00
40.00		134.98	565.19	0.00	0.00
42.00		272.07	1124.18	0.00	0.00
45.00		411.93	891.61	0.00	0.00
50.00		695.73	1466.95	0.00	0.00
54.00	(2) attachments	689.44	1216.40	0.00	0.00
55.00		138.74	286.52	0.00	0.00
60.00		701.82	1418.32	0.00	0.00
65.00		702.14	1394.48	0.00	0.00
70.00		700.92	1370.64	0.00	0.00
71.25		176.73	594.51	0.00	0.00
75.00		531.81	1765.66	0.00	0.00
76.00		140.77	466.31	0.00	0.00
80.00		564.65	1071.26	0.00	0.00
85.00		702.68	1157.96	0.00	0.00
86.00		138.94	229.21	0.00	0.00
90.00		556.03	908.89	0.00	0.00
95.00		689.90	1118.23	0.00	0.00
100.00		682.09	1098.37	0.00	0.00
104.00		538.71	864.39	0.00	0.00
105.00		133.22	214.11	0.00	0.00
110.00		663.93	1047.96	0.00	0.00
115.00		653.68	1028.09	0.00	0.00
120.00		654.98	1688.04	0.00	0.00
124.00	(9) attachments	1872.10	1888.31	0.00	0.00
125.00		127.16	183.60	0.00	0.00
130.00		631.33	779.11	0.00	0.00
134.00	(29) attachments	4368.19	2024.73	0.00	13554.86
135.00		122.14	134.09	0.00	0.00
137.50	(1) attachments	1343.23	2132.45	0.00	0.00
140.00		300.13	328.48	0.00	0.00
145.00		591.30	645.03	0.00	0.00
147.00	(32) attachments	4826.79	2352.20	0.00	-2125.29
150.00		343.68	326.47	0.00	0.00
155.00		572.43	973.26	0.00	0.00
160.00		557.06	523.74	0.00	0.00

Total Applied Force Summary

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 14

Tower Engineering Solutions

165.00		541.21	507.85	0.00	0.00
170.00		524.90	491.95	0.00	0.00
174.00	(3) attachments	2454.32	1290.09	0.00	20801.51
175.00	(36) attachments	7282.91	3891.44	0.00	28759.18
	Totals:	**42,969.99**	**56,080.12**	**0.00**	**60,990.26**

Linear Appurtenance Segment Forces (Factored)

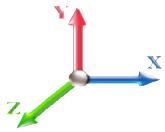
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 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	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.059	0.000	17.366	0.00	10.68
10.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.060	0.000	17.366	0.00	10.68
15.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.061	0.000	17.366	0.00	10.68
20.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.062	0.000	17.366	0.00	10.68
22.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.063	0.000	17.366	0.00	4.27
25.00	3" Chanel	Yes	3.00	0.000	3.25	0.81	0.00	0.063	0.000	17.366	0.00	6.41
30.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.064	0.000	17.381	0.00	10.68
35.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.066	0.000	18.163	0.00	10.68
36.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.067	0.000	18.310	0.00	2.14
38.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.067	0.000	18.595	0.00	4.27
39.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.067	0.000	18.734	0.00	2.14
40.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.068	0.000	18.870	0.00	2.14
42.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.068	0.000	19.135	0.00	4.27
45.00	3" Chanel	Yes	3.00	0.000	3.25	0.81	0.00	0.068	0.000	19.516	0.00	6.41
50.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.069	0.000	20.112	0.00	10.68
54.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.070	0.000	20.559	0.00	8.54
55.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.071	0.000	20.667	0.00	2.14
60.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.072	0.000	21.187	0.00	10.68
65.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.074	0.000	21.678	0.00	10.68
70.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.075	0.000	22.142	0.00	10.68
71.25	3" Chanel	Yes	1.25	0.000	3.25	0.34	0.00	0.076	0.000	22.254	0.00	2.67
75.00	3" Chanel	Yes	3.75	0.000	3.25	1.02	0.00	0.077	0.000	22.582	0.00	8.01
76.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.078	0.000	22.668	0.00	2.14
80.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.078	0.000	23.003	0.00	8.54
85.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.079	0.000	23.404	0.00	10.68
86.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.081	0.000	23.483	0.00	2.14
90.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.082	0.000	23.790	0.00	8.54
95.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.083	0.000	24.160	0.00	10.68
100.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.086	0.000	24.517	0.00	10.68
104.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.088	0.000	24.793	0.00	8.54
105.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.089	0.000	24.861	0.00	2.14
										Totals:	**0.0**	**224.3**

Calculated Forces

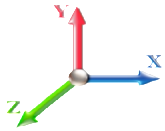
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

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	-56.02	-43.05	0.00	-5353.4	0.00	5353.45	4294.71	2147.35	9493.67	4688.57	0.00	0.000	0.000	0.709
5.00	-54.01	-42.50	0.00	-5138.1	0.00	5138.19	4251.62	2125.81	9227.39	4557.06	0.09	-0.166	0.000	0.695
10.00	-52.04	-41.95	0.00	-4925.6	0.00	4925.69	4207.27	2103.63	8961.88	4425.94	0.35	-0.332	0.000	0.680
15.00	-50.10	-41.41	0.00	-4715.9	0.00	4715.94	4161.65	2080.83	8697.29	4295.27	0.79	-0.500	0.000	0.665
20.00	-48.23	-40.82	0.00	-4508.9	0.00	4508.91	4114.76	2057.38	8433.78	4165.13	1.40	-0.668	0.000	0.650
22.00	-47.46	-40.63	0.00	-4427.2	0.00	4427.28	4095.66	2047.83	8328.71	4113.24	1.70	-0.736	0.000	0.770
25.00	-46.29	-40.35	0.00	-4305.4	0.00	4305.40	4066.61	2033.31	8171.50	4035.59	2.20	-0.859	0.000	0.760
30.00	-44.42	-39.84	0.00	-4103.6	0.00	4103.64	4017.20	2008.60	7910.59	3906.74	3.21	-1.061	0.000	0.743
35.00	-42.64	-39.23	0.00	-3904.4	0.00	3904.45	3966.51	1983.26	7651.22	3778.65	4.43	-1.264	0.000	0.606
36.00	-42.26	-39.14	0.00	-3865.2	0.00	3865.22	3956.22	1978.11	7599.55	3753.13	4.70	-1.299	0.000	0.809
38.00	-41.08	-38.89	0.00	-3786.9	0.00	3786.94	3935.49	1967.75	7496.40	3702.19	5.26	-1.392	0.000	0.588
39.00	-40.49	-38.77	0.00	-3748.0	0.00	3748.05	3925.05	1962.53	7444.93	3676.77	5.56	-1.427	0.000	0.705
40.00	-39.89	-38.66	0.00	-3709.2	0.00	3709.28	3914.56	1957.28	7393.54	3651.39	5.86	-1.468	0.000	0.702
42.00	-38.70	-38.43	0.00	-3631.9	0.00	3631.95	3554.53	1777.27	6785.59	3351.15	6.49	-1.550	0.000	0.674
45.00	-37.71	-38.11	0.00	-3516.6	0.00	3516.65	3532.39	1766.19	6658.05	3288.16	7.51	-1.674	0.000	0.709
50.00	-36.14	-37.49	0.00	-3326.1	0.00	3326.11	3494.22	1747.11	6445.54	3183.21	9.38	-1.891	0.000	0.687
54.00	-34.88	-36.83	0.00	-3176.1	0.00	3176.15	3462.54	1731.27	6275.67	3099.32	11.03	-2.065	0.000	0.669
55.00	-34.51	-36.76	0.00	-3139.3	0.00	3139.33	3454.46	1727.23	6233.23	3078.36	11.47	-2.110	0.000	0.664
60.00	-32.98	-36.12	0.00	-2955.5	0.00	2955.55	3413.12	1706.56	6021.34	2973.71	13.80	-2.327	0.000	0.642
65.00	-31.49	-35.48	0.00	-2774.9	0.00	2774.93	3370.20	1685.10	5810.04	2869.36	16.35	-2.542	0.000	0.619
70.00	-30.07	-34.79	0.00	-2597.5	0.00	2597.52	3325.69	1662.84	5599.53	2765.40	19.13	-2.757	0.000	0.595
71.25	-29.42	-34.64	0.00	-2554.0	0.00	2554.03	3314.31	1657.16	5547.04	2739.48	19.86	-2.812	0.000	0.582
75.00	-27.62	-34.07	0.00	-2424.1	0.00	2424.13	3279.60	1639.80	5389.99	2661.91	22.13	-2.971	0.000	0.563
76.00	-27.10	-33.95	0.00	-2390.0	0.00	2390.07	3306.32	1653.16	5510.48	2721.42	22.75	-3.014	0.000	0.573
80.00	-25.96	-33.41	0.00	-2254.2	0.00	2254.26	3269.04	1634.52	5343.14	2638.78	25.35	-3.181	0.000	0.534
80.00	-25.96	-33.41	0.00	-2254.2	0.00	2254.26	2504.08	1252.04	4105.75	2027.68	25.35	-3.181	0.000	0.582
85.00	-24.77	-32.70	0.00	-2087.1	0.00	2087.19	2474.85	1237.43	3958.27	1954.84	28.79	-3.380	0.000	0.615
86.00	-24.48	-32.60	0.00	-2054.4	0.00	2054.49	2468.82	1234.41	3928.75	1940.26	29.50	-3.425	0.000	0.759
90.00	-23.47	-32.09	0.00	-1924.0	0.00	1924.08	2444.04	1222.02	3810.67	1881.94	32.46	-3.643	0.000	0.727
95.00	-22.25	-31.43	0.00	-1763.6	0.00	1763.62	2411.64	1205.82	3663.14	1809.09	36.42	-3.910	0.000	0.687
100.00	-21.08	-30.76	0.00	-1606.4	0.00	1606.46	2377.66	1188.83	3515.87	1736.36	40.65	-4.170	0.000	0.646
104.00	-20.19	-30.20	0.00	-1483.4	0.00	1483.42	2349.34	1174.67	3398.38	1678.33	44.23	-4.376	0.000	0.612
104.00	-20.19	-30.20	0.00	-1483.4	0.00	1483.42	2349.34	1174.67	3398.38	1678.33	44.23	-4.376	0.000	0.612
105.00	-19.88	-30.13	0.00	-1453.2	0.00	1453.22	2342.10	1171.05	3369.07	1663.86	45.15	-4.427	0.000	0.883
110.00	-18.70	-29.50	0.00	-1302.5	0.00	1302.58	2304.95	1152.47	3222.91	1591.67	49.98	-4.787	0.000	0.827
115.00	-17.56	-28.86	0.00	-1155.1	0.00	1155.10	2266.22	1133.11	3077.59	1519.90	55.17	-5.136	0.000	0.768
120.00	-15.80	-28.14	0.00	-1010.7	0.00	1010.78	2252.14	1126.07	3026.44	1494.64	60.73	-5.471	0.000	0.684
124.00	-14.03	-26.13	0.00	-898.24	0.00	898.24	2219.57	1109.78	2911.24	1437.75	65.41	-5.730	0.000	0.632
125.00	-13.78	-26.02	0.00	-872.11	0.00	872.11	2211.27	1105.63	2882.56	1423.59	66.62	-5.790	0.000	0.619
125.00	-13.78	-26.02	0.00	-872.11	0.00	872.11	1600.93	800.47	2095.19	1034.73	66.62	-5.790	0.000	0.853
130.00	-12.95	-25.38	0.00	-741.99	0.00	741.99	1577.27	788.64	2000.77	988.11	72.83	-6.073	0.000	0.760
134.00	-11.35	-20.85	0.00	-626.92	0.00	626.92	1557.20	778.60	1925.20	950.79	78.02	-6.336	0.000	0.667
135.00	-11.19	-20.73	0.00	-606.07	0.00	606.07	1552.03	776.01	1906.32	941.46	79.35	-6.400	0.000	0.652
137.50	-9.18	-19.18	0.00	-554.24	0.00	554.24	1538.81	769.41	1859.13	918.16	82.74	-6.552	0.000	0.610
140.00	-8.82	-18.88	0.00	-506.29	0.00	506.29	1525.20	762.60	1812.01	894.88	86.20	-6.698	0.000	0.572
145.00	-8.19	-18.24	0.00	-411.90	0.00	411.90	1496.79	748.40	1718.05	848.48	93.35	-6.964	0.000	0.492
147.00	-6.42	-13.18	0.00	-375.42	0.00	375.42	1484.98	742.49	1680.60	829.98	96.28	-7.065	0.000	0.457
150.00	-6.09	-12.81	0.00	-335.89	0.00	335.89	1466.80	733.40	1624.61	802.34	100.75	-7.208	0.000	0.423

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

155.00	-5.16	-12.14	0.00	-271.82	0.00	271.82	1451.75	725.87	1579.74	780.18	108.40	-7.425	0.000	0.352
160.00	-4.68	-11.53	0.00	-211.12	0.00	211.12	1419.41	709.70	1487.45	734.60	116.26	-7.617	0.000	0.291
165.00	-4.22	-10.94	0.00	-153.45	0.00	153.45	1385.48	692.74	1396.17	689.51	124.30	-7.771	0.000	0.226
170.00	-3.79	-10.36	0.00	-98.75	0.00	98.75	1349.97	674.99	1306.08	645.02	132.48	-7.890	0.000	0.156
170.00	-3.79	-10.36	0.00	-98.75	0.00	98.75	1349.97	674.99	1306.08	645.02	132.48	-7.890	0.000	0.156
174.00	-2.84	-7.75	0.00	-36.51	0.00	36.51	1121.46	560.73	870.39	429.85	139.10	-7.956	0.000	0.088
175.00	0.00	-7.28	0.00	-28.76	0.00	28.76	1053.22	526.61	767.04	378.81	140.76	-7.970	0.000	0.076

Wind Loading - Shaft

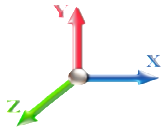
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 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	RB1 RB2	1.00	0.70	17.366	19.10	393.68	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	17.366	19.10	386.63	1.000	0.000	5.00	23.085	23.09	705.6	0.0	1145.0
10.00		1.00	0.70	17.366	19.10	379.58	1.000	0.000	5.00	22.668	22.67	692.8	0.0	1124.1
15.00		1.00	0.70	17.366	19.10	372.53	1.000	0.000	5.00	22.251	22.25	680.1	0.0	1103.3
20.00		1.00	0.70	17.366	19.10	365.48	1.000	0.000	5.00	21.834	21.83	667.3	0.0	1082.4
22.00	RT2	1.00	0.70	17.366	19.10	362.66	1.000	0.000	2.00	8.617	8.62	263.4	0.0	427.1
25.00		1.00	0.70	17.366	19.10	358.43	1.000	0.000	3.00	12.800	12.80	391.2	0.0	634.4
30.00		1.00	0.70	17.381	19.12	351.53	1.000	0.000	5.00	21.000	21.00	642.4	0.0	1040.7
35.00	RB3	1.00	0.73	18.163	19.98	352.15	1.000	0.000	5.00	20.583	20.58	658.0	0.0	1019.8
36.00	Bot - Section 2 RT1	1.00	0.74	18.310	20.14	352.12	1.000	0.000	1.00	4.066	4.07	131.0	0.0	201.5
38.00	RB4	1.00	0.75	18.595	20.45	351.93	1.000	0.000	2.00	8.212	8.21	268.8	0.0	749.7
39.00	RT3	1.00	0.76	18.734	20.61	351.78	1.000	0.000	1.00	4.081	4.08	134.6	0.0	372.5
40.00		1.00	0.76	18.870	20.76	351.58	1.000	0.000	1.00	4.064	4.06	135.0	0.0	371.0
42.00	Top - Section 1	1.00	0.77	19.135	21.05	351.08	1.000	0.000	2.00	8.079	8.08	272.1	0.0	737.3
45.00		1.00	0.79	19.516	21.47	355.87	1.000	0.000	3.00	11.993	11.99	411.9	0.0	509.9
50.00		1.00	0.81	20.112	22.12	353.68	1.000	0.000	5.00	19.655	19.65	695.7	0.0	835.5
54.00	Appurtenance(s)	1.00	0.83	20.559	22.62	351.46	1.000	0.000	4.00	15.424	15.42	558.1	0.0	655.6
55.00		1.00	0.83	20.667	22.73	350.84	1.000	0.000	1.00	3.814	3.81	138.7	0.0	162.1
60.00		1.00	0.85	21.187	23.31	347.44	1.000	0.000	5.00	18.821	18.82	701.8	0.0	799.8
65.00		1.00	0.87	21.678	23.85	343.56	1.000	0.000	5.00	18.404	18.40	702.1	0.0	781.9
70.00	Bot - Section 3	1.00	0.89	22.142	24.36	339.26	1.000	0.000	5.00	17.986	17.99	700.9	0.0	764.0
71.25	RT4 RB5	1.00	0.90	22.254	24.48	338.12	1.000	0.000	1.25	4.512	4.51	176.7	0.0	379.9
75.00		1.00	0.91	22.582	24.84	334.58	1.000	0.000	3.75	13.381	13.38	531.8	0.0	1126.3
76.00	Top - Section 2	1.00	0.91	22.668	24.93	333.61	1.000	0.000	1.00	3.529	3.53	140.8	0.0	296.9
80.00	Top - Section 3	1.00	0.93	23.003	25.30	335.86	1.000	0.000	4.00	13.947	13.95	564.6	0.0	592.3
85.00		1.00	0.94	23.404	25.74	330.60	1.000	0.000	5.00	17.059	17.06	702.7	0.0	604.5
86.00	RT5 RB6	1.00	0.95	23.483	25.83	329.51	1.000	0.000	1.00	3.362	3.36	138.9	0.0	119.1
90.00		1.00	0.96	23.790	26.17	325.06	1.000	0.000	4.00	13.280	13.28	556.0	0.0	470.5
95.00		1.00	0.97	24.160	26.58	319.27	1.000	0.000	5.00	16.225	16.22	689.9	0.0	574.7
100.00		1.00	0.99	24.517	26.97	313.24	1.000	0.000	5.00	15.807	15.81	682.1	0.0	559.8
104.00	RT6	1.00	1.00	24.793	27.27	308.26	1.000	0.000	4.00	12.346	12.35	538.7	0.0	437.1
105.00		1.00	1.00	24.861	27.35	307.00	1.000	0.000	1.00	3.045	3.04	133.2	0.0	107.8
110.00		1.00	1.02	25.194	27.71	300.55	1.000	0.000	5.00	14.973	14.97	663.9	0.0	530.0
115.00	Bot - Section 5	1.00	1.03	25.516	28.07	293.92	1.000	0.000	5.00	14.556	14.56	653.7	0.0	515.1
120.00	Top - Section 4	1.00	1.04	25.828	28.41	287.12	1.000	0.000	5.00	14.409	14.41	655.0	0.0	1010.1
124.00	Appurtenance(s)	1.00	1.05	26.071	28.68	287.14	1.000	0.000	4.00	11.227	11.23	515.1	0.0	397.2
125.00	Top - Section 5	1.00	1.05	26.131	28.74	285.74	1.000	0.000	1.00	2.765	2.76	127.2	0.0	97.8
130.00		1.00	1.07	26.425	29.07	278.65	1.000	0.000	5.00	13.575	13.57	631.3	0.0	384.8
134.00	Appurtenance(s)	1.00	1.07	26.655	29.32	272.87	1.000	0.000	4.00	10.559	10.56	495.4	0.0	299.3
135.00		1.00	1.08	26.712	29.38	271.41	1.000	0.000	1.00	2.598	2.60	122.1	0.0	73.6
137.50	Appurtenance(s)	1.00	1.08	26.852	29.54	267.74	1.000	0.000	2.50	6.422	6.42	303.5	0.0	182.0
140.00		1.00	1.09	26.991	29.69	264.04	1.000	0.000	2.50	6.318	6.32	300.1	0.0	179.0
145.00		1.00	1.10	27.263	29.99	256.53	1.000	0.000	5.00	12.323	12.32	591.3	0.0	349.1
147.00	Appurtenance(s)	1.00	1.10	27.370	30.11	253.50	1.000	0.000	2.00	4.813	4.81	231.8	0.0	136.3
150.00	Bot - Section 7	1.00	1.11	27.528	30.28	248.90	1.000	0.000	3.00	7.094	7.09	343.7	0.0	200.9
155.00	Top - Section 6	1.00	1.12	27.787	30.57	241.16	1.000	0.000	5.00	11.705	11.70	572.4	0.0	656.6
160.00		1.00	1.13	28.040	30.84	237.93	1.000	0.000	5.00	11.288	11.29	557.1	0.0	319.5

Wind Loading - Shaft

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

165.00	1.00	1.14	28.288	31.12	229.98	1.000	0.000	5.00	10.871	10.87	541.2	0.0	307.6
170.00 Top - Section 7	1.00	1.15	28.530	31.38	221.93	1.000	0.000	5.00	10.453	10.45	524.9	0.0	295.6
174.00 Appurtenance(s)	1.00	1.16	28.721	31.59	179.54	1.000	0.000	4.00	7.402	7.40	374.2	0.0	209.1
175.00 Appurtenance(s)	1.00	1.16	28.768	31.64	168.90	1.000	0.000	1.00	1.603	1.60	81.1	0.0	45.2
							Totals:	**175.00**			**22,692.3**		**25,975.3**

Discrete Appurtenance Forces

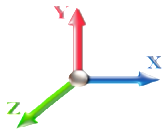
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 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	175.00	800 MHz	6	28.861	31.747	0.67	1.00	10.01	286.20	0.000	2.000	508.45	0.00	1016.91
2	175.00	DR65-18-02DPL2Q	6	29.518	32.470	0.67	1.00	23.36	129.60	0.000	16.500	1213.39	0.00	20020.89
3	175.00	E15S09P94	6	29.385	32.323	0.75	1.00	2.97	78.84	0.000	13.500	153.60	0.00	2073.62
4	175.00	T-Arms	3	28.768	31.644	0.75	1.00	24.75	653.40	0.000	0.000	1253.12	0.00	0.00
5	175.00	1900MHz	3	28.861	31.747	0.67	1.00	5.57	162.00	0.000	2.000	282.82	0.00	565.63
6	175.00	PRK-1245L	1	28.768	31.644	0.75	0.75	7.13	418.42	0.000	0.000	360.75	0.00	0.00
7	175.00	TD-RRH8x20-25	3	28.861	31.747	0.67	1.00	8.14	189.00	0.000	2.000	413.50	0.00	827.00
8	175.00	APXVTM14-C-I20	3	28.861	31.747	0.77	1.00	14.65	151.74	0.000	2.000	743.92	0.00	1487.85
9	175.00	NNVV-65B-R4	3	28.861	31.747	0.74	1.00	27.24	208.98	0.000	2.000	1383.64	0.00	2767.29
10	175.00	PRK-SFS-L	1	28.768	31.644	1.00	1.00	7.70	207.00	0.000	0.000	389.86	0.00	0.00
11	175.00	Handrail	1	28.768	31.644	1.00	1.00	9.85	373.55	0.000	0.000	498.72	0.00	0.00
12	174.00	4.5" x 24 FT Pipe	3	29.183	32.101	1.00	1.00	40.50	699.84	0.000	10.000	2080.15	0.00	20801.51
13	147.00	T-Arms	3	27.370	30.107	0.56	0.75	18.56	653.40	0.000	0.000	894.17	0.00	0.00
14	147.00	RRH2X60-700	3	27.209	29.930	0.54	0.80	5.63	162.00	0.000	-3.000	269.51	0.00	-808.54
15	147.00	RRH2X60-PCS	3	27.209	29.930	0.54	0.80	3.54	148.50	0.000	-3.000	169.41	0.00	-508.22
16	147.00	RRH2X60-AWS	3	27.209	29.930	0.54	0.80	5.63	162.00	0.000	-3.000	269.51	0.00	-808.54
17	147.00	DB-T1-6Z-8AB-0Z	2	27.370	30.107	0.80	0.80	7.68	79.20	0.000	0.000	369.95	0.00	0.00
18	147.00	FD9R6004/2C-3L	6	27.370	30.107	0.50	0.80	1.09	16.74	0.000	0.000	52.36	0.00	0.00
19	147.00	SBNHH-1D65B	6	27.370	30.107	0.66	0.80	31.88	273.83	0.000	0.000	1535.70	0.00	0.00
20	147.00	BXA-80080-4CF	3	27.370	30.107	0.70	0.80	7.50	32.40	0.000	0.000	361.36	0.00	0.00
21	147.00	BXA-70063-6CF-EDIN-X	3	27.370	30.107	0.62	0.80	13.97	45.90	0.000	0.000	673.00	0.00	0.00
22	137.50	Low Profile	1	26.852	29.537	1.00	1.00	22.00	1350.00	0.000	0.000	1039.72	0.00	0.00
23	134.00	TPA-65R-LCUUUU-H8	3	26.852	29.537	0.66	0.80	26.49	202.50	0.000	3.500	1252.08	0.00	4382.30
24	134.00	RRUS-32	6	26.852	29.537	0.54	0.80	12.45	415.80	0.000	3.500	588.19	0.00	2058.67
25	134.00	DBC0061F1V51-2	3	26.852	29.537	0.55	0.80	0.99	27.00	0.000	3.500	46.96	0.00	164.35
26	134.00	DC6-48-60-18-8C	1	26.852	29.537	0.80	0.80	2.54	10.62	0.000	3.500	119.85	0.00	419.48
27	134.00	7770.00	3	26.852	29.537	0.58	0.80	9.64	94.50	0.000	3.500	455.40	0.00	1593.89
28	134.00	AM-X-CD-17-65-00T-RET	3	26.852	29.537	0.60	0.80	20.36	83.16	0.000	3.500	962.12	0.00	3367.41
29	134.00	LGP21401	6	26.852	29.537	0.40	0.80	3.10	76.14	0.000	3.500	146.32	0.00	512.11
30	134.00	RRUS 11	3	26.852	29.537	0.54	0.80	4.05	136.89	0.000	3.500	191.50	0.00	670.27
31	134.00	DC6-48-60-18-8F	1	26.852	29.537	0.80	0.80	2.34	13.05	0.000	3.500	110.40	0.00	386.40
32	124.00	T-Arms	3	26.071	28.678	0.56	0.75	13.82	653.40	0.000	0.000	634.16	0.00	0.00
33	124.00	742 351	6	26.071	28.678	0.49	0.80	15.75	160.92	0.000	0.000	722.81	0.00	0.00
34	54.00	Standoff	1	20.559	22.615	1.00	1.00	2.63	36.00	0.000	0.000	95.16	0.00	0.00
35	54.00	GPS	1	20.559	22.615	1.00	1.00	1.00	9.00	0.000	0.000	36.18	0.00	0.00
							Totals:		**8,401.53**			**20,277.74**		

Total Applied Force Summary

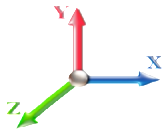
Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 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		705.59	1409.67	0.00	0.00
10.00		692.84	1388.81	0.00	0.00
15.00		680.09	1367.95	0.00	0.00
20.00		667.34	1347.09	0.00	0.00
22.00		263.37	533.00	0.00	0.00
25.00		391.23	793.24	0.00	0.00
30.00		642.39	1305.38	0.00	0.00
35.00		657.98	1284.52	0.00	0.00
36.00		131.05	254.40	0.00	0.00
38.00		268.77	855.53	0.00	0.00
39.00		134.56	425.44	0.00	0.00
40.00		134.98	423.89	0.00	0.00
42.00		272.07	843.14	0.00	0.00
45.00		411.93	668.71	0.00	0.00
50.00		695.73	1100.22	0.00	0.00
54.00	(2) attachments	689.44	912.30	0.00	0.00
55.00		138.74	214.89	0.00	0.00
60.00		701.82	1063.74	0.00	0.00
65.00		702.14	1045.86	0.00	0.00
70.00		700.92	1027.98	0.00	0.00
71.25		176.73	445.88	0.00	0.00
75.00		531.81	1324.24	0.00	0.00
76.00		140.77	349.73	0.00	0.00
80.00		564.65	803.45	0.00	0.00
85.00		702.68	868.47	0.00	0.00
86.00		138.94	171.91	0.00	0.00
90.00		556.03	681.66	0.00	0.00
95.00		689.90	838.67	0.00	0.00
100.00		682.09	823.77	0.00	0.00
104.00		538.71	648.29	0.00	0.00
105.00		133.22	160.58	0.00	0.00
110.00		663.93	785.97	0.00	0.00
115.00		653.68	771.07	0.00	0.00
120.00		654.98	1266.03	0.00	0.00
124.00	(9) attachments	1872.10	1416.23	0.00	0.00
125.00		127.16	137.70	0.00	0.00
130.00		631.33	584.33	0.00	0.00
134.00	(29) attachments	4368.19	1518.54	0.00	13554.86
135.00		122.14	100.57	0.00	0.00
137.50	(1) attachments	1343.23	1599.34	0.00	0.00
140.00		300.13	246.36	0.00	0.00
145.00		591.30	483.78	0.00	0.00
147.00	(32) attachments	4826.79	1764.15	0.00	-2125.29
150.00		343.68	244.86	0.00	0.00
155.00		572.43	729.95	0.00	0.00
160.00		557.06	392.80	0.00	0.00

Total Applied Force Summary

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 22

Tower Engineering Solutions

165.00		541.21	380.88	0.00	0.00
170.00		524.90	368.97	0.00	0.00
174.00	(3) attachments	2454.32	967.56	0.00	20801.51
175.00	(36) attachments	7282.91	2918.58	0.00	28759.18
	Totals:	**42,969.99**	**42,060.09**	**0.00**	**60,990.26**

Linear Appurtenance Segment Forces (Factored)

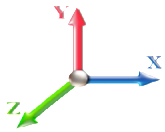
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 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	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.059	0.000	17.366	0.00	8.01
10.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.060	0.000	17.366	0.00	8.01
15.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.061	0.000	17.366	0.00	8.01
20.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.062	0.000	17.366	0.00	8.01
22.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.063	0.000	17.366	0.00	3.20
25.00	3" Chanel	Yes	3.00	0.000	3.25	0.81	0.00	0.063	0.000	17.366	0.00	4.81
30.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.064	0.000	17.381	0.00	8.01
35.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.066	0.000	18.163	0.00	8.01
36.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.067	0.000	18.310	0.00	1.60
38.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.067	0.000	18.595	0.00	3.20
39.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.067	0.000	18.734	0.00	1.60
40.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.068	0.000	18.870	0.00	1.60
42.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.068	0.000	19.135	0.00	3.20
45.00	3" Chanel	Yes	3.00	0.000	3.25	0.81	0.00	0.068	0.000	19.516	0.00	4.81
50.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.069	0.000	20.112	0.00	8.01
54.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.070	0.000	20.559	0.00	6.41
55.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.071	0.000	20.667	0.00	1.60
60.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.072	0.000	21.187	0.00	8.01
65.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.074	0.000	21.678	0.00	8.01
70.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.075	0.000	22.142	0.00	8.01
71.25	3" Chanel	Yes	1.25	0.000	3.25	0.34	0.00	0.076	0.000	22.254	0.00	2.00
75.00	3" Chanel	Yes	3.75	0.000	3.25	1.02	0.00	0.077	0.000	22.582	0.00	6.01
76.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.078	0.000	22.668	0.00	1.60
80.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.078	0.000	23.003	0.00	6.41
85.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.079	0.000	23.404	0.00	8.01
86.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.081	0.000	23.483	0.00	1.60
90.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.082	0.000	23.790	0.00	6.41
95.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.083	0.000	24.160	0.00	8.01
100.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.086	0.000	24.517	0.00	8.01
104.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.088	0.000	24.793	0.00	6.41
105.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.089	0.000	24.861	0.00	1.60
									Totals:		**0.0**	**168.2**

Calculated Forces

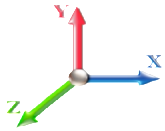
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

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	-42.00	-43.03	0.00	-5298.3	0.00	5298.30	4294.71	2147.35	9493.67	4688.57	0.00	0.000	0.000	0.700
5.00	-40.47	-42.44	0.00	-5083.1	0.00	5083.15	4251.62	2125.81	9227.39	4557.06	0.09	-0.164	0.000	0.685
10.00	-38.96	-41.85	0.00	-4870.9	0.00	4870.95	4207.27	2103.63	8961.88	4425.94	0.35	-0.329	0.000	0.671
15.00	-37.48	-41.27	0.00	-4661.6	0.00	4661.69	4161.65	2080.83	8697.29	4295.27	0.78	-0.494	0.000	0.656
20.00	-36.06	-40.66	0.00	-4455.3	0.00	4455.33	4114.76	2057.38	8433.78	4165.13	1.39	-0.661	0.000	0.641
22.00	-35.46	-40.45	0.00	-4374.0	0.00	4374.00	4095.66	2047.83	8328.71	4113.24	1.68	-0.728	0.000	0.758
25.00	-34.56	-40.15	0.00	-4252.6	0.00	4252.64	4066.61	2033.31	8171.50	4035.59	2.18	-0.849	0.000	0.748
30.00	-33.13	-39.60	0.00	-4051.9	0.00	4051.90	4017.20	2008.60	7910.59	3906.74	3.17	-1.049	0.000	0.732
35.00	-31.78	-38.98	0.00	-3853.9	0.00	3853.90	3966.51	1983.26	7651.22	3778.65	4.38	-1.250	0.000	0.596
36.00	-31.48	-38.88	0.00	-3814.9	0.00	3814.92	3956.22	1978.11	7599.55	3753.13	4.64	-1.284	0.000	0.797
38.00	-30.59	-38.62	0.00	-3737.1	0.00	3737.16	3935.49	1967.75	7496.40	3702.19	5.20	-1.376	0.000	0.579
39.00	-30.14	-38.50	0.00	-3698.5	0.00	3698.54	3925.05	1962.53	7444.93	3676.77	5.49	-1.410	0.000	0.694
40.00	-29.68	-38.39	0.00	-3660.0	0.00	3660.04	3914.56	1957.28	7393.54	3651.39	5.79	-1.450	0.000	0.690
42.00	-28.78	-38.14	0.00	-3583.2	0.00	3583.27	3554.53	1777.27	6785.59	3351.15	6.42	-1.532	0.000	0.664
45.00	-28.01	-37.80	0.00	-3468.8	0.00	3468.84	3532.39	1766.19	6658.05	3288.16	7.42	-1.653	0.000	0.697
50.00	-26.81	-37.16	0.00	-3279.8	0.00	3279.87	3494.22	1747.11	6445.54	3183.21	9.27	-1.868	0.000	0.675
54.00	-25.85	-36.48	0.00	-3131.2	0.00	3131.25	3462.54	1731.27	6275.67	3099.32	10.90	-2.040	0.000	0.658
55.00	-25.56	-36.40	0.00	-3094.7	0.00	3094.76	3454.46	1727.23	6233.23	3078.36	11.34	-2.084	0.000	0.653
60.00	-24.39	-35.75	0.00	-2912.7	0.00	2912.78	3413.12	1706.56	6021.34	2973.71	13.63	-2.297	0.000	0.631
65.00	-23.24	-35.09	0.00	-2734.0	0.00	2734.06	3370.20	1685.10	5810.04	2869.36	16.15	-2.510	0.000	0.608
70.00	-22.17	-34.39	0.00	-2558.6	0.00	2558.63	3325.69	1662.84	5599.53	2765.40	18.89	-2.721	0.000	0.585
71.25	-21.67	-34.23	0.00	-2515.6	0.00	2515.65	3314.31	1657.16	5547.04	2739.48	19.61	-2.775	0.000	0.571
75.00	-20.32	-33.67	0.00	-2387.2	0.00	2387.28	3279.60	1639.80	5389.99	2661.91	21.86	-2.932	0.000	0.553
76.00	-19.91	-33.55	0.00	-2353.6	0.00	2353.61	3306.32	1653.16	5510.48	2721.42	22.47	-2.974	0.000	0.563
80.00	-19.04	-33.00	0.00	-2219.4	0.00	2219.42	3269.04	1634.52	5343.14	2638.78	25.04	-3.139	0.000	0.525
80.00	-19.04	-33.00	0.00	-2219.4	0.00	2219.42	2504.08	1252.04	4105.75	2027.68	25.04	-3.139	0.000	0.572
85.00	-18.14	-32.29	0.00	-2054.4	0.00	2054.41	2474.85	1237.43	3958.27	1954.84	28.43	-3.335	0.000	0.604
86.00	-17.90	-32.18	0.00	-2022.1	0.00	2022.12	2468.82	1234.41	3928.75	1940.26	29.13	-3.379	0.000	0.745
90.00	-17.13	-31.66	0.00	-1893.4	0.00	1893.40	2444.04	1222.02	3810.67	1881.94	32.05	-3.594	0.000	0.714
95.00	-16.19	-30.99	0.00	-1735.1	0.00	1735.13	2411.64	1205.82	3663.14	1809.09	35.95	-3.856	0.000	0.674
100.00	-15.30	-30.31	0.00	-1580.2	0.00	1580.20	2377.66	1188.83	3515.87	1736.36	40.13	-4.112	0.000	0.634
104.00	-14.63	-29.76	0.00	-1458.9	0.00	1458.96	2349.34	1174.67	3398.38	1678.33	43.66	-4.314	0.000	0.601
104.00	-14.63	-29.76	0.00	-1458.9	0.00	1458.96	2349.34	1174.67	3398.38	1678.33	43.66	-4.314	0.000	0.601
105.00	-14.37	-29.66	0.00	-1429.2	0.00	1429.20	2342.10	1171.05	3369.07	1663.86	44.57	-4.365	0.000	0.866
110.00	-13.46	-29.02	0.00	-1280.8	0.00	1280.88	2304.95	1152.47	3222.91	1591.67	49.32	-4.719	0.000	0.811
115.00	-12.58	-28.38	0.00	-1135.7	0.00	1135.77	2266.22	1133.11	3077.59	1519.90	54.45	-5.062	0.000	0.753
120.00	-11.24	-27.67	0.00	-993.88	0.00	993.88	2252.14	1126.07	3026.44	1494.64	59.92	-5.391	0.000	0.671
124.00	-9.94	-25.70	0.00	-883.20	0.00	883.20	2219.57	1109.78	2911.24	1437.75	64.54	-5.646	0.000	0.619
125.00	-9.74	-25.59	0.00	-857.50	0.00	857.50	2211.27	1105.63	2882.56	1423.59	65.73	-5.705	0.000	0.607
125.00	-9.74	-25.59	0.00	-857.50	0.00	857.50	1600.93	800.47	2095.19	1034.73	65.73	-5.705	0.000	0.836
130.00	-9.11	-24.94	0.00	-729.58	0.00	729.58	1577.27	788.64	2000.77	988.11	71.84	-5.983	0.000	0.745
134.00	-8.01	-20.46	0.00	-616.26	0.00	616.26	1557.20	778.60	1925.20	950.79	76.96	-6.242	0.000	0.654
135.00	-7.88	-20.34	0.00	-595.80	0.00	595.80	1552.03	776.01	1906.32	941.46	78.27	-6.304	0.000	0.639
137.50	-6.40	-18.84	0.00	-544.95	0.00	544.95	1538.81	769.41	1859.13	918.16	81.61	-6.454	0.000	0.598
140.00	-6.12	-18.54	0.00	-497.84	0.00	497.84	1525.20	762.60	1812.01	894.88	85.02	-6.598	0.000	0.561
145.00	-5.65	-17.91	0.00	-405.14	0.00	405.14	1496.79	748.40	1718.05	848.48	92.06	-6.859	0.000	0.482
147.00	-4.46	-12.92	0.00	-369.31	0.00	369.31	1484.98	742.49	1680.60	829.98	94.95	-6.959	0.000	0.448
150.00	-4.22	-12.56	0.00	-330.55	0.00	330.55	1466.80	733.40	1624.61	802.34	99.35	-7.100	0.000	0.415

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

155.00	-3.52	-11.91	0.00	-267.75	0.00	267.75	1451.75	725.87	1579.74	780.18	106.89	-7.313	0.000	0.346
160.00	-3.17	-11.32	0.00	-208.18	0.00	208.18	1419.41	709.70	1487.45	734.60	114.63	-7.503	0.000	0.286
165.00	-2.84	-10.74	0.00	-151.58	0.00	151.58	1385.48	692.74	1396.17	689.51	122.55	-7.654	0.000	0.222
170.00	-2.53	-10.17	0.00	-97.87	0.00	97.87	1349.97	674.99	1306.08	645.02	130.61	-7.772	0.000	0.154
170.00	-2.53	-10.17	0.00	-97.87	0.00	97.87	1349.97	674.99	1306.08	645.02	130.61	-7.772	0.000	0.154
174.00	-1.90	-7.61	0.00	-36.37	0.00	36.37	1121.46	560.73	870.39	429.85	137.13	-7.838	0.000	0.086
175.00	0.00	-7.28	0.00	-28.76	0.00	28.76	1053.22	526.61	767.04	378.81	138.77	-7.851	0.000	0.076

Wind Loading - Shaft

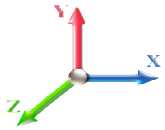
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

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	RB1 RB2	1.00	0.70	4.256	4.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	4.256	4.68	0.00	1.200	1.242	5.00	24.120	28.94	135.5	436.6	1963.3
10.00		1.00	0.70	4.256	4.68	0.00	1.200	1.331	5.00	23.777	28.53	133.6	460.4	1959.2
15.00		1.00	0.70	4.256	4.68	0.00	1.200	1.386	5.00	23.406	28.09	131.5	471.2	1942.2
20.00		1.00	0.70	4.256	4.68	0.00	1.200	1.427	5.00	23.023	27.63	129.3	476.4	1919.6
22.00	RT2	1.00	0.70	4.256	4.68	0.00	1.200	1.440	2.00	9.097	10.92	51.1	191.0	760.5
25.00		1.00	0.70	4.256	4.68	0.00	1.200	1.459	3.00	13.529	16.24	76.0	287.0	1132.9
30.00		1.00	0.70	4.260	4.69	0.00	1.200	1.486	5.00	22.238	26.69	125.0	478.0	1865.6
35.00	RB3	1.00	0.73	4.451	4.90	0.00	1.200	1.509	5.00	21.840	26.21	128.3	476.2	1836.0
36.00	Bot - Section 2 RT1	1.00	0.74	4.487	4.94	0.00	1.200	1.513	1.00	4.319	5.18	25.6	95.1	363.8
38.00	RB4	1.00	0.75	4.557	5.01	0.00	1.200	1.521	2.00	8.719	10.46	52.5	192.8	1192.3
39.00	RT3	1.00	0.76	4.591	5.05	0.00	1.200	1.525	1.00	4.335	5.20	26.3	96.3	592.9
40.00		1.00	0.76	4.625	5.09	0.00	1.200	1.529	1.00	4.319	5.18	26.4	96.1	590.7
42.00	Top - Section 1	1.00	0.77	4.689	5.16	0.00	1.200	1.537	2.00	8.591	10.31	53.2	191.7	1174.7
45.00		1.00	0.79	4.783	5.26	0.00	1.200	1.547	3.00	12.767	15.32	80.6	286.1	966.0
50.00		1.00	0.81	4.929	5.42	0.00	1.200	1.564	5.00	20.958	25.15	136.4	472.2	1586.3
54.00	Appurtenance(s)	1.00	0.83	5.039	5.54	0.00	1.200	1.576	4.00	16.474	19.77	109.6	374.5	1248.6
55.00		1.00	0.83	5.065	5.57	0.00	1.200	1.579	1.00	4.077	4.89	27.3	93.4	309.5
60.00		1.00	0.85	5.193	5.71	0.00	1.200	1.592	5.00	20.148	24.18	138.1	461.2	1527.6
65.00		1.00	0.87	5.313	5.84	0.00	1.200	1.605	5.00	19.741	23.69	138.4	455.0	1497.6
70.00	Bot - Section 3	1.00	0.89	5.426	5.97	0.00	1.200	1.617	5.00	19.334	23.20	138.5	448.4	1467.1
71.25	RT4 RB5	1.00	0.90	5.454	6.00	0.00	1.200	1.620	1.25	4.850	5.82	34.9	113.6	620.2
75.00		1.00	0.91	5.534	6.09	0.00	1.200	1.628	3.75	14.398	17.28	105.2	337.0	1838.7
76.00	Top - Section 2	1.00	0.91	5.555	6.11	0.00	1.200	1.631	1.00	3.800	4.56	27.9	89.6	485.5
80.00	Top - Section 3	1.00	0.93	5.637	6.20	0.00	1.200	1.639	4.00	15.040	18.05	111.9	353.6	1143.4
85.00		1.00	0.94	5.736	6.31	0.00	1.200	1.649	5.00	18.433	22.12	139.6	434.5	1240.5
86.00	RT5 RB6	1.00	0.95	5.755	6.33	0.00	1.200	1.651	1.00	3.637	4.36	27.6	86.6	245.4
90.00		1.00	0.96	5.830	6.41	0.00	1.200	1.658	4.00	14.385	17.26	110.7	341.4	968.7
95.00		1.00	0.97	5.921	6.51	0.00	1.200	1.667	5.00	17.614	21.14	137.7	418.7	1185.0
100.00		1.00	0.99	6.008	6.61	0.00	1.200	1.676	5.00	17.204	20.64	136.4	410.4	1156.8
104.00	RT6	1.00	1.00	6.076	6.68	0.00	1.200	1.682	4.00	13.467	16.16	108.0	322.9	905.8
105.00		1.00	1.00	6.093	6.70	0.00	1.200	1.684	1.00	3.325	3.99	26.7	80.4	224.1
110.00		1.00	1.02	6.174	6.79	0.00	1.200	1.692	5.00	16.383	19.66	133.5	393.3	1100.0
115.00	Bot - Section 5	1.00	1.03	6.253	6.88	0.00	1.200	1.699	5.00	15.972	19.17	131.8	384.5	1071.3
120.00	Top - Section 4	1.00	1.04	6.330	6.96	0.00	1.200	1.707	5.00	15.831	19.00	132.3	382.4	1729.2
124.00	Appurtenance(s)	1.00	1.05	6.389	7.03	0.00	1.200	1.712	4.00	12.368	14.84	104.3	300.1	829.7
125.00	Top - Section 5	1.00	1.05	6.404	7.04	0.00	1.200	1.714	1.00	3.051	3.66	25.8	74.7	205.1
130.00		1.00	1.07	6.476	7.12	0.00	1.200	1.720	5.00	15.008	18.01	128.3	364.1	877.2
134.00	Appurtenance(s)	1.00	1.07	6.532	7.19	0.00	1.200	1.726	4.00	11.710	14.05	101.0	285.3	684.3
135.00		1.00	1.08	6.546	7.20	0.00	1.200	1.727	1.00	2.886	3.46	24.9	70.9	169.1
137.50	Appurtenance(s)	1.00	1.08	6.581	7.24	0.00	1.200	1.730	2.50	7.143	8.57	62.1	175.0	417.6
140.00		1.00	1.09	6.615	7.28	0.00	1.200	1.733	2.50	7.040	8.45	61.5	172.6	411.3
145.00		1.00	1.10	6.681	7.35	0.00	1.200	1.739	5.00	13.773	16.53	121.5	335.6	801.0
147.00	Appurtenance(s)	1.00	1.10	6.708	7.38	0.00	1.200	1.742	2.00	5.393	6.47	47.8	132.7	314.4
150.00	Bot - Section 7	1.00	1.11	6.746	7.42	0.00	1.200	1.745	3.00	7.966	9.56	70.9	195.5	463.3
155.00	Top - Section 6	1.00	1.12	6.810	7.49	0.00	1.200	1.751	5.00	13.164	15.80	118.3	321.7	1197.2
160.00		1.00	1.13	6.872	7.56	0.00	1.200	1.757	5.00	12.751	15.30	115.7	311.7	737.7

Wind Loading - Shaft

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

165.00	1.00	1.14	6.933	7.63	0.00	1.200	1.762	5.00	12.339	14.81	112.9	301.7	711.8
170.00 Top - Section 7	1.00	1.15	6.992	7.69	0.00	1.200	1.767	5.00	11.926	14.31	110.1	291.6	685.8
174.00 Appurtenance(s)	1.00	1.16	7.039	7.74	0.00	1.200	1.771	4.00	8.583	10.30	79.7	191.6	470.4
175.00 Appurtenance(s)	1.00	1.16	7.050	7.76	0.00	1.200	1.772	1.00	1.898	2.28	17.7	45.3	105.5
							Totals:	**175.00**			**4,529.7**		**48,892.2**

Discrete Appurtenance Forces

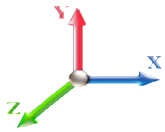
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

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	175.00	800 MHz	6	7.073	7.780	0.67	1.00	14.68	705.65	0.000	2.000	114.21	0.00	228.42
2	175.00	DR65-18-02DPL2Q	6	7.234	7.957	0.69	1.00	28.50	981.06	0.000	16.500	226.80	0.00	3742.19
3	175.00	E15S09P94	6	7.201	7.922	0.75	1.00	5.73	180.80	0.000	13.500	45.38	0.00	612.59
4	175.00	T-Arms	3	7.050	7.755	0.75	1.00	56.24	1321.60	0.000	0.000	436.18	0.00	0.00
5	175.00	1900MHz	3	7.073	7.780	0.67	1.00	8.16	398.49	0.000	2.000	63.47	0.00	126.93
6	175.00	PRK-1245L	1	7.050	7.755	0.75	0.75	14.70	792.39	0.000	0.000	114.01	0.00	0.00
7	175.00	TD-RRH8x20-25	3	7.073	7.780	0.67	1.00	9.80	589.63	0.000	2.000	76.27	0.00	152.53
8	175.00	APXVTM14-C-I20	3	7.073	7.780	0.77	1.00	17.26	692.57	0.000	2.000	134.29	0.00	268.58
9	175.00	NNVV-65B-R4	3	7.073	7.780	0.74	1.00	30.52	951.22	0.000	2.000	237.48	0.00	474.95
10	175.00	PRK-SFS-L	1	7.050	7.755	1.00	1.00	15.89	501.11	0.000	0.000	123.22	0.00	0.00
11	175.00	Handrail	1	7.050	7.755	1.00	1.00	22.42	725.08	0.000	0.000	173.87	0.00	0.00
12	174.00	4.5" x 24 FT Pipe	3	7.152	7.867	1.00	1.00	61.76	1475.17	0.000	10.000	485.84	0.00	4858.41
13	147.00	T-Arms	3	6.708	7.378	0.56	0.75	41.77	1310.76	0.000	0.000	308.22	0.00	0.00
14	147.00	RRH2X60-700	3	6.668	7.335	0.54	0.80	6.89	417.04	0.000	-3.000	50.57	0.00	-151.71
15	147.00	RRH2X60-PCS	3	6.668	7.335	0.54	0.80	4.56	450.95	0.000	-3.000	33.43	0.00	-100.30
16	147.00	RRH2X60-AWS	3	6.668	7.335	0.54	0.80	6.89	417.04	0.000	-3.000	50.57	0.00	-151.71
17	147.00	DB-T1-6Z-8AB-0Z	2	6.708	7.378	0.80	0.80	9.07	392.37	0.000	0.000	66.96	0.00	0.00
18	147.00	FD9R6004/2C-3L	6	6.708	7.378	0.53	0.80	2.56	60.18	0.000	0.000	18.87	0.00	0.00
19	147.00	SBNHH-1D65B	6	6.708	7.378	0.66	0.80	37.06	1571.84	0.000	0.000	273.42	0.00	0.00
20	147.00	BXA-80080-4CF	3	6.708	7.378	0.70	0.80	11.37	239.55	0.000	0.000	83.92	0.00	0.00
21	147.00	BXA-70063-6CF-EDIN-X	3	6.708	7.378	0.62	0.80	19.16	386.57	0.000	0.000	141.38	0.00	0.00
22	137.50	Low Profile	1	6.581	7.239	1.00	1.00	39.51	2797.57	0.000	0.000	286.00	0.00	0.00
23	134.00	TPA-65R-LCUUUU-H8	3	6.581	7.239	0.66	0.80	29.73	1194.23	0.000	3.500	215.24	0.00	753.34
24	134.00	RRUS-32	6	6.581	7.239	0.54	0.80	13.17	1226.73	0.000	3.500	95.37	0.00	333.79
25	134.00	DBC0061F1V51-2	3	6.581	7.239	0.55	0.80	1.59	99.40	0.000	3.500	11.51	0.00	40.27
26	134.00	DC6-48-60-18-8C	1	6.581	7.239	0.80	0.80	3.09	47.14	0.000	3.500	22.37	0.00	78.31
27	134.00	7770.00	3	6.581	7.239	0.60	0.80	11.79	525.95	0.000	3.500	85.38	0.00	298.82
28	134.00	AM-X-CD-17-65-00T-RET	3	6.581	7.239	0.62	0.80	28.65	346.51	0.000	3.500	207.38	0.00	725.83
29	134.00	LGP21401	6	6.581	7.239	0.40	0.80	5.08	207.25	0.000	3.500	36.77	0.00	128.69
30	134.00	RRUS 11	3	6.581	7.239	0.54	0.80	5.09	446.43	0.000	3.500	36.82	0.00	128.88
31	134.00	DC6-48-60-18-8F	1	6.581	7.239	0.80	0.80	3.30	61.82	0.000	3.500	23.87	0.00	83.53
32	124.00	T-Arms	3	6.389	7.028	0.56	0.75	30.81	1300.36	0.000	0.000	216.55	0.00	0.00
33	124.00	742 351	6	6.389	7.028	0.50	0.80	22.16	611.77	0.000	0.000	155.77	0.00	0.00
34	54.00	Standoff	1	5.039	5.542	1.00	1.00	8.02	97.48	0.000	0.000	44.44	0.00	0.00
35	54.00	GPS	1	5.039	5.542	1.00	1.00	1.64	30.47	0.000	0.000	9.11	0.00	0.00
							Totals:		**23,554.20**			**4,704.92**		

Total Applied Force Summary

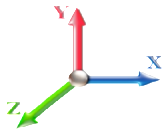
Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

Tower Engineering Solutions

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		135.51	2343.99	0.00	0.00
10.00		133.58	2342.37	0.00	0.00
15.00		131.49	2326.96	0.00	0.00
20.00		129.34	2305.49	0.00	0.00
22.00		51.11	915.00	0.00	0.00
25.00		76.01	1364.98	0.00	0.00
30.00		125.04	2253.25	0.00	0.00
35.00		128.33	2224.32	0.00	0.00
36.00		25.58	441.45	0.00	0.00
38.00		52.45	1347.81	0.00	0.00
39.00		26.27	670.70	0.00	0.00
40.00		26.37	668.53	0.00	0.00
42.00		53.18	1330.38	0.00	0.00
45.00		80.60	1199.66	0.00	0.00
50.00		136.36	1976.28	0.00	0.00
54.00	(2) attachments	163.12	1688.81	0.00	0.00
55.00		27.26	387.44	0.00	0.00
60.00		138.09	1917.56	0.00	0.00
65.00		138.44	1887.89	0.00	0.00
70.00		138.49	1857.80	0.00	0.00
71.25		34.91	717.86	0.00	0.00
75.00		105.18	2131.99	0.00	0.00
76.00		27.87	563.73	0.00	0.00
80.00		111.92	1456.48	0.00	0.00
85.00		139.56	1632.25	0.00	0.00
86.00		27.63	323.77	0.00	0.00
90.00		110.71	1282.32	0.00	0.00
95.00		137.67	1577.27	0.00	0.00
100.00		136.45	1549.42	0.00	0.00
104.00		108.01	1220.00	0.00	0.00
105.00		26.74	302.68	0.00	0.00
110.00		133.52	1441.26	0.00	0.00
115.00		131.84	1412.57	0.00	0.00
120.00		132.27	2070.45	0.00	0.00
124.00	(9) attachments	476.63	3014.80	0.00	0.00
125.00		25.79	258.27	0.00	0.00
130.00		128.30	1143.18	0.00	0.00
134.00	(29) attachments	835.68	5052.58	0.00	2571.46
135.00		24.94	205.03	0.00	0.00
137.50	(1) attachments	348.05	3305.00	0.00	0.00
140.00		61.47	501.07	0.00	0.00
145.00		121.47	980.61	0.00	0.00
147.00	(32) attachments	1075.10	5632.54	0.00	-403.73
150.00		70.94	521.98	0.00	0.00
155.00		118.33	1294.93	0.00	0.00
160.00		115.67	835.48	0.00	0.00

Total Applied Force Summary

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 30

Tower Engineering Solutions

165.00		112.91	809.57	0.00	0.00
170.00		110.07	783.56	0.00	0.00
174.00	(3) attachments	565.59	2023.75	0.00	4858.41
175.00	(36) attachments	1762.82	7964.69	0.00	5606.20
	Totals:	**9,234.64**	**83,459.77**	**0.00**	**12,632.34**

Linear Appurtenance Segment Forces (Factored)

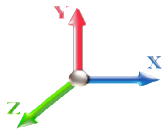
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

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	3" Chanel	Yes	5.00	0.000	3.25	2.39	0.00	0.059	0.000	4.256	0.00	38.50
10.00	3" Chanel	Yes	5.00	0.000	3.25	2.46	0.00	0.060	0.000	4.256	0.00	40.94
15.00	3" Chanel	Yes	5.00	0.000	3.25	2.51	0.00	0.061	0.000	4.256	0.00	42.51
20.00	3" Chanel	Yes	5.00	0.000	3.25	2.54	0.00	0.062	0.000	4.256	0.00	43.68
22.00	3" Chanel	Yes	2.00	0.000	3.25	1.02	0.00	0.063	0.000	4.256	0.00	17.63
25.00	3" Chanel	Yes	3.00	0.000	3.25	1.54	0.00	0.063	0.000	4.256	0.00	26.77
30.00	3" Chanel	Yes	5.00	0.000	3.25	2.59	0.00	0.064	0.000	4.260	0.00	45.42
35.00	3" Chanel	Yes	5.00	0.000	3.25	2.61	0.00	0.066	0.000	4.451	0.00	46.11
36.00	3" Chanel	Yes	1.00	0.000	3.25	0.52	0.00	0.067	0.000	4.487	0.00	9.25
38.00	3" Chanel	Yes	2.00	0.000	3.25	1.05	0.00	0.067	0.000	4.557	0.00	18.60
39.00	3" Chanel	Yes	1.00	0.000	3.25	0.53	0.00	0.067	0.000	4.591	0.00	9.32
40.00	3" Chanel	Yes	1.00	0.000	3.25	0.53	0.00	0.068	0.000	4.625	0.00	9.35
42.00	3" Chanel	Yes	2.00	0.000	3.25	1.05	0.00	0.068	0.000	4.689	0.00	18.78
45.00	3" Chanel	Yes	3.00	0.000	3.25	1.59	0.00	0.068	0.000	4.783	0.00	28.37
50.00	3" Chanel	Yes	5.00	0.000	3.25	2.66	0.00	0.069	0.000	4.929	0.00	47.79
54.00	3" Chanel	Yes	4.00	0.000	3.25	2.13	0.00	0.070	0.000	5.039	0.00	38.53
55.00	3" Chanel	Yes	1.00	0.000	3.25	0.53	0.00	0.071	0.000	5.065	0.00	9.65
60.00	3" Chanel	Yes	5.00	0.000	3.25	2.68	0.00	0.072	0.000	5.193	0.00	48.68
65.00	3" Chanel	Yes	5.00	0.000	3.25	2.69	0.00	0.074	0.000	5.313	0.00	49.08
70.00	3" Chanel	Yes	5.00	0.000	3.25	2.70	0.00	0.075	0.000	5.426	0.00	49.45
71.25	3" Chanel	Yes	1.25	0.000	3.25	0.68	0.00	0.076	0.000	5.454	0.00	12.39
75.00	3" Chanel	Yes	3.75	0.000	3.25	2.03	0.00	0.077	0.000	5.534	0.00	37.36
76.00	3" Chanel	Yes	1.00	0.000	3.25	0.54	0.00	0.078	0.000	5.555	0.00	9.98
80.00	3" Chanel	Yes	4.00	0.000	3.25	2.18	0.00	0.078	0.000	5.637	0.00	40.11
85.00	3" Chanel	Yes	5.00	0.000	3.25	2.73	0.00	0.079	0.000	5.736	0.00	50.46
86.00	3" Chanel	Yes	1.00	0.000	3.25	0.55	0.00	0.081	0.000	5.755	0.00	10.10
90.00	3" Chanel	Yes	4.00	0.000	3.25	2.19	0.00	0.082	0.000	5.830	0.00	40.61
95.00	3" Chanel	Yes	5.00	0.000	3.25	2.74	0.00	0.083	0.000	5.921	0.00	51.05
100.00	3" Chanel	Yes	5.00	0.000	3.25	2.75	0.00	0.086	0.000	6.008	0.00	51.32
104.00	3" Chanel	Yes	4.00	0.000	3.25	2.20	0.00	0.088	0.000	6.076	0.00	41.23
105.00	3" Chanel	Yes	1.00	0.000	3.25	0.55	0.00	0.089	0.000	6.093	0.00	10.32
										Totals:	**0.0**	**993.3**

Calculated Forces

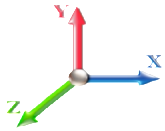
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

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	-83.46	-9.26	0.00	-1222.5	0.00	1222.59	4294.71	2147.35	9493.67	4688.57	0.00	0.000	0.000	0.172
5.00	-81.11	-9.18	0.00	-1176.2	0.00	1176.28	4251.62	2125.81	9227.39	4557.06	0.02	-0.038	0.000	0.168
10.00	-78.76	-9.10	0.00	-1130.3	0.00	1130.38	4207.27	2103.63	8961.88	4425.94	0.08	-0.076	0.000	0.165
15.00	-76.43	-9.01	0.00	-1084.9	0.00	1084.90	4161.65	2080.83	8697.29	4295.27	0.18	-0.115	0.000	0.162
20.00	-74.12	-8.91	0.00	-1039.8	0.00	1039.84	4114.76	2057.38	8433.78	4165.13	0.32	-0.153	0.000	0.159
22.00	-73.20	-8.89	0.00	-1022.0	0.00	1022.01	4095.66	2047.83	8328.71	4113.24	0.39	-0.169	0.000	0.189
25.00	-71.83	-8.85	0.00	-995.35	0.00	995.35	4066.61	2033.31	8171.50	4035.59	0.50	-0.197	0.000	0.186
30.00	-69.57	-8.78	0.00	-951.08	0.00	951.08	4017.20	2008.60	7910.59	3906.74	0.74	-0.244	0.000	0.183
35.00	-67.34	-8.67	0.00	-907.19	0.00	907.19	3966.51	1983.26	7651.22	3778.65	1.02	-0.291	0.000	0.149
36.00	-66.90	-8.66	0.00	-898.52	0.00	898.52	3956.22	1978.11	7599.55	3753.13	1.08	-0.299	0.000	0.199
38.00	-65.55	-8.62	0.00	-881.20	0.00	881.20	3935.49	1967.75	7496.40	3702.19	1.21	-0.321	0.000	0.145
39.00	-64.87	-8.60	0.00	-872.58	0.00	872.58	3925.05	1962.53	7444.93	3676.77	1.28	-0.329	0.000	0.174
40.00	-64.20	-8.58	0.00	-863.98	0.00	863.98	3914.56	1957.28	7393.54	3651.39	1.35	-0.339	0.000	0.173
42.00	-62.87	-8.55	0.00	-846.81	0.00	846.81	3554.53	1777.27	6785.59	3351.15	1.49	-0.358	0.000	0.166
45.00	-61.67	-8.50	0.00	-821.17	0.00	821.17	3532.39	1766.19	6658.05	3288.16	1.73	-0.387	0.000	0.176
50.00	-59.68	-8.40	0.00	-778.65	0.00	778.65	3494.22	1747.11	6445.54	3183.21	2.16	-0.437	0.000	0.171
54.00	-57.99	-8.25	0.00	-745.05	0.00	745.05	3462.54	1731.27	6275.67	3099.32	2.54	-0.478	0.000	0.166
55.00	-57.60	-8.25	0.00	-736.80	0.00	736.80	3454.46	1727.23	6233.23	3078.36	2.65	-0.489	0.000	0.165
60.00	-55.68	-8.14	0.00	-695.55	0.00	695.55	3413.12	1706.56	6021.34	2973.71	3.18	-0.540	0.000	0.160
65.00	-53.78	-8.04	0.00	-654.82	0.00	654.82	3370.20	1685.10	5810.04	2869.36	3.78	-0.591	0.000	0.155
70.00	-51.92	-7.91	0.00	-614.65	0.00	614.65	3325.69	1662.84	5599.53	2765.40	4.42	-0.641	0.000	0.149
71.25	-51.20	-7.89	0.00	-604.77	0.00	604.77	3314.31	1657.16	5547.04	2739.48	4.59	-0.654	0.000	0.146
75.00	-49.07	-7.78	0.00	-575.20	0.00	575.20	3279.60	1639.80	5389.99	2661.91	5.12	-0.692	0.000	0.142
76.00	-48.50	-7.76	0.00	-567.42	0.00	567.42	3306.32	1653.16	5510.48	2721.42	5.27	-0.702	0.000	0.144
80.00	-47.04	-7.67	0.00	-536.38	0.00	536.38	3269.04	1634.52	5343.14	2638.78	5.87	-0.742	0.000	0.135
80.00	-47.04	-7.67	0.00	-536.38	0.00	536.38	2504.08	1252.04	4105.75	2027.68	5.87	-0.742	0.000	0.147
85.00	-45.41	-7.53	0.00	-498.04	0.00	498.04	2474.85	1237.43	3958.27	1954.84	6.68	-0.789	0.000	0.156
86.00	-45.08	-7.52	0.00	-490.51	0.00	490.51	2468.82	1234.41	3928.75	1940.26	6.84	-0.800	0.000	0.193
90.00	-43.79	-7.44	0.00	-460.42	0.00	460.42	2444.04	1222.02	3810.67	1881.94	7.53	-0.852	0.000	0.185
95.00	-42.21	-7.32	0.00	-423.24	0.00	423.24	2411.64	1205.82	3663.14	1809.09	8.46	-0.916	0.000	0.176
100.00	-40.65	-7.20	0.00	-386.63	0.00	386.63	2377.66	1188.83	3515.87	1736.36	9.45	-0.979	0.000	0.166
104.00	-39.43	-7.09	0.00	-357.84	0.00	357.84	2349.34	1174.67	3398.38	1678.33	10.30	-1.028	0.000	0.158
104.00	-39.43	-7.09	0.00	-357.84	0.00	357.84	2349.34	1174.67	3398.38	1678.33	10.30	-1.028	0.000	0.158
105.00	-39.12	-7.09	0.00	-350.75	0.00	350.75	2342.10	1171.05	3369.07	1663.86	10.51	-1.041	0.000	0.228
110.00	-37.68	-6.99	0.00	-315.28	0.00	315.28	2304.95	1152.47	3222.91	1591.67	11.65	-1.128	0.000	0.214
115.00	-36.26	-6.88	0.00	-280.34	0.00	280.34	2266.22	1133.11	3077.59	1519.90	12.88	-1.212	0.000	0.200
120.00	-34.18	-6.75	0.00	-245.93	0.00	245.93	2252.14	1126.07	3026.44	1494.64	14.19	-1.294	0.000	0.180
124.00	-31.17	-6.22	0.00	-218.95	0.00	218.95	2219.57	1109.78	2911.24	1437.75	15.30	-1.356	0.000	0.166
125.00	-30.91	-6.21	0.00	-212.73	0.00	212.73	2211.27	1105.63	2882.56	1423.59	15.59	-1.371	0.000	0.163
125.00	-30.91	-6.21	0.00	-212.73	0.00	212.73	1600.93	800.47	2095.19	1034.73	15.59	-1.371	0.000	0.225
130.00	-29.76	-6.09	0.00	-181.67	0.00	181.67	1577.27	788.64	2000.77	988.11	17.06	-1.440	0.000	0.203
134.00	-24.73	-5.14	0.00	-154.73	0.00	154.73	1557.20	778.60	1925.20	950.79	18.30	-1.505	0.000	0.179
135.00	-24.52	-5.12	0.00	-149.59	0.00	149.59	1552.03	776.01	1906.32	941.46	18.61	-1.521	0.000	0.175
137.50	-21.23	-4.70	0.00	-136.79	0.00	136.79	1538.81	769.41	1859.13	918.16	19.42	-1.558	0.000	0.163
140.00	-20.72	-4.64	0.00	-125.04	0.00	125.04	1525.20	762.60	1812.01	894.88	20.24	-1.594	0.000	0.153
145.00	-19.74	-4.51	0.00	-101.82	0.00	101.82	1496.79	748.40	1718.05	848.48	21.95	-1.660	0.000	0.133
147.00	-14.14	-3.28	0.00	-92.80	0.00	92.80	1484.98	742.49	1680.60	829.98	22.65	-1.685	0.000	0.121
150.00	-13.62	-3.20	0.00	-82.97	0.00	82.97	1466.80	733.40	1624.61	802.34	23.72	-1.720	0.000	0.113

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

155.00	-12.33	-3.06	0.00	-66.95	0.00	66.95	1451.75	725.87	1579.74	780.18	25.55	-1.774	0.000	0.094
160.00	-11.49	-2.92	0.00	-51.68	0.00	51.68	1419.41	709.70	1487.45	734.60	27.44	-1.821	0.000	0.078
165.00	-10.69	-2.79	0.00	-37.07	0.00	37.07	1385.48	692.74	1396.17	689.51	29.36	-1.858	0.000	0.061
170.00	-9.91	-2.66	0.00	-23.12	0.00	23.12	1349.97	674.99	1306.08	645.02	31.33	-1.887	0.000	0.043
170.00	-9.91	-2.66	0.00	-23.12	0.00	23.12	1349.97	674.99	1306.08	645.02	31.33	-1.887	0.000	0.043
174.00	-7.90	-2.03	0.00	-7.63	0.00	7.63	1121.46	560.73	870.39	429.85	32.91	-1.902	0.000	0.025
175.00	0.00	-1.76	0.00	-5.61	0.00	5.61	1053.22	526.61	767.04	378.81	33.31	-1.905	0.000	0.015

Seismic Segment Forces (Factored)

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 34

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	22
Gust Response Factor	1.10				**Sds**	0.18		**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.28		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1 RB2	0.00	0.00	0.00	0.00	0.00	
5.00		1272.2	0.00	0.03	0.02	22.46	
10.00		1249.0	0.01	0.05	0.03	32.29	
15.00		1225.8	0.01	0.06	0.03	36.95	
20.00		1202.6	0.02	0.07	0.04	39.06	
22.00	RT2	474.59	0.03	0.07	0.04	15.71	
25.00		704.93	0.04	0.07	0.04	23.84	
30.00		1156.3	0.06	0.07	0.04	40.15	
35.00	RB3	1133.1	0.08	0.07	0.04	40.19	
36.00	Bot - Section 2 RT1	223.85	0.08	0.07	0.04	7.97	
38.00	RB4	832.96	0.09	0.07	0.04	29.91	
39.00	RT3	413.90	0.09	0.07	0.04	14.92	
40.00		412.18	0.10	0.07	0.04	14.92	
42.00	Top - Section 1	819.19	0.11	0.07	0.04	29.91	
45.00		566.56	0.12	0.07	0.03	20.94	
50.00		928.38	0.15	0.07	0.03	34.94	
54.00	Appurtenance(s)	778.40	0.18	0.07	0.03	29.56	
55.00		180.11	0.19	0.06	0.02	6.85	
60.00		888.65	0.22	0.06	0.02	33.55	
65.00		868.79	0.26	0.05	0.02	31.65	
70.00	Bot - Section 3	848.92	0.30	0.04	0.01	28.41	
71.25	RT4 RB5	422.11	0.31	0.04	0.01	13.68	
75.00		1251.4	0.35	0.03	0.01	35.36	
76.00	Top - Section 2	329.94	0.36	0.03	0.01	8.88	
80.00	Top - Section 3	658.09	0.39	0.02	0.01	13.39	
85.00		671.69	0.45	0.00	0.01	6.53	
86.00	RT5 RB6	132.35	0.46	0.00	0.01	0.97	
90.00		522.78	0.50	-0.02	0.01	-1.46	
95.00		638.58	0.56	-0.04	0.01	-9.95	
100.00		622.02	0.62	-0.06	0.02	-16.67	
104.00	RT6	485.70	0.67	-0.08	0.02	-16.36	
105.00		119.77	0.68	-0.08	0.03	-4.20	
110.00		588.92	0.75	-0.10	0.04	-23.35	
115.00	Bot - Section 5	572.36	0.82	-0.11	0.06	-23.12	
120.00	Top - Section 4	1122.3	0.89	-0.12	0.08	-41.99	
124.00	Appurtenance(s)	1346.0	0.95	-0.12	0.11	-43.63	
125.00	Top - Section 5	108.67	0.96	-0.12	0.11	-3.35	
130.00		427.58	1.04	-0.10	0.15	-8.85	
134.00	Appurtenance(s)	1509.9	1.11	-0.07	0.19	-15.28	
135.00		81.81	1.12	-0.05	0.20	-0.58	
137.50	Appurtenance(s)	1702.2	1.17	-0.02	0.23	1.59	
140.00		198.89	1.21	0.01	0.26	1.96	
145.00		387.85	1.30	0.12	0.33	11.77	
147.00	Appurtenance(s)	1900.2	1.33	0.17	0.37	75.09	
150.00	Bot - Section 7	223.17	1.39	0.26	0.42	12.13	
155.00	Top - Section 6	729.57	1.48	0.46	0.52	59.77	

Seismic Segment Forces (Factored)

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

160.00		354.97	1.58	0.72	0.64	40.17		
165.00		341.72	1.68	1.05	0.78	50.62		
170.00	Top - Section 7	328.48	1.78	1.46	0.95	61.40		
174.00	Appurtenance(s)	1009.8	1.87	1.87	1.10	222.96		
175.00	Appurtenance(s)	3226.5	1.89	1.98	1.14	740.91		
	Totals:	**38,196.5**				**1,682.6**	**Total Wind:**	**42,970.0**

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

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Iterations 22

Gust Response Factor	1.10			**Sds**	0.18			**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.28	**SA**	0.03	**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	-56.08	-1.89	0.00	-255.01	0.00	255.01	4294.71	2147.35	9493.67	4688.57		0.00	0.00	0.041
5.00	-54.20	-1.88	0.00	-245.54	0.00	245.54	4251.62	2125.81	9227.39	4557.06		0.00	-0.01	0.040
10.00	-52.35	-1.85	0.00	-236.14	0.00	236.14	4207.27	2103.63	8961.88	4425.94		0.02	-0.02	0.039
15.00	-50.52	-1.82	0.00	-226.87	0.00	226.87	4161.65	2080.83	8697.29	4295.27		0.04	-0.02	0.039
20.00	-48.73	-1.79	0.00	-217.76	0.00	217.76	4114.76	2057.38	8433.78	4165.13		0.07	-0.03	0.038
22.00	-48.02	-1.78	0.00	-214.18	0.00	214.18	4095.66	2047.83	8328.71	4113.24		0.08	-0.04	0.045
25.00	-46.96	-1.76	0.00	-208.85	0.00	208.85	4066.61	2033.31	8171.50	4035.59		0.11	-0.04	0.045
30.00	-45.22	-1.72	0.00	-200.06	0.00	200.06	4017.20	2008.60	7910.59	3906.74		0.15	-0.05	0.044
35.00	-43.51	-1.69	0.00	-191.44	0.00	191.44	3966.51	1983.26	7651.22	3778.65		0.21	-0.06	0.036
36.00	-43.17	-1.68	0.00	-189.76	0.00	189.76	3956.22	1978.11	7599.55	3753.13		0.23	-0.06	0.048
38.00	-42.03	-1.65	0.00	-186.40	0.00	186.40	3935.49	1967.75	7496.40	3702.19		0.25	-0.07	0.035
39.00	-41.46	-1.64	0.00	-184.74	0.00	184.74	3925.05	1962.53	7444.93	3676.77		0.27	-0.07	0.042
40.00	-40.89	-1.62	0.00	-183.11	0.00	183.11	3914.56	1957.28	7393.54	3651.39		0.28	-0.07	0.042
42.00	-39.77	-1.60	0.00	-179.86	0.00	179.86	3554.53	1777.27	6785.59	3351.15		0.31	-0.08	0.040
45.00	-38.88	-1.58	0.00	-175.07	0.00	175.07	3532.39	1766.19	6658.05	3288.16		0.36	-0.08	0.042
50.00	-37.41	-1.55	0.00	-167.17	0.00	167.17	3494.22	1747.11	6445.54	3183.21		0.45	-0.09	0.041
54.00	-36.19	-1.52	0.00	-160.97	0.00	160.97	3462.54	1731.27	6275.67	3099.32		0.53	-0.10	0.041
55.00	-35.91	-1.52	0.00	-159.45	0.00	159.45	3454.46	1727.23	6233.23	3078.36		0.55	-0.10	0.040
60.00	-34.49	-1.49	0.00	-151.86	0.00	151.86	3413.12	1706.56	6021.34	2973.71		0.67	-0.11	0.039
65.00	-33.09	-1.46	0.00	-144.42	0.00	144.42	3370.20	1685.10	5810.04	2869.36		0.79	-0.13	0.038
70.00	-31.72	-1.43	0.00	-137.12	0.00	137.12	3325.69	1662.84	5599.53	2765.40		0.93	-0.14	0.037
71.25	-31.13	-1.42	0.00	-135.33	0.00	135.33	3314.31	1657.16	5547.04	2739.48		0.97	-0.14	0.037
75.00	-29.36	-1.38	0.00	-130.00	0.00	130.00	3279.60	1639.80	5389.99	2661.91		1.08	-0.15	0.036
76.00	-28.90	-1.38	0.00	-128.62	0.00	128.62	3306.32	1653.16	5510.48	2721.42		1.11	-0.15	0.036
80.00	-27.82	-1.37	0.00	-123.11	0.00	123.11	3269.04	1634.52	5343.14	2638.78		1.24	-0.16	0.034
80.00	-27.82	-1.37	0.00	-123.11	0.00	123.11	2504.08	1252.04	4105.75	2027.68		1.24	-0.16	0.037
85.00	-26.67	-1.36	0.00	-116.29	0.00	116.29	2474.85	1237.43	3958.27	1954.84		1.41	-0.17	0.040
86.00	-26.44	-1.36	0.00	-114.93	0.00	114.93	2468.82	1234.41	3928.75	1940.26		1.45	-0.17	0.050
90.00	-25.53	-1.36	0.00	-109.49	0.00	109.49	2444.04	1222.02	3810.67	1881.94		1.60	-0.19	0.049
95.00	-24.41	-1.37	0.00	-102.67	0.00	102.67	2411.64	1205.82	3663.14	1809.09		1.80	-0.20	0.047
100.00	-23.31	-1.37	0.00	-95.84	0.00	95.84	2377.66	1188.83	3515.87	1736.36		2.02	-0.22	0.045
104.00	-22.45	-1.37	0.00	-90.37	0.00	90.37	2349.34	1174.67	3398.38	1678.33		2.21	-0.23	0.044
104.00	-22.45	-1.37	0.00	-90.37	0.00	90.37	2349.34	1174.67	3398.38	1678.33		2.21	-0.23	0.044
105.00	-22.23	-1.37	0.00	-89.00	0.00	89.00	2342.10	1171.05	3369.07	1663.86		2.26	-0.23	0.063
110.00	-21.18	-1.38	0.00	-82.15	0.00	82.15	2304.95	1152.47	3222.91	1591.67		2.51	-0.25	0.061
115.00	-20.15	-1.38	0.00	-75.27	0.00	75.27	2266.22	1133.11	3077.59	1519.90		2.79	-0.28	0.058
120.00	-18.47	-1.38	0.00	-68.37	0.00	68.37	2252.14	1126.07	3026.44	1494.64		3.09	-0.30	0.054
124.00	-16.58	-1.37	0.00	-62.87	0.00	62.87	2219.57	1109.78	2911.24	1437.75		3.35	-0.32	0.051
125.00	-16.39	-1.37	0.00	-61.50	0.00	61.50	2211.27	1105.63	2882.56	1423.59		3.41	-0.32	0.051
125.00	-16.39	-1.37	0.00	-61.50	0.00	61.50	1600.93	800.47	2095.19	1034.73		3.41	-0.32	0.070
130.00	-15.61	-1.37	0.00	-54.64	0.00	54.64	1577.27	788.64	2000.77	988.11		3.76	-0.34	0.065
134.00	-13.59	-1.36	0.00	-49.14	0.00	49.14	1557.20	778.60	1925.20	950.79		4.05	-0.36	0.060
135.00	-13.45	-1.37	0.00	-47.78	0.00	47.78	1552.03	776.01	1906.32	941.46		4.13	-0.37	0.059
137.50	-11.32	-1.35	0.00	-44.37	0.00	44.37	1538.81	769.41	1859.13	918.16		4.32	-0.38	0.056
140.00	-10.99	-1.35	0.00	-40.99	0.00	40.99	1525.20	762.60	1812.01	894.88		4.53	-0.39	0.053
145.00	-10.35	-1.34	0.00	-34.23	0.00	34.23	1496.79	748.40	1718.05	848.48		4.95	-0.41	0.047
147.00	-8.00	-1.25	0.00	-31.56	0.00	31.56	1484.98	742.49	1680.60	829.98		5.12	-0.42	0.043

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G
Site Name:	Putnam	**Exposure:**	B
Height:	175.00 (ft)	**Crest Height:**	0.00
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil
Gh:	1.1	**Topography:** 1	**Struct Class:** II

5/31/2018

Tower Engineering Solutions

150.00	-7.67	-1.23	0.00	-27.82	0.00	27.82	1466.80	733.40	1624.61	802.34	5.39	-0.43	0.040
155.00	-6.70	-1.17	0.00	-21.64	0.00	21.64	1451.75	725.87	1579.74	780.18	5.85	-0.45	0.032
160.00	-6.17	-1.13	0.00	-15.80	0.00	15.80	1419.41	709.70	1487.45	734.60	6.33	-0.46	0.026
165.00	-5.66	-1.07	0.00	-10.17	0.00	10.17	1385.48	692.74	1396.17	689.51	6.82	-0.47	0.019
170.00	-5.17	-1.01	0.00	-4.80	0.00	4.80	1349.97	674.99	1306.08	645.02	7.32	-0.48	0.011
170.00	-5.17	-1.01	0.00	-4.80	0.00	4.80	1349.97	674.99	1306.08	645.02	7.32	-0.48	0.011
174.00	-3.89	-0.77	0.00	-0.77	0.00	0.77	1121.46	560.73	870.39	429.85	7.73	-0.48	0.005
175.00	0.00	-0.74	0.00	0.00	0.00	0.00	1053.22	526.61	767.04	378.81	7.83	-0.48	0.000

Seismic Segment Forces (Factored)

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 38

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	22
Gust Response Factor	1.10				**Sds**	0.18		**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.28		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1 RB2	0.00	0.00	0.00	0.00	0.00	
5.00		1272.2	0.00	0.03	0.02	22.46	
10.00		1249.0	0.01	0.05	0.03	32.29	
15.00		1225.8	0.01	0.06	0.03	36.95	
20.00		1202.6	0.02	0.07	0.04	39.06	
22.00	RT2	474.59	0.03	0.07	0.04	15.71	
25.00		704.93	0.04	0.07	0.04	23.84	
30.00		1156.3	0.06	0.07	0.04	40.15	
35.00	RB3	1133.1	0.08	0.07	0.04	40.19	
36.00	Bot - Section 2 RT1	223.85	0.08	0.07	0.04	7.97	
38.00	RB4	832.96	0.09	0.07	0.04	29.91	
39.00	RT3	413.90	0.09	0.07	0.04	14.92	
40.00		412.18	0.10	0.07	0.04	14.92	
42.00	Top - Section 1	819.19	0.11	0.07	0.04	29.91	
45.00		566.56	0.12	0.07	0.03	20.94	
50.00		928.38	0.15	0.07	0.03	34.94	
54.00	Appurtenance(s)	778.40	0.18	0.07	0.03	29.56	
55.00		180.11	0.19	0.06	0.02	6.85	
60.00		888.65	0.22	0.06	0.02	33.55	
65.00		868.79	0.26	0.05	0.02	31.65	
70.00	Bot - Section 3	848.92	0.30	0.04	0.01	28.41	
71.25	RT4 RB5	422.11	0.31	0.04	0.01	13.68	
75.00		1251.4	0.35	0.03	0.01	35.36	
76.00	Top - Section 2	329.94	0.36	0.03	0.01	8.88	
80.00	Top - Section 3	658.09	0.39	0.02	0.01	13.39	
85.00		671.69	0.45	0.00	0.01	6.53	
86.00	RT5 RB6	132.35	0.46	0.00	0.01	0.97	
90.00		522.78	0.50	-0.02	0.01	-1.46	
95.00		638.58	0.56	-0.04	0.01	-9.95	
100.00		622.02	0.62	-0.06	0.02	-16.67	
104.00	RT6	485.70	0.67	-0.08	0.02	-16.36	
105.00		119.77	0.68	-0.08	0.03	-4.20	
110.00		588.92	0.75	-0.10	0.04	-23.35	
115.00	Bot - Section 5	572.36	0.82	-0.11	0.06	-23.12	
120.00	Top - Section 4	1122.3	0.89	-0.12	0.08	-41.99	
124.00	Appurtenance(s)	1346.0	0.95	-0.12	0.11	-43.63	
125.00	Top - Section 5	108.67	0.96	-0.12	0.11	-3.35	
130.00		427.58	1.04	-0.10	0.15	-8.85	
134.00	Appurtenance(s)	1509.9	1.11	-0.07	0.19	-15.28	
135.00		81.81	1.12	-0.05	0.20	-0.58	
137.50	Appurtenance(s)	1702.2	1.17	-0.02	0.23	1.59	
140.00		198.89	1.21	0.01	0.26	1.96	
145.00		387.85	1.30	0.12	0.33	11.77	
147.00	Appurtenance(s)	1900.2	1.33	0.17	0.37	75.09	
150.00	Bot - Section 7	223.17	1.39	0.26	0.42	12.13	
155.00	Top - Section 6	729.57	1.48	0.46	0.52	59.77	

Seismic Segment Forces (Factored)

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

160.00		354.97	1.58	0.72	0.64	40.17		
165.00		341.72	1.68	1.05	0.78	50.62		
170.00	Top - Section 7	328.48	1.78	1.46	0.95	61.40		
174.00	Appurtenance(s)	1009.8	1.87	1.87	1.10	222.96		
175.00	Appurtenance(s)	3226.5	1.89	1.98	1.14	740.91		
	Totals:	**38,196.5**				**1,682.6**	**Total Wind:**	**42,970.0**

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

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Iterations 22

Gust Response Factor	1.10			**Sds**	0.18			**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency**	0.28	**SA**	0.03			**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	-42.06	-1.89	0.00	-252.09	0.00	252.09	4294.71	2147.35	9493.67	4688.57		0.00	0.00	0.039
5.00	-40.65	-1.88	0.00	-242.62	0.00	242.62	4251.62	2125.81	9227.39	4557.06		0.00	-0.01	0.038
10.00	-39.26	-1.85	0.00	-233.24	0.00	233.24	4207.27	2103.63	8961.88	4425.94		0.02	-0.02	0.037
15.00	-37.89	-1.82	0.00	-223.99	0.00	223.99	4161.65	2080.83	8697.29	4295.27		0.04	-0.02	0.036
20.00	-36.55	-1.78	0.00	-214.91	0.00	214.91	4114.76	2057.38	8433.78	4165.13		0.07	-0.03	0.036
22.00	-36.01	-1.77	0.00	-211.35	0.00	211.35	4095.66	2047.83	8328.71	4113.24		0.08	-0.03	0.043
25.00	-35.22	-1.75	0.00	-206.04	0.00	206.04	4066.61	2033.31	8171.50	4035.59		0.10	-0.04	0.042
30.00	-33.91	-1.71	0.00	-197.30	0.00	197.30	4017.20	2008.60	7910.59	3906.74		0.15	-0.05	0.041
35.00	-32.63	-1.67	0.00	-188.74	0.00	188.74	3966.51	1983.26	7651.22	3778.65		0.21	-0.06	0.034
36.00	-32.37	-1.67	0.00	-187.07	0.00	187.07	3956.22	1978.11	7599.55	3753.13		0.22	-0.06	0.045
38.00	-31.52	-1.64	0.00	-183.73	0.00	183.73	3935.49	1967.75	7496.40	3702.19		0.25	-0.07	0.033
39.00	-31.09	-1.62	0.00	-182.09	0.00	182.09	3925.05	1962.53	7444.93	3676.77		0.26	-0.07	0.040
40.00	-30.67	-1.61	0.00	-180.47	0.00	180.47	3914.56	1957.28	7393.54	3651.39		0.28	-0.07	0.039
42.00	-29.83	-1.58	0.00	-177.25	0.00	177.25	3554.53	1777.27	6785.59	3351.15		0.31	-0.07	0.038
45.00	-29.16	-1.56	0.00	-172.50	0.00	172.50	3532.39	1766.19	6658.05	3288.16		0.36	-0.08	0.040
50.00	-28.06	-1.53	0.00	-164.68	0.00	164.68	3494.22	1747.11	6445.54	3183.21		0.45	-0.09	0.039
54.00	-27.14	-1.50	0.00	-158.54	0.00	158.54	3462.54	1731.27	6275.67	3099.32		0.53	-0.10	0.038
55.00	-26.93	-1.50	0.00	-157.04	0.00	157.04	3454.46	1727.23	6233.23	3078.36		0.55	-0.10	0.038
60.00	-25.87	-1.47	0.00	-149.54	0.00	149.54	3413.12	1706.56	6021.34	2973.71		0.66	-0.11	0.037
65.00	-24.82	-1.44	0.00	-142.19	0.00	142.19	3370.20	1685.10	5810.04	2869.36		0.78	-0.12	0.036
70.00	-23.79	-1.41	0.00	-134.99	0.00	134.99	3325.69	1662.84	5599.53	2765.40		0.92	-0.13	0.035
71.25	-23.35	-1.40	0.00	-133.22	0.00	133.22	3314.31	1657.16	5547.04	2739.48		0.96	-0.14	0.035
75.00	-22.02	-1.36	0.00	-127.97	0.00	127.97	3279.60	1639.80	5389.99	2661.91		1.07	-0.15	0.034
76.00	-21.67	-1.36	0.00	-126.61	0.00	126.61	3306.32	1653.16	5510.48	2721.42		1.10	-0.15	0.034
80.00	-20.87	-1.34	0.00	-121.18	0.00	121.18	3269.04	1634.52	5343.14	2638.78		1.23	-0.16	0.033
80.00	-20.87	-1.34	0.00	-121.18	0.00	121.18	2504.08	1252.04	4105.75	2027.68		1.23	-0.16	0.035
85.00	-20.00	-1.34	0.00	-114.46	0.00	114.46	2474.85	1237.43	3958.27	1954.84		1.40	-0.17	0.038
86.00	-19.83	-1.34	0.00	-113.13	0.00	113.13	2468.82	1234.41	3928.75	1940.26		1.43	-0.17	0.047
90.00	-19.14	-1.34	0.00	-107.77	0.00	107.77	2444.04	1222.02	3810.67	1881.94		1.58	-0.18	0.046
95.00	-18.31	-1.34	0.00	-101.07	0.00	101.07	2411.64	1205.82	3663.14	1809.09		1.78	-0.20	0.045
100.00	-17.48	-1.34	0.00	-94.35	0.00	94.35	2377.66	1188.83	3515.87	1736.36		1.99	-0.21	0.043
104.00	-16.83	-1.34	0.00	-88.97	0.00	88.97	2349.34	1174.67	3398.38	1678.33		2.18	-0.22	0.042
104.00	-16.83	-1.34	0.00	-88.97	0.00	88.97	2349.34	1174.67	3398.38	1678.33		2.18	-0.22	0.042
105.00	-16.67	-1.35	0.00	-87.63	0.00	87.63	2342.10	1171.05	3369.07	1663.86		2.22	-0.23	0.060
110.00	-15.89	-1.35	0.00	-80.89	0.00	80.89	2304.95	1152.47	3222.91	1591.67		2.47	-0.25	0.058
115.00	-15.11	-1.35	0.00	-74.14	0.00	74.14	2266.22	1133.11	3077.59	1519.90		2.75	-0.27	0.055
120.00	-13.85	-1.35	0.00	-67.38	0.00	67.38	2252.14	1126.07	3026.44	1494.64		3.05	-0.29	0.051
124.00	-12.43	-1.35	0.00	-61.98	0.00	61.98	2219.57	1109.78	2911.24	1437.75		3.30	-0.31	0.049
125.00	-12.29	-1.35	0.00	-60.63	0.00	60.63	2211.27	1105.63	2882.56	1423.59		3.36	-0.32	0.048
125.00	-12.29	-1.35	0.00	-60.63	0.00	60.63	1600.93	800.47	2095.19	1034.73		3.36	-0.32	0.066
130.00	-11.71	-1.35	0.00	-53.90	0.00	53.90	1577.27	788.64	2000.77	988.11		3.71	-0.34	0.062
134.00	-10.19	-1.34	0.00	-48.50	0.00	48.50	1557.20	778.60	1925.20	950.79		4.00	-0.36	0.058
135.00	-10.09	-1.34	0.00	-47.16	0.00	47.16	1552.03	776.01	1906.32	941.46		4.07	-0.36	0.057
137.50	-8.49	-1.33	0.00	-43.80	0.00	43.80	1538.81	769.41	1859.13	918.16		4.26	-0.37	0.053
140.00	-8.24	-1.33	0.00	-40.47	0.00	40.47	1525.20	762.60	1812.01	894.88		4.46	-0.38	0.051
145.00	-7.76	-1.32	0.00	-33.82	0.00	33.82	1496.79	748.40	1718.05	848.48		4.87	-0.41	0.045
147.00	-5.99	-1.23	0.00	-31.18	0.00	31.18	1484.98	742.49	1680.60	829.98		5.05	-0.41	0.042

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G
Site Name:	Putnam	**Exposure:**	B
Height:	175.00 (ft)	**Crest Height:**	0.00
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil
Gh:	1.1	**Topography:** 1	**Struct Class:** II

5/31/2018

Tower Engineering Solutions

150.00	-5.75	-1.22	0.00	-27.49	0.00	27.49	1466.80	733.40	1624.61	802.34	5.31	-0.43	0.038
155.00	-5.02	-1.16	0.00	-21.39	0.00	21.39	1451.75	725.87	1579.74	780.18	5.76	-0.44	0.031
160.00	-4.63	-1.11	0.00	-15.62	0.00	15.62	1419.41	709.70	1487.45	734.60	6.24	-0.46	0.025
165.00	-4.25	-1.06	0.00	-10.05	0.00	10.05	1385.48	692.74	1396.17	689.51	6.72	-0.47	0.018
170.00	-3.88	-1.00	0.00	-4.75	0.00	4.75	1349.97	674.99	1306.08	645.02	7.22	-0.48	0.010
170.00	-3.88	-1.00	0.00	-4.75	0.00	4.75	1349.97	674.99	1306.08	645.02	7.22	-0.48	0.010
174.00	-2.91	-0.77	0.00	-0.77	0.00	0.77	1121.46	560.73	870.39	429.85	7.62	-0.48	0.004
175.00	0.00	-0.74	0.00	0.00	0.00	0.00	1053.22	526.61	767.04	378.81	7.72	-0.48	0.000

Wind Loading - Shaft

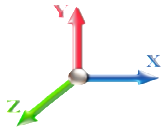
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 42	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2	1.00	0.70	6.129	6.74	233.87	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.70	6.129	6.74	229.68	1.000	0.000	5.00	23.085	23.09	155.6	0.0	1272.2
10.00		1.00	0.70	6.129	6.74	225.49	1.000	0.000	5.00	22.668	22.67	152.8	0.0	1249.0
15.00		1.00	0.70	6.129	6.74	221.30	1.000	0.000	5.00	22.251	22.25	150.0	0.0	1225.9
20.00		1.00	0.70	6.129	6.74	217.12	1.000	0.000	5.00	21.834	21.83	147.2	0.0	1202.7
22.00	RT2	1.00	0.70	6.129	6.74	215.44	1.000	0.000	2.00	8.617	8.62	58.1	0.0	474.6
25.00		1.00	0.70	6.129	6.74	212.93	1.000	0.000	3.00	12.800	12.80	86.3	0.0	704.9
30.00		1.00	0.70	6.134	6.75	208.83	1.000	0.000	5.00	21.000	21.00	141.7	0.0	1156.3
35.00	RB3	1.00	0.73	6.410	7.05	209.20	1.000	0.000	5.00	20.583	20.58	145.1	0.0	1133.2
36.00	Bot - Section 2 RT1	1.00	0.74	6.462	7.11	209.18	1.000	0.000	1.00	4.066	4.07	28.9	0.0	223.9
38.00	RB4	1.00	0.75	6.562	7.22	209.07	1.000	0.000	2.00	8.212	8.21	59.3	0.0	833.0
39.00	RT3	1.00	0.76	6.611	7.27	208.98	1.000	0.000	1.00	4.081	4.08	29.7	0.0	413.9
40.00		1.00	0.76	6.659	7.33	208.86	1.000	0.000	1.00	4.064	4.06	29.8	0.0	412.2
42.00	Top - Section 1	1.00	0.77	6.753	7.43	208.56	1.000	0.000	2.00	8.079	8.08	60.0	0.0	819.2
45.00		1.00	0.79	6.887	7.58	211.41	1.000	0.000	3.00	11.993	11.99	90.9	0.0	566.6
50.00		1.00	0.81	7.098	7.81	210.11	1.000	0.000	5.00	19.655	19.65	153.5	0.0	928.4
54.00	Appurtenance(s)	1.00	0.83	7.255	7.98	208.79	1.000	0.000	4.00	15.424	15.42	123.1	0.0	728.4
55.00		1.00	0.83	7.294	8.02	208.42	1.000	0.000	1.00	3.814	3.81	30.6	0.0	180.1
60.00		1.00	0.85	7.477	8.22	206.40	1.000	0.000	5.00	18.821	18.82	154.8	0.0	888.7
65.00		1.00	0.87	7.650	8.42	204.10	1.000	0.000	5.00	18.404	18.40	154.9	0.0	868.8
70.00	Bot - Section 3	1.00	0.89	7.814	8.60	201.54	1.000	0.000	5.00	17.986	17.99	154.6	0.0	848.9
71.25	RT4 RB5	1.00	0.90	7.853	8.64	200.87	1.000	0.000	1.25	4.512	4.51	39.0	0.0	422.1
75.00		1.00	0.91	7.969	8.77	198.76	1.000	0.000	3.75	13.381	13.38	117.3	0.0	1251.4
76.00	Top - Section 2	1.00	0.91	8.000	8.80	198.18	1.000	0.000	1.00	3.529	3.53	31.0	0.0	329.9
80.00	Top - Section 3	1.00	0.93	8.118	8.93	199.52	1.000	0.000	4.00	13.947	13.95	124.5	0.0	658.1
85.00		1.00	0.94	8.260	9.09	196.40	1.000	0.000	5.00	17.059	17.06	155.0	0.0	671.7
86.00	RT5 RB6	1.00	0.95	8.287	9.12	195.75	1.000	0.000	1.00	3.362	3.36	30.6	0.0	132.4
90.00		1.00	0.96	8.396	9.24	193.10	1.000	0.000	4.00	13.280	13.28	122.6	0.0	522.8
95.00		1.00	0.97	8.526	9.38	189.66	1.000	0.000	5.00	16.225	16.22	152.2	0.0	638.6
100.00		1.00	0.99	8.652	9.52	186.08	1.000	0.000	5.00	15.807	15.81	150.4	0.0	622.0
104.00	RT6	1.00	1.00	8.750	9.62	183.13	1.000	0.000	4.00	12.346	12.35	118.8	0.0	485.7
105.00		1.00	1.00	8.774	9.65	182.37	1.000	0.000	1.00	3.045	3.04	29.4	0.0	119.8
110.00		1.00	1.02	8.891	9.78	178.55	1.000	0.000	5.00	14.973	14.97	146.4	0.0	588.9
115.00	Bot - Section 5	1.00	1.03	9.005	9.91	174.61	1.000	0.000	5.00	14.556	14.56	144.2	0.0	572.4
120.00	Top - Section 4	1.00	1.04	9.115	10.03	170.57	1.000	0.000	5.00	14.409	14.41	144.5	0.0	1122.3
124.00	Appurtenance(s)	1.00	1.05	9.201	10.12	170.58	1.000	0.000	4.00	11.227	11.23	113.6	0.0	441.3
125.00	Top - Section 5	1.00	1.05	9.222	10.14	169.75	1.000	0.000	1.00	2.765	2.76	28.0	0.0	108.7
130.00		1.00	1.07	9.326	10.26	165.53	1.000	0.000	5.00	13.575	13.57	139.3	0.0	427.6
134.00	Appurtenance(s)	1.00	1.07	9.407	10.35	162.10	1.000	0.000	4.00	10.559	10.56	109.3	0.0	332.5
135.00		1.00	1.08	9.427	10.37	161.24	1.000	0.000	1.00	2.598	2.60	26.9	0.0	81.8
137.50	Appurtenance(s)	1.00	1.08	9.476	10.42	159.06	1.000	0.000	2.50	6.422	6.42	66.9	0.0	202.2
140.00		1.00	1.09	9.525	10.48	156.86	1.000	0.000	2.50	6.318	6.32	66.2	0.0	198.9
145.00		1.00	1.10	9.621	10.58	152.40	1.000	0.000	5.00	12.323	12.32	130.4	0.0	387.8
147.00	Appurtenance(s)	1.00	1.10	9.659	10.62	150.59	1.000	0.000	2.00	4.813	4.81	51.1	0.0	151.4
150.00	Bot - Section 7	1.00	1.11	9.715	10.69	147.86	1.000	0.000	3.00	7.094	7.09	75.8	0.0	223.2
155.00	Top - Section 6	1.00	1.12	9.806	10.79	143.26	1.000	0.000	5.00	11.705	11.70	126.3	0.0	729.6
160.00		1.00	1.13	9.896	10.89	141.34	1.000	0.000	5.00	11.288	11.29	122.9	0.0	355.0

Wind Loading - Shaft

Structure: CT00680-S-SBA | **Code:** EIA/TIA-222-G | 5/31/2018

Site Name: Putnam | **Exposure:** B

Height: 175.00 (ft) | **Crest Height:** 0.00

Base Elev: 0.000 (ft) | **Site Class:** D - Stiff Soil

Gh: 1.1 | **Topography:** 1 | **Struct Class:** II | Page: 43

165.00		1.00	1.14	9.983	10.98	136.62	1.000	0.000	5.00	10.871	10.87	119.4	0.0	341.7
170.00	Top - Section 7	1.00	1.15	10.069	11.08	131.84	1.000	0.000	5.00	10.453	10.45	115.8	0.0	328.5
174.00	Appurtenance(s)	1.00	1.16	10.136	11.15	106.66	1.000	0.000	4.00	7.402	7.40	82.5	0.0	232.3
175.00	Appurtenance(s)	1.00	1.16	10.152	11.17	100.33	1.000	0.000	1.00	1.603	1.60	17.9	0.0	50.2
								Totals:	**175.00**			**5,005.2**		**28,861.4**

Discrete Appurtenance Forces

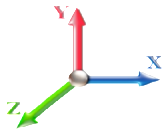
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 44	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

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	175.00	800 MHz	6	10.185	11.204	0.67	1.00	10.01	318.00	0.000	2.000	112.15	0.00	224.30
2	175.00	DR65-18-02DPL2Q	6	10.417	11.459	0.67	1.00	23.36	144.00	0.000	16.500	267.63	0.00	4415.94
3	175.00	E15S09P94	6	10.370	11.407	0.75	1.00	2.97	87.60	0.000	13.500	33.88	0.00	457.37
4	175.00	T-Arms	3	10.152	11.168	0.75	1.00	24.75	726.00	0.000	0.000	276.40	0.00	0.00
5	175.00	1900MHz	3	10.185	11.204	0.67	1.00	5.57	180.00	0.000	2.000	62.38	0.00	124.76
6	175.00	PRK-1245L	1	10.152	11.168	0.75	0.75	7.13	464.91	0.000	0.000	79.57	0.00	0.00
7	175.00	TD-RRH8x20-25	3	10.185	11.204	0.67	1.00	8.14	210.00	0.000	2.000	91.20	0.00	182.41
8	175.00	APXVTM14-C-I20	3	10.185	11.204	0.77	1.00	14.65	168.60	0.000	2.000	164.08	0.00	328.17
9	175.00	NNVV-65B-R4	3	10.185	11.204	0.74	1.00	27.24	232.20	0.000	2.000	305.19	0.00	610.37
10	175.00	PRK-SFS-L	1	10.152	11.168	1.00	1.00	7.70	230.00	0.000	0.000	85.99	0.00	0.00
11	175.00	Handrail	1	10.152	11.168	1.00	1.00	9.85	415.06	0.000	0.000	110.00	0.00	0.00
12	174.00	4.5" x 24 FT Pipe	3	10.299	11.329	1.00	1.00	40.50	777.60	0.000	10.000	458.81	0.00	4588.12
13	147.00	T-Arms	3	9.659	10.625	0.56	0.75	18.56	726.00	0.000	0.000	197.22	0.00	0.00
14	147.00	RRH2X60-700	3	9.602	10.562	0.54	0.80	5.63	180.00	0.000	-3.000	59.45	0.00	-178.34
15	147.00	RRH2X60-PCS	3	9.602	10.562	0.54	0.80	3.54	165.00	0.000	-3.000	37.37	0.00	-112.10
16	147.00	RRH2X60-AWS	3	9.602	10.562	0.54	0.80	5.63	180.00	0.000	-3.000	59.45	0.00	-178.34
17	147.00	DB-T1-6Z-8AB-0Z	2	9.659	10.625	0.80	0.80	7.68	88.00	0.000	0.000	81.60	0.00	0.00
18	147.00	FD9R6004/2C-3L	6	9.659	10.625	0.50	0.80	1.09	18.60	0.000	0.000	11.55	0.00	0.00
19	147.00	SBNHH-1D65B	6	9.659	10.625	0.66	0.80	31.88	304.26	0.000	0.000	338.72	0.00	0.00
20	147.00	BXA-80080-4CF	3	9.659	10.625	0.70	0.80	7.50	36.00	0.000	0.000	79.70	0.00	0.00
21	147.00	BXA-70063-6CF-EDIN-X	3	9.659	10.625	0.62	0.80	13.97	51.00	0.000	0.000	148.44	0.00	0.00
22	137.50	Low Profile	1	9.476	10.424	1.00	1.00	22.00	1500.00	0.000	0.000	229.33	0.00	0.00
23	134.00	TPA-65R-LCUUUU-H8	3	9.476	10.424	0.66	0.80	26.49	225.00	0.000	3.500	276.17	0.00	966.59
24	134.00	RRUS-32	6	9.476	10.424	0.54	0.80	12.45	462.00	0.000	3.500	129.74	0.00	454.07
25	134.00	DBC0061F1V51-2	3	9.476	10.424	0.55	0.80	0.99	30.00	0.000	3.500	10.36	0.00	36.25
26	134.00	DC6-48-60-18-8C	1	9.476	10.424	0.80	0.80	2.54	11.80	0.000	3.500	26.44	0.00	92.52
27	134.00	7770.00	3	9.476	10.424	0.58	0.80	9.64	105.00	0.000	3.500	100.45	0.00	351.56
28	134.00	AM-X-CD-17-65-00T-RET	3	9.476	10.424	0.60	0.80	20.36	92.40	0.000	3.500	212.21	0.00	742.74
29	134.00	LGP21401	6	9.476	10.424	0.40	0.80	3.10	84.60	0.000	3.500	32.27	0.00	112.95
30	134.00	RRUS 11	3	9.476	10.424	0.54	0.80	4.05	152.10	0.000	3.500	42.24	0.00	147.84
31	134.00	DC6-48-60-18-8F	1	9.476	10.424	0.80	0.80	2.34	14.50	0.000	3.500	24.35	0.00	85.23
32	124.00	T-Arms	3	9.201	10.121	0.56	0.75	13.82	726.00	0.000	0.000	139.87	0.00	0.00
33	124.00	742 351	6	9.201	10.121	0.49	0.80	15.75	178.80	0.000	0.000	159.43	0.00	0.00
34	54.00	Standoff	1	7.255	7.981	1.00	1.00	2.63	40.00	0.000	0.000	20.99	0.00	0.00
35	54.00	GPS	1	7.255	7.981	1.00	1.00	1.00	10.00	0.000	0.000	7.98	0.00	0.00
							Totals:		**9,335.03**			**4,472.59**		

Total Applied Force Summary

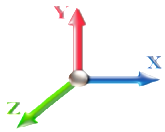
Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 45

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		155.63	1566.30	0.00	0.00
10.00		152.82	1543.12	0.00	0.00
15.00		150.01	1519.94	0.00	0.00
20.00		147.19	1496.77	0.00	0.00
22.00		58.09	592.22	0.00	0.00
25.00		86.29	881.38	0.00	0.00
30.00		141.69	1450.42	0.00	0.00
35.00		145.13	1427.24	0.00	0.00
36.00		28.90	282.67	0.00	0.00
38.00		59.28	950.59	0.00	0.00
39.00		29.68	472.71	0.00	0.00
40.00		29.77	470.99	0.00	0.00
42.00		60.01	936.82	0.00	0.00
45.00		90.86	743.01	0.00	0.00
50.00		153.45	1222.46	0.00	0.00
54.00	(2) attachments	152.07	1013.67	0.00	0.00
55.00		30.60	238.77	0.00	0.00
60.00		154.80	1181.93	0.00	0.00
65.00		154.87	1162.07	0.00	0.00
70.00		154.60	1142.20	0.00	0.00
71.25		38.98	495.43	0.00	0.00
75.00		117.30	1471.38	0.00	0.00
76.00		31.05	388.59	0.00	0.00
80.00		124.54	892.72	0.00	0.00
85.00		154.99	964.97	0.00	0.00
86.00		30.65	191.01	0.00	0.00
90.00		122.64	757.41	0.00	0.00
95.00		152.17	931.86	0.00	0.00
100.00		150.45	915.30	0.00	0.00
104.00		118.82	720.32	0.00	0.00
105.00		29.38	178.43	0.00	0.00
110.00		146.44	873.30	0.00	0.00
115.00		144.18	856.74	0.00	0.00
120.00		144.47	1406.70	0.00	0.00
124.00	(9) attachments	412.92	1573.59	0.00	0.00
125.00		28.05	153.00	0.00	0.00
130.00		139.25	649.26	0.00	0.00
134.00	(29) attachments	963.48	1687.27	0.00	2989.75
135.00		26.94	111.74	0.00	0.00
137.50	(1) attachments	296.27	1777.04	0.00	0.00
140.00		66.20	273.73	0.00	0.00
145.00		130.42	537.53	0.00	0.00
147.00	(32) attachments	1064.63	1960.16	0.00	-468.77
150.00		75.81	272.06	0.00	0.00
155.00		126.26	811.05	0.00	0.00
160.00		122.87	436.45	0.00	0.00

Total Applied Force Summary

Structure:	CT00680-S-SBA		**Code:**	EIA/TIA-222-G	5/31/2018
Site Name:	Putnam		**Exposure:**	B	
Height:	175.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 46

Tower Engineering Solutions

165.00		119.37	423.20	0.00	0.00
170.00		115.78	409.96	0.00	0.00
174.00	(3) attachments	541.34	1075.07	0.00	4588.12
175.00	(36) attachments	1606.37	3242.86	0.00	6343.32
	Totals:	**9,477.75**	**46,733.44**	**0.00**	**13,452.42**

Linear Appurtenance Segment Forces (Factored)

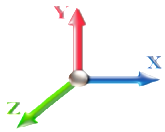
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 47	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

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	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.059	0.000	6.129	0.00	8.90
10.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.060	0.000	6.129	0.00	8.90
15.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.061	0.000	6.129	0.00	8.90
20.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.062	0.000	6.129	0.00	8.90
22.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.063	0.000	6.129	0.00	3.56
25.00	3" Chanel	Yes	3.00	0.000	3.25	0.81	0.00	0.063	0.000	6.129	0.00	5.34
30.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.064	0.000	6.134	0.00	8.90
35.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.066	0.000	6.410	0.00	8.90
36.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.067	0.000	6.462	0.00	1.78
38.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.067	0.000	6.562	0.00	3.56
39.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.067	0.000	6.611	0.00	1.78
40.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.068	0.000	6.659	0.00	1.78
42.00	3" Chanel	Yes	2.00	0.000	3.25	0.54	0.00	0.068	0.000	6.753	0.00	3.56
45.00	3" Chanel	Yes	3.00	0.000	3.25	0.81	0.00	0.068	0.000	6.887	0.00	5.34
50.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.069	0.000	7.098	0.00	8.90
54.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.070	0.000	7.255	0.00	7.12
55.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.071	0.000	7.294	0.00	1.78
60.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.072	0.000	7.477	0.00	8.90
65.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.074	0.000	7.650	0.00	8.90
70.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.075	0.000	7.814	0.00	8.90
71.25	3" Chanel	Yes	1.25	0.000	3.25	0.34	0.00	0.076	0.000	7.853	0.00	2.23
75.00	3" Chanel	Yes	3.75	0.000	3.25	1.02	0.00	0.077	0.000	7.969	0.00	6.67
76.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.078	0.000	8.000	0.00	1.78
80.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.078	0.000	8.118	0.00	7.12
85.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.079	0.000	8.260	0.00	8.90
86.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.081	0.000	8.287	0.00	1.78
90.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.082	0.000	8.396	0.00	7.12
95.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.083	0.000	8.526	0.00	8.90
100.00	3" Chanel	Yes	5.00	0.000	3.25	1.35	0.00	0.086	0.000	8.652	0.00	8.90
104.00	3" Chanel	Yes	4.00	0.000	3.25	1.08	0.00	0.088	0.000	8.750	0.00	7.12
105.00	3" Chanel	Yes	1.00	0.000	3.25	0.27	0.00	0.089	0.000	8.774	0.00	1.78
										Totals:	**0.0**	**186.9**

Calculated Forces

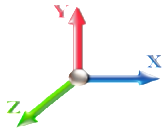
Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 48	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

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	-46.73	-9.49	0.00	-1174.8	0.00	1174.84	4294.71	2147.35	9493.67	4688.57	0.00	0.000	0.000	0.160
5.00	-45.16	-9.36	0.00	-1127.3	0.00	1127.38	4251.62	2125.81	9227.39	4557.06	0.02	-0.036	0.000	0.157
10.00	-43.61	-9.24	0.00	-1080.5	0.00	1080.56	4207.27	2103.63	8961.88	4425.94	0.08	-0.073	0.000	0.154
15.00	-42.08	-9.11	0.00	-1034.3	0.00	1034.38	4161.65	2080.83	8697.29	4295.27	0.17	-0.110	0.000	0.150
20.00	-40.58	-8.98	0.00	-988.82	0.00	988.82	4114.76	2057.38	8433.78	4165.13	0.31	-0.147	0.000	0.147
22.00	-39.99	-8.94	0.00	-970.86	0.00	970.86	4095.66	2047.83	8328.71	4113.24	0.37	-0.162	0.000	0.174
25.00	-39.10	-8.87	0.00	-944.05	0.00	944.05	4066.61	2033.31	8171.50	4035.59	0.48	-0.188	0.000	0.172
30.00	-37.64	-8.75	0.00	-899.70	0.00	899.70	4017.20	2008.60	7910.59	3906.74	0.70	-0.233	0.000	0.168
35.00	-36.21	-8.62	0.00	-855.94	0.00	855.94	3966.51	1983.26	7651.22	3778.65	0.97	-0.277	0.000	0.137
36.00	-35.93	-8.60	0.00	-847.32	0.00	847.32	3956.22	1978.11	7599.55	3753.13	1.03	-0.285	0.000	0.183
38.00	-34.98	-8.54	0.00	-830.13	0.00	830.13	3935.49	1967.75	7496.40	3702.19	1.15	-0.305	0.000	0.133
39.00	-34.50	-8.51	0.00	-821.59	0.00	821.59	3925.05	1962.53	7444.93	3676.77	1.22	-0.313	0.000	0.159
40.00	-34.03	-8.49	0.00	-813.07	0.00	813.07	3914.56	1957.28	7393.54	3651.39	1.29	-0.322	0.000	0.158
42.00	-33.09	-8.44	0.00	-796.10	0.00	796.10	3554.53	1777.27	6785.59	3351.15	1.42	-0.340	0.000	0.152
45.00	-32.34	-8.36	0.00	-770.79	0.00	770.79	3532.39	1766.19	6658.05	3288.16	1.65	-0.367	0.000	0.160
50.00	-31.12	-8.22	0.00	-728.98	0.00	728.98	3494.22	1747.11	6445.54	3183.21	2.06	-0.415	0.000	0.155
54.00	-30.10	-8.08	0.00	-696.08	0.00	696.08	3462.54	1731.27	6275.67	3099.32	2.42	-0.453	0.000	0.151
55.00	-29.86	-8.06	0.00	-688.01	0.00	688.01	3454.46	1727.23	6233.23	3078.36	2.52	-0.463	0.000	0.150
60.00	-28.67	-7.92	0.00	-647.71	0.00	647.71	3413.12	1706.56	6021.34	2973.71	3.03	-0.510	0.000	0.145
65.00	-27.50	-7.77	0.00	-608.12	0.00	608.12	3370.20	1685.10	5810.04	2869.36	3.59	-0.557	0.000	0.140
70.00	-26.36	-7.62	0.00	-569.25	0.00	569.25	3325.69	1662.84	5599.53	2765.40	4.19	-0.604	0.000	0.134
71.25	-25.86	-7.59	0.00	-559.72	0.00	559.72	3314.31	1657.16	5547.04	2739.48	4.35	-0.616	0.000	0.131
75.00	-24.39	-7.46	0.00	-531.27	0.00	531.27	3279.60	1639.80	5389.99	2661.91	4.85	-0.651	0.000	0.127
76.00	-24.00	-7.44	0.00	-523.80	0.00	523.80	3306.32	1653.16	5510.48	2721.42	4.99	-0.661	0.000	0.129
80.00	-23.10	-7.32	0.00	-494.05	0.00	494.05	3269.04	1634.52	5343.14	2638.78	5.56	-0.697	0.000	0.120
80.00	-23.10	-7.32	0.00	-494.05	0.00	494.05	2504.08	1252.04	4105.75	2027.68	5.56	-0.697	0.000	0.131
85.00	-22.13	-7.16	0.00	-457.45	0.00	457.45	2474.85	1237.43	3958.27	1954.84	6.31	-0.741	0.000	0.139
86.00	-21.94	-7.14	0.00	-450.29	0.00	450.29	2468.82	1234.41	3928.75	1940.26	6.47	-0.751	0.000	0.171
90.00	-21.18	-7.03	0.00	-421.72	0.00	421.72	2444.04	1222.02	3810.67	1881.94	7.12	-0.799	0.000	0.164
95.00	-20.24	-6.88	0.00	-386.59	0.00	386.59	2411.64	1205.82	3663.14	1809.09	7.99	-0.857	0.000	0.155
100.00	-19.32	-6.74	0.00	-352.17	0.00	352.17	2377.66	1188.83	3515.87	1736.36	8.92	-0.914	0.000	0.146
104.00	-18.60	-6.61	0.00	-325.23	0.00	325.23	2349.34	1174.67	3398.38	1678.33	9.70	-0.959	0.000	0.139
104.00	-18.60	-6.61	0.00	-325.23	0.00	325.23	2349.34	1174.67	3398.38	1678.33	9.70	-0.959	0.000	0.139
105.00	-18.42	-6.60	0.00	-318.62	0.00	318.62	2342.10	1171.05	3369.07	1663.86	9.90	-0.971	0.000	0.199
110.00	-17.54	-6.46	0.00	-285.64	0.00	285.64	2304.95	1152.47	3222.91	1591.67	10.96	-1.049	0.000	0.187
115.00	-16.68	-6.32	0.00	-253.35	0.00	253.35	2266.22	1133.11	3077.59	1519.90	12.10	-1.126	0.000	0.174
120.00	-15.27	-6.16	0.00	-221.75	0.00	221.75	2252.14	1126.07	3026.44	1494.64	13.32	-1.199	0.000	0.155
124.00	-13.70	-5.73	0.00	-197.10	0.00	197.10	2219.57	1109.78	2911.24	1437.75	14.35	-1.256	0.000	0.143
125.00	-13.54	-5.70	0.00	-191.37	0.00	191.37	2211.27	1105.63	2882.56	1423.59	14.62	-1.270	0.000	0.141
125.00	-13.54	-5.70	0.00	-191.37	0.00	191.37	1600.93	800.47	2095.19	1034.73	14.62	-1.270	0.000	0.193
130.00	-12.89	-5.56	0.00	-162.86	0.00	162.86	1577.27	788.64	2000.77	988.11	15.98	-1.331	0.000	0.173
134.00	-11.22	-4.57	0.00	-137.62	0.00	137.62	1557.20	778.60	1925.20	950.79	17.12	-1.389	0.000	0.152
135.00	-11.11	-4.54	0.00	-133.05	0.00	133.05	1552.03	776.01	1906.32	941.46	17.41	-1.403	0.000	0.149
137.50	-9.34	-4.21	0.00	-121.70	0.00	121.70	1538.81	769.41	1859.13	918.16	18.16	-1.437	0.000	0.139
140.00	-9.06	-4.14	0.00	-111.18	0.00	111.18	1525.20	762.60	1812.01	894.88	18.92	-1.469	0.000	0.130
145.00	-8.53	-4.00	0.00	-90.48	0.00	90.48	1496.79	748.40	1718.05	848.48	20.49	-1.527	0.000	0.112
147.00	-6.59	-2.89	0.00	-82.47	0.00	82.47	1484.98	742.49	1680.60	829.98	21.13	-1.549	0.000	0.104
150.00	-6.32	-2.81	0.00	-73.81	0.00	73.81	1466.80	733.40	1624.61	802.34	22.12	-1.581	0.000	0.096

Calculated Forces

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 49

Tower Engineering Solutions

155.00	-5.51	-2.67	0.00	-59.76	0.00	59.76	1451.75	725.87	1579.74	780.18	23.80	-1.628	0.000	0.080
160.00	-5.08	-2.53	0.00	-46.43	0.00	46.43	1419.41	709.70	1487.45	734.60	25.53	-1.671	0.000	0.067
165.00	-4.66	-2.40	0.00	-33.77	0.00	33.77	1385.48	692.74	1396.17	689.51	27.30	-1.705	0.000	0.052
170.00	-4.25	-2.28	0.00	-21.75	0.00	21.75	1349.97	674.99	1306.08	645.02	29.10	-1.731	0.000	0.037
170.00	-4.25	-2.28	0.00	-21.75	0.00	21.75	1349.97	674.99	1306.08	645.02	29.10	-1.731	0.000	0.037
174.00	-3.19	-1.70	0.00	-8.05	0.00	8.05	1121.46	560.73	870.39	429.85	30.55	-1.745	0.000	0.022
175.00	0.00	-1.61	0.00	-6.34	0.00	6.34	1053.22	526.61	767.04	378.81	30.92	-1.748	0.000	0.017

Final Analysis Summary

Structure:	CT00680-S-SBA	**Code:**	EIA/TIA-222-G	5/31/2018	
Site Name:	Putnam	**Exposure:**	B		
Height:	175.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 50	

Tower Engineering Solutions

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 101 mph Wind	43.1	0.00	56.02	0.00	0.00	5353.45
0.9D + 1.6W 101 mph Wind	43.0	0.00	42.00	0.00	0.00	5298.30
1.2D + 1.0Di + 1.0Wi 50 mph Wind	9.3	0.00	83.46	0.00	0.00	1222.59
1.2D + 1.0E	1.9	0.00	56.08	0.00	0.00	255.01
0.9D + 1.0E	1.9	0.00	42.06	0.00	0.00	252.09
1.0D + 1.0W 60 mph Wind	9.5	0.00	46.73	0.00	0.00	1174.84

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 101 mph Wind	-19.88	-30.13	0.00	-1453.2	0.00	-1453.2	2342.10	1171.0	3369.07	1663.86	105.00	0.883
0.9D + 1.6W 101 mph Wind	-14.37	-29.66	0.00	-1429.2	0.00	-1429.2	2342.10	1171.0	3369.07	1663.86	105.00	0.866
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-39.12	-7.09	0.00	-350.75	0.00	-350.75	2342.10	1171.0	3369.07	1663.86	105.00	0.228
1.2D + 1.0E	-16.39	-1.37	0.00	-61.50	0.00	-61.50	2211.27	1105.6	2882.56	1423.59	125.00	0.070
0.9D + 1.0E	-12.29	-1.35	0.00	-60.63	0.00	-60.63	2211.27	1105.6	2882.56	1423.59	125.00	0.066
1.0D + 1.0W 60 mph Wind	-18.42	-6.60	0.00	-318.62	0.00	-318.62	2342.10	1171.0	3369.07	1663.86	105.00	0.199

Additional Steel Summary

			Intermediate Connectors			Lower Termination				Upper Termination				Max Member			
Elev From (ft)	Elev To (ft)	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)	Ratio
0.0	36.0	(3) PLT-C10x30(1.5" Hole)	322.4	0.00	37.1	354.2	37.1	10	0	320.1	37.1	9	0	398.94	516.0	468.64	0.851
0.0	22.0	(3) PLT-C10x30(1.5" Hole)	238.7	5.73	37.1	331.3	37.1	9	0	312.2	37.1	9	0	331.34	500.4	468.64	0.707
35.0	39.0	(3) LNP-LP6X100-G-10TT	245.0	5.88	25.3	213.3	25.3	9	11	210.7	25.3	9	11	286.32	297.8	292.50	0.979
38.0	71.3	(3) PLT-C10x30(1.5" Hole)	401.4	9.63	37.1	318.5	37.1	9	0	355.1	37.1			400.71	500.4	468.64	0.855
71.3	86.0	(3) PLT-C10x30(1.5" Hole)	455.5	10.93	37.1	355.1	37.1			344.5	37.1			355.14	500.4	468.64	0.758
86.0	104.0	(3) PLT-C10x15.3(1.5" Hole)	455.5	10.93	37.1	225.7	37.1			192.0	37.1	6	0	225.66	255.7	247.80	0.911

Monopole Mat Foundation Design

				Date
				5/31/2018
	Customer Name:	Sprint Nextel	**EIA/TIA Standard:**	EIA-222-G
	Site Name:		**Structure Height (Ft.):**	175
	Site Number:	CT00680-S-SBA	**Engineer Name:**	M. Franco
	Engr. Number:	53347	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

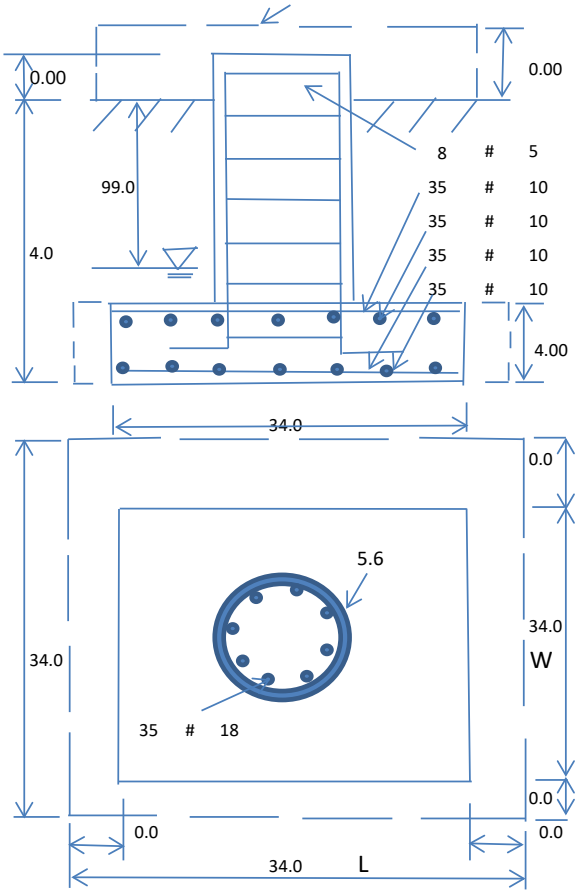
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	56.0	Shear Force (Kips):	43.1
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5353.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	5.6	Depth of Base BG (ft.):	4.0
Pier Height A. G. (ft.):	0.00	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	34	Width of Pad (ft.):	34
Final Length of pad (ft)	34.0	Final width of pad (ft):	34.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	18	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	35	Tie Spacing (in):	6.0	
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):	35	Qty. of Rebar in Pad (W):	35	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	35	Qty. of Rebar in Pad (W):	35	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	100.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	40000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	0.00	Total Dry Soil Weight (Kips):	0.00
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.00	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	4624.12	Total Dry Concrete Weight (Kips):	693.62
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	693.62	Total Vertical Load on Base (Kips):	749.64

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1649	<	Allowable Factored Soil Bearing (psf): 30000	0.05	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	11564.7	>	Design Factored Momont (kips-ft): 5526	0.48	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.09	OK!			

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00		

(1) Concrete Pier:

							Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	4.00		Tie / Stirrup Area (sq. in./each):	0.31				
Calculated Moment Capacity (Mn,Kips-Ft):	14287.5	>	Design Factored Moment (Mu, Kips-F	5353.5	0.37	OK!
Calculated Shear Capacity (Kips):	624.7	>	Design Factored Shear (Kips):	43.1	0.07	OK!
Calculated Tension Capacity (Tn, Kips):	7560.0	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	4517.3	>	Design Factored Axial Load (Pu Kips):	56.0	0.01	OK!
Moment & Axial Strength Combination:	0.37	OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.039	Reinforcement Ratio is satisfied per ACI				

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1487.5	>	One-Way Factored Shear (L-D. Kips):	344.7	0.23	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1487.5	>	One-Way Factored Shear (W-D., Kips)	344.7	0.23	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1535.1	>	One-Way Factored Shear (C-C, Kips):	331.1	0.22	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0025	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0025		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	8619.7	>	Moment at Bottom (L-Dir. K-Ft):	2885.7	0.33	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	8619.7	>	Moment at Bottom (W-Dir. K-Ft):	2885.7	0.33	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	12142.4	>	Moment at Bottom (C-C Dir. K-Ft):	4080.9	0.34	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0025	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0025		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	8619.7	>	Moment at the top (L-Dir K-Ft):	1179.4	0.14	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	8619.7	>	Moment at the top (W-Dir K-Ft):	1179.4	0.14	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	12142.4	>	Moment at the top (C-C Dir. K-Ft):	1099.2	0.09	OK!

(3).Check Punching Shear Capacity due to Moment in the Pier:

Moment transferred by punching shear:	2141.4	k-ft.	Max. factored shear stress v_{u_CD}:	9.2	Psi
Max. factored shear stress v_{u_AB}:	14.3	Psi	Factored shear Strength ϕv_n:	164.3	Psi
Max. factored shear stress v_u:	14.3	Psi	Check Usage of Punching Shear Capacity:	0.09	OK!

Antenna Mount Structural Analysis

Source: SBA Date: 11.15.2017

SBA Site:	**CT00680-S Putnam**
Sprint Site Number:	**CT23XC409**
Project:	**Sprint DO Macro Upgrade**
Prepared For:	**Sprint**
Mount Description:	**(3) Nudd T-Arms**
Site Location:	**154 Sayle Ave, Putnam, CT** **Windham County** **41.92944°, -71.88556°**
Design Codes:	**ANSI/TIA-222-G** **IBC 2012 w/ 2016 CT Building Code**
Analysis Load Case:	**Sprint Final Configuration**
Analysis Result:	**Adequate @ 81% - Once Augmented** **See Conclusion**

STATE OF CONNECTICUT
GREGORY DURGIN
No.32155
LICENSED
PROFESSIONAL ENGINEER

Revision 0
March 15, 2018

CT23XC409-PASSING-MOUNT-STRUCTURAL-ANALYSIS-03-15-18

1.0 Introduction

An antenna mount structural analysis has been performed on Sprint's existing mount assembly located at the CT00680-S Putnam communications site in Windham County, CT considering the final equipment loading configuration listed in Section 3.0.

2.0 Analysis Criteria

An elastic three-dimensional model of the mount structure has been analyzed pursuant to the following criteria:

- IBC 2012 – International Building Code.
- ANSI/TIA-222-G – Structural Standard for Antenna Supporting Structures and Antennas.
- AISC – Steel Construction Manual.
- ANSI/AWS D1.1 – Structural Welding Code.

Wind w/o ice = 130 mph (3-sec gust Ultimate Wind Speed) Wind w/o ice = 101 mph (3-sec gust Equivalent per TIA-222-G Tower Code)	
Wind with ice = 50 mph (3-sec gust, 3/4" Ice) Exposure Category B	Topographic Category 1 Structure Class II

The following documents were provided:

- Prelim Construction Drawings
  Infinigy, 1/17/18.
- Mount and Tower Record Documents
  SBA
- Mount Assessment
  Westchester, 12/21/17.
- RF Design
  Sprint DOMU Project

The results of the analysis are illustrated in Section 4.0. If any of the existing or proposed conditions reported in this analysis are fadnot properly represented, please contact our office immediately to request an amended report.

3.0 Appurtenance Information

Table 3.1 – Sprint Final Configuration[1]

COR	(Quantity) Appurtenance Make/Model	Mount Description
180.0'±	(3) RFS APXVTM14-ALU-I20	*(3) Nudd T-Arms*
	(3) COMMSCOPE NNVV-65B-R4	
	(6) ALU 800MHz RRH	
	(3) ALU 1900MHz RRH	
	(3) ALU 2500MHz RRH	

1. *Refer to antenna installation Construction Drawings (by others, when applicable) for additional information regarding final antenna and equipment orientations.*
2. *Panel antennas to be installed in Positions 2 and 3. RRH units to be installed on dual swivel brackets behind panel antennas in Positions 2 and 3.*

4.0 Analysis Results

Table 4.1 – Existing Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final Sprint Configuration	Standoff Member	103%	**Inadequate[3]**
	Connection Capacity	136%	

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.*
3. *Structural augments to the existing mount structure are required to obtain a mount structure capable of supporting the currently proposed final loading configuration in Table 3.1.*

Table 4.2 – Augmented Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final Sprint Configuration	Mount Pipe	81%	**Adequate Once Augmented[3]**

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.*
3. *Refer to GeoStructural Mount Augmentation Drawings and Section 5.0 for information regarding required mount augments.*

Table 4.3 – Structural Component Material Strengths

Structural Component	Nominal Strength/Material[1]
Pipe	F_y = 35 ksi (A53, Gr. B)
Tube	F_y = 46 ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate / Bar	F_y = 36 ksi (A36)
Uni-Strut	F_y = 33 ksi (A570, Gr. 33)
Connection Bolts	A325
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 F_y = 74 ksi (Yield) & F_u = 29 ksi (Tension)
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) F_y = 57 ksi (Yield) & F_u = 74 ksi (Tension)
Welds	E70XX Electrodes

1. *Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.*

5.0 Conclusion & Recommendations

Based on Sprint's final equipment loading configuration, the existing mount assembly does not have sufficient capacity to support the loading considered in this analysis pursuant to the listed standards. Structural augments (reinforcements) will be required and are briefly summarized below:

- Install Platform Reinforcement Kit; located 3.0' below the existing standoff centerline and attaching to the existing standoff member end near the face rail.
  - Sitepro1 PRK-1245L, (1) total.
- Install V-Brace Kit; located 3.75' below the existing mount face rail centerline.
  - Sitepro1 PRK-SFS-L, (1) total. Attach kit ring mount in kit to monopole shaft.
    - If the PRK-SFS-L kit is not available, provide (6) total L2-1/2x2-1/2x3/16 x ~8' long replacement angles, field-cut and drill to suit.
  - Pipe2.0STD x 12.5' Horizontal Rail, (3) total. Attach SFS-L kit angles to new horizontal rail.
  - Pipe2.0STD x ~4' long corner braces, (3) total. Attach to new horizontal rail w/ Sitepro1 PUCK brackets, (6) total.
  - Sitepro1 SCX_x_-K, (24) total. Attach all mount pipes to new rail. (12) new Pipe2.0STD mount pipes will be required to span between existing rail and new rail.
- Panel antennas to be installed in Positions 2 and 3. RRH units to be installed on dual swivel brackets behind panel antennas in Positions 2 and 3.

Once the recommended augments are successfully implemented, the augmented mount assembly has sufficient capacity to support the loading considered in this analysis pursuant to the listed standards.

Augmentation Requirements:

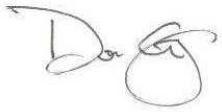
- **In order to obtain a mount structure capable of supporting the currently proposed final loading configuration, upgrade augments must be installed in accordance with GeoStructural's *Mount Augmentation Drawings*.**
- **Antennas and equipment shall be installed centered vertically on the mount front face rails. If this assumption is incorrect, the results of this analysis will be affected.**
- **In order for the specified modifications to perform as designed and to "fit-up" the existing Nudd T-Arm mounts must be appropriately rotated on standoff member such that they are perpendicular to the face of the tower (T-Arm standoff tube and collar standoff member to be colinear). Panel antenna azimuths will need to be adjusted to obtain desired azimuths.**

This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If any of the existing or proposed conditions (appurtenance loading, member sizes, etc.) reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

Prepared by:

Jesse Drennen, PE, MLE
208.761.7986
jesse.drennen@geostructural.com

Reviewed and Approved by:



Don George, PE, SE, MLSE
208.602.6569
don.george@geostructural.com

6.0 Standard Conditions

- All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided. It has been assumed that the tower, antenna support structure and foundation have been constructed according to the provided existing drawings, previous structural analysis reports, mapping documents, etc.

- The default Structure Classification is Class II in accordance with ANSI/TIA-222-G §A.2.2 & §A.15.3 and has been assumed for this analysis. The owner shall verify this classification conforms with original or desired reliability criteria.

- This analysis assumes that the structure has been properly installed and maintained in accordance with ANSI/TIA-222-G §15.5 and that no physical deterioration has occurred in any of the components of the structure. Damaged, missing, or rusted members were not considered.

- This analysis verifies the adequacy of the main components of the structure. Not all connections, welds, bolts, plates, etc. were individually detailed and analyzed. Where not specifically analyzed, the existing connection plates, welds, bolts, etc. were assumed adequate to develop the full capacity of the main structural members.

- No consideration has been made for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding or other similar conditions.

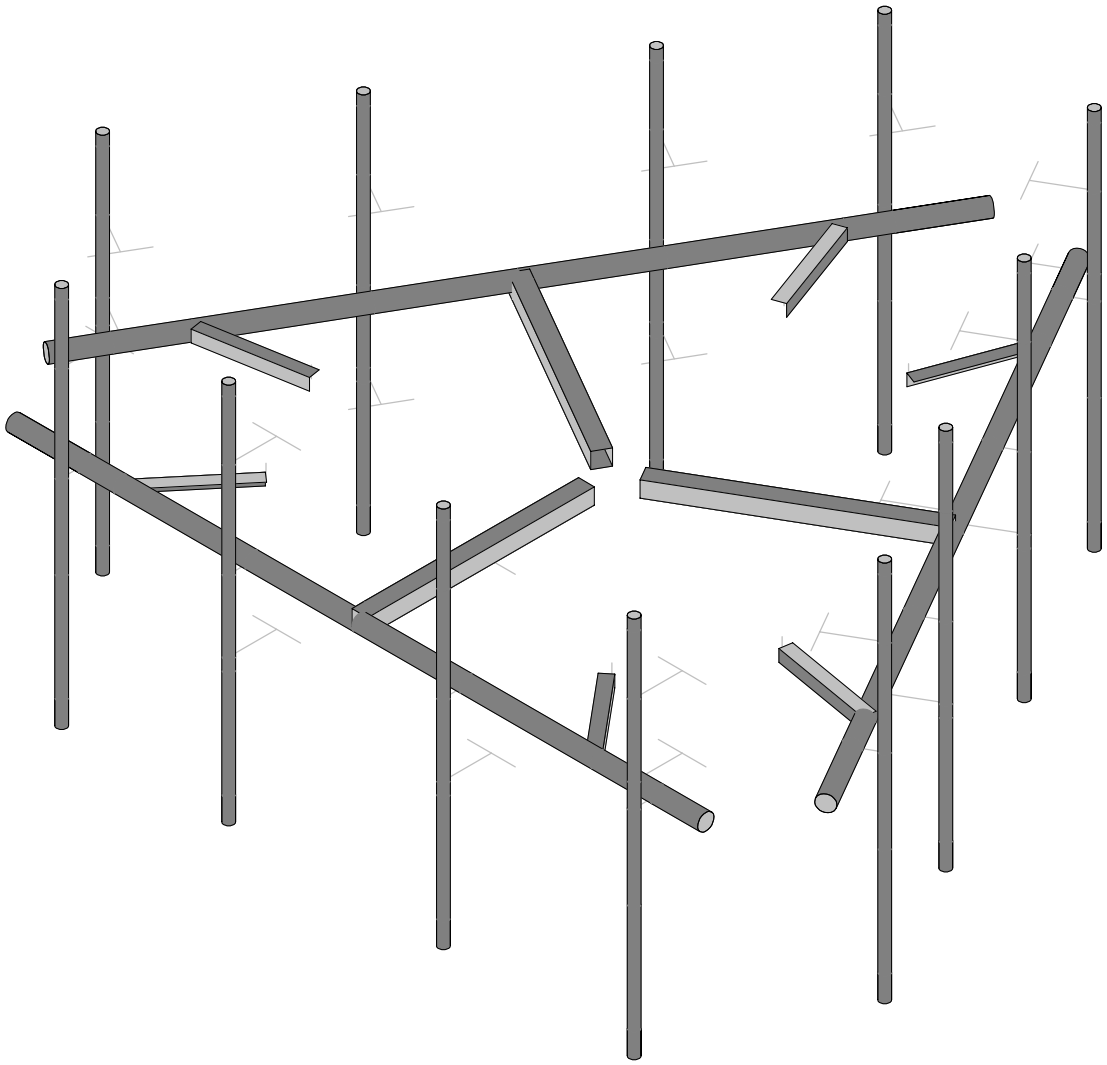
- It is the owner's responsibility to determine the appropriate design wind speed and amount of ice accumulation beyond code minimum values that should be considered in the analysis.

- This analysis report does not constitute a maintenance and condition assessment. No certifications regarding maintenance and condition are expressed or implied. If desired, GeoStructural can provide these services under a subsequent contract.

- This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If desired, GeoStructural can provide these services under a subsequent contract.

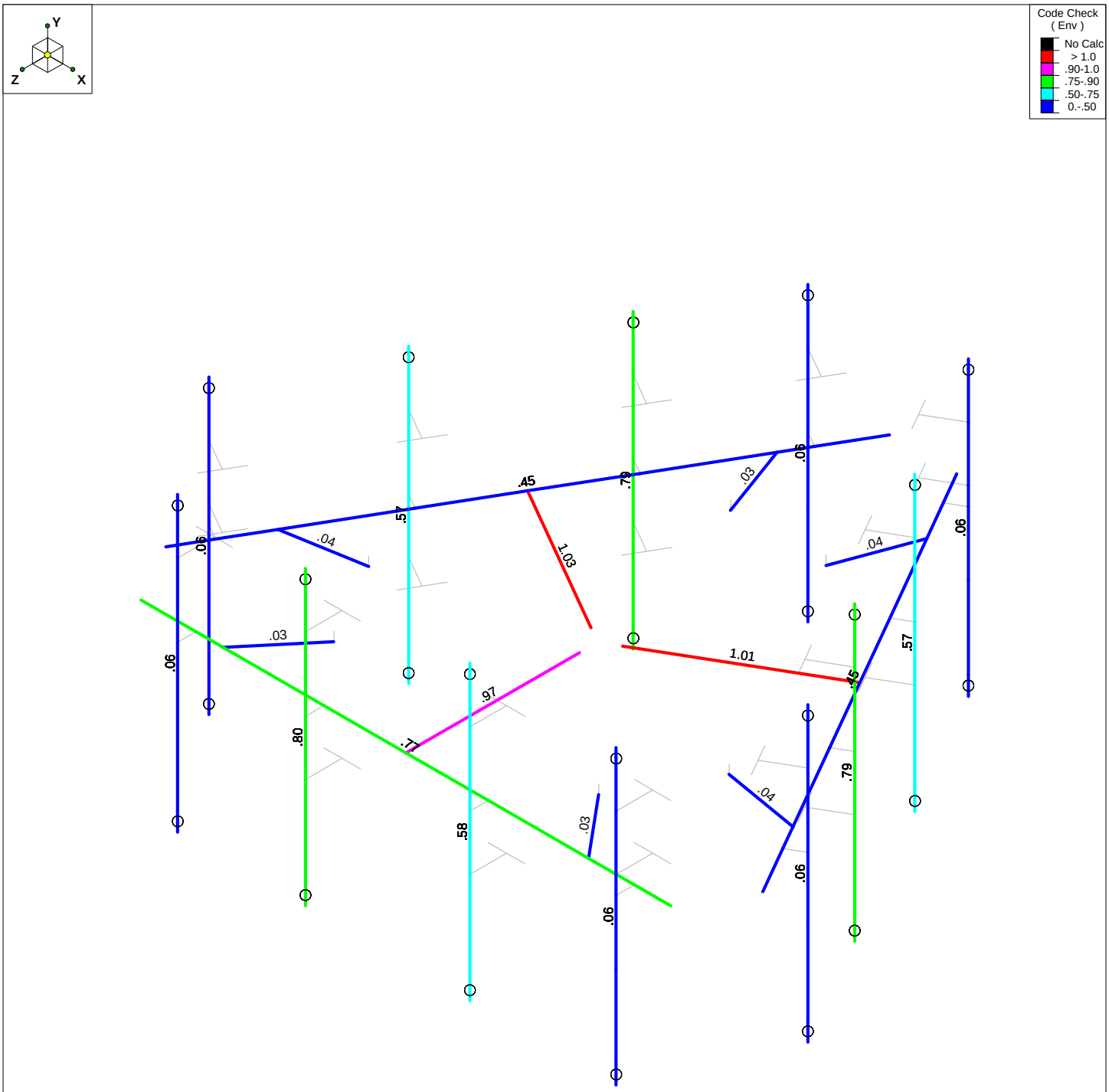
7.0 Calculations & Software Output

This page intentionally left blank.



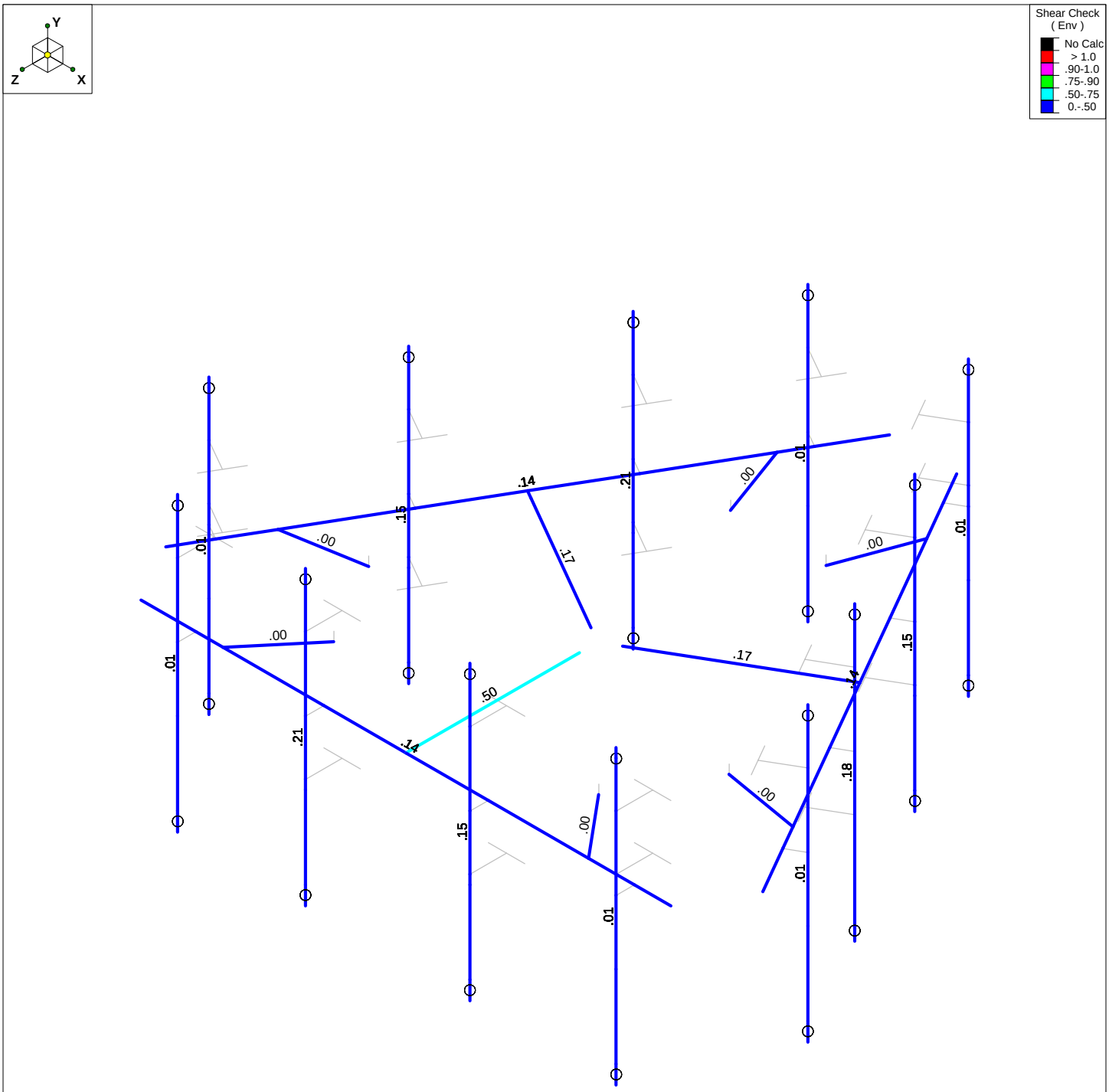
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 1
Jesse Drennen, PE		Mar 15, 2018 at 12:37 PM
		CT23XC409_Mount Analysis_R0 1...



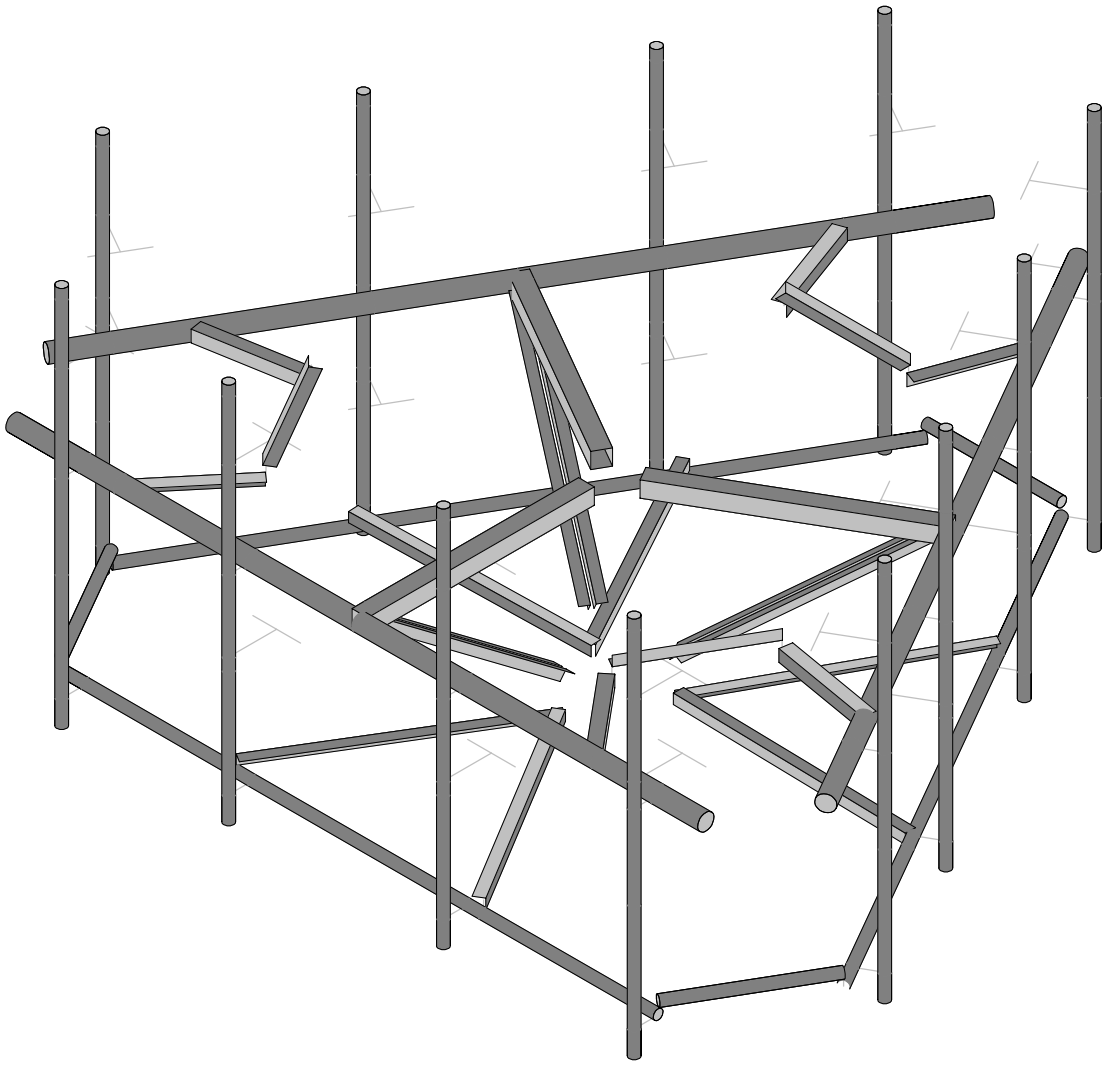
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 2
Jesse Drennen, PE		Mar 15, 2018 at 12:37 PM
		CT23XC409_Mount Analysis_R0 1...



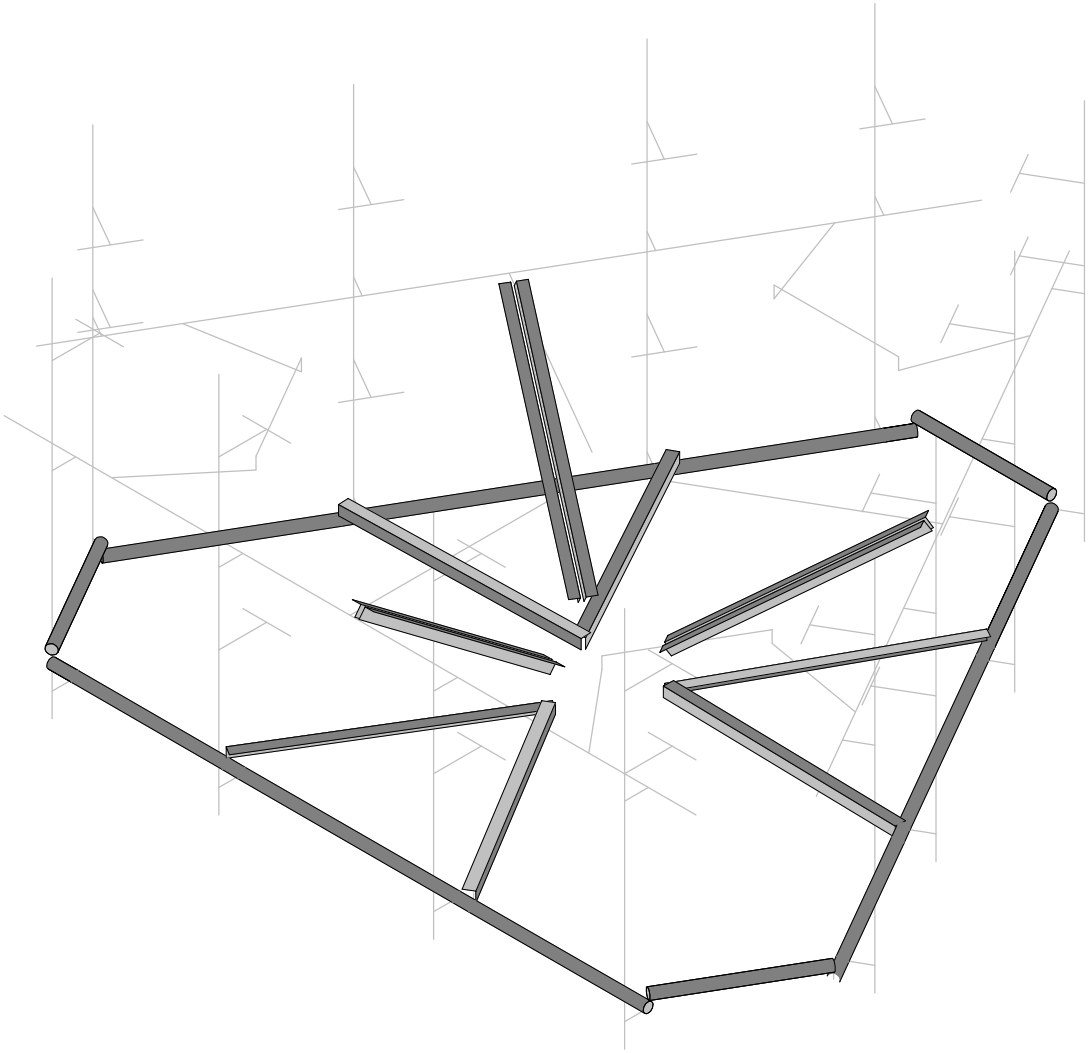
Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 3
Jesse Drennen, PE		Mar 15, 2018 at 12:38 PM
		CT23XC409_Mount Analysis_R0 1...



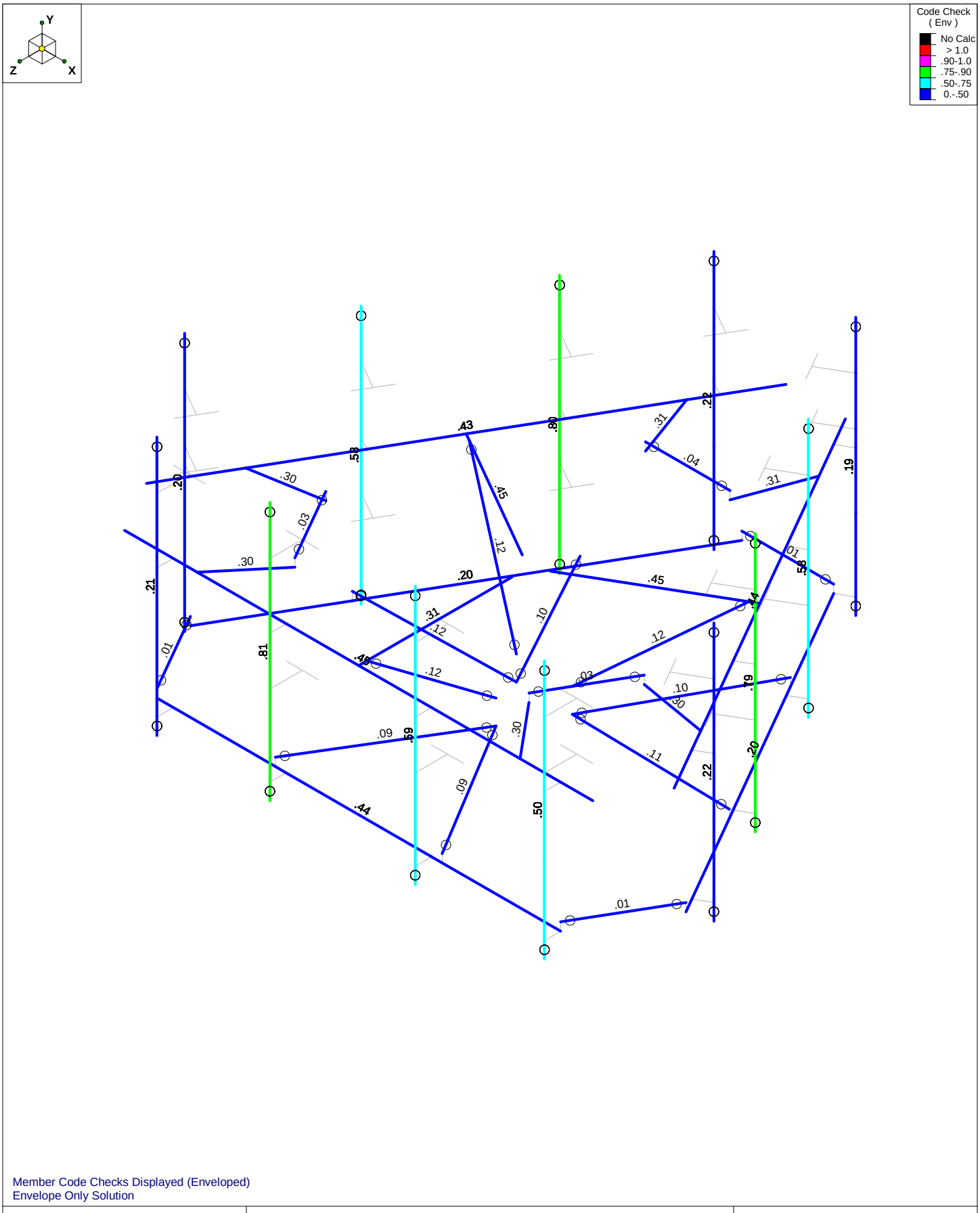
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 1
Jesse Drennen, PE		Mar 15, 2018 at 12:40 PM
		CT23XC409_Mount Analysis_R0 1...



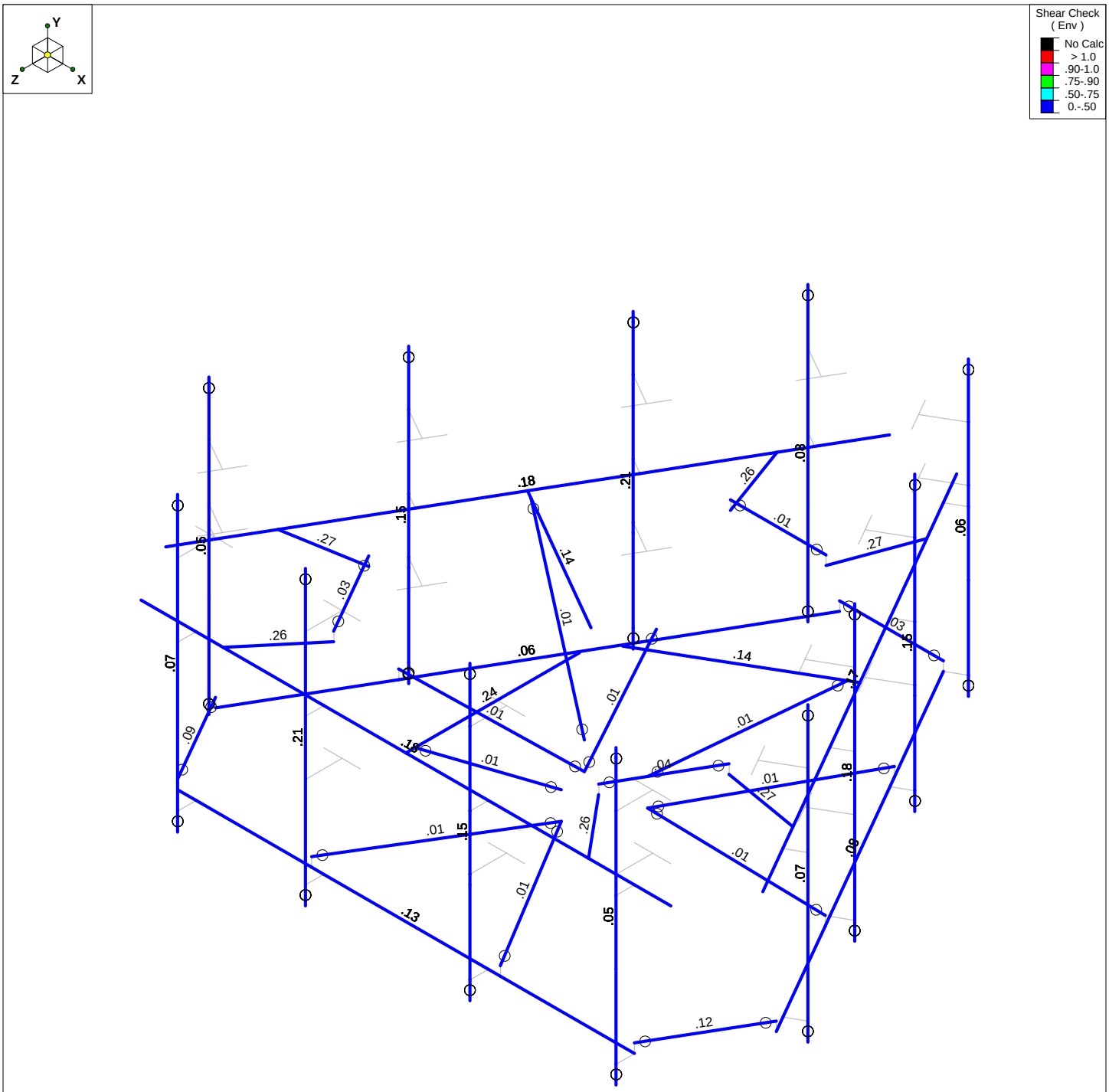
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 7
Jesse Drennen, PE		Mar 15, 2018 at 12:41 PM
		CT23XC409_Mount Analysis_R0 1...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 2
Jesse Drennen, PE		Mar 15, 2018 at 12:40 PM
		CT23XC409_Mount Analysis_R0 1...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 3
Jesse Drennen, PE		Mar 15, 2018 at 12:40 PM
		CT23XC409_Mount Analysis_R0 1...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	D	DL		-1		25		3		
2	Di	SL				25		45		
3	Lm [500]	LL				1				
4	Lv [250]	LL				2				
5	Woz	WL				25		42		
6	Wox	WL				25		42		
7	Wiz	WL				25		42		
8	Wix	WL				25		42		
9	Ez	EL				25				
10	Ex	EL				25				

Load Combination Design

	Description	ASIF	CD	ABIF	Service	Hot Rolled	Cold For...	Wood	Concrete	Masonry	Footings	Aluminum	Connecti...
1	1) 1.4D					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	ASIF	CD	ABIF	Service	Hot Rolled	Cold For...	Wood	Concrete	Masonry	Footings	Aluminum	Connecti...
42	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	6) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N36	max	3.307	36	2.959	36	-.298	17	0	47	0	47	0	5
2		min	.525	18	.411	18	-1.909	36	0	5	0	5	0	47
3	N37	max	.045	17	2.962	32	3.825	32	0	1	.002	47	.002	47
4		min	-.044	23	.388	14	.559	14	0	1	0	5	0	5
5	N47	max	.532	41	.088	33	.453	2	0	1	0	1	0	1
6		min	-.106	11	.011	47	-.43	20	0	1	0	1	0	1
7	N54	max	.355	6	.088	37	.23	12	0	1	0	1	0	1
8		min	-.329	24	.013	70	-.231	18	0	1	0	1	0	1
9	N80	max	-.521	22	2.96	28	-.296	23	0	5	0	47	0	5
10		min	-3.308	28	.407	22	-1.909	28	0	47	0	5	0	47
11	N84	max	.323	16	.088	29	.236	15	0	1	0	1	0	1
12		min	-.335	10	.013	74	-.261	10	0	1	0	1	0	1
13	N19	max	1.372	5	.457	14	1.662	14	.653	8	3.847	5	1.933	47
14		min	-1.357	11	-.498	8	-4.313	8	-.655	2	-3.841	11	-1.062	5
15	N95	max	3.921	5	.437	22	2.576	2	.837	12	5.46	13	.693	3
16		min	-1.627	23	-.478	4	-1.23	20	-.748	18	-5.448	7	-.651	21
17	N96	max	1.666	17	.433	18	2.515	2	.75	16	5.397	9	.719	7
18		min	-3.973	11	-.474	12	-1.19	20	-.814	10	-5.399	3	-.67	25
19	Totals:	max	6.592	17	8.631	30	6.439	2						

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
20		min	-6.592	23	2.471	73	-6.439	20						

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M4	1	max	.572	8	.696	47	.463	5	9.657e-03	5	NC	1	NC	1
2			min	-.561	14	-.641	5	-.401	23	-9.863e-03	47	NC	1	NC	1
3		2	max	.572	8	.688	47	.465	5	9.657e-03	5	NC	1	NC	1
4			min	-.561	14	-.636	5	-.403	23	-9.863e-03	47	NC	1	NC	1
5		3	max	.572	8	.68	47	.467	5	9.657e-03	5	NC	1	NC	1
6			min	-.561	14	-.63	5	-.405	23	-9.863e-03	47	NC	1	NC	1
7		4	max	.572	8	.672	47	.469	5	9.657e-03	5	NC	1	NC	1
8			min	-.561	14	-.625	5	-.408	23	-9.863e-03	47	NC	1	NC	1
9		5	max	.572	8	.664	47	.472	5	9.657e-03	5	NC	1	NC	1
10			min	-.561	14	-.62	5	-.41	23	-9.863e-03	47	NC	1	NC	1
11	M5	1	max	.664	47	.467	48	.319	7	8.802e-03	7	NC	1	NC	2
12			min	-.619	5	-.158	6	-.293	49	-8.199e-03	25	107.736	39	259.282	45
13		2	max	.664	47	.238	39	.342	8	8.393e-03	8	NC	2	NC	1
14			min	-.62	5	-.088	9	-.324	14	-8.027e-03	14	142.902	39	397.891	45
15		3	max	.664	47	.203	16	.417	8	7.989e-03	8	NC	10	NC	1
16			min	-.62	5	-.216	10	-.408	14	-7.896e-03	14	220.98	39	390.721	3
17		4	max	.664	47	.414	5	.538	8	7.888e-03	20	NC	9	NC	1
18			min	-.62	5	-.368	23	-.528	14	-7.863e-03	14	172.676	5	257.426	3
19		5	max	.664	47	.646	5	.673	8	7.888e-03	20	NC	8	NC	1
20			min	-.62	5	-.537	23	-.661	14	-7.863e-03	14	121.766	5	188.227	3
21	M6	1	max	.463	5	.637	47	.514	14	5.691e-03	15	NC	1	NC	1
22			min	-.401	23	-.583	5	-.524	8	-5.743e-03	9	NC	1	NC	1
23		2	max	.463	5	.666	47	.538	14	5.691e-03	15	NC	1	NC	1
24			min	-.401	23	-.612	5	-.548	8	-5.743e-03	9	NC	1	NC	1
25		3	max	.463	5	.696	47	.561	14	5.691e-03	15	NC	1	NC	1
26			min	-.401	23	-.641	5	-.572	8	-5.743e-03	9	NC	1	NC	1
27		4	max	.463	5	.725	47	.585	14	5.691e-03	15	NC	1	NC	1
28			min	-.401	23	-.67	5	-.595	8	-5.743e-03	9	NC	1	NC	1
29		5	max	.463	5	.755	47	.608	14	5.691e-03	15	NC	1	NC	1
30			min	-.401	23	-.699	5	-.619	8	-5.743e-03	9	NC	1	NC	1
31	M7	1	max	.325	20	.191	18	.569	17	1.5e-02	17	NC	1	NC	1
32			min	-.371	2	-.469	48	-.62	11	-1.811e-02	47	NC	1	NC	1
33		2	max	.325	20	.172	18	.56	17	1.5e-02	17	NC	1	NC	1
34			min	-.371	2	-.459	48	-.612	11	-1.811e-02	47	NC	1	NC	1
35		3	max	.325	20	.153	18	.551	17	1.5e-02	17	NC	1	NC	1
36			min	-.371	2	-.449	47	-.604	11	-1.811e-02	47	NC	1	NC	1
37		4	max	.325	20	.154	17	.542	17	1.5e-02	17	NC	1	NC	1
38			min	-.371	2	-.44	47	-.596	11	-1.811e-02	47	NC	1	NC	1
39		5	max	.325	20	.158	17	.533	17	1.5e-02	17	NC	1	NC	1
40			min	-.371	2	-.431	47	-.588	11	-1.811e-02	47	NC	1	NC	1
41	M8	1	max	.158	17	.549	47	.25	48	4.276e-03	2	NC	1	NC	1
42			min	-.432	47	-.126	5	-.063	7	-6.291e-03	44	1585.344	31	267.345	38
43		2	max	.158	17	.263	42	.116	42	4.685e-03	2	NC	1	NC	1
44			min	-.432	47	-.061	11	-.038	36	-4.524e-03	20	326.631	47	426.968	38
45		3	max	.158	17	.21	5	.074	19	5.231e-03	2	NC	14	NC	1
46			min	-.431	47	-.205	23	-.081	13	-4.994e-03	20	178.024	47	704.234	7
47		4	max	.158	17	.446	17	.247	19	5.372e-03	3	NC	8	NC	28
48			min	-.431	47	-.488	11	-.272	13	-5.142e-03	21	100.783	47	296.543	13
49		5	max	.158	17	.813	17	.584	20	5.8e-03	3	NC	20	NC	5
50			min	-.431	47	-.907	11	-.708	2	-5.581e-03	21	69.183	47	129.02	2
51	M9	1	max	.569	17	.268	18	.401	2	1.778e-02	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
52			min	-.62	11	-.576	48	-.354	20	-1.348e-02	20	NC	1	NC	1
53		2	max	.569	17	.23	18	.386	2	1.778e-02	2	NC	1	NC	1
54			min	-.62	11	-.523	48	-.339	20	-1.348e-02	20	NC	1	NC	1
55		3	max	.569	17	.191	18	.371	2	1.778e-02	2	NC	1	NC	1
56			min	-.62	11	-.469	48	-.325	20	-1.348e-02	20	NC	1	NC	1
57		4	max	.569	17	.155	19	.356	2	1.778e-02	2	NC	1	NC	1
58			min	-.62	11	-.415	48	-.31	20	-1.348e-02	20	NC	1	NC	1
59		5	max	.569	17	.134	19	.346	13	1.778e-02	2	NC	1	NC	1
60			min	-.62	11	-.362	49	-.3	19	-1.348e-02	20	NC	1	NC	1
61	M10	1	max	.488	19	.481	17	.404	17	7.169e-03	17	NC	1	NC	1
62			min	-.499	13	-1.334	47	-.528	47	-1.822e-02	47	NC	1	NC	1
63		2	max	.488	19	.475	17	.406	17	7.169e-03	17	NC	1	NC	1
64			min	-.499	13	-1.333	47	-.526	47	-1.822e-02	47	NC	1	NC	1
65		3	max	.488	19	.469	17	.407	17	7.169e-03	17	NC	1	NC	1
66			min	-.499	13	-1.332	47	-.525	47	-1.822e-02	47	NC	1	NC	1
67		4	max	.488	19	.464	17	.409	17	7.169e-03	17	NC	1	NC	1
68			min	-.499	13	-1.331	47	-.524	47	-1.822e-02	47	NC	1	NC	1
69		5	max	.488	19	.458	17	.411	17	7.169e-03	17	NC	1	NC	1
70			min	-.499	13	-1.33	47	-.523	47	-1.822e-02	47	NC	1	NC	1
71	M11	1	max	.458	17	.499	46	.301	21	7.879e-03	14	NC	1	NC	1
72			min	-1.329	47	-.124	4	-.329	3	-8.028e-03	8	2265.805	27	390.029	48
73		2	max	.458	17	.255	42	.317	20	7.563e-03	2	NC	1	NC	1
74			min	-1.329	47	-.065	12	-.338	2	-7.524e-03	20	383.207	47	679.512	50
75		3	max	.458	17	.207	5	.362	20	7.162e-03	2	NC	4	NC	1
76			min	-1.33	47	-.206	23	-.38	2	-6.873e-03	20	196.871	47	563.722	7
77		4	max	.458	17	.369	17	.459	19	7.062e-03	2	NC	1	NC	1
78			min	-1.33	47	-.414	47	-.472	13	-6.71e-03	20	105.307	47	346.527	7
79		5	max	.458	17	.541	17	.576	19	7.062e-03	2	NC	3	NC	1
80			min	-1.33	47	-.851	47	-.581	13	-6.71e-03	20	71.171	47	243.129	7
81	M12	1	max	.404	17	.524	17	.539	13	4.558e-03	25	NC	1	NC	1
82			min	-.528	47	-1.444	47	-.525	19	-4.885e-03	7	NC	1	NC	1
83		2	max	.404	17	.502	17	.519	13	4.558e-03	25	NC	1	NC	1
84			min	-.528	47	-1.389	47	-.507	19	-4.885e-03	7	NC	1	NC	1
85		3	max	.404	17	.481	17	.499	13	4.558e-03	25	NC	1	NC	1
86			min	-.528	47	-1.334	47	-.488	19	-4.885e-03	7	NC	1	NC	1
87		4	max	.404	17	.459	17	.479	13	4.558e-03	25	NC	1	NC	1
88			min	-.528	47	-1.28	47	-.47	19	-4.885e-03	7	NC	1	NC	1
89		5	max	.404	17	.438	17	.46	13	4.558e-03	25	NC	1	NC	1
90			min	-.528	47	-1.225	47	-.451	19	-4.885e-03	7	NC	1	NC	1
91	M37	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
92			min	0	1	0	1	0	1	0	1	NC	1	NC	1
93		2	max	.001	8	.004	20	.029	5	1.628e-03	5	NC	1	NC	1
94			min	0	14	-.004	2	-.029	11	-2.963e-03	47	6187.198	8	1939.706	5
95		3	max	.002	8	.01	20	.097	5	3.257e-03	5	NC	1	NC	1
96			min	0	14	-.011	2	-.097	11	-5.927e-03	47	2953.034	8	587.587	11
97		4	max	.003	8	.006	20	.176	17	4.885e-03	5	NC	1	NC	1
98			min	-.001	14	-.011	2	-.177	11	-8.89e-03	47	2866.976	8	322.136	11
99		5	max	.004	8	.006	14	.242	17	6.514e-03	5	NC	2	NC	1
100			min	-.002	14	-.022	32	-.244	11	-1.185e-02	47	2621.06	32	233.674	11
101	M38	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
102			min	0	1	0	1	0	1	0	1	NC	1	NC	1
103		2	max	.001	12	.004	24	.042	9	1.375e-03	9	NC	1	NC	1
104			min	0	18	-.004	6	-.042	3	-1.246e-03	15	6798.471	24	1359.93	3
105		3	max	.002	12	.009	24	.142	9	2.749e-03	9	NC	1	NC	1
106			min	0	18	-.011	6	-.143	3	-2.491e-03	15	3217.049	24	399.509	3
107		4	max	.003	12	.006	24	.269	21	4.124e-03	9	NC	1	NC	1
108			min	-.001	18	-.011	6	-.27	3	-3.737e-03	15	3114.152	24	210.805	3

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
109		5	max	.004	12	.005	18	.391	21	5.499e-03	9	NC	4	NC	1
110			min	-.002	18	-.022	36	-.394	3	-4.983e-03	15	2629.218	36	144.772	3
111	M48	1	max	.382	20	.469	17	.242	17	6.418e-03	17	NC	1	NC	1
112			min	-.398	2	-1.332	47	-.244	11	-1.816e-02	47	NC	1	NC	1
113		2	max	.382	20	.467	17	.243	17	6.418e-03	17	NC	1	NC	1
114			min	-.398	2	-1.332	47	-.246	11	-1.816e-02	47	NC	1	NC	1
115		3	max	.382	20	.464	17	.244	17	6.418e-03	17	NC	1	NC	1
116			min	-.398	2	-1.331	47	-.248	11	-1.816e-02	47	NC	1	NC	1
117		4	max	.382	20	.461	17	.245	17	6.418e-03	17	NC	1	NC	1
118			min	-.398	2	-1.33	47	-.249	11	-1.816e-02	47	NC	1	NC	1
119		5	max	.382	20	.458	17	.246	17	6.418e-03	17	NC	1	NC	1
120			min	-.398	2	-1.33	47	-.251	11	-1.816e-02	47	NC	1	NC	1
121	M49	1	max	.097	19	.164	17	.242	17	6.62e-03	17	NC	1	NC	1
122			min	-.101	13	-.431	47	-.244	11	-1.743e-02	47	NC	1	NC	1
123		2	max	.097	19	.163	17	.244	17	6.62e-03	17	NC	1	NC	1
124			min	-.101	13	-.431	47	-.246	11	-1.743e-02	47	NC	1	NC	1
125		3	max	.097	19	.161	17	.245	17	6.62e-03	17	NC	1	NC	1
126			min	-.101	13	-.431	47	-.248	11	-1.743e-02	47	NC	1	NC	1
127		4	max	.097	19	.159	17	.247	17	6.62e-03	17	NC	1	NC	1
128			min	-.101	13	-.431	47	-.25	11	-1.743e-02	47	NC	1	NC	1
129		5	max	.097	19	.158	17	.248	17	6.62e-03	17	NC	1	NC	1
130			min	-.101	13	-.431	47	-.252	11	-1.743e-02	47	NC	1	NC	1
131	M50	1	max	.444	8	.68	47	.242	17	8.904e-03	5	NC	1	NC	1
132			min	-.435	14	-.63	5	-.244	11	-9.809e-03	47	NC	1	NC	1
133		2	max	.444	8	.676	47	.243	17	8.904e-03	5	NC	1	NC	1
134			min	-.435	14	-.628	5	-.245	11	-9.809e-03	47	NC	1	NC	1
135		3	max	.444	8	.672	47	.244	17	8.904e-03	5	NC	1	NC	1
136			min	-.435	14	-.625	5	-.246	11	-9.809e-03	47	NC	1	NC	1
137		4	max	.444	8	.668	47	.246	17	8.904e-03	5	NC	1	NC	1
138			min	-.435	14	-.622	5	-.247	11	-9.809e-03	47	NC	1	NC	1
139		5	max	.444	8	.664	47	.247	17	8.904e-03	5	NC	1	NC	1
140			min	-.435	14	-.62	5	-.248	11	-9.809e-03	47	NC	1	NC	1
141	M61	1	max	.289	6	.423	3	.622	22	6.499e-03	4	NC	2	NC	2
142			min	-.283	24	-.301	21	-.636	4	-5.169e-03	22	143.306	5	118.339	11
143		2	max	.289	6	.404	3	.561	22	1.184e-02	7	NC	4	NC	27
144			min	-.283	24	-.292	21	-.572	4	-1.051e-02	25	192.112	5	160.481	11
145		3	max	.289	6	.391	3	.497	22	2.416e-02	7	NC	4	NC	26
146			min	-.283	24	-.287	21	-.505	4	-2.268e-02	25	289.17	5	243.256	11
147		4	max	.289	6	.38	3	.431	22	3.699e-02	8	NC	3	NC	1
148			min	-.283	24	-.285	21	-.435	4	-3.533e-02	14	579.471	5	489.105	11
149		5	max	.289	6	.371	3	.364	10	5.039e-02	8	NC	1	NC	1
150			min	-.283	24	-.283	21	-.364	16	-4.858e-02	14	1731.846	47	835.075	71
151	M62	1	max	.19	18	.511	3	.476	9	5.515e-03	14	NC	2	NC	2
152			min	-.195	12	-.504	21	-.296	15	-7.662e-03	8	230.873	7	171.987	13
153		2	max	.19	18	.475	3	.453	9	1.087e-02	23	NC	2	NC	19
154			min	-.195	12	-.468	21	-.284	15	-1.298e-02	5	309.006	7	231.537	13
155		3	max	.19	18	.43	3	.435	9	2.293e-02	22	NC	2	NC	19
156			min	-.195	12	-.423	21	-.278	15	-2.522e-02	4	464.477	7	348.866	13
157		4	max	.19	18	.38	3	.421	9	3.631e-02	22	NC	2	NC	19
158			min	-.195	12	-.372	21	-.273	15	-3.875e-02	4	929.93	7	294.448	20
159		5	max	.19	18	.328	3	.408	9	4.97e-02	22	NC	1	NC	1
160			min	-.195	12	-.318	21	-.27	15	-5.227e-02	4	NC	1	210.204	20
161	M63	1	max	.394	3	.427	15	.548	2	4.639e-03	13	NC	2	NC	1
162			min	-.391	21	-.679	9	-.542	20	-4.576e-03	19	159.439	9	269.291	2
163		2	max	.394	3	.215	15	.268	2	4.898e-03	12	NC	36	NC	1
164			min	-.391	21	-.345	9	-.263	20	-4.523e-03	18	228.243	21	474.467	2
165		3	max	.394	3	.005	18	.004	12	2.554e-03	12	NC	18	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
166			min	-.391	21	-.022	36	-.002	18	-1.81e-03	18	393.12	21	381.951	3
167		4	max	.394	3	.219	21	.379	23	4.297e-03	11	NC	18	NC	1
168			min	-.391	21	-.305	3	-.387	5	-3.773e-03	17	241.901	15	239.808	3
169		5	max	.394	3	.436	21	.838	23	4.235e-03	11	NC	1	NC	2
170			min	-.391	21	-.604	3	-.86	5	-3.902e-03	17	172.879	15	167.928	4
171	M67	1	max	.25	3	1.051	47	.289	18	1.487e-02	48	NC	3	NC	5
172			min	-.242	21	-.374	17	-.301	12	-6.191e-03	18	228.545	13	122.848	44
173		2	max	.25	3	.975	47	.262	18	1.189e-02	3	NC	6	NC	13
174			min	-.242	21	-.358	17	-.271	12	-1.053e-02	21	307.578	13	169.087	44
175		3	max	.25	3	.901	47	.232	18	2.415e-02	3	NC	6	NC	5
176			min	-.242	21	-.346	17	-.238	12	-2.262e-02	21	464.251	13	259.276	43
177		4	max	.25	3	.829	47	.199	18	3.642e-02	3	NC	5	NC	1
178			min	-.242	21	-.336	17	-.202	12	-3.472e-02	21	931.902	13	451.24	6
179		5	max	.25	3	.758	47	.166	6	4.921e-02	4	NC	1	NC	1
180			min	-.242	21	-.327	17	-.165	24	-4.721e-02	22	NC	1	324.494	6
181	M68	1	max	.282	25	.335	9	.55	5	9.172e-03	46	NC	4	NC	3
182			min	-.287	7	-.331	15	-.592	47	-8.64e-03	4	208.016	3	135.31	8
183		2	max	.282	25	.298	10	.523	5	9.352e-03	19	NC	4	NC	11
184			min	-.287	7	-.294	16	-.565	47	-1.15e-02	13	277.504	3	188.675	8
185		3	max	.282	25	.261	10	.501	5	2.091e-02	18	NC	4	NC	23
186			min	-.287	7	-.256	16	-.54	47	-2.329e-02	12	416.178	3	291.915	8
187		4	max	.282	25	.221	10	.482	5	3.389e-02	18	NC	4	NC	35
188			min	-.287	7	-.215	16	-.516	47	-3.643e-02	12	832.014	3	240.512	15
189		5	max	.282	25	.18	10	.465	5	4.688e-02	18	NC	1	NC	1
190			min	-.287	7	-.172	16	-.492	47	-4.957e-02	12	NC	1	179.481	15
191	M69	1	max	.244	11	.856	47	.586	8	5.092e-03	9	NC	9	NC	1
192			min	-.242	17	-.791	5	-.577	14	-5.04e-03	15	132.416	5	705.545	10
193		2	max	.244	11	.432	47	.244	9	5.199e-03	8	NC	2	NC	1
194			min	-.242	17	-.397	5	-.239	15	-4.835e-03	14	188.348	17	622.254	25
195		3	max	.244	11	.006	14	.004	8	2.662e-03	8	NC	58	NC	1
196			min	-.242	17	-.022	32	-.002	14	-1.921e-03	14	199.855	47	361.118	2
197		4	max	.244	11	.27	17	.187	19	4.313e-03	8	7279.938	29	NC	1
198			min	-.242	17	-.734	47	-.195	13	-3.784e-03	25	109.429	47	577.902	2
199		5	max	.244	11	.546	17	.463	20	4.234e-03	7	NC	1	NC	2
200			min	-.242	17	-1.55	47	-.483	2	-3.908e-03	25	72.314	47	750.861	60
201	M64A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
202			min	0	1	0	1	0	1	0	1	NC	1	NC	1
203		2	max	0	14	.004	14	.061	17	6.385e-04	5	NC	1	NC	1
204			min	-.002	32	-.016	32	-.062	11	-2.118e-03	47	4893.142	32	3832.255	43
205		3	max	0	14	.006	14	.12	17	1.277e-03	5	NC	1	NC	1
206			min	-.003	32	-.025	32	-.121	11	-4.236e-03	47	3486.364	32	1911.78	43
207		4	max	0	14	.005	14	.176	17	1.916e-03	5	NC	1	NC	1
208			min	-.005	32	-.024	32	-.178	11	-6.354e-03	47	4893.142	32	1270.958	43
209		5	max	0	14	.001	14	.23	17	2.554e-03	5	NC	1	NC	1
210			min	-.007	32	-.016	32	-.232	11	-8.472e-03	47	NC	1	950.814	43
211	M66A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
212			min	0	1	0	1	0	1	0	1	NC	1	NC	1
213		2	max	0	18	.01	18	.098	21	5.162e-04	5	NC	1	NC	1
214			min	-.002	36	-.017	36	-.099	3	-5.148e-04	47	4439.603	12	4405.141	42
215		3	max	0	18	.014	18	.192	21	1.032e-03	5	NC	1	NC	1
216			min	-.003	36	-.026	36	-.193	3	-1.03e-03	47	3163.217	12	2197.014	42
217		4	max	0	18	.01	18	.282	21	1.549e-03	5	NC	1	NC	1
218			min	-.005	36	-.025	36	-.283	3	-1.544e-03	47	4439.603	12	1460.125	42
219		5	max	0	18	.001	18	.367	21	2.065e-03	5	NC	1	NC	1
220			min	-.007	36	-.016	36	-.37	3	-2.059e-03	47	NC	1	1092.024	42
221	M68B	1	max	.297	21	.484	17	.423	47	6.457e-03	17	NC	1	NC	1
222			min	-.323	3	-1.361	47	-.077	5	-1.279e-02	47	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
223		2	max	.297	21	.478	17	.423	47	6.457e-03	17	NC	1	NC	1
224			min	-.323	3	-1.353	47	-.079	5	-1.279e-02	47	NC	1	NC	1
225		3	max	.297	21	.471	17	.422	47	6.457e-03	17	NC	1	NC	1
226			min	-.323	3	-1.345	47	-.08	5	-1.279e-02	47	NC	1	NC	1
227		4	max	.297	21	.465	17	.422	46	6.457e-03	17	NC	1	NC	1
228			min	-.323	3	-1.337	47	-.083	4	-1.279e-02	47	NC	1	NC	1
229		5	max	.297	21	.458	17	.422	46	6.457e-03	17	NC	1	NC	1
230			min	-.323	3	-1.329	47	-.091	4	-1.279e-02	47	NC	1	NC	1
231	M69B	1	max	.218	48	.169	17	.423	47	7.137e-03	17	NC	1	NC	1
232			min	-.049	7	-.464	47	-.077	5	-1.502e-02	47	NC	1	NC	1
233		2	max	.218	48	.166	17	.432	47	7.137e-03	17	NC	1	NC	1
234			min	-.049	7	-.456	47	-.079	5	-1.502e-02	47	NC	1	NC	1
235		3	max	.218	48	.163	17	.441	47	7.137e-03	17	NC	1	NC	1
236			min	-.049	7	-.448	47	-.08	5	-1.502e-02	47	NC	1	NC	1
237		4	max	.218	48	.161	17	.45	47	7.137e-03	17	NC	1	NC	1
238			min	-.049	7	-.44	47	-.082	5	-1.502e-02	47	NC	1	NC	1
239		5	max	.218	48	.158	17	.459	46	7.137e-03	17	NC	1	NC	1
240			min	-.049	7	-.432	47	-.083	5	-1.502e-02	47	NC	1	NC	1
241	M70B	1	max	.319	7	.698	47	.422	47	7.967e-03	5	NC	1	NC	1
242			min	-.291	25	-.648	5	-.078	5	-9.282e-03	47	NC	1	NC	1
243		2	max	.319	7	.689	47	.419	48	7.967e-03	5	NC	1	NC	1
244			min	-.291	25	-.641	5	-.086	6	-9.282e-03	47	NC	1	NC	1
245		3	max	.319	7	.681	47	.416	48	7.967e-03	5	NC	1	NC	1
246			min	-.291	25	-.634	5	-.096	6	-9.282e-03	47	NC	1	NC	1
247		4	max	.319	7	.672	47	.414	48	7.967e-03	5	NC	1	NC	1
248			min	-.291	25	-.627	5	-.106	6	-9.282e-03	47	NC	1	NC	1
249		5	max	.319	7	.664	47	.412	48	7.967e-03	5	NC	1	NC	1
250			min	-.291	25	-.619	5	-.116	6	-9.282e-03	47	NC	1	NC	1
251	M71A	1	max	.078	5	.752	47	.372	7	6.188e-03	46	NC	9	NC	1
252			min	-.422	47	-.695	5	-.341	25	-5.61e-03	4	129.461	5	314.525	48
253		2	max	.078	5	.393	47	.068	6	3.582e-03	46	NC	2	NC	1
254			min	-.422	47	-.347	5	-.264	48	-4.186e-03	4	184.031	17	303.544	48
255		3	max	.077	5	.002	14	.08	14	1.923e-03	20	NC	31	NC	1
256			min	-.422	47	-.098	32	-.086	8	-2.728e-03	2	181.869	47	379.562	2
257		4	max	.077	5	.242	17	.262	46	2.89e-03	18	7915.194	52	NC	1
258			min	-.423	47	-.649	47	-.055	4	-5.041e-03	48	107.107	47	316.344	45
259		5	max	.077	5	.484	17	.297	21	4.61e-03	6	NC	1	NC	1
260			min	-.423	47	-1.361	47	-.323	3	-5.284e-03	48	71.007	47	319.341	45
261	M73	1	max	.286	5	.387	47	.234	47	5.143e-03	25	NC	1	NC	1
262			min	-.321	47	-.053	6	-.033	6	-5.715e-03	7	NC	1	NC	1
263		2	max	.286	5	.396	47	.236	47	5.143e-03	25	NC	1	NC	1
264			min	-.321	47	-.059	6	-.034	6	-5.715e-03	7	NC	1	NC	1
265		3	max	.286	5	.405	47	.239	47	5.143e-03	25	NC	1	NC	1
266			min	-.321	47	-.065	6	-.035	5	-5.715e-03	7	NC	1	NC	1
267		4	max	.286	5	.413	47	.241	47	5.143e-03	25	NC	1	NC	1
268			min	-.321	47	-.071	5	-.038	5	-5.715e-03	7	NC	1	NC	1
269		5	max	.286	5	.422	47	.243	47	5.143e-03	25	NC	1	NC	1
270			min	-.321	47	-.078	5	-.04	5	-5.715e-03	7	NC	1	NC	1
271	M74	1	max	.529	47	.371	47	.038	29	4.905e-03	44	NC	1	NC	1
272			min	-.197	17	-.063	29	-.224	47	-5.019e-03	2	NC	1	NC	1
273		2	max	.529	47	.384	47	.038	30	4.905e-03	44	NC	1	NC	1
274			min	-.197	17	-.063	29	-.228	47	-5.019e-03	2	NC	1	NC	1
275		3	max	.529	47	.397	47	.039	6	4.905e-03	44	NC	1	NC	1
276			min	-.197	17	-.067	5	-.231	47	-5.019e-03	2	NC	1	NC	1
277		4	max	.529	47	.41	47	.04	6	4.905e-03	44	NC	1	NC	1
278			min	-.197	17	-.072	5	-.235	47	-5.019e-03	2	NC	1	NC	1
279		5	max	.529	47	.423	47	.042	6	4.905e-03	44	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
280			min	-.197	17	-.077	5	-.239	47	-5.019e-03	2	NC	1	NC	1
281	M75	1	max	0	1	0	1	0	1	9.176e-03	5	NC	1	NC	1
282			min	0	1	0	1	0	1	-1.137e-02	47	NC	1	NC	1
283		2	max	0	44	.07	29	.029	33	9.176e-03	5	NC	1	NC	2
284			min	0	2	-.075	47	-.111	40	-1.137e-02	47	5783.769	72	459.341	48
285		3	max	0	44	.128	29	.048	33	9.176e-03	5	NC	1	NC	2
286			min	0	2	-.153	47	-.222	39	-1.137e-02	47	2817.356	72	226.231	48
287		4	max	.001	44	.203	5	.056	31	9.176e-03	5	NC	1	NC	51
288			min	0	2	-.235	47	-.336	49	-1.137e-02	47	1820.288	72	147.994	47
289		5	max	.001	44	.286	5	.063	6	9.176e-03	5	NC	1	NC	1
290			min	0	2	-.321	47	-.453	47	-1.137e-02	47	1328.141	72	109.033	47
291	M76	1	max	0	1	0	1	0	1	7.034e-03	17	NC	1	NC	1
292			min	0	1	0	1	0	1	-1.726e-02	47	NC	1	NC	1
293		2	max	0	20	.111	42	.136	46	7.034e-03	17	NC	1	NC	2
294			min	0	38	-.016	12	-.031	16	-1.726e-02	47	3980.496	8	1982.89	10
295		3	max	0	20	.22	42	.269	46	7.034e-03	17	NC	1	NC	7
296			min	0	38	-.018	12	-.071	17	-1.726e-02	47	1937.346	8	864.333	10
297		4	max	0	20	.326	46	.4	47	7.034e-03	17	NC	1	NC	2
298			min	-.001	38	-.038	29	-.128	17	-1.726e-02	47	1250.504	8	466.215	11
299		5	max	0	20	.433	47	.529	47	7.034e-03	17	NC	1	NC	1
300			min	-.002	38	-.073	29	-.197	17	-1.726e-02	47	911.655	8	293.985	11
301	M88	1	max	.218	4	.382	15	.247	2	4.38e-03	14	NC	2	NC	1
302			min	-.194	22	-.599	9	-.382	44	-4.836e-03	8	155.197	9	256.628	46
303		2	max	.218	4	.19	15	.146	4	2.818e-03	25	NC	36	NC	1
304			min	-.194	22	-.301	9	-.135	46	-3.678e-03	7	222.684	21	426.666	47
305		3	max	.218	4	0	18	.079	18	1.729e-03	24	NC	6	NC	1
306			min	-.194	22	-.097	36	-.084	12	-2.529e-03	6	358.081	21	512.429	13
307		4	max	.218	4	.194	21	.163	22	2.716e-03	22	NC	18	NC	1
308			min	-.194	22	-.263	3	-.179	4	-3.14e-03	4	236.053	15	433.984	3
309		5	max	.218	4	.388	21	.544	23	4.377e-03	9	NC	1	NC	1
310			min	-.194	22	-.537	3	-.57	5	-4.087e-03	15	167.116	15	251.972	4
311	M90	1	max	.25	9	.005	22	.269	4	4.928e-03	44	NC	1	NC	1
312			min	-.155	15	-.006	4	-.247	22	-4.023e-03	2	NC	1	NC	1
313		2	max	.25	9	.007	22	.266	4	4.928e-03	44	NC	1	NC	1
314			min	-.155	15	-.007	4	-.243	22	-4.023e-03	2	NC	1	NC	1
315		3	max	.25	9	.008	22	.263	4	4.928e-03	44	NC	1	NC	1
316			min	-.155	15	-.009	4	-.239	22	-4.023e-03	2	NC	1	NC	1
317		4	max	.25	9	.01	10	.261	4	4.928e-03	44	NC	1	NC	1
318			min	-.155	15	-.01	16	-.235	22	-4.023e-03	2	NC	1	NC	1
319		5	max	.25	9	.012	10	.258	4	4.928e-03	44	NC	1	NC	1
320			min	-.155	15	-.011	16	-.23	22	-4.023e-03	2	NC	1	NC	1
321	M91	1	max	.218	3	.241	4	.132	4	8.112e-03	23	NC	1	NC	1
322			min	-.158	21	-.214	22	-.117	22	-8.316e-03	5	NC	1	NC	1
323		2	max	.218	3	.237	4	.129	4	8.112e-03	23	NC	1	NC	1
324			min	-.158	21	-.211	22	-.115	22	-8.316e-03	5	NC	1	NC	1
325		3	max	.218	3	.233	4	.127	4	8.112e-03	23	NC	1	NC	1
326			min	-.158	21	-.207	22	-.113	22	-8.316e-03	5	NC	1	NC	1
327		4	max	.218	3	.229	4	.124	4	8.112e-03	23	NC	1	NC	1
328			min	-.158	21	-.204	22	-.111	22	-8.316e-03	5	NC	1	NC	1
329		5	max	.218	3	.225	4	.122	4	8.112e-03	23	NC	1	NC	1
330			min	-.158	21	-.201	22	-.108	22	-8.316e-03	5	NC	1	NC	1
331	M92	1	max	0	1	0	1	0	1	7.909e-03	8	NC	1	NC	1
332			min	0	1	0	1	0	1	-5.572e-03	14	NC	1	NC	1
333		2	max	0	24	.068	34	.09	3	7.909e-03	8	NC	1	NC	5
334			min	0	6	-.019	16	-.08	21	-5.572e-03	14	1132.127	17	1307.924	2
335		3	max	0	24	.125	33	.163	4	7.909e-03	8	NC	1	NC	17
336			min	0	6	-.047	16	-.146	22	-5.572e-03	14	562.995	17	931.896	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
337		4	max	0	24	.173	9	.222	4	7.909e-03	8	NC	1	NC	5
338			min	0	6	-.094	15	-.201	22	-5.572e-03	14	372.833	17	651.364	6
339		5	max	0	24	.25	9	.269	4	7.909e-03	8	NC	1	NC	1
340			min	0	6	-.155	15	-.247	22	-5.572e-03	14	277.952	17	419.99	6
341	M93	1	max	0	1	0	1	0	1	5.82e-03	21	NC	1	NC	1
342			min	0	1	0	1	0	1	-6.918e-03	3	NC	1	NC	1
343		2	max	0	24	.091	22	.053	2	5.82e-03	21	NC	1	NC	7
344			min	0	18	-.094	4	-.03	20	-6.918e-03	3	2172.679	13	1620.59	10
345		3	max	0	24	.164	22	.106	2	5.82e-03	21	NC	1	NC	7
346			min	0	18	-.173	4	-.065	20	-6.918e-03	3	1080.03	13	1154.67	10
347		4	max	0	24	.213	22	.159	2	5.82e-03	21	NC	1	NC	7
348			min	0	18	-.231	4	-.107	20	-6.918e-03	3	714.891	13	1032.571	70
349		5	max	0	24	.244	22	.218	3	5.82e-03	21	NC	1	NC	1
350			min	0	18	-.275	4	-.158	21	-6.918e-03	3	532.735	13	727.089	70
351	M103	1	max	.695	5	.395	47	.343	25	8.322e-03	25	NC	1	NC	1
352			min	-.752	47	-.056	6	-.373	7	-8.916e-03	7	NC	1	NC	1
353		2	max	.695	5	.402	47	.342	25	8.322e-03	25	NC	1	NC	1
354			min	-.752	47	-.061	6	-.372	7	-8.916e-03	7	NC	1	NC	1
355		3	max	.695	5	.409	47	.342	25	8.322e-03	25	NC	1	NC	1
356			min	-.752	47	-.066	5	-.372	7	-8.916e-03	7	NC	1	NC	1
357		4	max	.695	5	.415	47	.342	25	8.322e-03	25	NC	1	NC	1
358			min	-.752	47	-.072	5	-.372	7	-8.916e-03	7	NC	1	NC	1
359		5	max	.695	5	.422	47	.341	25	8.322e-03	25	NC	1	NC	1
360			min	-.752	47	-.078	5	-.372	7	-8.916e-03	7	NC	1	NC	1
361	M108	1	max	.599	9	.244	43	.277	3	6.839e-03	43	NC	1	NC	1
362			min	-.382	15	-.204	13	-.326	45	-5.967e-03	13	NC	1	NC	1
363		2	max	.599	9	.247	43	.273	3	6.839e-03	43	NC	1	NC	1
364			min	-.382	15	-.202	13	-.327	45	-5.967e-03	13	NC	1	NC	1
365		3	max	.599	9	.25	43	.269	3	6.839e-03	43	NC	1	NC	1
366			min	-.382	15	-.2	13	-.327	45	-5.967e-03	13	NC	1	NC	1
367		4	max	.599	9	.252	43	.264	3	6.839e-03	43	NC	1	NC	1
368			min	-.382	15	-.199	13	-.328	45	-5.967e-03	13	NC	1	NC	1
369		5	max	.599	9	.255	43	.26	3	6.839e-03	43	NC	1	NC	1
370			min	-.382	15	-.197	13	-.329	45	-5.967e-03	13	NC	1	NC	1
371	M109	1	max	1.361	47	.385	47	.321	2	8.028e-03	8	NC	1	NC	1
372			min	-.484	17	-.062	30	-.297	20	-7.879e-03	14	NC	1	NC	1
373		2	max	1.361	47	.395	47	.321	2	8.028e-03	8	NC	1	NC	1
374			min	-.484	17	-.064	6	-.296	20	-7.879e-03	14	NC	1	NC	1
375		3	max	1.361	47	.404	47	.321	3	8.028e-03	8	NC	1	NC	1
376			min	-.484	17	-.068	6	-.296	21	-7.879e-03	14	NC	1	NC	1
377		4	max	1.361	47	.414	47	.322	3	8.028e-03	8	NC	1	NC	1
378			min	-.484	17	-.072	5	-.296	21	-7.879e-03	14	NC	1	NC	1
379		5	max	1.361	47	.423	47	.323	3	8.028e-03	8	NC	1	NC	1
380			min	-.484	17	-.077	5	-.297	21	-7.879e-03	14	NC	1	NC	1
381	M111	1	max	.537	3	.606	5	.156	12	1.083e-02	11	NC	1	NC	1
382			min	-.388	21	-.572	23	-.145	18	-1.071e-02	17	NC	1	NC	1
383		2	max	.537	3	.604	5	.154	12	1.083e-02	11	NC	1	NC	1
384			min	-.388	21	-.569	23	-.144	18	-1.071e-02	17	NC	1	NC	1
385		3	max	.537	3	.601	5	.153	12	1.083e-02	11	NC	1	NC	1
386			min	-.388	21	-.566	23	-.143	18	-1.071e-02	17	NC	1	NC	1
387		4	max	.537	3	.598	5	.152	12	1.083e-02	11	NC	1	NC	1
388			min	-.388	21	-.564	23	-.143	18	-1.071e-02	17	NC	1	NC	1
389		5	max	.537	3	.596	5	.15	12	1.083e-02	11	NC	1	NC	1
390			min	-.388	21	-.561	23	-.142	18	-1.071e-02	17	NC	1	NC	1
391	M75B	1	max	.465	5	.111	6	.314	14	7.294e-03	3	NC	1	NC	1
392			min	-.492	47	-.105	24	-.322	8	-7.117e-03	21	NC	1	NC	1
393		2	max	.465	5	.136	6	.3	14	7.294e-03	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
394			min	-.492	47	-.133	24	-.308	8	-7.117e-03	21	NC	1	NC	1
395		3	max	.465	5	.161	6	.286	14	7.294e-03	3	NC	1	NC	1
396			min	-.492	47	-.16	24	-.294	8	-7.117e-03	21	NC	1	NC	1
397		4	max	.465	5	.186	18	.272	14	7.294e-03	3	NC	1	NC	1
398			min	-.492	47	-.188	12	-.28	8	-7.117e-03	21	NC	1	NC	1
399		5	max	.465	5	.212	18	.258	14	7.294e-03	3	NC	1	NC	1
400			min	-.492	47	-.215	12	-.266	8	-7.117e-03	21	NC	1	NC	1
401	M76B	1	max	.758	47	.11	4	.28	2	5.242e-03	19	NC	1	NC	1
402			min	-.327	17	-.109	22	-.275	20	-5.753e-03	12	NC	1	NC	1
403		2	max	.758	47	.137	4	.263	2	5.242e-03	19	NC	1	NC	1
404			min	-.327	17	-.135	22	-.258	20	-5.753e-03	12	NC	1	NC	1
405		3	max	.758	47	.165	4	.245	2	5.242e-03	19	NC	1	NC	1
406			min	-.327	17	-.161	22	-.24	20	-5.753e-03	12	NC	1	NC	1
407		4	max	.758	47	.193	4	.228	2	5.242e-03	19	NC	1	NC	1
408			min	-.327	17	-.187	22	-.223	20	-5.753e-03	12	NC	1	NC	1
409		5	max	.758	47	.22	4	.211	2	5.242e-03	19	NC	1	NC	1
410			min	-.327	17	-.212	22	-.205	20	-5.753e-03	12	NC	1	NC	1
411	M77	1	max	.408	9	.201	18	.196	3	8.438e-03	8	NC	1	NC	1
412			min	-.27	15	-.212	12	-.195	9	-8.216e-03	14	NC	1	NC	1
413		2	max	.408	9	.197	18	.228	3	8.438e-03	8	NC	1	NC	1
414			min	-.27	15	-.206	12	-.225	21	-8.216e-03	14	NC	1	NC	1
415		3	max	.408	9	.192	18	.26	3	8.438e-03	8	NC	1	NC	1
416			min	-.27	15	-.2	12	-.255	21	-8.216e-03	14	NC	1	NC	1
417		4	max	.408	9	.187	18	.292	3	8.438e-03	8	NC	1	NC	1
418			min	-.27	15	-.194	12	-.285	21	-8.216e-03	14	NC	1	NC	1
419		5	max	.408	9	.183	19	.323	3	8.438e-03	8	NC	1	NC	1
420			min	-.27	15	-.189	13	-.315	21	-8.216e-03	14	NC	1	NC	1
421	M78	1	max	.371	3	.403	5	.189	25	1.042e-02	22	NC	1	NC	1
422			min	-.283	21	-.398	23	-.191	7	-1.104e-02	4	NC	1	NC	1
423		2	max	.371	3	.395	5	.199	25	1.042e-02	22	NC	1	NC	1
424			min	-.283	21	-.391	23	-.203	7	-1.104e-02	4	NC	1	NC	1
425		3	max	.371	3	.388	5	.21	25	1.042e-02	22	NC	1	NC	1
426			min	-.283	21	-.384	23	-.215	7	-1.104e-02	4	NC	1	NC	1
427		4	max	.371	3	.387	4	.22	25	1.042e-02	22	NC	1	NC	1
428			min	-.283	21	-.384	22	-.226	7	-1.104e-02	4	NC	1	NC	1
429		5	max	.371	3	.398	4	.23	25	1.042e-02	22	NC	1	NC	1
430			min	-.283	21	-.395	22	-.238	7	-1.104e-02	4	NC	1	NC	1
431	M89A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
432			min	0	1	0	1	0	1	0	1	NC	1	NC	1
433		2	max	.001	4	.004	16	.042	13	1.351e-03	13	NC	1	NC	1
434			min	0	22	-.004	10	-.042	7	-1.216e-03	19	6755.999	16	1344.748	13
435		3	max	.002	4	.009	16	.144	13	2.703e-03	13	NC	1	NC	1
436			min	0	22	-.011	10	-.144	7	-2.431e-03	19	3195.07	16	395.151	13
437		4	max	.003	4	.006	16	.273	25	4.054e-03	13	NC	1	NC	1
438			min	-.001	22	-.011	10	-.274	7	-3.647e-03	19	3092.138	16	208.189	7
439		5	max	.004	4	.005	22	.398	24	5.405e-03	13	NC	8	NC	1
440			min	-.002	22	-.022	28	-.4	7	-4.862e-03	19	2628.07	28	142.665	7
441	M92A	1	max	.17	10	.414	7	.519	25	6.362e-03	8	NC	2	NC	2
442			min	-.162	16	-.295	25	-.529	7	-5.055e-03	14	241.235	9	233.33	3
443		2	max	.17	10	.393	7	.483	25	1.324e-02	11	NC	2	NC	30
444			min	-.162	16	-.283	25	-.49	7	-1.194e-02	17	325.913	9	325.141	3
445		3	max	.17	10	.377	7	.439	25	2.61e-02	11	NC	2	NC	30
446			min	-.162	16	-.275	25	-.443	7	-2.462e-02	17	493.293	9	501.771	3
447		4	max	.17	10	.363	7	.391	25	3.896e-02	11	NC	2	NC	1
448			min	-.162	16	-.269	25	-.392	7	-3.731e-02	17	611.576	49	1018.063	3
449		5	max	.17	10	.351	7	.341	13	5.182e-02	11	NC	1	NC	1
450			min	-.162	16	-.265	25	-.338	19	-5.e-02	17	447.977	49	834.92	63

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
451	M93A	1	max	.319	22	.667	6	.469	13	5.485e-03	18	NC	2	NC	5
452			min	-.325	4	-.665	24	-.287	19	-7.663e-03	12	213.951	10	109.403	4
453		2	max	.319	22	.601	6	.45	13	9.481e-03	15	NC	5	NC	2
454			min	-.325	4	-.598	24	-.28	19	-1.16e-02	9	291.208	10	151.145	4
455		3	max	.319	22	.529	6	.436	13	2.207e-02	14	NC	5	NC	5
456			min	-.325	4	-.525	24	-.277	19	-2.436e-02	8	443.349	10	232.202	4
457		4	max	.319	22	.454	6	.426	13	3.533e-02	14	NC	3	NC	5
458			min	-.325	4	-.449	24	-.277	19	-3.774e-02	8	895.077	10	343.599	13
459		5	max	.319	22	.378	6	.417	13	4.859e-02	14	NC	1	NC	1
460			min	-.325	4	-.371	24	-.278	19	-5.112e-02	8	NC	1	232.659	13
461	M94	1	max	.4	7	.415	19	.932	5	5.192e-03	5	NC	5	NC	1
462			min	-.399	24	-.67	13	-.926	23	-5.133e-03	23	162.338	13	152.802	6
463		2	max	.4	7	.208	19	.432	5	5.152e-03	5	NC	34	NC	1
464			min	-.399	24	-.34	13	-.427	23	-4.812e-03	23	233.159	25	228.08	7
465		3	max	.4	7	.005	22	.004	4	2.571e-03	4	NC	38	NC	1
466			min	-.398	24	-.022	28	-.002	22	-1.827e-03	22	404.218	25	353.106	7
467		4	max	.4	7	.215	25	.253	25	4.035e-03	4	NC	16	NC	1
468			min	-.398	24	-.3	7	-.261	7	-3.48e-03	22	247.622	19	487.16	48
469		5	max	.4	7	.425	25	.52	14	3.759e-03	3	NC	1	NC	3
470			min	-.398	24	-.591	7	-.546	8	-3.428e-03	21	177.218	19	290.485	8
471	M98	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
472			min	0	1	0	1	0	1	0	1	NC	1	NC	1
473		2	max	0	22	.01	22	.1	25	6.262e-04	5	NC	1	NC	1
474			min	-.002	28	-.017	28	-.1	7	-5.453e-04	47	4439.603	4	4697.67	40
475		3	max	0	22	.014	22	.195	25	1.252e-03	5	NC	1	NC	1
476			min	-.003	28	-.026	28	-.196	7	-1.091e-03	47	3163.217	4	2342.517	40
477		4	max	0	22	.01	22	.286	25	1.879e-03	5	NC	1	NC	1
478			min	-.005	28	-.025	28	-.287	7	-1.636e-03	47	4439.603	4	1556.506	40
479		5	max	0	22	.001	22	.374	25	2.505e-03	5	NC	1	NC	1
480			min	-.007	28	-.016	28	-.375	7	-2.181e-03	47	NC	1	1163.892	40
481	M110	1	max	.235	6	.372	19	.559	5	4.867e-03	18	NC	5	NC	1
482			min	-.21	24	-.591	13	-.529	23	-5.329e-03	12	157.919	13	242.346	6
483		2	max	.235	6	.183	19	.186	6	3.256e-03	18	NC	4	NC	1
484			min	-.21	24	-.296	13	-.169	24	-4.126e-03	12	227.572	25	417.718	6
485		3	max	.235	6	.001	22	.081	22	1.797e-03	16	NC	16	NC	1
486			min	-.21	24	-.098	28	-.086	4	-2.599e-03	10	368.717	25	470.06	9
487		4	max	.235	6	.192	25	.142	24	2.401e-03	14	7915.363	60	NC	1
488			min	-.21	24	-.26	7	-.159	6	-2.822e-03	8	241.03	19	411.726	7
489		5	max	.235	6	.38	25	.38	38	3.784e-03	2	NC	1	NC	1
490			min	-.21	24	-.526	7	-.296	8	-3.965e-03	44	171.173	19	260.091	48
491	M112	1	max	.245	13	.255	6	.129	24	7.89e-03	23	NC	1	NC	1
492			min	-.148	19	-.236	24	-.139	6	-8.453e-03	5	NC	1	NC	1
493		2	max	.245	13	.251	6	.126	24	7.89e-03	23	NC	1	NC	1
494			min	-.148	19	-.231	24	-.137	6	-8.453e-03	5	NC	1	NC	1
495		3	max	.245	13	.248	6	.123	24	7.89e-03	23	NC	1	NC	1
496			min	-.148	19	-.226	24	-.136	6	-8.453e-03	5	NC	1	NC	1
497		4	max	.245	13	.245	6	.12	24	7.89e-03	23	NC	1	NC	1
498			min	-.148	19	-.221	24	-.134	6	-8.453e-03	5	NC	1	NC	1
499		5	max	.245	13	.241	6	.118	24	7.89e-03	23	NC	1	NC	1
500			min	-.148	19	-.216	24	-.132	6	-8.453e-03	5	NC	1	NC	1
501	M113	1	max	.217	7	.006	24	.261	24	5.145e-03	38	NC	1	NC	1
502			min	-.158	25	-.006	6	-.293	6	-4.466e-03	8	NC	1	NC	1
503		2	max	.217	7	.007	24	.258	24	5.145e-03	38	NC	1	NC	1
504			min	-.158	25	-.008	6	-.289	6	-4.466e-03	8	NC	1	NC	1
505		3	max	.217	7	.008	24	.255	24	5.145e-03	38	NC	1	NC	1
506			min	-.158	25	-.009	6	-.285	6	-4.466e-03	8	NC	1	NC	1
507		4	max	.217	7	.009	24	.252	24	5.145e-03	38	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
508			min	-.158	25	-.01	6	-.281	6	-4.466e-03	8	NC	1	NC	1
509		5	max	.217	7	.011	24	.249	24	5.145e-03	38	NC	1	NC	1
510			min	-.158	25	-.011	6	-.278	6	-4.466e-03	8	NC	1	NC	1
511	M114	1	max	0	1	0	1	0	1	7.922e-03	13	NC	1	NC	1
512			min	0	1	0	1	0	1	-5.62e-03	19	NC	1	NC	1
513		2	max	0	16	.069	26	.103	6	7.922e-03	13	NC	1	NC	9
514			min	0	10	-.026	20	-.093	24	-5.62e-03	19	2413.249	3	1620.594	6
515		3	max	0	16	.126	26	.188	6	7.922e-03	13	NC	1	NC	9
516			min	0	10	-.058	20	-.17	24	-5.62e-03	19	1198.845	3	938.21	47
517		4	max	0	16	.175	13	.248	6	7.922e-03	13	NC	1	NC	9
518			min	0	10	-.096	20	-.227	24	-5.62e-03	19	792.915	3	603.513	47
519		5	max	0	16	.245	13	.29	6	7.922e-03	13	NC	1	NC	1
520			min	0	10	-.148	19	-.268	24	-5.62e-03	19	590.465	3	437.288	46
521	M115	1	max	0	1	0	1	0	1	5.487e-03	25	NC	1	NC	1
522			min	0	1	0	1	0	1	-6.551e-03	7	NC	1	NC	1
523		2	max	0	16	.087	25	.047	30	5.487e-03	25	NC	1	NC	4
524			min	0	22	-.09	7	-.021	24	-6.551e-03	7	1091.54	23	1307.92	2
525		3	max	0	16	.158	24	.091	6	5.487e-03	25	NC	1	NC	9
526			min	0	22	-.167	6	-.051	24	-6.551e-03	7	542.917	23	931.893	2
527		4	max	0	16	.216	24	.148	7	5.487e-03	25	NC	1	NC	3
528			min	0	22	-.235	6	-.096	25	-6.551e-03	7	359.622	23	901.865	17
529		5	max	0	16	.261	24	.217	7	5.487e-03	25	NC	1	NC	1
530			min	0	22	-.293	6	-.158	25	-6.551e-03	7	268.16	23	555.23	10
531	M116	1	max	.591	13	.606	5	.154	15	1.051e-02	22	NC	1	NC	1
532			min	-.372	19	-.572	23	-.156	9	-1.109e-02	4	NC	1	NC	1
533		2	max	.591	13	.603	5	.152	15	1.051e-02	22	NC	1	NC	1
534			min	-.372	19	-.567	23	-.155	9	-1.109e-02	4	NC	1	NC	1
535		3	max	.591	13	.6	5	.149	15	1.051e-02	22	NC	1	NC	1
536			min	-.372	19	-.563	23	-.153	9	-1.109e-02	4	NC	1	NC	1
537		4	max	.591	13	.597	5	.147	15	1.051e-02	22	NC	1	NC	1
538			min	-.372	19	-.559	23	-.151	9	-1.109e-02	4	NC	1	NC	1
539		5	max	.591	13	.593	5	.144	15	1.051e-02	22	NC	1	NC	1
540			min	-.372	19	-.555	23	-.15	9	-1.109e-02	4	NC	1	NC	1
541	M117	1	max	.526	7	.244	39	.324	49	6.63e-03	39	NC	1	NC	1
542			min	-.38	25	-.223	9	-.32	7	-6.326e-03	21	NC	1	NC	1
543		2	max	.526	7	.246	39	.327	49	6.63e-03	39	NC	1	NC	1
544			min	-.38	25	-.223	9	-.315	7	-6.326e-03	21	NC	1	NC	1
545		3	max	.526	7	.247	39	.329	49	6.63e-03	39	NC	1	NC	1
546			min	-.38	25	-.222	9	-.31	7	-6.326e-03	21	NC	1	NC	1
547		4	max	.526	7	.249	39	.331	49	6.63e-03	39	NC	1	NC	1
548			min	-.38	25	-.222	9	-.305	7	-6.326e-03	21	NC	1	NC	1
549		5	max	.526	7	.25	39	.334	49	6.63e-03	39	NC	1	NC	1
550			min	-.38	25	-.221	9	-.3	7	-6.326e-03	21	NC	1	NC	1
551	M118	1	max	.417	13	.403	5	.229	4	1.217e-02	12	NC	1	NC	1
552			min	-.278	19	-.399	23	-.218	22	-1.19e-02	18	NC	1	NC	1
553		2	max	.417	13	.403	5	.233	3	1.217e-02	12	NC	1	NC	1
554			min	-.278	19	-.398	23	-.225	21	-1.19e-02	18	NC	1	NC	1
555		3	max	.417	13	.403	5	.241	3	1.217e-02	12	NC	1	NC	1
556			min	-.278	19	-.397	23	-.235	21	-1.19e-02	18	NC	1	NC	1
557		4	max	.417	13	.403	5	.249	3	1.217e-02	12	NC	1	NC	1
558			min	-.278	19	-.397	23	-.245	21	-1.19e-02	18	NC	1	NC	1
559		5	max	.417	13	.417	6	.257	3	1.217e-02	12	NC	1	NC	1
560			min	-.278	19	-.408	24	-.255	21	-1.19e-02	18	NC	1	NC	1
561	M119	1	max	.351	7	.175	16	.225	25	7.853e-03	25	NC	1	NC	1
562			min	-.265	25	-.179	10	-.226	7	-8.422e-03	7	NC	1	NC	1
563		2	max	.351	7	.169	15	.253	25	7.853e-03	25	NC	1	NC	1
564			min	-.265	25	-.174	9	-.252	7	-8.422e-03	7	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
565		3	max	.351	7	.167	15	.281	13	7.853e-03	25	NC	1	NC	1
566			min	-.265	25	-.173	9	-.278	19	-8.422e-03	7	NC	1	NC	1
567		4	max	.351	7	.164	15	.308	13	7.853e-03	25	NC	1	NC	1
568			min	-.265	25	-.171	9	-.305	19	-8.422e-03	7	NC	1	NC	1
569		5	max	.351	7	.162	15	.336	13	7.853e-03	25	NC	1	NC	1
570			min	-.265	25	-.17	9	-.331	19	-8.422e-03	7	NC	1	NC	1
571	M86	1	max	.522	2	.348	15	.553	9	8.224e-03	9	NC	1	NC	1
572			min	-.515	20	-.553	9	-.493	15	-5.612e-03	15	NC	1	NC	1
573		2	max	.522	2	.344	15	.568	9	8.224e-03	9	NC	1	NC	1
574			min	-.515	20	-.548	9	-.507	15	-5.612e-03	15	NC	1	NC	1
575		3	max	.522	2	.339	15	.582	9	8.224e-03	9	NC	1	NC	1
576			min	-.515	20	-.544	9	-.522	15	-5.612e-03	15	NC	1	NC	1
577		4	max	.522	2	.335	15	.597	9	8.224e-03	9	NC	1	NC	1
578			min	-.515	20	-.54	9	-.536	15	-5.612e-03	15	NC	1	NC	1
579		5	max	.522	2	.33	15	.611	9	8.224e-03	9	NC	1	NC	1
580			min	-.515	20	-.535	9	-.551	15	-5.612e-03	15	NC	1	NC	1
581	M87	1	max	.33	15	.216	43	.353	45	5.973e-03	13	NC	1	NC	1
582			min	-.535	9	-.135	13	-.229	3	-6.707e-03	43	661.484	48	379.994	38
583		2	max	.33	15	.177	19	.353	21	6.127e-03	13	NC	1	NC	2
584			min	-.535	9	-.182	13	-.379	3	-5.797e-03	19	1109.551	47	553.28	9
585		3	max	.33	15	.23	7	.505	21	6.331e-03	13	NC	1	NC	2
586			min	-.535	9	-.23	25	-.522	3	-6.274e-03	19	1000.363	25	287.912	8
587		4	max	.33	15	.275	18	.68	9	6.466e-03	2	NC	2	NC	2
588			min	-.535	9	-.307	12	-.646	15	-6.497e-03	8	501.876	12	182.087	8
589		5	max	.33	15	.361	18	.87	9	6.466e-03	2	NC	2	NC	2
590			min	-.535	9	-.426	12	-.782	15	-6.497e-03	8	309.3	12	130.668	8
591	M88A	1	max	.553	9	.315	15	.476	20	5.226e-03	19	NC	1	NC	1
592			min	-.493	15	-.504	9	-.483	2	-5.289e-03	13	NC	1	NC	1
593		2	max	.553	9	.332	15	.496	20	5.226e-03	19	NC	1	NC	1
594			min	-.493	15	-.528	9	-.503	2	-5.289e-03	13	NC	1	NC	1
595		3	max	.553	9	.348	15	.515	20	5.226e-03	19	NC	1	NC	1
596			min	-.493	15	-.553	9	-.522	2	-5.289e-03	13	NC	1	NC	1
597		4	max	.553	9	.365	15	.535	20	5.226e-03	19	NC	1	NC	1
598			min	-.493	15	-.578	9	-.541	2	-5.289e-03	13	NC	1	NC	1
599		5	max	.553	9	.382	15	.554	20	5.226e-03	19	NC	1	NC	1
600			min	-.493	15	-.602	9	-.561	2	-5.289e-03	13	NC	1	NC	1
601	M89B	1	max	.82	23	.389	21	.492	21	5.766e-03	21	NC	1	NC	1
602			min	-.83	5	-.536	3	-.531	3	-7.384e-03	3	NC	1	NC	1
603		2	max	.82	23	.383	21	.507	21	5.766e-03	21	NC	1	NC	1
604			min	-.83	5	-.53	3	-.548	3	-7.384e-03	3	NC	1	NC	1
605		3	max	.82	23	.376	21	.523	21	5.766e-03	21	NC	1	NC	1
606			min	-.83	5	-.524	3	-.565	3	-7.384e-03	3	NC	1	NC	1
607		4	max	.82	23	.369	21	.539	21	5.766e-03	21	NC	1	NC	1
608			min	-.83	5	-.518	3	-.582	3	-7.384e-03	3	NC	1	NC	1
609		5	max	.82	23	.362	21	.554	21	5.766e-03	21	NC	1	NC	1
610			min	-.83	5	-.513	3	-.599	3	-7.384e-03	3	NC	1	NC	1
611	M90A	1	max	.362	21	.606	5	.083	19	1.071e-02	17	NC	1	NC	1
612			min	-.512	3	-.572	23	-.086	13	-1.083e-02	11	539.958	40	3895.393	72
613		2	max	.362	21	.687	5	.139	19	1.081e-02	5	NC	1	NC	1
614			min	-.513	3	-.659	23	-.141	13	-1.075e-02	23	700.43	16	1509.415	8
615		3	max	.362	21	.772	4	.208	7	1.097e-02	5	NC	10	NC	1
616			min	-.513	3	-.753	23	-.197	25	-1.066e-02	23	357.046	16	703.09	8
617		4	max	.362	21	.915	4	.296	20	1.101e-02	5	NC	1	NC	35
618			min	-.513	3	-.882	22	-.317	2	-1.064e-02	23	234.357	16	381.607	2
619		5	max	.362	21	1.068	4	.409	20	1.101e-02	5	NC	1	NC	5
620			min	-.513	3	-1.021	22	-.465	2	-1.064e-02	23	170.865	4	240.095	2
621	M91A	1	max	.492	21	.424	21	.896	5	4.552e-03	17	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
622			min	-.531	3	-.58	3	-.884	23	-4.886e-03	11	NC	1	NC	1
623		2	max	.492	21	.407	21	.863	5	4.552e-03	17	NC	1	NC	1
624			min	-.531	3	-.558	3	-.852	23	-4.886e-03	11	NC	1	NC	1
625		3	max	.492	21	.389	21	.83	5	4.552e-03	17	NC	1	NC	1
626			min	-.531	3	-.536	3	-.82	23	-4.886e-03	11	NC	1	NC	1
627		4	max	.492	21	.372	21	.797	5	4.552e-03	17	NC	1	NC	1
628			min	-.531	3	-.514	3	-.788	23	-4.886e-03	11	NC	1	NC	1
629		5	max	.492	21	.355	21	.764	5	4.552e-03	17	NC	1	NC	1
630			min	-.531	3	-.492	3	-.757	23	-4.886e-03	11	NC	1	NC	1
631	M92B	1	max	.71	23	.376	21	.391	21	5.015e-03	21	NC	1	NC	1
632			min	-.728	5	-.524	3	-.394	3	-6.632e-03	3	NC	1	NC	1
633		2	max	.71	23	.372	21	.399	21	5.015e-03	21	NC	1	NC	1
634			min	-.728	5	-.521	3	-.403	3	-6.632e-03	3	NC	1	NC	1
635		3	max	.71	23	.369	21	.407	21	5.015e-03	21	NC	1	NC	1
636			min	-.728	5	-.518	3	-.413	4	-6.632e-03	3	NC	1	NC	1
637		4	max	.71	23	.366	21	.42	22	5.015e-03	21	NC	1	NC	1
638			min	-.728	5	-.516	3	-.427	4	-6.632e-03	3	NC	1	NC	1
639		5	max	.71	23	.362	21	.433	22	5.015e-03	21	NC	1	NC	1
640			min	-.728	5	-.513	3	-.441	4	-6.632e-03	3	NC	1	NC	1
641	M93B	1	max	.431	2	.339	15	.391	21	7.471e-03	9	NC	1	NC	1
642			min	-.425	20	-.544	9	-.394	3	-4.861e-03	15	NC	1	NC	1
643		2	max	.431	2	.337	15	.399	21	7.471e-03	9	NC	1	NC	1
644			min	-.425	20	-.542	9	-.401	3	-4.861e-03	15	NC	1	NC	1
645		3	max	.431	2	.335	15	.406	21	7.471e-03	9	NC	1	NC	1
646			min	-.425	20	-.54	9	-.409	3	-4.861e-03	15	NC	1	NC	1
647		4	max	.431	2	.332	15	.413	21	7.471e-03	9	NC	1	NC	1
648			min	-.425	20	-.537	9	-.416	3	-4.861e-03	15	NC	1	NC	1
649		5	max	.431	2	.33	15	.421	21	7.471e-03	9	NC	1	NC	1
650			min	-.425	20	-.535	9	-.423	3	-4.861e-03	15	NC	1	NC	1
651	M94A	1	max	.859	5	.343	19	.554	13	8.145e-03	13	NC	1	NC	1
652			min	-.851	23	-.549	13	-.492	19	-5.506e-03	19	NC	1	NC	1
653		2	max	.859	5	.336	19	.571	13	8.145e-03	13	NC	1	NC	1
654			min	-.851	23	-.543	13	-.509	19	-5.506e-03	19	NC	1	NC	1
655		3	max	.859	5	.33	19	.587	13	8.145e-03	13	NC	1	NC	1
656			min	-.851	23	-.537	13	-.525	19	-5.506e-03	19	NC	1	NC	1
657		4	max	.859	5	.323	19	.604	13	8.145e-03	13	NC	1	NC	1
658			min	-.851	23	-.53	13	-.542	19	-5.506e-03	19	NC	1	NC	1
659		5	max	.859	5	.317	19	.623	12	8.145e-03	13	NC	1	NC	1
660			min	-.851	23	-.524	13	-.558	19	-5.506e-03	19	NC	1	NC	1
661	M95	1	max	.317	19	.544	5	.075	8	1.103e-02	4	NC	1	NC	1
662			min	-.524	13	-.5	23	-.066	38	-1.044e-02	22	637.344	27	1041.933	46
663		2	max	.317	19	.656	5	.136	8	1.087e-02	5	NC	1	NC	1
664			min	-.524	13	-.631	23	-.128	14	-1.054e-02	23	540.823	12	1327.242	2
665		3	max	.317	19	.776	5	.205	8	1.14e-02	5	NC	26	NC	1
666			min	-.524	13	-.765	23	-.196	14	-1.134e-02	23	277.104	12	681.198	3
667		4	max	.317	19	.907	17	.301	20	1.153e-02	17	NC	1	NC	10
668			min	-.524	13	-.926	11	-.344	2	-1.154e-02	11	185.5	12	332.195	2
669		5	max	.317	19	1.051	17	.412	20	1.153e-02	17	NC	1	NC	10
670			min	-.524	13	-1.102	11	-.509	2	-1.154e-02	11	137.409	12	211.257	2
671	M96	1	max	.554	13	.31	19	.782	23	5.783e-03	23	NC	1	NC	1
672			min	-.492	19	-.5	13	-.79	5	-5.843e-03	5	NC	1	NC	1
673		2	max	.554	13	.326	19	.816	23	5.783e-03	23	NC	1	NC	1
674			min	-.492	19	-.525	13	-.824	5	-5.843e-03	5	NC	1	NC	1
675		3	max	.554	13	.343	19	.851	23	5.783e-03	23	NC	1	NC	1
676			min	-.492	19	-.549	13	-.859	5	-5.843e-03	5	NC	1	NC	1
677		4	max	.554	13	.359	19	.886	23	5.783e-03	23	NC	1	NC	1
678			min	-.492	19	-.574	13	-.894	5	-5.843e-03	5	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
679		5	max	.554	13	.376	19	.92	23	5.783e-03	23	NC	1	NC	1
680			min	-.492	19	-.598	13	-.928	5	-5.843e-03	5	NC	1	NC	1
681	M97	1	max	.523	14	.376	25	.497	25	5.605e-03	25	NC	1	NC	1
682			min	-.536	8	-.521	7	-.534	7	-7.194e-03	7	NC	1	NC	1
683		2	max	.523	14	.372	25	.511	25	5.605e-03	25	NC	1	NC	1
684			min	-.536	8	-.517	7	-.55	7	-7.194e-03	7	NC	1	NC	1
685		3	max	.523	14	.367	25	.526	25	5.605e-03	25	NC	1	NC	1
686			min	-.536	8	-.513	7	-.566	7	-7.194e-03	7	NC	1	NC	1
687		4	max	.523	14	.362	25	.541	25	5.605e-03	25	NC	1	NC	1
688			min	-.536	8	-.51	7	-.582	7	-7.194e-03	7	NC	1	NC	1
689		5	max	.523	14	.358	25	.556	25	5.605e-03	25	NC	1	NC	1
690			min	-.536	8	-.506	7	-.598	7	-7.194e-03	7	NC	1	NC	1
691	M98A	1	max	.358	25	.243	39	.278	7	6.326e-03	21	NC	1	NC	1
692			min	-.506	7	-.198	9	-.386	49	-6.63e-03	39	1148.371	46	263.12	43
693		2	max	.358	25	.208	15	.424	7	6.301e-03	9	NC	1	NC	1
694			min	-.506	7	-.22	9	-.398	25	-6.223e-03	15	2029.268	6	357.995	44
695		3	max	.358	25	.232	15	.552	7	6.547e-03	8	NC	2	NC	2
696			min	-.506	7	-.25	9	-.543	25	-6.183e-03	14	1035.056	6	346.056	19
697		4	max	.358	25	.282	3	.706	7	6.688e-03	8	NC	1	NC	1
698			min	-.506	7	-.276	21	-.67	25	-6.262e-03	14	819.513	4	224.388	7
699		5	max	.358	25	.354	4	.871	7	6.688e-03	8	NC	1	NC	2
700			min	-.506	7	-.321	22	-.806	25	-6.262e-03	14	453.592	4	161.74	8
701	M99A	1	max	.497	25	.41	25	.576	8	4.078e-03	21	NC	1	NC	1
702			min	-.534	7	-.564	7	-.561	14	-4.409e-03	3	NC	1	NC	1
703		2	max	.497	25	.393	25	.556	8	4.078e-03	21	NC	1	NC	1
704			min	-.534	7	-.542	7	-.542	14	-4.409e-03	3	NC	1	NC	1
705		3	max	.497	25	.376	25	.536	8	4.078e-03	21	NC	1	NC	1
706			min	-.534	7	-.521	7	-.523	14	-4.409e-03	3	NC	1	NC	1
707		4	max	.497	25	.36	25	.516	8	4.078e-03	21	NC	1	NC	1
708			min	-.534	7	-.499	7	-.504	14	-4.409e-03	3	NC	1	NC	1
709		5	max	.497	25	.343	25	.496	8	4.078e-03	21	NC	1	NC	1
710			min	-.534	7	-.478	7	-.486	14	-4.409e-03	3	NC	1	NC	1
711	M100A	1	max	.445	14	.367	25	.398	24	4.854e-03	25	NC	1	NC	1
712			min	-.465	8	-.513	7	-.4	7	-6.442e-03	7	NC	1	NC	1
713		2	max	.445	14	.365	25	.406	25	4.854e-03	25	NC	1	NC	1
714			min	-.465	8	-.511	7	-.408	7	-6.442e-03	7	NC	1	NC	1
715		3	max	.445	14	.362	25	.413	25	4.854e-03	25	NC	1	NC	1
716			min	-.465	8	-.51	7	-.416	7	-6.442e-03	7	NC	1	NC	1
717		4	max	.445	14	.36	25	.42	25	4.854e-03	25	NC	1	NC	1
718			min	-.465	8	-.508	7	-.424	7	-6.442e-03	7	NC	1	NC	1
719		5	max	.445	14	.358	25	.428	25	4.854e-03	25	NC	1	NC	1
720			min	-.465	8	-.506	7	-.432	7	-6.442e-03	7	NC	1	NC	1
721	M101A	1	max	.724	5	.33	19	.399	24	7.393e-03	13	NC	1	NC	1
722			min	-.718	23	-.537	13	-.4	7	-4.755e-03	19	NC	1	NC	1
723		2	max	.724	5	.326	19	.414	24	7.393e-03	13	NC	1	NC	1
724			min	-.718	23	-.533	13	-.412	6	-4.755e-03	19	NC	1	NC	1
725		3	max	.724	5	.323	19	.428	24	7.393e-03	13	NC	1	NC	1
726			min	-.718	23	-.53	13	-.427	6	-4.755e-03	19	NC	1	NC	1
727		4	max	.724	5	.32	19	.443	24	7.393e-03	13	NC	1	NC	1
728			min	-.718	23	-.527	13	-.442	6	-4.755e-03	19	NC	1	NC	1
729		5	max	.724	5	.317	19	.458	24	7.393e-03	13	NC	1	NC	1
730			min	-.718	23	-.524	13	-.457	6	-4.755e-03	19	NC	1	NC	1
731	M102A	1	max	.406	20	.481	17	.278	17	6.72e-03	17	NC	1	NC	1
732			min	-.42	13	-1.334	47	-.287	11	-1.818e-02	47	NC	1	NC	1
733		2	max	.406	20	.475	17	.28	17	6.72e-03	17	NC	1	NC	1
734			min	-.42	13	-1.333	47	-.29	11	-1.818e-02	47	NC	1	NC	1
735		3	max	.406	20	.469	17	.282	17	6.72e-03	17	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
736			min	-.42	13	-1.332	47	-.294	11	-1.818e-02	47	NC	1	NC	1
737		4	max	.406	20	.464	17	.283	17	6.72e-03	17	NC	1	NC	1
738			min	-.42	13	-1.331	47	-.297	11	-1.818e-02	47	NC	1	NC	1
739		5	max	.406	20	.458	17	.285	17	6.72e-03	17	NC	1	NC	1
740			min	-.42	13	-1.33	47	-.3	11	-1.818e-02	47	NC	1	NC	1
741	M103B	1	max	.278	17	.521	17	.462	2	4.169e-03	25	NC	1	NC	1
742			min	-.287	11	-1.444	47	-.447	20	-4.495e-03	7	NC	1	NC	1
743		2	max	.278	17	.501	17	.441	2	4.169e-03	25	NC	1	NC	1
744			min	-.287	11	-1.389	47	-.426	20	-4.495e-03	7	NC	1	NC	1
745		3	max	.278	17	.481	17	.42	13	4.169e-03	25	NC	1	NC	1
746			min	-.287	11	-1.334	47	-.406	20	-4.495e-03	7	NC	1	NC	1
747		4	max	.278	17	.461	17	.401	13	4.169e-03	25	NC	1	NC	1
748			min	-.287	11	-1.28	47	-.386	20	-4.495e-03	7	NC	1	NC	1
749		5	max	.278	17	.44	17	.381	13	4.169e-03	25	NC	1	NC	1
750			min	-.287	11	-1.225	47	-.367	19	-4.495e-03	7	NC	1	NC	1
751	M104A	1	max	.736	23	.389	21	.391	21	5.317e-03	21	NC	1	NC	1
752			min	-.752	5	-.536	3	-.401	3	-6.934e-03	3	NC	1	NC	1
753		2	max	.736	23	.383	21	.407	21	5.317e-03	21	NC	1	NC	1
754			min	-.752	5	-.53	3	-.418	3	-6.934e-03	3	NC	1	NC	1
755		3	max	.736	23	.376	21	.422	21	5.317e-03	21	NC	1	NC	1
756			min	-.752	5	-.524	3	-.435	3	-6.934e-03	3	NC	1	NC	1
757		4	max	.736	23	.369	21	.438	21	5.317e-03	21	NC	1	NC	1
758			min	-.752	5	-.518	3	-.452	3	-6.934e-03	3	NC	1	NC	1
759		5	max	.736	23	.362	21	.458	22	5.317e-03	21	NC	1	NC	1
760			min	-.752	5	-.513	3	-.475	4	-6.934e-03	3	NC	1	NC	1
761	M105A	1	max	.391	21	.421	21	.818	5	4.163e-03	17	NC	1	NC	1
762			min	-.401	3	-.577	3	-.8	23	-4.496e-03	11	NC	1	NC	1
763		2	max	.391	21	.405	21	.785	5	4.163e-03	17	NC	1	NC	1
764			min	-.401	3	-.557	3	-.768	23	-4.496e-03	11	NC	1	NC	1
765		3	max	.391	21	.389	21	.752	5	4.163e-03	17	NC	1	NC	1
766			min	-.401	3	-.536	3	-.736	23	-4.496e-03	11	NC	1	NC	1
767		4	max	.391	21	.373	21	.719	5	4.163e-03	17	NC	1	NC	1
768			min	-.401	3	-.515	3	-.704	23	-4.496e-03	11	NC	1	NC	1
769		5	max	.391	21	.357	21	.686	5	4.163e-03	17	NC	1	NC	1
770			min	-.401	3	-.494	3	-.672	23	-4.496e-03	11	NC	1	NC	1
771	M106A	1	max	.464	14	.376	25	.41	24	5.155e-03	25	NC	1	NC	1
772			min	-.482	8	-.521	7	-.416	6	-6.744e-03	7	NC	1	NC	1
773		2	max	.464	14	.372	25	.416	24	5.155e-03	25	NC	1	NC	1
774			min	-.482	8	-.517	7	-.424	7	-6.744e-03	7	NC	1	NC	1
775		3	max	.464	14	.367	25	.428	25	5.155e-03	25	NC	1	NC	1
776			min	-.482	8	-.513	7	-.44	7	-6.744e-03	7	NC	1	NC	1
777		4	max	.464	14	.362	25	.443	25	5.155e-03	25	NC	1	NC	1
778			min	-.482	8	-.51	7	-.456	7	-6.744e-03	7	NC	1	NC	1
779		5	max	.464	14	.358	25	.458	25	5.155e-03	25	NC	1	NC	1
780			min	-.482	8	-.506	7	-.472	7	-6.744e-03	7	NC	1	NC	1
781	M107	1	max	.41	24	.407	25	.522	8	3.689e-03	21	NC	1	NC	1
782			min	-.416	6	-.561	7	-.501	14	-4.02e-03	3	NC	1	NC	1
783		2	max	.41	24	.392	25	.502	8	3.689e-03	21	NC	1	NC	1
784			min	-.416	6	-.541	7	-.483	14	-4.02e-03	3	NC	1	NC	1
785		3	max	.41	24	.376	25	.482	8	3.689e-03	21	NC	1	NC	1
786			min	-.416	6	-.521	7	-.464	14	-4.02e-03	3	NC	1	NC	1
787		4	max	.41	24	.361	25	.462	8	3.689e-03	21	NC	1	NC	1
788			min	-.416	6	-.501	7	-.445	14	-4.02e-03	3	NC	1	NC	1
789		5	max	.41	24	.346	25	.442	8	3.689e-03	21	NC	1	NC	1
790			min	-.416	6	-.48	7	-.426	14	-4.02e-03	3	NC	1	NC	1
791	M108B	1	max	.059	42	.182	17	.135	4	6.686e-03	5	NC	1	NC	1
792			min	-.053	12	-.482	47	-.128	22	-9.67e-03	47	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
793		2	max	.059	42	.176	17	.139	41	6.686e-03	5	NC	1	NC	1
794			min	-.053	12	-.47	47	-.125	23	-9.67e-03	47	NC	1	NC	1
795		3	max	.059	42	.17	17	.148	41	6.686e-03	5	NC	1	NC	1
796			min	-.053	12	-.457	47	-.126	23	-9.67e-03	47	NC	1	NC	1
797		4	max	.059	42	.164	17	.156	41	6.686e-03	5	NC	1	NC	1
798			min	-.053	12	-.444	47	-.128	23	-9.67e-03	47	NC	1	NC	1
799		5	max	.059	42	.158	17	.165	41	6.686e-03	5	NC	1	NC	1
800			min	-.053	12	-.432	47	-.129	23	-9.67e-03	47	NC	1	NC	1
801	M109A	1	max	.135	4	.221	17	.078	13	4.295e-03	49	NC	1	NC	1
802			min	-.128	22	-.54	47	-.078	43	-2.933e-03	7	NC	1	NC	1
803		2	max	.135	4	.201	17	.065	13	4.295e-03	49	NC	1	NC	1
804			min	-.128	22	-.511	47	-.069	43	-2.933e-03	7	NC	1	NC	1
805		3	max	.135	4	.182	17	.053	12	4.295e-03	49	NC	1	NC	1
806			min	-.128	22	-.482	47	-.059	42	-2.933e-03	7	NC	1	NC	1
807		4	max	.135	4	.162	17	.044	12	4.295e-03	49	NC	1	NC	1
808			min	-.128	22	-.453	47	-.05	42	-2.933e-03	7	NC	1	NC	1
809		5	max	.135	4	.142	17	.039	11	4.295e-03	49	NC	1	NC	1
810			min	-.128	22	-.424	47	-.042	41	-2.933e-03	7	NC	1	NC	1
811	M114A	1	max	.346	7	.38	25	.184	4	3.248e-03	7	NC	1	NC	1
812			min	-.4	49	-.526	7	-.174	22	-2.509e-03	25	84.191	2	NC	1
813		2	max	.346	7	.345	24	.139	5	3.458e-03	6	NC	1	NC	1
814			min	-.4	49	-.504	6	-.132	23	-2.65e-03	24	112.366	2	661.361	45
815		3	max	.346	7	.366	24	.148	42	3.814e-03	6	NC	1	NC	1
816			min	-.4	49	-.545	6	-.108	24	-2.898e-03	24	69.391	45	330.664	45
817		4	max	.345	7	.508	47	.196	43	4.17e-03	6	NC	1	NC	1
818			min	-.4	49	-.597	5	-.12	25	-3.447e-03	48	46.24	45	220.428	45
819		5	max	.345	7	.752	47	.246	44	4.526e-03	6	NC	1	NC	1
820			min	-.4	49	-.695	5	-.16	2	-4.506e-03	48	34.666	45	165.312	45
821	M115A	1	max	.288	3	.484	17	.173	8	8.442e-03	46	NC	1	NC	1
822			min	-.401	45	-1.361	47	-.232	38	-3.393e-03	16	65.562	6	124.665	7
823		2	max	.288	3	.397	16	.127	9	6.995e-03	46	NC	1	NC	1
824			min	-.401	45	-1.023	46	-.185	39	-3.208e-03	16	87.483	6	166.326	7
825		3	max	.288	3	.368	16	.112	10	5.548e-03	46	NC	1	NC	1
826			min	-.401	45	-.688	46	-.141	40	-3.023e-03	16	131.337	6	249.665	7
827		4	max	.288	3	.345	15	.133	11	4.1e-03	46	NC	1	NC	1
828			min	-.401	45	-.544	9	-.133	17	-2.838e-03	16	126.288	14	499.617	7
829		5	max	.288	3	.382	15	.175	23	3.772e-03	10	NC	1	NC	1
830			min	-.401	45	-.599	9	-.177	5	-2.652e-03	16	94.637	14	NC	1
831	M116A	1	max	.606	5	.388	21	.156	12	3.369e-03	2	NC	1	NC	1
832			min	-.572	23	-.537	3	-.145	18	-2.655e-03	20	95.971	10	NC	1
833		2	max	.606	5	.356	20	.13	13	3.481e-03	2	NC	1	NC	1
834			min	-.572	23	-.518	2	-.123	19	-2.663e-03	20	128.106	10	1467.948	42
835		3	max	.606	5	.348	20	.118	2	3.593e-03	2	NC	1	NC	1
836			min	-.572	23	-.528	2	-.114	20	-2.671e-03	20	192.398	10	733.709	42
837		4	max	.606	5	.34	20	.126	3	3.705e-03	2	NC	1	NC	1
838			min	-.572	23	-.538	2	-.125	21	-2.679e-03	20	162.357	18	488.921	42
839		5	max	.606	5	.372	19	.154	15	3.817e-03	2	NC	1	NC	1
840			min	-.572	23	-.591	13	-.156	9	-2.687e-03	20	121.638	18	366.543	42
841	M117A	1	max	.544	23	.388	21	.194	22	5.19e-03	21	NC	1	NC	1
842			min	-.57	5	-.537	3	-.218	4	-5.886e-03	3	NC	1	NC	1
843		2	max	.544	23	.382	21	.206	22	5.19e-03	21	NC	1	NC	1
844			min	-.57	5	-.531	3	-.23	4	-5.886e-03	3	NC	1	NC	1
845		3	max	.544	23	.375	21	.219	22	5.19e-03	21	NC	1	NC	1
846			min	-.57	5	-.525	3	-.242	4	-5.886e-03	3	NC	1	NC	1
847		4	max	.544	23	.369	21	.231	22	5.19e-03	21	NC	1	NC	1
848			min	-.57	5	-.519	3	-.254	4	-5.886e-03	3	NC	1	NC	1
849		5	max	.544	23	.362	21	.245	23	5.19e-03	21	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
850			min	-.57	5	-.512	3	-.268	5	-5.886e-03	3	NC	1	NC	1
851	M118A	1	max	.22	2	.352	15	.194	22	6.623e-03	9	NC	1	NC	1
852			min	-.341	44	-.559	9	-.218	4	-5.013e-03	15	NC	1	NC	1
853		2	max	.22	2	.347	15	.191	22	6.623e-03	9	NC	1	NC	1
854			min	-.341	44	-.553	9	-.217	4	-5.013e-03	15	NC	1	NC	1
855		3	max	.22	2	.341	15	.189	22	6.623e-03	9	NC	1	NC	1
856			min	-.341	44	-.547	9	-.216	4	-5.013e-03	15	NC	1	NC	1
857		4	max	.22	2	.336	15	.192	46	6.623e-03	9	NC	1	NC	1
858			min	-.341	44	-.541	9	-.214	4	-5.013e-03	15	NC	1	NC	1
859		5	max	.22	2	.33	15	.201	46	6.623e-03	9	NC	1	NC	1
860			min	-.341	44	-.535	9	-.213	4	-5.013e-03	15	NC	1	NC	1
861	M119A	1	max	.38	38	.38	25	.21	24	5.005e-03	25	NC	1	NC	1
862			min	-.296	8	-.526	7	-.235	6	-5.674e-03	7	NC	1	NC	1
863		2	max	.38	38	.374	25	.21	24	5.005e-03	25	NC	1	NC	1
864			min	-.296	8	-.521	7	-.235	6	-5.674e-03	7	NC	1	NC	1
865		3	max	.38	38	.369	25	.211	24	5.005e-03	25	NC	1	NC	1
866			min	-.296	8	-.516	7	-.235	6	-5.674e-03	7	NC	1	NC	1
867		4	max	.38	38	.363	25	.211	24	5.005e-03	25	NC	1	NC	1
868			min	-.296	8	-.511	7	-.235	6	-5.674e-03	7	NC	1	NC	1
869		5	max	.38	38	.358	25	.211	24	5.005e-03	25	NC	1	NC	1
870			min	-.296	8	-.506	7	-.235	6	-5.674e-03	7	NC	1	NC	1
871	M120	1	max	.496	5	.342	19	.21	24	6.572e-03	13	NC	1	NC	1
872			min	-.469	23	-.552	13	-.235	6	-4.935e-03	19	NC	1	NC	1
873		2	max	.496	5	.336	19	.22	24	6.572e-03	13	NC	1	NC	1
874			min	-.469	23	-.545	13	-.246	6	-4.935e-03	19	NC	1	NC	1
875		3	max	.496	5	.33	19	.23	24	6.572e-03	13	NC	1	NC	1
876			min	-.469	23	-.538	13	-.257	6	-4.935e-03	19	NC	1	NC	1
877		4	max	.496	5	.323	19	.24	24	6.572e-03	13	NC	1	NC	1
878			min	-.469	23	-.531	13	-.268	6	-4.935e-03	19	NC	1	NC	1
879		5	max	.496	5	.317	19	.253	23	6.572e-03	13	NC	1	NC	1
880			min	-.469	23	-.524	13	-.282	5	-4.935e-03	19	NC	1	NC	1
881	M104	1	max	.465	20	.253	45	.726	5	2.222e-02	5	NC	1	NC	1
882			min	-.511	2	-.373	3	-.65	23	-1.891e-02	23	NC	1	NC	1
883		2	max	.465	20	.253	46	.712	5	2.222e-02	5	NC	1	NC	1
884			min	-.511	2	-.321	4	-.636	23	-1.891e-02	23	NC	1	NC	1
885		3	max	.465	20	.253	46	.698	5	2.222e-02	5	NC	1	NC	1
886			min	-.511	2	-.277	4	-.622	23	-1.891e-02	23	NC	1	NC	1
887		4	max	.465	20	.254	47	.683	5	2.222e-02	5	NC	1	NC	1
888			min	-.511	2	-.246	5	-.608	23	-1.891e-02	23	NC	1	NC	1
889		5	max	.465	20	.256	47	.669	5	2.222e-02	5	NC	1	NC	1
890			min	-.511	2	-.235	5	-.594	23	-1.891e-02	23	NC	1	NC	1
891	M105	1	max	.256	47	.523	48	.061	4	5.135e-03	7	NC	1	NC	1
892			min	-.235	5	-.142	6	-.245	46	-5.241e-03	49	95.114	49	324.098	44
893		2	max	.256	47	.25	40	.035	21	5.702e-03	8	NC	1	NC	12
894			min	-.235	5	-.085	10	-.146	39	-5.229e-03	14	130.681	49	494.175	44
895		3	max	.256	47	.198	16	.109	9	6.482e-03	8	7157.517	1	NC	12
896			min	-.235	5	-.214	11	-.107	15	-6.33e-03	14	201.282	49	581.992	3
897		4	max	.256	47	.539	5	.35	20	7.417e-03	7	NC	35	NC	42
898			min	-.235	5	-.483	23	-.372	2	-7.309e-03	25	141.895	5	230.323	3
899		5	max	.256	47	1.084	5	.853	20	8.125e-03	7	NC	8	NC	11
900			min	-.235	5	-.949	23	-.987	2	-8.008e-03	25	78.595	5	93.253	2
901	M106	1	max	.65	23	.318	22	.505	20	1.987e-02	20	NC	1	NC	1
902			min	-.726	5	-.481	4	-.55	2	-2.47e-02	2	NC	1	NC	1
903		2	max	.65	23	.284	46	.485	20	1.987e-02	20	NC	1	NC	1
904			min	-.726	5	-.423	4	-.531	2	-2.47e-02	2	NC	1	NC	1
905		3	max	.65	23	.253	45	.465	20	1.987e-02	20	NC	1	NC	1
906			min	-.726	5	-.373	3	-.511	2	-2.47e-02	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
907		4	max	.65	23	.223	45	.445	20	1.987e-02	20	NC	1	NC	1
908			min	-.726	5	-.337	3	-.492	2	-2.47e-02	2	NC	1	NC	1
909		5	max	.65	23	.193	45	.425	20	1.987e-02	20	NC	1	NC	1
910			min	-.726	5	-.3	3	-.472	2	-2.47e-02	2	NC	1	NC	1
911	M107A	1	max	.135	9	.27	47	.242	17	9.809e-03	5	NC	1	NC	1
912			min	-.13	15	-.237	5	-.244	11	-9.927e-03	47	NC	1	NC	1
913		2	max	.135	9	.267	47	.244	17	9.809e-03	5	NC	1	NC	1
914			min	-.13	15	-.237	5	-.246	11	-9.927e-03	47	NC	1	NC	1
915		3	max	.135	9	.263	47	.245	17	9.809e-03	5	NC	1	NC	1
916			min	-.13	15	-.236	5	-.247	11	-9.927e-03	47	NC	1	NC	1
917		4	max	.135	9	.26	47	.247	17	9.809e-03	5	NC	1	NC	1
918			min	-.13	15	-.235	5	-.249	11	-9.927e-03	47	NC	1	NC	1
919		5	max	.135	9	.256	47	.248	17	9.809e-03	5	NC	1	NC	1
920			min	-.13	15	-.235	5	-.25	11	-9.927e-03	47	NC	1	NC	1
921	M108A	1	max	.038	4	.275	47	.422	47	8.247e-03	5	NC	1	NC	1
922			min	-.225	46	-.252	5	-.078	5	-1.178e-02	47	NC	1	NC	1
923		2	max	.038	4	.27	47	.429	47	8.247e-03	5	NC	1	NC	1
924			min	-.225	46	-.248	5	-.082	6	-1.178e-02	47	NC	1	NC	1
925		3	max	.038	4	.266	47	.437	48	8.247e-03	5	NC	1	NC	1
926			min	-.225	46	-.243	5	-.088	6	-1.178e-02	47	NC	1	NC	1
927		4	max	.038	4	.261	47	.445	48	8.247e-03	5	NC	1	NC	1
928			min	-.225	46	-.239	5	-.094	6	-1.178e-02	47	NC	1	NC	1
929		5	max	.038	4	.256	47	.452	48	8.247e-03	5	NC	1	NC	1
930			min	-.225	46	-.235	5	-.1	6	-1.178e-02	47	NC	1	NC	1
931	M109B	1	max	.072	21	.318	47	.117	17	6.145e-03	5	NC	1	NC	1
932			min	-.085	39	-.253	5	-.14	11	-1.1e-02	47	NC	1	NC	1
933		2	max	.072	21	.303	47	.117	17	6.145e-03	5	NC	1	NC	1
934			min	-.085	39	-.249	5	-.141	11	-1.1e-02	47	NC	1	NC	1
935		3	max	.072	21	.287	47	.117	17	6.145e-03	5	NC	1	NC	1
936			min	-.085	39	-.244	5	-.142	11	-1.1e-02	47	NC	1	NC	1
937		4	max	.072	21	.272	47	.118	16	6.145e-03	5	NC	1	NC	1
938			min	-.085	39	-.239	5	-.143	10	-1.1e-02	47	NC	1	NC	1
939		5	max	.072	21	.256	47	.127	16	6.145e-03	5	NC	1	NC	1
940			min	-.085	39	-.235	5	-.153	10	-1.1e-02	47	NC	1	NC	1
941	M110A	1	max	.14	11	.384	47	.104	9	5.248e-03	45	NC	1	NC	1
942			min	-.117	17	-.29	5	-.103	15	-2.743e-03	15	NC	1	NC	1
943		2	max	.14	11	.351	47	.088	21	5.248e-03	45	NC	1	NC	1
944			min	-.117	17	-.272	5	-.094	39	-2.743e-03	15	NC	1	NC	1
945		3	max	.14	11	.318	47	.072	21	5.248e-03	45	NC	1	NC	1
946			min	-.117	17	-.253	5	-.085	39	-2.743e-03	15	NC	1	NC	1
947		4	max	.14	11	.285	47	.056	21	5.248e-03	45	NC	1	NC	1
948			min	-.117	17	-.235	5	-.077	39	-2.743e-03	15	NC	1	NC	1
949		5	max	.14	11	.252	47	.041	22	5.248e-03	45	NC	1	NC	1
950			min	-.117	17	-.216	5	-.069	40	-2.743e-03	15	NC	1	NC	1
951	M111A	1	max	.435	23	.168	22	.671	21	1.448e-02	21	NC	1	NC	1
952			min	-.483	5	-.276	4	-.723	3	-1.663e-02	3	NC	1	NC	1
953		2	max	.435	23	.146	22	.676	21	1.448e-02	21	NC	1	NC	1
954			min	-.483	5	-.241	4	-.729	3	-1.663e-02	3	NC	1	NC	1
955		3	max	.435	23	.127	21	.681	21	1.448e-02	21	NC	1	NC	1
956			min	-.483	5	-.208	3	-.734	3	-1.663e-02	3	NC	1	NC	1
957		4	max	.435	23	.126	21	.685	21	1.448e-02	21	NC	1	NC	1
958			min	-.483	5	-.193	3	-.74	3	-1.663e-02	3	NC	1	NC	1
959		5	max	.435	23	.13	20	.69	21	1.448e-02	21	NC	1	NC	1
960			min	-.483	5	-.182	2	-.746	3	-1.663e-02	3	NC	1	NC	1
961	M112A	1	max	.13	20	.191	4	.151	23	7.735e-03	5	NC	1	NC	1
962			min	-.182	2	-.176	46	-.166	5	-7.628e-03	23	NC	1	1146.296	44
963		2	max	.13	20	.301	4	.201	22	8.476e-03	5	NC	1	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
964			min	-.182	2	-.28	22	-.202	4	-8.304e-03	23	874.495	4	939.624	8
965		3	max	.13	20	.388	4	.259	9	9.463e-03	5	NC	26	NC	5
966			min	-.182	2	-.382	22	-.252	15	-9.206e-03	23	449.421	10	488.544	8
967		4	max	.13	20	.619	4	.428	21	8.057e-03	5	NC	31	NC	1
968			min	-.182	2	-.573	22	-.452	3	-7.814e-03	23	224.524	4	244.287	2
969		5	max	.13	20	1.051	4	.738	20	7.651e-03	6	NC	8	NC	1
970			min	-.182	2	-.89	22	-.752	2	-7.462e-03	24	111.719	4	131.145	8
971	M113A	1	max	.671	21	.244	22	.528	5	1.69e-02	6	NC	1	NC	1
972			min	-.723	3	-.366	4	-.479	23	-1.26e-02	24	NC	1	NC	1
973		2	max	.671	21	.206	22	.505	5	1.69e-02	6	NC	1	NC	1
974			min	-.723	3	-.321	4	-.457	23	-1.26e-02	24	NC	1	NC	1
975		3	max	.671	21	.168	22	.483	5	1.69e-02	6	NC	1	NC	1
976			min	-.723	3	-.276	4	-.435	23	-1.26e-02	24	NC	1	NC	1
977		4	max	.671	21	.13	22	.46	5	1.69e-02	6	NC	1	NC	1
978			min	-.723	3	-.231	4	-.413	23	-1.26e-02	24	NC	1	NC	1
979		5	max	.671	21	.106	23	.438	5	1.69e-02	6	NC	1	NC	1
980			min	-.723	3	-.2	5	-.391	23	-1.26e-02	24	NC	1	NC	1
981	M114B	1	max	.225	22	.133	21	.391	21	5.414e-03	21	NC	1	NC	1
982			min	-.229	4	-.183	3	-.394	3	-7.501e-03	3	NC	1	NC	1
983		2	max	.225	22	.131	21	.399	21	5.414e-03	21	NC	1	NC	1
984			min	-.229	4	-.182	3	-.403	3	-7.501e-03	3	NC	1	NC	1
985		3	max	.225	22	.129	21	.408	21	5.414e-03	21	NC	1	NC	1
986			min	-.229	4	-.181	3	-.412	3	-7.501e-03	3	NC	1	NC	1
987		4	max	.225	22	.129	20	.417	22	5.414e-03	21	NC	1	NC	1
988			min	-.229	4	-.18	2	-.424	4	-7.501e-03	3	NC	1	NC	1
989		5	max	.225	22	.13	20	.43	22	5.414e-03	21	NC	1	NC	1
990			min	-.229	4	-.182	2	-.437	4	-7.501e-03	3	NC	1	NC	1
991	M115B	1	max	.094	22	.136	21	.194	22	5.738e-03	21	NC	1	NC	1
992			min	-.108	4	-.193	3	-.218	4	-5.975e-03	3	NC	1	NC	1
993		2	max	.094	22	.133	21	.204	22	5.738e-03	21	NC	1	NC	1
994			min	-.108	4	-.19	3	-.228	4	-5.975e-03	3	NC	1	NC	1
995		3	max	.094	22	.132	20	.213	22	5.738e-03	21	NC	1	NC	1
996			min	-.108	4	-.186	3	-.237	4	-5.975e-03	3	NC	1	NC	1
997		4	max	.094	22	.131	20	.223	22	5.738e-03	21	NC	1	NC	1
998			min	-.108	4	-.184	2	-.247	4	-5.975e-03	3	NC	1	NC	1
999		5	max	.094	22	.13	20	.232	22	5.738e-03	21	NC	1	NC	1
1000			min	-.108	4	-.182	2	-.257	4	-5.975e-03	3	NC	1	NC	1
1001	M116B	1	max	.175	22	.148	21	.28	9	4.946e-03	9	NC	1	NC	1
1002			min	-.189	4	-.196	3	-.275	15	-4.146e-03	15	NC	1	NC	1
1003		2	max	.175	22	.142	21	.294	9	4.946e-03	9	NC	1	NC	1
1004			min	-.189	4	-.191	3	-.289	15	-4.146e-03	15	NC	1	NC	1
1005		3	max	.175	22	.136	21	.316	10	4.946e-03	9	NC	1	NC	1
1006			min	-.189	4	-.187	3	-.313	16	-4.146e-03	15	NC	1	NC	1
1007		4	max	.175	22	.132	20	.339	10	4.946e-03	9	NC	1	NC	1
1008			min	-.189	4	-.183	3	-.337	16	-4.146e-03	15	NC	1	NC	1
1009		5	max	.175	22	.13	20	.362	10	4.946e-03	9	NC	1	NC	1
1010			min	-.189	4	-.182	2	-.361	16	-4.146e-03	15	NC	1	NC	1
1011	M117B	1	max	.28	9	.177	21	.237	4	2.417e-03	17	NC	1	NC	1
1012			min	-.275	15	-.22	3	-.222	22	-2.875e-03	11	NC	1	NC	1
1013		2	max	.28	9	.162	21	.213	4	2.417e-03	17	NC	1	NC	1
1014			min	-.275	15	-.208	3	-.198	22	-2.875e-03	11	NC	1	NC	1
1015		3	max	.28	9	.148	21	.189	4	2.417e-03	17	NC	1	NC	1
1016			min	-.275	15	-.196	3	-.175	22	-2.875e-03	11	NC	1	NC	1
1017		4	max	.28	9	.133	21	.165	4	2.417e-03	17	NC	1	NC	1
1018			min	-.275	15	-.183	3	-.151	22	-2.875e-03	11	NC	1	NC	1
1019		5	max	.28	9	.119	21	.141	4	2.417e-03	17	NC	1	NC	1
1020			min	-.275	15	-.171	3	-.128	22	-2.875e-03	11	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1021	M118B	1	max	.388	25	.201	25	.821	9	2.212e-02	9	NC	1	NC	1
1022			min	-.435	7	-.343	7	-.746	15	-1.883e-02	15	NC	1	NC	1
1023		2	max	.388	25	.156	25	.823	9	2.212e-02	9	NC	1	NC	1
1024			min	-.435	7	-.283	7	-.748	15	-1.883e-02	15	NC	1	NC	1
1025		3	max	.388	25	.13	14	.824	9	2.212e-02	9	NC	1	NC	1
1026			min	-.435	7	-.244	8	-.75	15	-1.883e-02	15	NC	1	NC	1
1027		4	max	.388	25	.114	15	.826	9	2.212e-02	9	NC	1	NC	1
1028			min	-.435	7	-.211	9	-.752	15	-1.883e-02	15	NC	1	NC	1
1029		5	max	.388	25	.125	15	.828	9	2.212e-02	9	NC	1	NC	1
1030			min	-.435	7	-.207	9	-.754	15	-1.883e-02	15	NC	1	NC	1
1031	M119B	1	max	.125	15	.032	12	.213	46	4.029e-03	2	NC	1	NC	1
1032			min	-.207	9	-.029	18	-.245	4	-4.355e-03	44	3359.448	46	766.131	38
1033		2	max	.125	15	.04	4	.305	22	4.844e-03	2	NC	1	NC	53
1034			min	-.207	9	-.028	22	-.327	4	-4.395e-03	20	1712.041	5	619.539	8
1035		3	max	.125	15	.075	4	.409	21	5.93e-03	2	NC	1	NC	39
1036			min	-.206	9	-.068	22	-.425	3	-5.805e-03	20	1000.039	5	339.841	8
1037		4	max	.125	15	.322	17	.691	9	3.336e-03	13	NC	1	NC	38
1038			min	-.207	9	-.331	11	-.633	15	-3.267e-03	19	268.118	11	160.515	8
1039		5	max	.125	15	.901	5	1.184	8	3.016e-03	59	NC	32	NC	5
1040			min	-.207	9	-.849	23	-.996	14	-2.941e-03	65	103.867	5	84.276	8
1041	M120A	1	max	.746	15	.264	14	.403	25	1.847e-02	24	NC	1	NC	1
1042			min	-.821	9	-.427	8	-.45	7	-2.327e-02	6	NC	1	NC	1
1043		2	max	.746	15	.223	25	.395	25	1.847e-02	24	NC	1	NC	1
1044			min	-.821	9	-.375	7	-.442	7	-2.327e-02	6	NC	1	NC	1
1045		3	max	.746	15	.201	25	.388	25	1.847e-02	24	NC	1	NC	1
1046			min	-.821	9	-.343	7	-.435	7	-2.327e-02	6	NC	1	NC	1
1047		4	max	.746	15	.178	25	.38	25	1.847e-02	24	NC	1	NC	1
1048			min	-.821	9	-.31	7	-.427	7	-2.327e-02	6	NC	1	NC	1
1049		5	max	.746	15	.177	24	.372	25	1.847e-02	24	NC	1	NC	1
1050			min	-.821	9	-.297	6	-.42	7	-2.327e-02	6	NC	1	NC	1
1051	M121A	1	max	.168	3	.129	15	.391	21	8.567e-03	9	NC	1	NC	1
1052			min	-.163	21	-.207	9	-.394	3	-5.458e-03	15	NC	1	NC	1
1053		2	max	.168	3	.128	15	.399	21	8.567e-03	9	NC	1	NC	1
1054			min	-.163	21	-.207	9	-.402	3	-5.458e-03	15	NC	1	NC	1
1055		3	max	.168	3	.127	15	.407	21	8.567e-03	9	NC	1	NC	1
1056			min	-.163	21	-.207	9	-.41	3	-5.458e-03	15	NC	1	NC	1
1057		4	max	.168	3	.126	15	.414	21	8.567e-03	9	NC	1	NC	1
1058			min	-.163	21	-.207	9	-.417	3	-5.458e-03	15	NC	1	NC	1
1059		5	max	.168	3	.125	15	.422	21	8.567e-03	9	NC	1	NC	1
1060			min	-.163	21	-.206	9	-.425	3	-5.458e-03	15	NC	1	NC	1
1061	M122	1	max	.132	4	.133	15	.194	22	6.838e-03	9	NC	1	NC	1
1062			min	-.12	22	-.221	9	-.218	4	-5.499e-03	15	NC	1	NC	1
1063		2	max	.132	4	.131	15	.196	22	6.838e-03	9	NC	1	NC	1
1064			min	-.12	22	-.217	9	-.221	4	-5.499e-03	15	NC	1	NC	1
1065		3	max	.132	4	.129	15	.198	22	6.838e-03	9	NC	1	NC	1
1066			min	-.12	22	-.214	9	-.225	4	-5.499e-03	15	NC	1	NC	1
1067		4	max	.132	4	.127	15	.2	22	6.838e-03	9	NC	1	NC	1
1068			min	-.12	22	-.21	9	-.228	4	-5.499e-03	15	NC	1	NC	1
1069		5	max	.132	4	.125	15	.202	22	6.838e-03	9	NC	1	NC	1
1070			min	-.12	22	-.207	9	-.231	4	-5.499e-03	15	NC	1	NC	1
1071	M123	1	max	.144	15	.144	15	.289	22	4.402e-03	8	NC	1	NC	1
1072			min	-.144	9	-.225	9	-.314	4	-4.246e-03	14	NC	1	NC	1
1073		2	max	.144	15	.139	15	.296	22	4.402e-03	8	NC	1	NC	1
1074			min	-.144	9	-.22	9	-.321	4	-4.246e-03	14	NC	1	NC	1
1075		3	max	.144	15	.134	15	.302	22	4.402e-03	8	NC	1	NC	1
1076			min	-.144	9	-.216	9	-.329	4	-4.246e-03	14	NC	1	NC	1
1077		4	max	.144	15	.13	15	.309	22	4.402e-03	8	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1078			min	-.144	9	-.211	9	-.337	4	-4.246e-03	14	NC	1	NC	1
1079		5	max	.144	15	.125	15	.321	21	4.402e-03	8	NC	1	NC	1
1080			min	-.144	9	-.207	9	-.348	3	-4.246e-03	14	NC	1	NC	1
1081	M124	1	max	.314	4	.169	15	.171	3	2.743e-03	13	NC	1	NC	1
1082			min	-.289	22	-.251	9	-.17	21	-2.655e-03	19	NC	1	NC	1
1083		2	max	.314	4	.157	15	.157	15	2.743e-03	13	NC	1	NC	1
1084			min	-.289	22	-.238	9	-.157	9	-2.655e-03	19	NC	1	NC	1
1085		3	max	.314	4	.144	15	.144	15	2.743e-03	13	NC	1	NC	1
1086			min	-.289	22	-.225	9	-.144	9	-2.655e-03	19	NC	1	NC	1
1087		4	max	.314	4	.132	15	.13	15	2.743e-03	13	NC	1	NC	1
1088			min	-.289	22	-.212	9	-.132	9	-2.655e-03	19	NC	1	NC	1
1089		5	max	.314	4	.119	15	.117	15	2.743e-03	13	NC	1	NC	1
1090			min	-.289	22	-.199	9	-.119	9	-2.655e-03	19	NC	1	NC	1
1091	M125	1	max	.288	15	.15	15	.676	25	1.434e-02	25	NC	1	NC	1
1092			min	-.336	9	-.255	9	-.726	7	-1.647e-02	7	NC	1	NC	1
1093		2	max	.288	15	.134	14	.68	25	1.434e-02	25	NC	1	NC	1
1094			min	-.336	9	-.228	8	-.731	7	-1.647e-02	7	NC	1	NC	1
1095		3	max	.288	15	.12	14	.684	25	1.434e-02	25	NC	1	NC	1
1096			min	-.336	9	-.201	8	-.736	7	-1.647e-02	7	NC	1	NC	1
1097		4	max	.288	15	.119	25	.688	25	1.434e-02	25	NC	1	NC	1
1098			min	-.336	9	-.185	7	-.741	7	-1.647e-02	7	NC	1	NC	1
1099		5	max	.288	15	.127	25	.692	25	1.434e-02	25	NC	1	NC	1
1100			min	-.336	9	-.18	7	-.746	7	-1.647e-02	7	NC	1	NC	1
1101	M126	1	max	.127	25	.028	10	.259	6	4.231e-03	8	NC	1	NC	1
1102			min	-.18	7	-.026	40	-.232	24	-4.743e-03	38	3736.344	44	1792.132	27
1103		2	max	.127	25	.028	19	.347	6	4.943e-03	8	NC	1	NC	1
1104			min	-.18	7	-.038	13	-.33	24	-4.755e-03	14	2072.254	11	718.937	2
1105		3	max	.127	25	.062	18	.428	7	5.893e-03	8	NC	1	NC	31
1106			min	-.18	7	-.07	12	-.429	13	-5.611e-03	14	1109.931	11	369.927	2
1107		4	max	.127	25	.255	17	.655	7	3.413e-03	8	NC	1	NC	61
1108			min	-.18	7	-.258	11	-.607	25	-3.114e-03	14	343.329	11	200.847	8
1109		5	max	.127	25	.609	17	1.024	7	2.745e-03	9	NC	8	NC	4
1110			min	-.18	7	-.675	11	-.88	25	-2.706e-03	39	137.821	11	108.688	8
1111	M127	1	max	.676	25	.219	14	.352	9	1.684e-02	10	NC	1	NC	1
1112			min	-.726	7	-.339	8	-.303	15	-1.253e-02	16	NC	1	NC	1
1113		2	max	.676	25	.183	14	.344	9	1.684e-02	10	NC	1	NC	1
1114			min	-.726	7	-.297	8	-.295	15	-1.253e-02	16	NC	1	NC	1
1115		3	max	.676	25	.15	15	.336	9	1.684e-02	10	NC	1	NC	1
1116			min	-.726	7	-.255	9	-.288	15	-1.253e-02	16	NC	1	NC	1
1117		4	max	.676	25	.132	15	.327	9	1.684e-02	10	NC	1	NC	1
1118			min	-.726	7	-.231	9	-.28	15	-1.253e-02	16	NC	1	NC	1
1119		5	max	.676	25	.114	15	.319	9	1.684e-02	10	NC	1	NC	1
1120			min	-.726	7	-.207	9	-.273	15	-1.253e-02	16	NC	1	NC	1
1121	M128	1	max	.171	25	.132	25	.398	24	5.278e-03	25	NC	1	NC	1
1122			min	-.174	7	-.18	7	-.4	7	-7.335e-03	7	NC	1	NC	1
1123		2	max	.171	25	.131	25	.406	25	5.278e-03	25	NC	1	NC	1
1124			min	-.174	7	-.18	7	-.408	7	-7.335e-03	7	NC	1	NC	1
1125		3	max	.171	25	.129	25	.414	25	5.278e-03	25	NC	1	NC	1
1126			min	-.174	7	-.18	7	-.417	7	-7.335e-03	7	NC	1	NC	1
1127		4	max	.171	25	.128	25	.422	25	5.278e-03	25	NC	1	NC	1
1128			min	-.174	7	-.18	7	-.425	7	-7.335e-03	7	NC	1	NC	1
1129		5	max	.171	25	.127	25	.43	25	5.278e-03	25	NC	1	NC	1
1130			min	-.174	7	-.18	7	-.433	7	-7.335e-03	7	NC	1	NC	1
1131	M129	1	max	.126	24	.136	25	.21	24	5.559e-03	25	NC	1	NC	1
1132			min	-.14	6	-.192	7	-.235	6	-5.766e-03	7	NC	1	NC	1
1133		2	max	.126	24	.134	25	.214	24	5.559e-03	25	NC	1	NC	1
1134			min	-.14	6	-.189	7	-.238	6	-5.766e-03	7	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1135		3	max	.126	24	.132	25	.217	24	5.559e-03	25	NC	1	NC	1
1136			min	-.14	6	-.186	7	-.242	6	-5.766e-03	7	NC	1	NC	1
1137		4	max	.126	24	.129	25	.22	24	5.559e-03	25	NC	1	NC	1
1138			min	-.14	6	-.183	7	-.245	6	-5.766e-03	7	NC	1	NC	1
1139		5	max	.126	24	.127	25	.224	24	5.559e-03	25	NC	1	NC	1
1140			min	-.14	6	-.18	7	-.249	6	-5.766e-03	7	NC	1	NC	1
1141	M130	1	max	.146	25	.149	25	.316	12	4.721e-03	13	NC	1	NC	1
1142			min	-.16	7	-.196	7	-.308	18	-3.896e-03	19	NC	1	NC	1
1143		2	max	.146	25	.144	25	.324	12	4.721e-03	13	NC	1	NC	1
1144			min	-.16	7	-.192	7	-.317	18	-3.896e-03	19	NC	1	NC	1
1145		3	max	.146	25	.138	25	.333	12	4.721e-03	13	NC	1	NC	1
1146			min	-.16	7	-.188	7	-.327	18	-3.896e-03	19	NC	1	NC	1
1147		4	max	.146	25	.133	25	.341	12	4.721e-03	13	NC	1	NC	1
1148			min	-.16	7	-.184	7	-.336	18	-3.896e-03	19	NC	1	NC	1
1149		5	max	.146	25	.127	25	.35	12	4.721e-03	13	NC	1	NC	1
1150			min	-.16	7	-.18	7	-.345	18	-3.896e-03	19	NC	1	NC	1
1151	M131	1	max	.316	12	.177	25	.189	7	2.272e-03	21	NC	1	NC	1
1152			min	-.308	18	-.219	7	-.174	25	-2.733e-03	3	NC	1	NC	1
1153		2	max	.316	12	.163	25	.175	7	2.272e-03	21	NC	1	NC	1
1154			min	-.308	18	-.207	7	-.16	25	-2.733e-03	3	NC	1	NC	1
1155		3	max	.316	12	.149	25	.16	7	2.272e-03	21	NC	1	NC	1
1156			min	-.308	18	-.196	7	-.146	25	-2.733e-03	3	NC	1	NC	1
1157		4	max	.316	12	.135	25	.148	6	2.272e-03	21	NC	1	NC	1
1158			min	-.308	18	-.185	7	-.135	24	-2.733e-03	3	NC	1	NC	1
1159		5	max	.316	12	.121	25	.138	6	2.272e-03	21	NC	1	NC	1
1160			min	-.308	18	-.173	7	-.127	24	-2.733e-03	3	NC	1	NC	1
1161	M132	1	max	.553	17	.208	17	.835	13	2.203e-02	13	NC	1	NC	1
1162			min	-.601	11	-.351	11	-.758	19	-1.871e-02	19	NC	1	NC	1
1163		2	max	.553	17	.17	18	.835	13	2.203e-02	13	NC	1	NC	1
1164			min	-.601	11	-.299	12	-.759	19	-1.871e-02	19	NC	1	NC	1
1165		3	max	.553	17	.137	18	.835	13	2.203e-02	13	NC	1	NC	1
1166			min	-.601	11	-.252	12	-.759	19	-1.871e-02	19	NC	1	NC	1
1167		4	max	.553	17	.119	19	.836	13	2.203e-02	13	NC	1	NC	1
1168			min	-.601	11	-.217	13	-.759	19	-1.871e-02	19	NC	1	NC	1
1169		5	max	.553	17	.119	20	.836	13	2.203e-02	13	NC	1	NC	1
1170			min	-.601	11	-.201	2	-.76	19	-1.871e-02	19	NC	1	NC	1
1171	M133	1	max	.119	20	.212	6	.181	5	8.146e-03	5	NC	1	NC	1
1172			min	-.201	2	-.177	24	-.157	23	-7.44e-03	23	1171.923	41	713.655	42
1173		2	max	.119	20	.321	6	.222	6	9.096e-03	5	NC	9	NC	33
1174			min	-.201	2	-.31	24	-.202	24	-8.635e-03	23	708.062	12	983.284	42
1175		3	max	.119	20	.415	6	.266	7	1.036e-02	5	NC	9	NC	31
1176			min	-.201	2	-.407	24	-.253	25	-1.023e-02	23	411.724	12	522.785	2
1177		4	max	.119	20	.651	18	.463	19	1.009e-02	4	NC	56	NC	1
1178			min	-.201	2	-.701	12	-.5	13	-9.957e-03	22	181.582	12	207.593	2
1179		5	max	.119	20	1.129	17	.872	20	1.044e-02	4	NC	8	NC	1
1180			min	-.201	2	-1.319	11	-.918	2	-1.029e-02	22	82.647	11	104.765	2
1181	M134	1	max	.758	19	.303	18	.607	17	1.861e-02	16	NC	1	NC	1
1182			min	-.835	13	-.468	12	-.655	11	-2.341e-02	10	NC	1	NC	1
1183		2	max	.758	19	.253	18	.58	17	1.861e-02	16	NC	1	NC	1
1184			min	-.835	13	-.407	12	-.628	11	-2.341e-02	10	NC	1	NC	1
1185		3	max	.758	19	.208	17	.553	17	1.861e-02	16	NC	1	NC	1
1186			min	-.835	13	-.351	11	-.601	11	-2.341e-02	10	NC	1	NC	1
1187		4	max	.758	19	.177	17	.526	17	1.861e-02	16	NC	1	NC	1
1188			min	-.835	13	-.311	11	-.574	11	-2.341e-02	10	NC	1	NC	1
1189		5	max	.758	19	.147	17	.498	17	1.861e-02	16	NC	1	NC	1
1190			min	-.835	13	-.27	11	-.547	11	-2.341e-02	10	NC	1	NC	1
1191	M135	1	max	.251	5	.124	19	.399	24	8.478e-03	13	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1192			min	-.246	23	-.203	13	-.4	7	-5.339e-03	19	NC	1	NC	1
1193		2	max	.251	5	.122	19	.413	24	8.478e-03	13	NC	1	NC	1
1194			min	-.246	23	-.202	13	-.412	6	-5.339e-03	19	NC	1	NC	1
1195		3	max	.251	5	.12	19	.427	24	8.478e-03	13	NC	1	NC	1
1196			min	-.246	23	-.201	13	-.426	6	-5.339e-03	19	NC	1	NC	1
1197		4	max	.251	5	.118	19	.441	24	8.478e-03	13	NC	1	NC	1
1198			min	-.246	23	-.2	13	-.44	6	-5.339e-03	19	NC	1	NC	1
1199		5	max	.251	5	.119	20	.455	24	8.478e-03	13	NC	1	NC	1
1200			min	-.246	23	-.201	2	-.454	6	-5.339e-03	19	NC	1	NC	1
1201	M136	1	max	.116	6	.127	19	.21	24	6.773e-03	13	NC	1	NC	1
1202			min	-.104	24	-.216	13	-.235	6	-5.404e-03	19	NC	1	NC	1
1203		2	max	.116	6	.124	19	.219	24	6.773e-03	13	NC	1	NC	1
1204			min	-.104	24	-.212	13	-.245	6	-5.404e-03	19	NC	1	NC	1
1205		3	max	.116	6	.122	19	.228	24	6.773e-03	13	NC	1	NC	1
1206			min	-.104	24	-.207	13	-.255	6	-5.404e-03	19	NC	1	NC	1
1207		4	max	.116	6	.12	20	.237	24	6.773e-03	13	NC	1	NC	1
1208			min	-.104	24	-.203	13	-.265	6	-5.404e-03	19	NC	1	NC	1
1209		5	max	.116	6	.119	20	.246	24	6.773e-03	13	NC	1	NC	1
1210			min	-.104	24	-.201	2	-.276	6	-5.404e-03	19	NC	1	NC	1
1211	M137	1	max	.199	18	.133	19	.277	25	4.199e-03	13	NC	1	NC	1
1212			min	-.201	12	-.215	13	-.3	7	-4.076e-03	19	NC	1	NC	1
1213		2	max	.199	18	.129	19	.298	24	4.199e-03	13	NC	1	NC	1
1214			min	-.201	12	-.211	13	-.32	6	-4.076e-03	19	NC	1	NC	1
1215		3	max	.199	18	.125	19	.322	24	4.199e-03	13	NC	1	NC	1
1216			min	-.201	12	-.207	13	-.346	6	-4.076e-03	19	NC	1	NC	1
1217		4	max	.199	18	.121	19	.347	24	4.199e-03	13	NC	1	NC	1
1218			min	-.201	12	-.203	13	-.371	6	-4.076e-03	19	NC	1	NC	1
1219		5	max	.199	18	.119	20	.371	24	4.199e-03	13	NC	1	NC	1
1220			min	-.201	12	-.201	2	-.396	6	-4.076e-03	19	NC	1	NC	1
1221	M138	1	max	.3	7	.158	19	.25	6	2.819e-03	5	NC	1	NC	1
1222			min	-.277	25	-.24	13	-.249	24	-2.739e-03	23	NC	1	NC	1
1223		2	max	.3	7	.146	19	.224	18	2.819e-03	5	NC	1	NC	1
1224			min	-.277	25	-.227	13	-.225	12	-2.739e-03	23	NC	1	NC	1
1225		3	max	.3	7	.133	19	.199	18	2.819e-03	5	NC	1	NC	1
1226			min	-.277	25	-.215	13	-.201	12	-2.739e-03	23	NC	1	NC	1
1227		4	max	.3	7	.121	19	.174	18	2.819e-03	5	NC	1	NC	1
1228			min	-.277	25	-.202	13	-.176	12	-2.739e-03	23	NC	1	NC	1
1229		5	max	.3	7	.109	19	.149	18	2.819e-03	5	NC	1	NC	1
1230			min	-.277	25	-.19	13	-.152	12	-2.739e-03	23	NC	1	NC	1
1231	M124A	1	max	.245	14	.492	47	.23	25	1.28e-02	18	NC	1	NC	1
1232			min	-.249	8	-.465	5	-.24	7	-1.528e-02	12	66.107	3	56.424	46
1233		2	max	.245	14	.337	47	.194	25	1.34e-02	18	NC	1	NC	1
1234			min	-.249	8	-.39	5	-.2	7	-1.57e-02	12	88.149	3	75.284	46
1235		3	max	.245	14	.225	24	.168	24	1.399e-02	18	NC	1	NC	1
1236			min	-.249	8	-.333	6	-.171	6	-1.612e-02	12	132.232	3	113.012	46
1237		4	max	.245	14	.218	25	.153	12	1.458e-02	18	NC	1	NC	1
1238			min	-.249	8	-.316	7	-.152	18	-1.654e-02	12	108.009	20	226.165	46
1239		5	max	.245	14	.265	25	.158	11	1.534e-02	17	NC	1	NC	1
1240			min	-.249	8	-.351	7	-.154	17	-1.721e-02	11	80.975	20	205.84	51
1241	M125A	1	max	.399	23	.278	19	.218	22	1.433e-02	14	NC	1	NC	1
1242			min	-.403	5	-.417	13	-.229	4	-1.675e-02	8	72.058	12	288.163	67
1243		2	max	.399	23	.238	19	.179	21	1.445e-02	14	NC	1	NC	1
1244			min	-.403	5	-.363	13	-.186	3	-1.671e-02	8	96.159	12	385.569	67
1245		3	max	.398	23	.223	20	.153	20	1.456e-02	14	NC	1	NC	1
1246			min	-.403	5	-.332	2	-.156	2	-1.667e-02	8	144.374	12	414.858	59
1247		4	max	.398	23	.229	20	.157	7	1.467e-02	14	NC	1	NC	1
1248			min	-.403	5	-.329	3	-.158	25	-1.662e-02	8	99.757	16	275.463	59

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1249		5	max	.398	23	.283	21	.191	7	1.478e-02	14	NC	1	NC	1
1250			min	-.403	5	-.371	3	-.189	25	-1.658e-02	8	74.746	16	205.851	59
1251	M126A	1	max	.22	20	.27	15	.175	17	1.464e-02	22	NC	1	NC	1
1252			min	-.225	2	-.408	9	-.184	11	-1.707e-02	4	76.661	8	151.564	7
1253		2	max	.22	20	.232	15	.162	17	1.435e-02	22	NC	1	NC	1
1254			min	-.225	2	-.356	9	-.167	11	-1.664e-02	4	102.244	8	202.199	7
1255		3	max	.22	20	.226	16	.166	16	1.406e-02	22	NC	1	NC	1
1256			min	-.225	2	-.385	46	-.168	10	-1.622e-02	4	141.196	25	303.487	7
1257		4	max	.22	20	.256	17	.174	4	1.377e-02	22	NC	1	NC	1
1258			min	-.225	2	-.57	47	-.174	22	-1.579e-02	4	94.117	25	275.449	55
1259		5	max	.22	20	.327	17	.204	3	1.348e-02	22	NC	1	NC	1
1260			min	-.225	2	-.758	47	-.201	21	-1.536e-02	4	70.578	25	205.84	55

Envelope AISI S100-10: ASD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Pn/Om[k]	Tn/Om[k]	Mnyy/O...	Mnzz/O...	Cb	Cmyy	Cmzz	Eqn
No Data to Print ...																

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M105	PIPE_2.0	.805	4.5	2	.213	4.5		11	14.916	32.13	1.872	1.872	2...	H1-1b
2	M133	PIPE_2.0	.800	4.5	11	.210	4.5		13	14.916	32.13	1.872	1.872	2...	H1-1b
3	M119B	PIPE_2.0	.791	4.5	5	.180	4.5		9	14.916	32.13	1.872	1.872	2...	H1-1b
4	M8	PIPE_2.0	.588	4.5	2	.149	4.5		11	14.916	32.13	1.872	1.872	2...	H1-1b
5	M112A	PIPE_2.0	.582	4.5	5	.150	4.5		3	14.916	32.13	1.872	1.872	2...	H1-1b
6	M126	PIPE_2.0	.576	4.5	11	.150	4.5		7	14.916	32.13	1.872	1.872	2...	H1-1b
7	M11	PIPE_2.0	.502	4.5	46	.054	.5		40	14.916	32.13	1.872	1.872	2...	H1-1b
8	M69	PIPE_3.5	.455	7.25	7	.182	7.25		2	33.422	78.75	7.954	7.954	1...	H1-1b
9	M89A	HSS4x4x3	.453	0	6	.139	0	z	13	97.541	106.812	12.662	12.662	2...	H1-1b
10	M38	HSS4x4x3	.446	0	10	.140	0	z	9	97.541	106.812	12.662	12.662	2...	H1-1b
11	M71A	PIPE_2.0	.442	12.5	47	.126	4.036		47	6.295	32.13	1.872	1.872	2...	H1-1b
12	M63	PIPE_3.5	.435	7.25	11	.173	7.25		6	33.422	78.75	7.954	7.954	1...	H1-1b
13	M94	PIPE_3.5	.431	7.25	3	.178	7.25		11	33.422	78.75	7.954	7.954	1...	H1-1b
14	M37	HSS4x4x3	.311	0	5	.243	4.503	y	47	97.541	106.812	12.662	12.662	1...	H1-1b
15	M61	L3x3x4	.310	0	2	.265	2.148	z	8	42.124	46.656	1.688	3.756	1...	H2-1
16	M93A	L3x3x4	.310	0	2	.265	2.148	y	8	42.124	46.656	1.688	3.756	1...	H2-1
17	M92A	L3x3x4	.303	0	5	.267	2.148	z	12	42.124	46.656	1.688	3.756	1...	H2-1
18	M62	L3x3x4	.302	0	10	.268	2.148	y	4	42.124	46.656	1.688	3.756	1...	H2-1
19	M67	L3x3x4	.297	0	10	.261	2.148	z	4	42.124	46.656	1.688	3.756	1...	H2-1
20	M68	L3x3x4	.296	0	6	.260	2.148	y	12	42.124	46.656	1.688	3.756	1...	H2-1
21	M87	PIPE_2.0	.219	4.5	10	.068	4.5		10	14.916	32.13	1.872	1.872	2...	H1-1b
22	M95	PIPE_2.0	.215	4.5	37	.076	4.5		13	14.916	32.13	1.872	1.872	2...	H1-1b
23	M5	PIPE_2.0	.212	4.5	29	.066	4.5		5	14.916	32.13	1.872	1.872	2...	H1-1b
24	M98A	PIPE_2.0	.201	4.5	6	.054	4.5		6	14.916	32.13	1.872	1.872	2...	H1-1b
25	M88	PIPE_2.0	.197	3.906	33	.078	3.906		40	6.295	32.13	1.872	1.872	2...	H1-1b
26	M110	PIPE_2.0	.197	3.906	36	.060	8.594		42	6.295	32.13	1.872	1.872	2...	H1-1b
27	M90A	PIPE_2.0	.194	4.5	27	.058	4.5		2	14.916	32.13	1.872	1.872	1...	H1-1b
28	M64A	LL2.5x2.5x...	.115	0	32	.013	0	y	46	41.904	58.32	3.954	2.55	1	H1-1b*
29	M115	L2.5x2.5x3	.115	2.487	2	.008	4.974	y	2	12.979	29.192	.873	1.662	1...	H2-1
30	M98	LL2.5x2.5x...	.115	0	28	.008	5	y	5	41.904	58.32	3.954	2.55	1...	H1-1b*
31	M66A	LL2.5x2.5x...	.115	0	36	.008	5	z	4	41.904	58.32	3.954	2.55	1...	H1-1b*
32	M92	L2.5x2.5x3	.114	2.487	2	.008	4.974	z	8	12.979	29.192	.873	1.662	1...	H2-1
33	M114	L2.5x2.5x3	.097	2.435	23	.006	0	z	18	12.979	29.192	.873	1.662	1...	H2-1
34	M93	L2.5x2.5x3	.095	2.435	17	.006	0	y	4	12.979	29.192	.873	1.662	1...	H2-1
35	M76	L2.5x2.5x3	.091	2.487	6	.006	0	y	18	12.979	29.192	.873	1.662	1...	H2-1

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
36	M75	L2.5x2.5x3	.090	2.487	10	.006	0	z	22	12.979	29.192	.873	1.662	1...	H2-1
37	M125A	L2.5x2.5x3	.041	1.305	2	.007	2.611	y	43	23.061	29.192	.873	1.899	1...	H2-1
38	M126A	L2.5x2.5x3	.035	1.305	10	.043	2.611	y	48	23.061	29.192	.873	1.899	1...	H2-1
39	M124A	L2.5x2.5x3	.035	1.305	6	.025	2.611	y	46	23.061	29.192	.873	1.899	1...	H2-1
40	M116A	PIPE_2.0	.009	1.422	2	.029	0		44	29.162	32.13	1.872	1.872	1...	H1-1b
41	M115A	PIPE_2.0	.008	1.422	28	.120	0		48	29.162	32.13	1.872	1.872	1...	H1-1b
42	M114A	PIPE_2.0	.008	1.422	36	.088	0		46	29.162	32.13	1.872	1.872	1...	H1-1b

Antenna Mount Structural Analysis

Source: SBA Date: 11.15.2017

SBA Site:	**CT00680-S Putnam**
Sprint Site Number:	**CT23XC409**
Project:	**Sprint DO Macro Upgrade**
Prepared For:	**Sprint**
Mount Description:	**(3) Nudd T-Arms**
Site Location:	**154 Sayle Ave, Putnam, CT** **Windham County** **41.92944°, -71.88556°**
Design Codes:	**ANSI/TIA-222-G** **IBC 2012 w/ 2016 CT Building Code**
Analysis Load Case:	**Sprint Final Configuration**
Analysis Result:	**Adequate @ 81% - Once Augmented** **See Conclusion**

STATE OF CONNECTICUT
GREGORY DURGIN
No.32155
LICENSED
PROFESSIONAL ENGINEER

Revision 0
March 15, 2018

CT23XC409-PASSING-MOUNT-STRUCTURAL-ANALYSIS-03-15-18

1.0 Introduction

An antenna mount structural analysis has been performed on Sprint's existing mount assembly located at the CT00680-S Putnam communications site in Windham County, CT considering the final equipment loading configuration listed in Section 3.0.

2.0 Analysis Criteria

An elastic three-dimensional model of the mount structure has been analyzed pursuant to the following criteria:

- IBC 2012 – International Building Code.
- ANSI/TIA-222-G – Structural Standard for Antenna Supporting Structures and Antennas.
- AISC – Steel Construction Manual.
- ANSI/AWS D1.1 – Structural Welding Code.

Wind w/o ice = 130 mph (3-sec gust Ultimate Wind Speed) Wind w/o ice = 101 mph (3-sec gust Equivalent per TIA-222-G Tower Code)	
Wind with ice = 50 mph (3-sec gust, 3/4" Ice) Exposure Category B	Topographic Category 1 Structure Class II

The following documents were provided:

- Prelim Construction Drawings
  Infinigy, 1/17/18.
- Mount and Tower Record Documents
  SBA
- Mount Assessment
  Westchester, 12/21/17.
- RF Design
  Sprint DOMU Project

The results of the analysis are illustrated in Section 4.0. If any of the existing or proposed conditions reported in this analysis are fadnot properly represented, please contact our office immediately to request an amended report.

3.0 Appurtenance Information

Table 3.1 – Sprint Final Configuration[1]

COR	(Quantity) Appurtenance Make/Model	Mount Description
180.0'±	(3) RFS APXVTM14-ALU-I20	*(3) Nudd T-Arms*
	(3) COMMSCOPE NNVV-65B-R4	
	(6) ALU 800MHz RRH	
	(3) ALU 1900MHz RRH	
	(3) ALU 2500MHz RRH	

1. *Refer to antenna installation Construction Drawings (by others, when applicable) for additional information regarding final antenna and equipment orientations.*
2. *Panel antennas to be installed in Positions 2 and 3. RRH units to be installed on dual swivel brackets behind panel antennas in Positions 2 and 3.*

4.0 Analysis Results

Table 4.1 – Existing Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final Sprint Configuration	Standoff Member	103%	**Inadequate[3]**
	Connection Capacity	136%	

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.*
3. *Structural augments to the existing mount structure are required to obtain a mount structure capable of supporting the currently proposed final loading configuration in Table 3.1.*

Table 4.2 – Augmented Mount Capacity

Load Case	Governing Mount Component[1]	% Capacity[2]	Result
Final Sprint Configuration	Mount Pipe	81%	**Adequate Once Augmented[3]**

1. *Refer to the Calculations & Software Output portion of this report for mount component and structural information.*
2. *Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.*
3. *Refer to GeoStructural Mount Augmentation Drawings and Section 5.0 for information regarding required mount augments.*

Table 4.3 – Structural Component Material Strengths

Structural Component	Nominal Strength/Material[1]
Pipe	F_y = 35 ksi (A53, Gr. B)
Tube	F_y = 46 ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate / Bar	F_y = 36 ksi (A36)
Uni-Strut	F_y = 33 ksi (A570, Gr. 33)
Connection Bolts	A325
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 F_y = 74 ksi (Yield) & F_u = 29 ksi (Tension)
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) F_y = 57 ksi (Yield) & F_u = 74 ksi (Tension)
Welds	E70XX Electrodes

1. *Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.*

5.0 Conclusion & Recommendations

Based on Sprint's final equipment loading configuration, the existing mount assembly does not have sufficient capacity to support the loading considered in this analysis pursuant to the listed standards. Structural augments (reinforcements) will be required and are briefly summarized below:

- Install Platform Reinforcement Kit; located 3.0' below the existing standoff centerline and attaching to the existing standoff member end near the face rail.
  - Sitepro1 PRK-1245L, (1) total.
- Install V-Brace Kit; located 3.75' below the existing mount face rail centerline.
  - Sitepro1 PRK-SFS-L, (1) total. Attach kit ring mount in kit to monopole shaft.
    - If the PRK-SFS-L kit is not available, provide (6) total L2-1/2x2-1/2x3/16 x ~8' long replacement angles, field-cut and drill to suit.
  - Pipe2.0STD x 12.5' Horizontal Rail, (3) total. Attach SFS-L kit angles to new horizontal rail.
  - Pipe2.0STD x ~4' long corner braces, (3) total. Attach to new horizontal rail w/ Sitepro1 PUCK brackets, (6) total.
  - Sitepro1 SCX_x_-K, (24) total. Attach all mount pipes to new rail. (12) new Pipe2.0STD mount pipes will be required to span between existing rail and new rail.
- Panel antennas to be installed in Positions 2 and 3. RRH units to be installed on dual swivel brackets behind panel antennas in Positions 2 and 3.

Once the recommended augments are successfully implemented, the augmented mount assembly has sufficient capacity to support the loading considered in this analysis pursuant to the listed standards.

Augmentation Requirements:

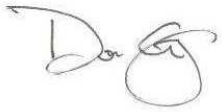
- **In order to obtain a mount structure capable of supporting the currently proposed final loading configuration, upgrade augments must be installed in accordance with GeoStructural's *Mount Augmentation Drawings*.**
- **Antennas and equipment shall be installed centered vertically on the mount front face rails. If this assumption is incorrect, the results of this analysis will be affected.**
- **In order for the specified modifications to perform as designed and to "fit-up" the existing Nudd T-Arm mounts must be appropriately rotated on standoff member such that they are perpendicular to the face of the tower (T-Arm standoff tube and collar standoff member to be colinear). Panel antenna azimuths will need to be adjusted to obtain desired azimuths.**

This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If any of the existing or proposed conditions (appurtenance loading, member sizes, etc.) reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

Prepared by:

Jesse Drennen, PE, MLE
208.761.7986
jesse.drennen@geostructural.com

Reviewed and Approved by:



Don George, PE, SE, MLSE
208.602.6569
don.george@geostructural.com

6.0 Standard Conditions

- All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided. It has been assumed that the tower, antenna support structure and foundation have been constructed according to the provided existing drawings, previous structural analysis reports, mapping documents, etc.

- The default Structure Classification is Class II in accordance with ANSI/TIA-222-G §A.2.2 & §A.15.3 and has been assumed for this analysis. The owner shall verify this classification conforms with original or desired reliability criteria.

- This analysis assumes that the structure has been properly installed and maintained in accordance with ANSI/TIA-222-G §15.5 and that no physical deterioration has occurred in any of the components of the structure. Damaged, missing, or rusted members were not considered.

- This analysis verifies the adequacy of the main components of the structure. Not all connections, welds, bolts, plates, etc. were individually detailed and analyzed. Where not specifically analyzed, the existing connection plates, welds, bolts, etc. were assumed adequate to develop the full capacity of the main structural members.

- No consideration has been made for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding or other similar conditions.

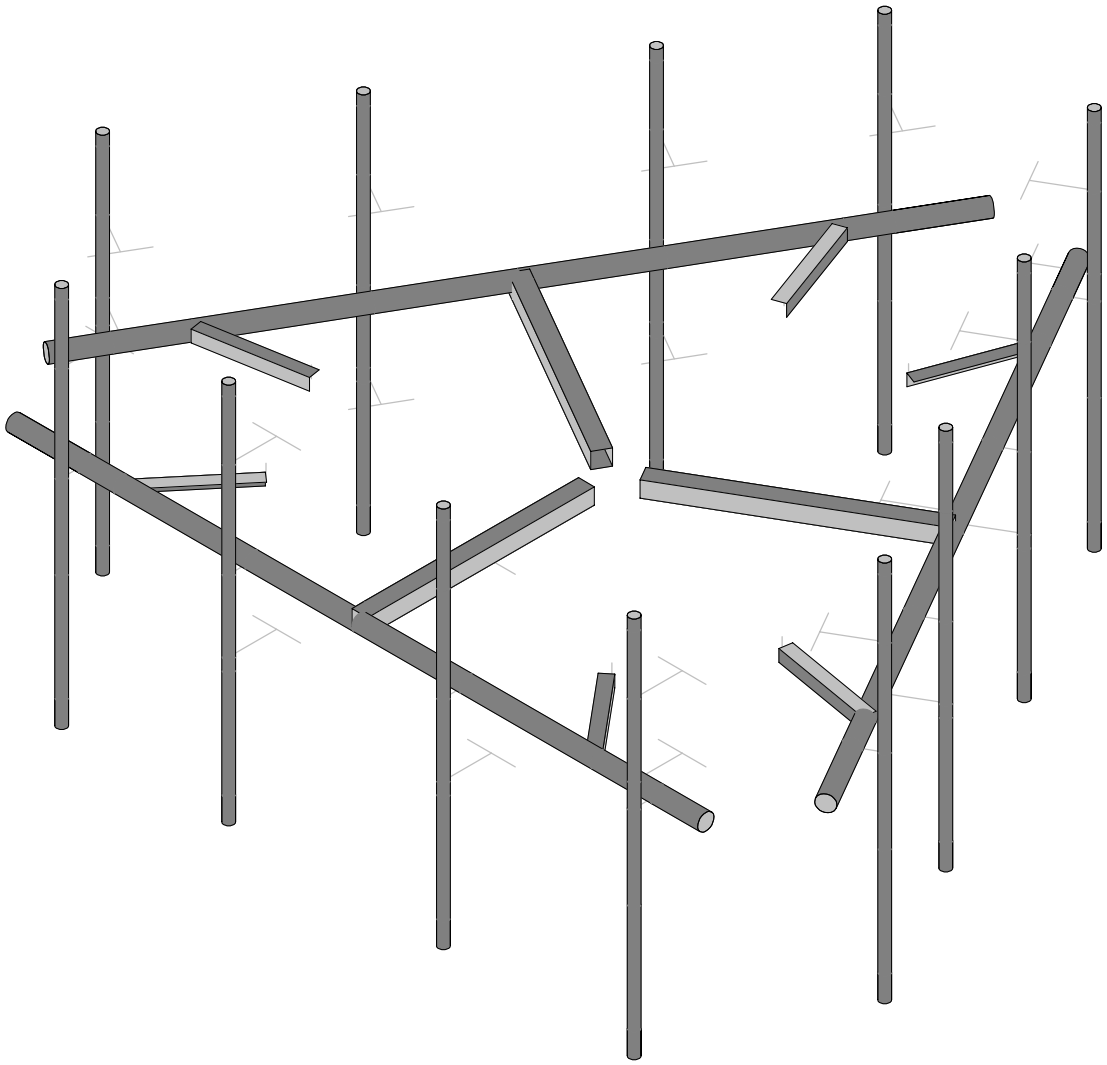
- It is the owner's responsibility to determine the appropriate design wind speed and amount of ice accumulation beyond code minimum values that should be considered in the analysis.

- This analysis report does not constitute a maintenance and condition assessment. No certifications regarding maintenance and condition are expressed or implied. If desired, GeoStructural can provide these services under a subsequent contract.

- This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If desired, GeoStructural can provide these services under a subsequent contract.

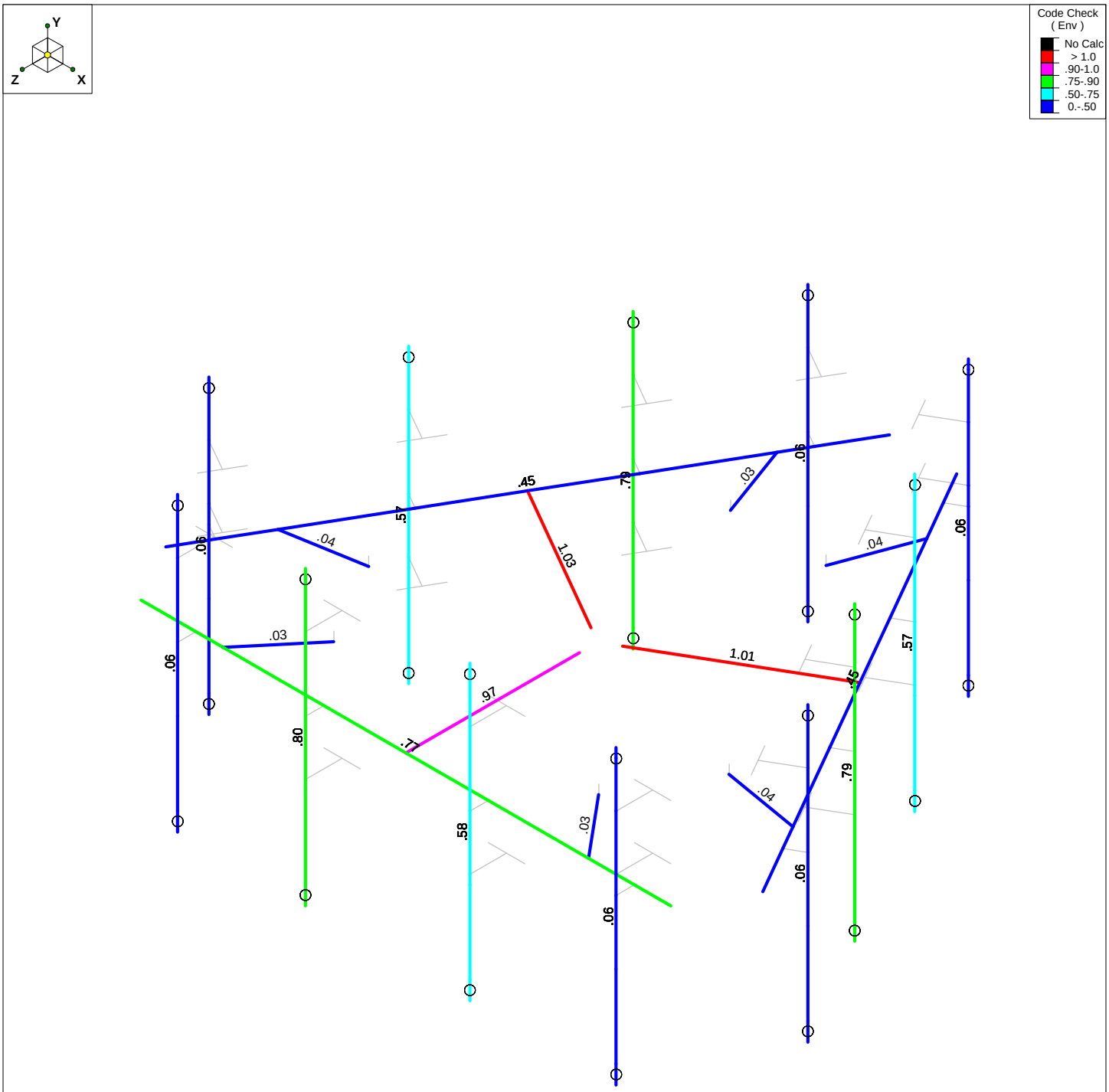
7.0 Calculations & Software Output

This page intentionally left blank.



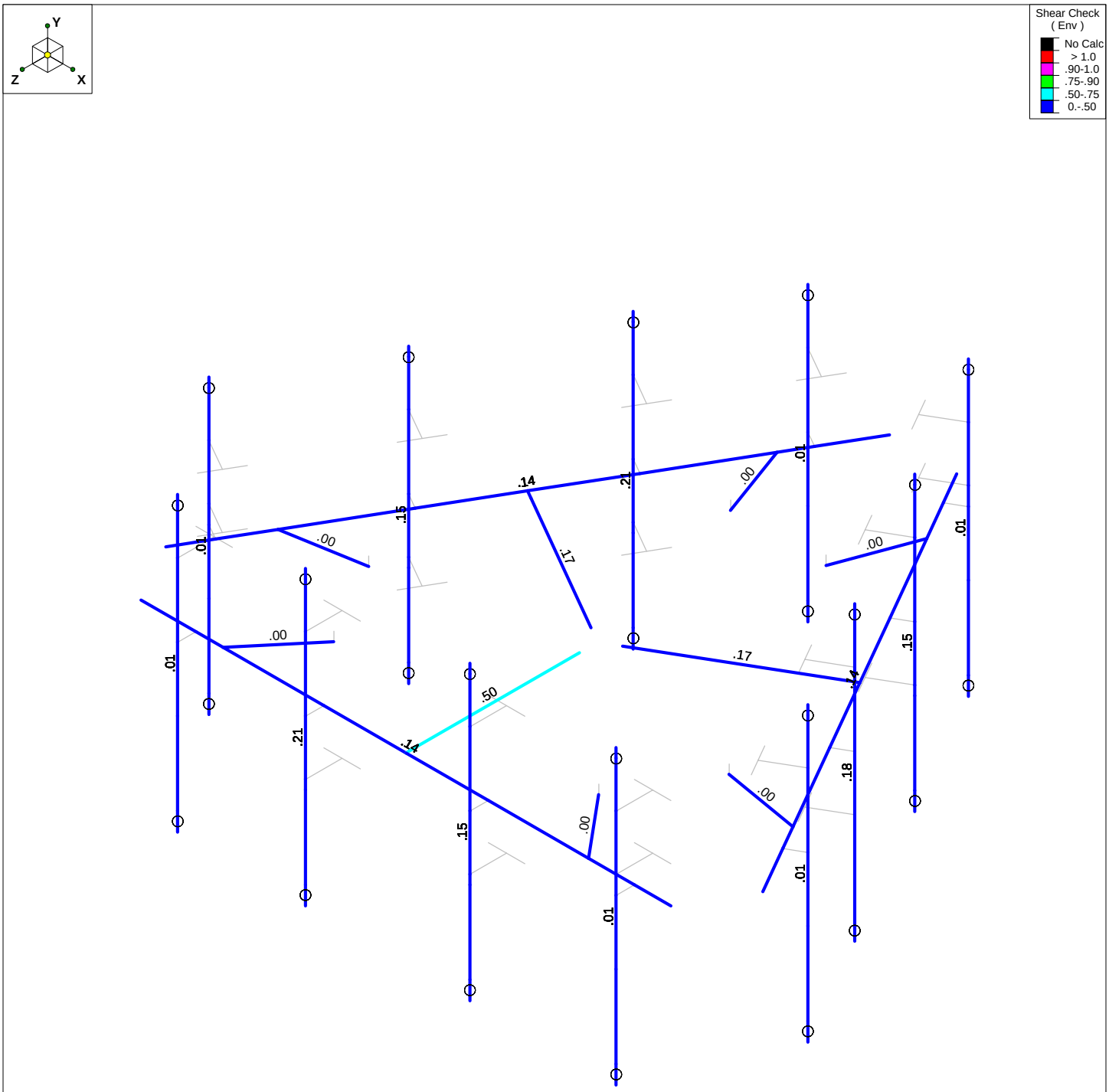
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 1
Jesse Drennen, PE		Mar 15, 2018 at 12:37 PM
		CT23XC409_Mount Analysis_R0 1...



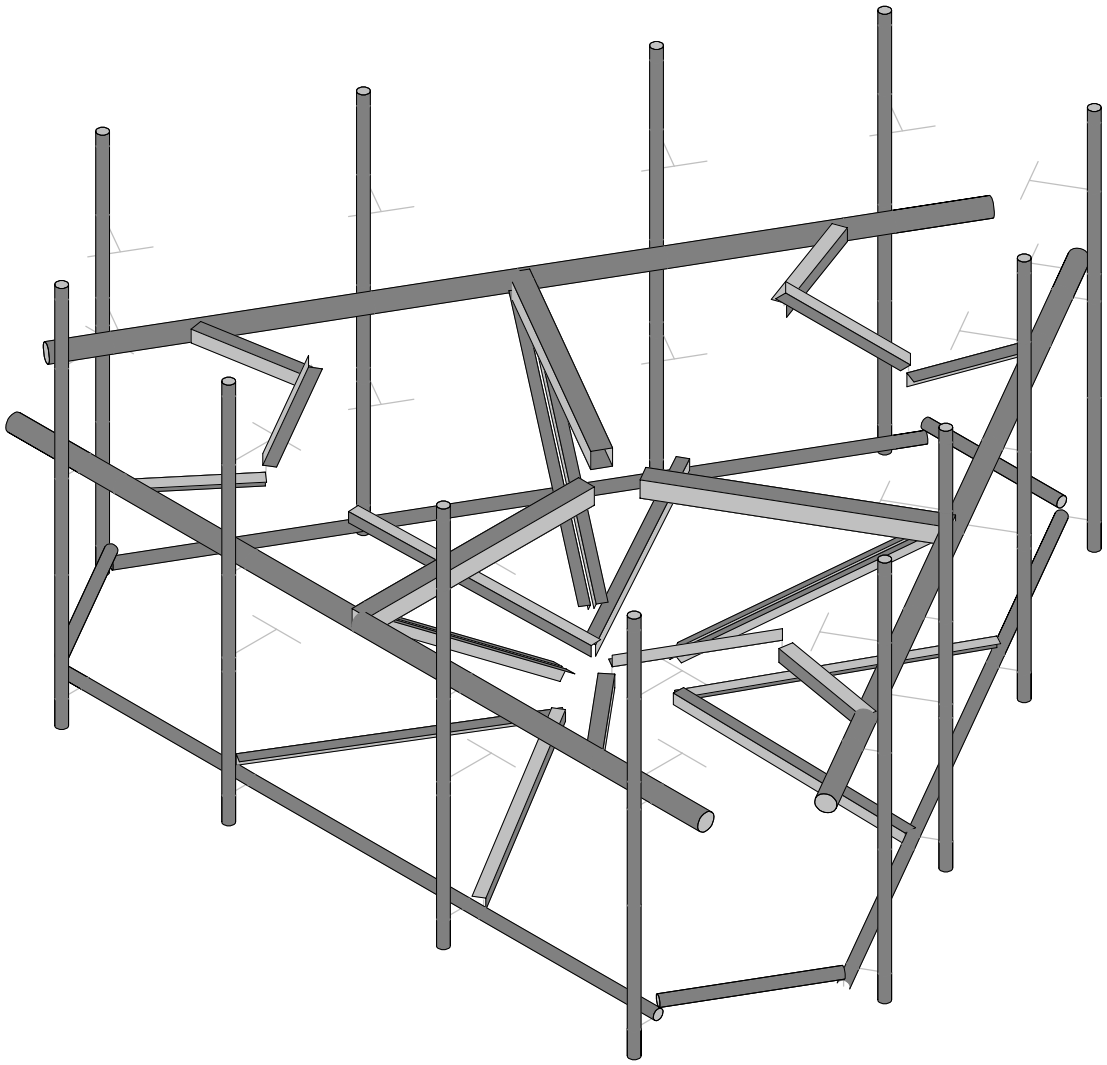
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 2
Jesse Drennen, PE		Mar 15, 2018 at 12:37 PM
		CT23XC409_Mount Analysis_R0 1...



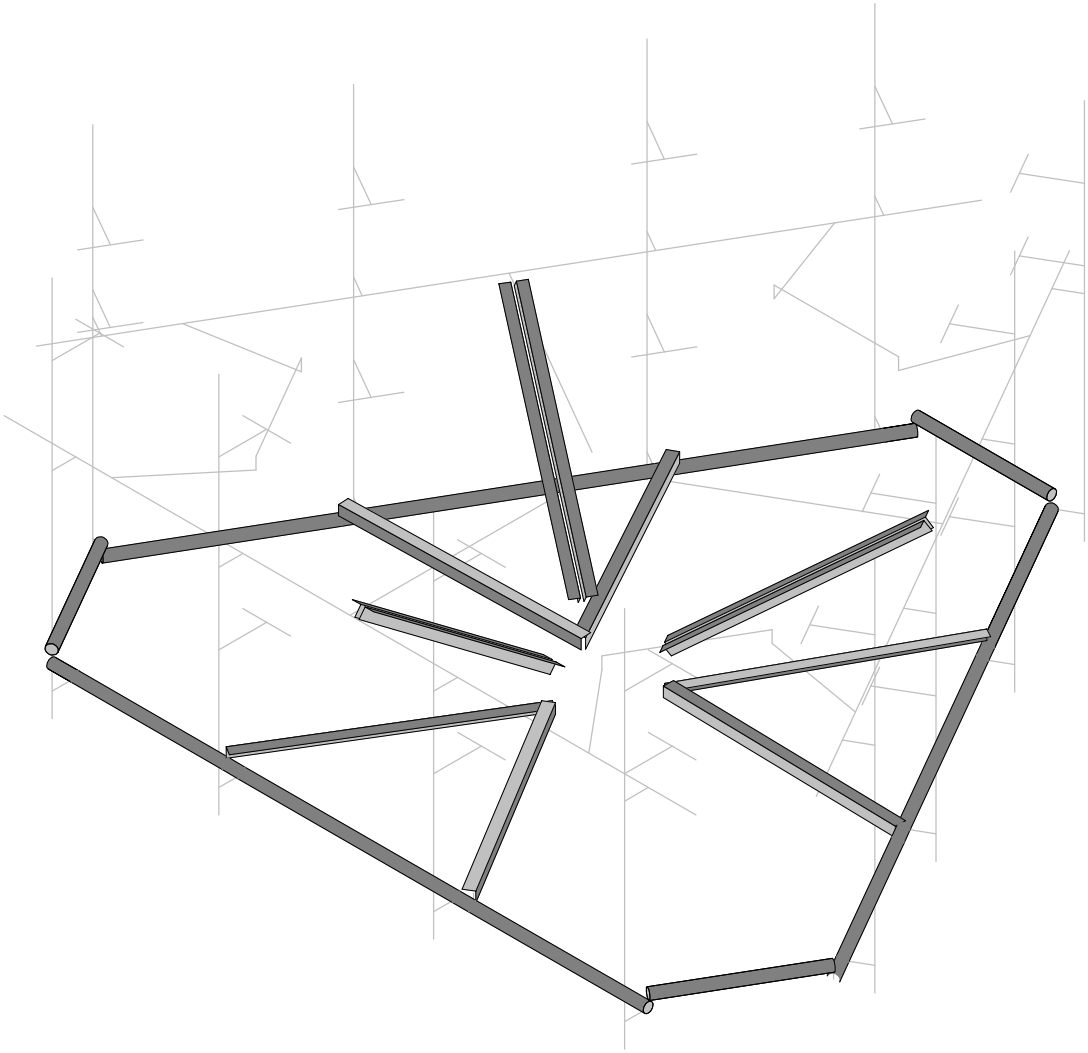
Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 3
Jesse Drennen, PE		Mar 15, 2018 at 12:38 PM
		CT23XC409_Mount Analysis_R0 1...



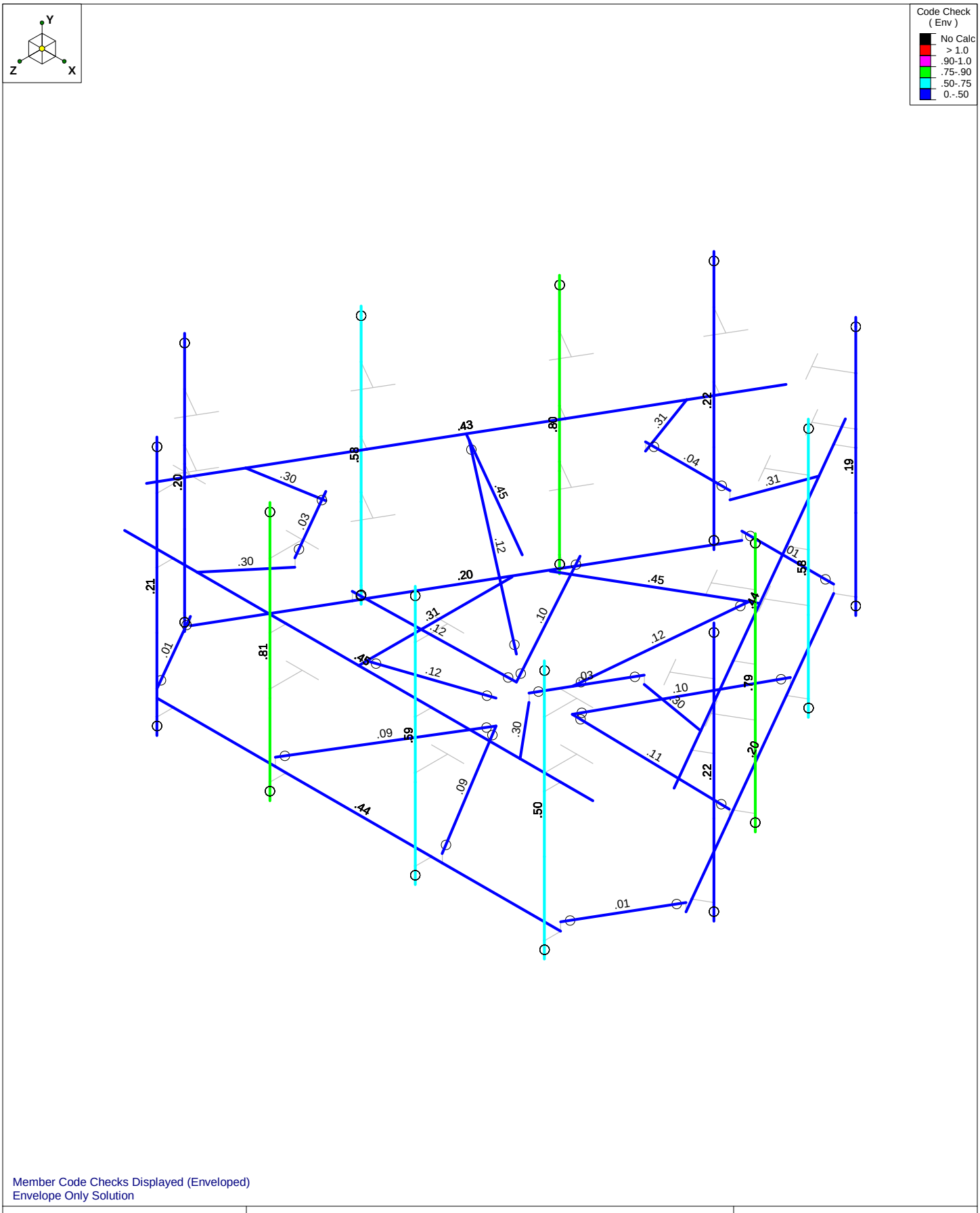
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 1
Jesse Drennen, PE		Mar 15, 2018 at 12:40 PM
		CT23XC409_Mount Analysis_R0 1...



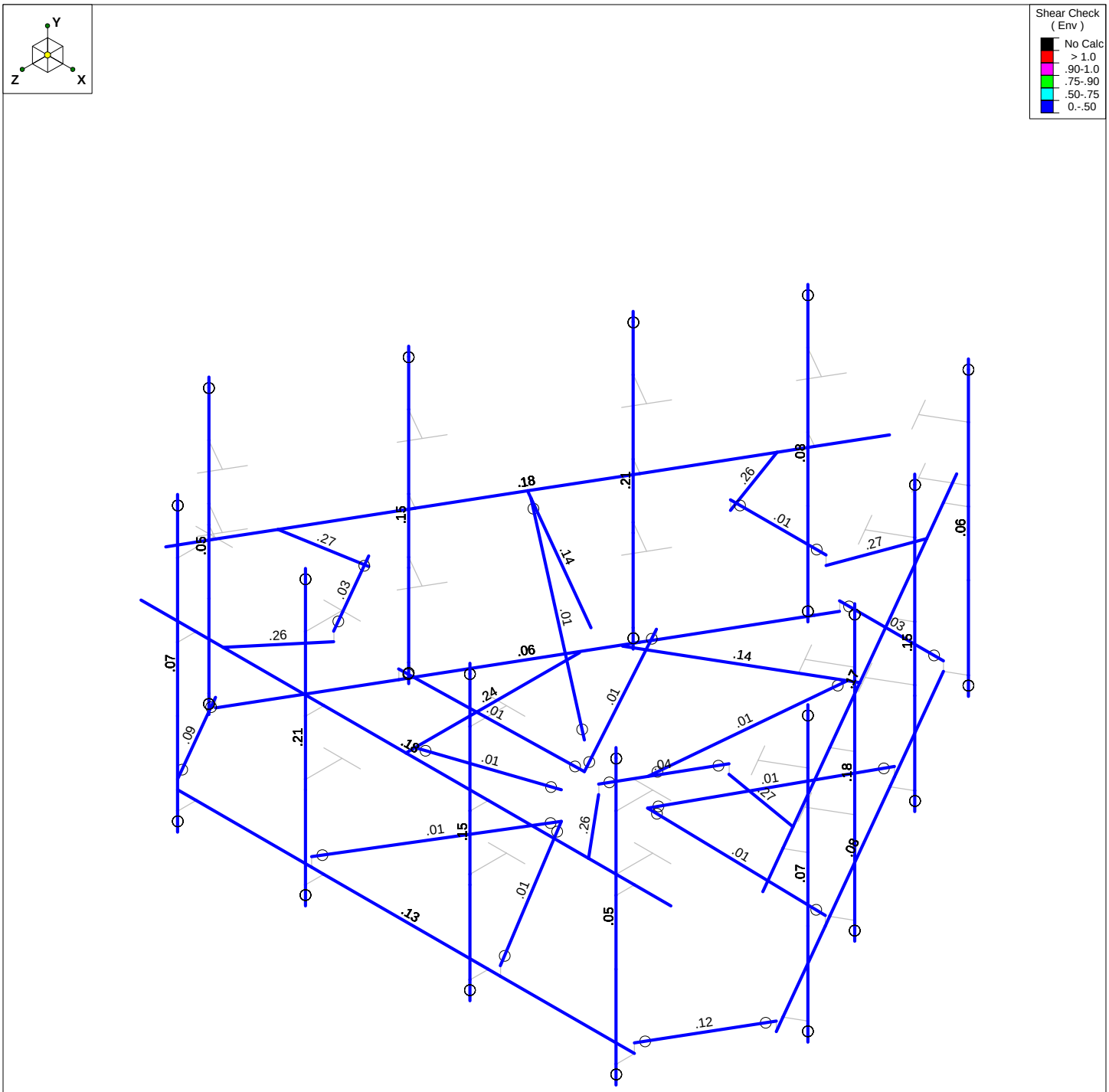
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 7
Jesse Drennen, PE		Mar 15, 2018 at 12:41 PM
		CT23XC409_Mount Analysis_R0 1...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 2
Jesse Drennen, PE		Mar 15, 2018 at 12:40 PM
		CT23XC409_Mount Analysis_R0 1...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

GeoStructural, LLC	CT23XC409	SK - 3
Jesse Drennen, PE		Mar 15, 2018 at 12:40 PM
		CT23XC409_Mount Analysis_R0 1...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	D	DL		-1		25		3		
2	Di	SL				25		45		
3	Lm [500]	LL				1				
4	Lv [250]	LL				2				
5	Woz	WL				25		42		
6	Wox	WL				25		42		
7	Wiz	WL				25		42		
8	Wix	WL				25		42		
9	Ez	EL				25				
10	Ex	EL				25				

Load Combination Design

	Description	ASIF	CD	ABIF	Service	Hot Rolled	Cold For...	Wood	Concrete	Masonry	Footings	Aluminum	Connecti...
1	1) 1.4D					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	ASIF	CD	ABIF	Service	Hot Rolled	Cold For...	Wood	Concrete	Masonry	Footings	Aluminum	Connecti...
42	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	5) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	6) 1.2D+1.5...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	7) (1.2+0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	8) (0.9-0.2S...					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N36	max	3.307	36	2.959	36	-.298	17	0	47	0	47	0	5
2		min	.525	18	.411	18	-1.909	36	0	5	0	5	0	47
3	N37	max	.045	17	2.962	32	3.825	32	0	1	.002	47	.002	47
4		min	-.044	23	.388	14	.559	14	0	1	0	5	0	5
5	N47	max	.532	41	.088	33	.453	2	0	1	0	1	0	1
6		min	-.106	11	.011	47	-.43	20	0	1	0	1	0	1
7	N54	max	.355	6	.088	37	.23	12	0	1	0	1	0	1
8		min	-.329	24	.013	70	-.231	18	0	1	0	1	0	1
9	N80	max	-.521	22	2.96	28	-.296	23	0	5	0	47	0	5
10		min	-3.308	28	.407	22	-1.909	28	0	47	0	5	0	47
11	N84	max	.323	16	.088	29	.236	15	0	1	0	1	0	1
12		min	-.335	10	.013	74	-.261	10	0	1	0	1	0	1
13	N19	max	1.372	5	.457	14	1.662	14	.653	8	3.847	5	1.933	47
14		min	-1.357	11	-.498	8	-4.313	8	-.655	2	-3.841	11	-1.062	5
15	N95	max	3.921	5	.437	22	2.576	2	.837	12	5.46	13	.693	3
16		min	-1.627	23	-.478	4	-1.23	20	-.748	18	-5.448	7	-.651	21
17	N96	max	1.666	17	.433	18	2.515	2	.75	16	5.397	9	.719	7
18		min	-3.973	11	-.474	12	-1.19	20	-.814	10	-5.399	3	-.67	25
19	Totals:	max	6.592	17	8.631	30	6.439	2						

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
20		min	-6.592	23	2.471	73	-6.439	20						

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M4	1	max	.572	8	.696	47	.463	5	9.657e-03	5	NC	1	NC	1
2			min	-.561	14	-.641	5	-.401	23	-9.863e-03	47	NC	1	NC	1
3		2	max	.572	8	.688	47	.465	5	9.657e-03	5	NC	1	NC	1
4			min	-.561	14	-.636	5	-.403	23	-9.863e-03	47	NC	1	NC	1
5		3	max	.572	8	.68	47	.467	5	9.657e-03	5	NC	1	NC	1
6			min	-.561	14	-.63	5	-.405	23	-9.863e-03	47	NC	1	NC	1
7		4	max	.572	8	.672	47	.469	5	9.657e-03	5	NC	1	NC	1
8			min	-.561	14	-.625	5	-.408	23	-9.863e-03	47	NC	1	NC	1
9		5	max	.572	8	.664	47	.472	5	9.657e-03	5	NC	1	NC	1
10			min	-.561	14	-.62	5	-.41	23	-9.863e-03	47	NC	1	NC	1
11	M5	1	max	.664	47	.467	48	.319	7	8.802e-03	7	NC	1	NC	2
12			min	-.619	5	-.158	6	-.293	49	-8.199e-03	25	107.736	39	259.282	45
13		2	max	.664	47	.238	39	.342	8	8.393e-03	8	NC	2	NC	1
14			min	-.62	5	-.088	9	-.324	14	-8.027e-03	14	142.902	39	397.891	45
15		3	max	.664	47	.203	16	.417	8	7.989e-03	8	NC	10	NC	1
16			min	-.62	5	-.216	10	-.408	14	-7.896e-03	14	220.98	39	390.721	3
17		4	max	.664	47	.414	5	.538	8	7.888e-03	20	NC	9	NC	1
18			min	-.62	5	-.368	23	-.528	14	-7.863e-03	14	172.676	5	257.426	3
19		5	max	.664	47	.646	5	.673	8	7.888e-03	20	NC	8	NC	1
20			min	-.62	5	-.537	23	-.661	14	-7.863e-03	14	121.766	5	188.227	3
21	M6	1	max	.463	5	.637	47	.514	14	5.691e-03	15	NC	1	NC	1
22			min	-.401	23	-.583	5	-.524	8	-5.743e-03	9	NC	1	NC	1
23		2	max	.463	5	.666	47	.538	14	5.691e-03	15	NC	1	NC	1
24			min	-.401	23	-.612	5	-.548	8	-5.743e-03	9	NC	1	NC	1
25		3	max	.463	5	.696	47	.561	14	5.691e-03	15	NC	1	NC	1
26			min	-.401	23	-.641	5	-.572	8	-5.743e-03	9	NC	1	NC	1
27		4	max	.463	5	.725	47	.585	14	5.691e-03	15	NC	1	NC	1
28			min	-.401	23	-.67	5	-.595	8	-5.743e-03	9	NC	1	NC	1
29		5	max	.463	5	.755	47	.608	14	5.691e-03	15	NC	1	NC	1
30			min	-.401	23	-.699	5	-.619	8	-5.743e-03	9	NC	1	NC	1
31	M7	1	max	.325	20	.191	18	.569	17	1.5e-02	17	NC	1	NC	1
32			min	-.371	2	-.469	48	-.62	11	-1.811e-02	47	NC	1	NC	1
33		2	max	.325	20	.172	18	.56	17	1.5e-02	17	NC	1	NC	1
34			min	-.371	2	-.459	48	-.612	11	-1.811e-02	47	NC	1	NC	1
35		3	max	.325	20	.153	18	.551	17	1.5e-02	17	NC	1	NC	1
36			min	-.371	2	-.449	47	-.604	11	-1.811e-02	47	NC	1	NC	1
37		4	max	.325	20	.154	17	.542	17	1.5e-02	17	NC	1	NC	1
38			min	-.371	2	-.44	47	-.596	11	-1.811e-02	47	NC	1	NC	1
39		5	max	.325	20	.158	17	.533	17	1.5e-02	17	NC	1	NC	1
40			min	-.371	2	-.431	47	-.588	11	-1.811e-02	47	NC	1	NC	1
41	M8	1	max	.158	17	.549	47	.25	48	4.276e-03	2	NC	1	NC	1
42			min	-.432	47	-.126	5	-.063	7	-6.291e-03	44	1585.344	31	267.345	38
43		2	max	.158	17	.263	42	.116	42	4.685e-03	2	NC	1	NC	1
44			min	-.432	47	-.061	11	-.038	36	-4.524e-03	20	326.631	47	426.968	38
45		3	max	.158	17	.21	5	.074	19	5.231e-03	2	NC	14	NC	1
46			min	-.431	47	-.205	23	-.081	13	-4.994e-03	20	178.024	47	704.234	7
47		4	max	.158	17	.446	17	.247	19	5.372e-03	3	NC	8	NC	28
48			min	-.431	47	-.488	11	-.272	13	-5.142e-03	21	100.783	47	296.543	13
49		5	max	.158	17	.813	17	.584	20	5.8e-03	3	NC	20	NC	5
50			min	-.431	47	-.907	11	-.708	2	-5.581e-03	21	69.183	47	129.02	2
51	M9	1	max	.569	17	.268	18	.401	2	1.778e-02	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
52			min	-.62	11	-.576	48	-.354	20	-1.348e-02	20	NC	1	NC	1
53		2	max	.569	17	.23	18	.386	2	1.778e-02	2	NC	1	NC	1
54			min	-.62	11	-.523	48	-.339	20	-1.348e-02	20	NC	1	NC	1
55		3	max	.569	17	.191	18	.371	2	1.778e-02	2	NC	1	NC	1
56			min	-.62	11	-.469	48	-.325	20	-1.348e-02	20	NC	1	NC	1
57		4	max	.569	17	.155	19	.356	2	1.778e-02	2	NC	1	NC	1
58			min	-.62	11	-.415	48	-.31	20	-1.348e-02	20	NC	1	NC	1
59		5	max	.569	17	.134	19	.346	13	1.778e-02	2	NC	1	NC	1
60			min	-.62	11	-.362	49	-.3	19	-1.348e-02	20	NC	1	NC	1
61	M10	1	max	.488	19	.481	17	.404	17	7.169e-03	17	NC	1	NC	1
62			min	-.499	13	-1.334	47	-.528	47	-1.822e-02	47	NC	1	NC	1
63		2	max	.488	19	.475	17	.406	17	7.169e-03	17	NC	1	NC	1
64			min	-.499	13	-1.333	47	-.526	47	-1.822e-02	47	NC	1	NC	1
65		3	max	.488	19	.469	17	.407	17	7.169e-03	17	NC	1	NC	1
66			min	-.499	13	-1.332	47	-.525	47	-1.822e-02	47	NC	1	NC	1
67		4	max	.488	19	.464	17	.409	17	7.169e-03	17	NC	1	NC	1
68			min	-.499	13	-1.331	47	-.524	47	-1.822e-02	47	NC	1	NC	1
69		5	max	.488	19	.458	17	.411	17	7.169e-03	17	NC	1	NC	1
70			min	-.499	13	-1.33	47	-.523	47	-1.822e-02	47	NC	1	NC	1
71	M11	1	max	.458	17	.499	46	.301	21	7.879e-03	14	NC	1	NC	1
72			min	-1.329	47	-.124	4	-.329	3	-8.028e-03	8	2265.805	27	390.029	48
73		2	max	.458	17	.255	42	.317	20	7.563e-03	2	NC	1	NC	1
74			min	-1.329	47	-.065	12	-.338	2	-7.524e-03	20	383.207	47	679.512	50
75		3	max	.458	17	.207	5	.362	20	7.162e-03	2	NC	4	NC	1
76			min	-1.33	47	-.206	23	-.38	2	-6.873e-03	20	196.871	47	563.722	7
77		4	max	.458	17	.369	17	.459	19	7.062e-03	2	NC	1	NC	1
78			min	-1.33	47	-.414	47	-.472	13	-6.71e-03	20	105.307	47	346.527	7
79		5	max	.458	17	.541	17	.576	19	7.062e-03	2	NC	3	NC	1
80			min	-1.33	47	-.851	47	-.581	13	-6.71e-03	20	71.171	47	243.129	7
81	M12	1	max	.404	17	.524	17	.539	13	4.558e-03	25	NC	1	NC	1
82			min	-.528	47	-1.444	47	-.525	19	-4.885e-03	7	NC	1	NC	1
83		2	max	.404	17	.502	17	.519	13	4.558e-03	25	NC	1	NC	1
84			min	-.528	47	-1.389	47	-.507	19	-4.885e-03	7	NC	1	NC	1
85		3	max	.404	17	.481	17	.499	13	4.558e-03	25	NC	1	NC	1
86			min	-.528	47	-1.334	47	-.488	19	-4.885e-03	7	NC	1	NC	1
87		4	max	.404	17	.459	17	.479	13	4.558e-03	25	NC	1	NC	1
88			min	-.528	47	-1.28	47	-.47	19	-4.885e-03	7	NC	1	NC	1
89		5	max	.404	17	.438	17	.46	13	4.558e-03	25	NC	1	NC	1
90			min	-.528	47	-1.225	47	-.451	19	-4.885e-03	7	NC	1	NC	1
91	M37	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
92			min	0	1	0	1	0	1	0	1	NC	1	NC	1
93		2	max	.001	8	.004	20	.029	5	1.628e-03	5	NC	1	NC	1
94			min	0	14	-.004	2	-.029	11	-2.963e-03	47	6187.198	8	1939.706	5
95		3	max	.002	8	.01	20	.097	5	3.257e-03	5	NC	1	NC	1
96			min	0	14	-.011	2	-.097	11	-5.927e-03	47	2953.034	8	587.587	11
97		4	max	.003	8	.006	20	.176	17	4.885e-03	5	NC	1	NC	1
98			min	-.001	14	-.011	2	-.177	11	-8.89e-03	47	2866.976	8	322.136	11
99		5	max	.004	8	.006	14	.242	17	6.514e-03	5	NC	2	NC	1
100			min	-.002	14	-.022	32	-.244	11	-1.185e-02	47	2621.06	32	233.674	11
101	M38	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
102			min	0	1	0	1	0	1	0	1	NC	1	NC	1
103		2	max	.001	12	.004	24	.042	9	1.375e-03	9	NC	1	NC	1
104			min	0	18	-.004	6	-.042	3	-1.246e-03	15	6798.471	24	1359.93	3
105		3	max	.002	12	.009	24	.142	9	2.749e-03	9	NC	1	NC	1
106			min	0	18	-.011	6	-.143	3	-2.491e-03	15	3217.049	24	399.509	3
107		4	max	.003	12	.006	24	.269	21	4.124e-03	9	NC	1	NC	1
108			min	-.001	18	-.011	6	-.27	3	-3.737e-03	15	3114.152	24	210.805	3

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
109		5	max	.004	12	.005	18	.391	21	5.499e-03	9	NC	4	NC	1
110			min	-.002	18	-.022	36	-.394	3	-4.983e-03	15	2629.218	36	144.772	3
111	M48	1	max	.382	20	.469	17	.242	17	6.418e-03	17	NC	1	NC	1
112			min	-.398	2	-1.332	47	-.244	11	-1.816e-02	47	NC	1	NC	1
113		2	max	.382	20	.467	17	.243	17	6.418e-03	17	NC	1	NC	1
114			min	-.398	2	-1.332	47	-.246	11	-1.816e-02	47	NC	1	NC	1
115		3	max	.382	20	.464	17	.244	17	6.418e-03	17	NC	1	NC	1
116			min	-.398	2	-1.331	47	-.248	11	-1.816e-02	47	NC	1	NC	1
117		4	max	.382	20	.461	17	.245	17	6.418e-03	17	NC	1	NC	1
118			min	-.398	2	-1.33	47	-.249	11	-1.816e-02	47	NC	1	NC	1
119		5	max	.382	20	.458	17	.246	17	6.418e-03	17	NC	1	NC	1
120			min	-.398	2	-1.33	47	-.251	11	-1.816e-02	47	NC	1	NC	1
121	M49	1	max	.097	19	.164	17	.242	17	6.62e-03	17	NC	1	NC	1
122			min	-.101	13	-.431	47	-.244	11	-1.743e-02	47	NC	1	NC	1
123		2	max	.097	19	.163	17	.244	17	6.62e-03	17	NC	1	NC	1
124			min	-.101	13	-.431	47	-.246	11	-1.743e-02	47	NC	1	NC	1
125		3	max	.097	19	.161	17	.245	17	6.62e-03	17	NC	1	NC	1
126			min	-.101	13	-.431	47	-.248	11	-1.743e-02	47	NC	1	NC	1
127		4	max	.097	19	.159	17	.247	17	6.62e-03	17	NC	1	NC	1
128			min	-.101	13	-.431	47	-.25	11	-1.743e-02	47	NC	1	NC	1
129		5	max	.097	19	.158	17	.248	17	6.62e-03	17	NC	1	NC	1
130			min	-.101	13	-.431	47	-.252	11	-1.743e-02	47	NC	1	NC	1
131	M50	1	max	.444	8	.68	47	.242	17	8.904e-03	5	NC	1	NC	1
132			min	-.435	14	-.63	5	-.244	11	-9.809e-03	47	NC	1	NC	1
133		2	max	.444	8	.676	47	.243	17	8.904e-03	5	NC	1	NC	1
134			min	-.435	14	-.628	5	-.245	11	-9.809e-03	47	NC	1	NC	1
135		3	max	.444	8	.672	47	.244	17	8.904e-03	5	NC	1	NC	1
136			min	-.435	14	-.625	5	-.246	11	-9.809e-03	47	NC	1	NC	1
137		4	max	.444	8	.668	47	.246	17	8.904e-03	5	NC	1	NC	1
138			min	-.435	14	-.622	5	-.247	11	-9.809e-03	47	NC	1	NC	1
139		5	max	.444	8	.664	47	.247	17	8.904e-03	5	NC	1	NC	1
140			min	-.435	14	-.62	5	-.248	11	-9.809e-03	47	NC	1	NC	1
141	M61	1	max	.289	6	.423	3	.622	22	6.499e-03	4	NC	2	NC	2
142			min	-.283	24	-.301	21	-.636	4	-5.169e-03	22	143.306	5	118.339	11
143		2	max	.289	6	.404	3	.561	22	1.184e-02	7	NC	4	NC	27
144			min	-.283	24	-.292	21	-.572	4	-1.051e-02	25	192.112	5	160.481	11
145		3	max	.289	6	.391	3	.497	22	2.416e-02	7	NC	4	NC	26
146			min	-.283	24	-.287	21	-.505	4	-2.268e-02	25	289.17	5	243.256	11
147		4	max	.289	6	.38	3	.431	22	3.699e-02	8	NC	3	NC	1
148			min	-.283	24	-.285	21	-.435	4	-3.533e-02	14	579.471	5	489.105	11
149		5	max	.289	6	.371	3	.364	10	5.039e-02	8	NC	1	NC	1
150			min	-.283	24	-.283	21	-.364	16	-4.858e-02	14	1731.846	47	835.075	71
151	M62	1	max	.19	18	.511	3	.476	9	5.515e-03	14	NC	2	NC	2
152			min	-.195	12	-.504	21	-.296	15	-7.662e-03	8	230.873	7	171.987	13
153		2	max	.19	18	.475	3	.453	9	1.087e-02	23	NC	2	NC	19
154			min	-.195	12	-.468	21	-.284	15	-1.298e-02	5	309.006	7	231.537	13
155		3	max	.19	18	.43	3	.435	9	2.293e-02	22	NC	2	NC	19
156			min	-.195	12	-.423	21	-.278	15	-2.522e-02	4	464.477	7	348.866	13
157		4	max	.19	18	.38	3	.421	9	3.631e-02	22	NC	2	NC	19
158			min	-.195	12	-.372	21	-.273	15	-3.875e-02	4	929.93	7	294.448	20
159		5	max	.19	18	.328	3	.408	9	4.97e-02	22	NC	1	NC	1
160			min	-.195	12	-.318	21	-.27	15	-5.227e-02	4	NC	1	210.204	20
161	M63	1	max	.394	3	.427	15	.548	2	4.639e-03	13	NC	2	NC	1
162			min	-.391	21	-.679	9	-.542	20	-4.576e-03	19	159.439	9	269.291	2
163		2	max	.394	3	.215	15	.268	2	4.898e-03	12	NC	36	NC	1
164			min	-.391	21	-.345	9	-.263	20	-4.523e-03	18	228.243	21	474.467	2
165		3	max	.394	3	.005	18	.004	12	2.554e-03	12	NC	18	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
166			min	-.391	21	-.022	36	-.002	18	-1.81e-03	18	393.12	21	381.951	3
167		4	max	.394	3	.219	21	.379	23	4.297e-03	11	NC	18	NC	1
168			min	-.391	21	-.305	3	-.387	5	-3.773e-03	17	241.901	15	239.808	3
169		5	max	.394	3	.436	21	.838	23	4.235e-03	11	NC	1	NC	2
170			min	-.391	21	-.604	3	-.86	5	-3.902e-03	17	172.879	15	167.928	4
171	M67	1	max	.25	3	1.051	47	.289	18	1.487e-02	48	NC	3	NC	5
172			min	-.242	21	-.374	17	-.301	12	-6.191e-03	18	228.545	13	122.848	44
173		2	max	.25	3	.975	47	.262	18	1.189e-02	3	NC	6	NC	13
174			min	-.242	21	-.358	17	-.271	12	-1.053e-02	21	307.578	13	169.087	44
175		3	max	.25	3	.901	47	.232	18	2.415e-02	3	NC	6	NC	5
176			min	-.242	21	-.346	17	-.238	12	-2.262e-02	21	464.251	13	259.276	43
177		4	max	.25	3	.829	47	.199	18	3.642e-02	3	NC	5	NC	1
178			min	-.242	21	-.336	17	-.202	12	-3.472e-02	21	931.902	13	451.24	6
179		5	max	.25	3	.758	47	.166	6	4.921e-02	4	NC	1	NC	1
180			min	-.242	21	-.327	17	-.165	24	-4.721e-02	22	NC	1	324.494	6
181	M68	1	max	.282	25	.335	9	.55	5	9.172e-03	46	NC	4	NC	3
182			min	-.287	7	-.331	15	-.592	47	-8.64e-03	4	208.016	3	135.31	8
183		2	max	.282	25	.298	10	.523	5	9.352e-03	19	NC	4	NC	11
184			min	-.287	7	-.294	16	-.565	47	-1.15e-02	13	277.504	3	188.675	8
185		3	max	.282	25	.261	10	.501	5	2.091e-02	18	NC	4	NC	23
186			min	-.287	7	-.256	16	-.54	47	-2.329e-02	12	416.178	3	291.915	8
187		4	max	.282	25	.221	10	.482	5	3.389e-02	18	NC	4	NC	35
188			min	-.287	7	-.215	16	-.516	47	-3.643e-02	12	832.014	3	240.512	15
189		5	max	.282	25	.18	10	.465	5	4.688e-02	18	NC	1	NC	1
190			min	-.287	7	-.172	16	-.492	47	-4.957e-02	12	NC	1	179.481	15
191	M69	1	max	.244	11	.856	47	.586	8	5.092e-03	9	NC	9	NC	1
192			min	-.242	17	-.791	5	-.577	14	-5.04e-03	15	132.416	5	705.545	10
193		2	max	.244	11	.432	47	.244	9	5.199e-03	8	NC	2	NC	1
194			min	-.242	17	-.397	5	-.239	15	-4.835e-03	14	188.348	17	622.254	25
195		3	max	.244	11	.006	14	.004	8	2.662e-03	8	NC	58	NC	1
196			min	-.242	17	-.022	32	-.002	14	-1.921e-03	14	199.855	47	361.118	2
197		4	max	.244	11	.27	17	.187	19	4.313e-03	8	7279.938	29	NC	1
198			min	-.242	17	-.734	47	-.195	13	-3.784e-03	25	109.429	47	577.902	2
199		5	max	.244	11	.546	17	.463	20	4.234e-03	7	NC	1	NC	2
200			min	-.242	17	-1.55	47	-.483	2	-3.908e-03	25	72.314	47	750.861	60
201	M64A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
202			min	0	1	0	1	0	1	0	1	NC	1	NC	1
203		2	max	0	14	.004	14	.061	17	6.385e-04	5	NC	1	NC	1
204			min	-.002	32	-.016	32	-.062	11	-2.118e-03	47	4893.142	32	3832.255	43
205		3	max	0	14	.006	14	.12	17	1.277e-03	5	NC	1	NC	1
206			min	-.003	32	-.025	32	-.121	11	-4.236e-03	47	3486.364	32	1911.78	43
207		4	max	0	14	.005	14	.176	17	1.916e-03	5	NC	1	NC	1
208			min	-.005	32	-.024	32	-.178	11	-6.354e-03	47	4893.142	32	1270.958	43
209		5	max	0	14	.001	14	.23	17	2.554e-03	5	NC	1	NC	1
210			min	-.007	32	-.016	32	-.232	11	-8.472e-03	47	NC	1	950.814	43
211	M66A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
212			min	0	1	0	1	0	1	0	1	NC	1	NC	1
213		2	max	0	18	.01	18	.098	21	5.162e-04	5	NC	1	NC	1
214			min	-.002	36	-.017	36	-.099	3	-5.148e-04	47	4439.603	12	4405.141	42
215		3	max	0	18	.014	18	.192	21	1.032e-03	5	NC	1	NC	1
216			min	-.003	36	-.026	36	-.193	3	-1.03e-03	47	3163.217	12	2197.014	42
217		4	max	0	18	.01	18	.282	21	1.549e-03	5	NC	1	NC	1
218			min	-.005	36	-.025	36	-.283	3	-1.544e-03	47	4439.603	12	1460.125	42
219		5	max	0	18	.001	18	.367	21	2.065e-03	5	NC	1	NC	1
220			min	-.007	36	-.016	36	-.37	3	-2.059e-03	47	NC	1	1092.024	42
221	M68B	1	max	.297	21	.484	17	.423	47	6.457e-03	17	NC	1	NC	1
222			min	-.323	3	-1.361	47	-.077	5	-1.279e-02	47	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
223		2	max	.297	21	.478	17	.423	47	6.457e-03	17	NC	1	NC	1
224			min	-.323	3	-1.353	47	-.079	5	-1.279e-02	47	NC	1	NC	1
225		3	max	.297	21	.471	17	.422	47	6.457e-03	17	NC	1	NC	1
226			min	-.323	3	-1.345	47	-.08	5	-1.279e-02	47	NC	1	NC	1
227		4	max	.297	21	.465	17	.422	46	6.457e-03	17	NC	1	NC	1
228			min	-.323	3	-1.337	47	-.083	4	-1.279e-02	47	NC	1	NC	1
229		5	max	.297	21	.458	17	.422	46	6.457e-03	17	NC	1	NC	1
230			min	-.323	3	-1.329	47	-.091	4	-1.279e-02	47	NC	1	NC	1
231	M69B	1	max	.218	48	.169	17	.423	47	7.137e-03	17	NC	1	NC	1
232			min	-.049	7	-.464	47	-.077	5	-1.502e-02	47	NC	1	NC	1
233		2	max	.218	48	.166	17	.432	47	7.137e-03	17	NC	1	NC	1
234			min	-.049	7	-.456	47	-.079	5	-1.502e-02	47	NC	1	NC	1
235		3	max	.218	48	.163	17	.441	47	7.137e-03	17	NC	1	NC	1
236			min	-.049	7	-.448	47	-.08	5	-1.502e-02	47	NC	1	NC	1
237		4	max	.218	48	.161	17	.45	47	7.137e-03	17	NC	1	NC	1
238			min	-.049	7	-.44	47	-.082	5	-1.502e-02	47	NC	1	NC	1
239		5	max	.218	48	.158	17	.459	46	7.137e-03	17	NC	1	NC	1
240			min	-.049	7	-.432	47	-.083	5	-1.502e-02	47	NC	1	NC	1
241	M70B	1	max	.319	7	.698	47	.422	47	7.967e-03	5	NC	1	NC	1
242			min	-.291	25	-.648	5	-.078	5	-9.282e-03	47	NC	1	NC	1
243		2	max	.319	7	.689	47	.419	48	7.967e-03	5	NC	1	NC	1
244			min	-.291	25	-.641	5	-.086	6	-9.282e-03	47	NC	1	NC	1
245		3	max	.319	7	.681	47	.416	48	7.967e-03	5	NC	1	NC	1
246			min	-.291	25	-.634	5	-.096	6	-9.282e-03	47	NC	1	NC	1
247		4	max	.319	7	.672	47	.414	48	7.967e-03	5	NC	1	NC	1
248			min	-.291	25	-.627	5	-.106	6	-9.282e-03	47	NC	1	NC	1
249		5	max	.319	7	.664	47	.412	48	7.967e-03	5	NC	1	NC	1
250			min	-.291	25	-.619	5	-.116	6	-9.282e-03	47	NC	1	NC	1
251	M71A	1	max	.078	5	.752	47	.372	7	6.188e-03	46	NC	9	NC	1
252			min	-.422	47	-.695	5	-.341	25	-5.61e-03	4	129.461	5	314.525	48
253		2	max	.078	5	.393	47	.068	6	3.582e-03	46	NC	2	NC	1
254			min	-.422	47	-.347	5	-.264	48	-4.186e-03	4	184.031	17	303.544	48
255		3	max	.077	5	.002	14	.08	14	1.923e-03	20	NC	31	NC	1
256			min	-.422	47	-.098	32	-.086	8	-2.728e-03	2	181.869	47	379.562	2
257		4	max	.077	5	.242	17	.262	46	2.89e-03	18	7915.194	52	NC	1
258			min	-.423	47	-.649	47	-.055	4	-5.041e-03	48	107.107	47	316.344	45
259		5	max	.077	5	.484	17	.297	21	4.61e-03	6	NC	1	NC	1
260			min	-.423	47	-1.361	47	-.323	3	-5.284e-03	48	71.007	47	319.341	45
261	M73	1	max	.286	5	.387	47	.234	47	5.143e-03	25	NC	1	NC	1
262			min	-.321	47	-.053	6	-.033	6	-5.715e-03	7	NC	1	NC	1
263		2	max	.286	5	.396	47	.236	47	5.143e-03	25	NC	1	NC	1
264			min	-.321	47	-.059	6	-.034	6	-5.715e-03	7	NC	1	NC	1
265		3	max	.286	5	.405	47	.239	47	5.143e-03	25	NC	1	NC	1
266			min	-.321	47	-.065	6	-.035	5	-5.715e-03	7	NC	1	NC	1
267		4	max	.286	5	.413	47	.241	47	5.143e-03	25	NC	1	NC	1
268			min	-.321	47	-.071	5	-.038	5	-5.715e-03	7	NC	1	NC	1
269		5	max	.286	5	.422	47	.243	47	5.143e-03	25	NC	1	NC	1
270			min	-.321	47	-.078	5	-.04	5	-5.715e-03	7	NC	1	NC	1
271	M74	1	max	.529	47	.371	47	.038	29	4.905e-03	44	NC	1	NC	1
272			min	-.197	17	-.063	29	-.224	47	-5.019e-03	2	NC	1	NC	1
273		2	max	.529	47	.384	47	.038	30	4.905e-03	44	NC	1	NC	1
274			min	-.197	17	-.063	29	-.228	47	-5.019e-03	2	NC	1	NC	1
275		3	max	.529	47	.397	47	.039	6	4.905e-03	44	NC	1	NC	1
276			min	-.197	17	-.067	5	-.231	47	-5.019e-03	2	NC	1	NC	1
277		4	max	.529	47	.41	47	.04	6	4.905e-03	44	NC	1	NC	1
278			min	-.197	17	-.072	5	-.235	47	-5.019e-03	2	NC	1	NC	1
279		5	max	.529	47	.423	47	.042	6	4.905e-03	44	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
280			min	-.197	17	-.077	5	-.239	47	-5.019e-03	2	NC	1	NC	1
281	M75	1	max	0	1	0	1	0	1	9.176e-03	5	NC	1	NC	1
282			min	0	1	0	1	0	1	-1.137e-02	47	NC	1	NC	1
283		2	max	0	44	.07	29	.029	33	9.176e-03	5	NC	1	NC	2
284			min	0	2	-.075	47	-.111	40	-1.137e-02	47	5783.769	72	459.341	48
285		3	max	0	44	.128	29	.048	33	9.176e-03	5	NC	1	NC	2
286			min	0	2	-.153	47	-.222	39	-1.137e-02	47	2817.356	72	226.231	48
287		4	max	.001	44	.203	5	.056	31	9.176e-03	5	NC	1	NC	51
288			min	0	2	-.235	47	-.336	49	-1.137e-02	47	1820.288	72	147.994	47
289		5	max	.001	44	.286	5	.063	6	9.176e-03	5	NC	1	NC	1
290			min	0	2	-.321	47	-.453	47	-1.137e-02	47	1328.141	72	109.033	47
291	M76	1	max	0	1	0	1	0	1	7.034e-03	17	NC	1	NC	1
292			min	0	1	0	1	0	1	-1.726e-02	47	NC	1	NC	1
293		2	max	0	20	.111	42	.136	46	7.034e-03	17	NC	1	NC	2
294			min	0	38	-.016	12	-.031	16	-1.726e-02	47	3980.496	8	1982.89	10
295		3	max	0	20	.22	42	.269	46	7.034e-03	17	NC	1	NC	7
296			min	0	38	-.018	12	-.071	17	-1.726e-02	47	1937.346	8	864.333	10
297		4	max	0	20	.326	46	.4	47	7.034e-03	17	NC	1	NC	2
298			min	-.001	38	-.038	29	-.128	17	-1.726e-02	47	1250.504	8	466.215	11
299		5	max	0	20	.433	47	.529	47	7.034e-03	17	NC	1	NC	1
300			min	-.002	38	-.073	29	-.197	17	-1.726e-02	47	911.655	8	293.985	11
301	M88	1	max	.218	4	.382	15	.247	2	4.38e-03	14	NC	2	NC	1
302			min	-.194	22	-.599	9	-.382	44	-4.836e-03	8	155.197	9	256.628	46
303		2	max	.218	4	.19	15	.146	4	2.818e-03	25	NC	36	NC	1
304			min	-.194	22	-.301	9	-.135	46	-3.678e-03	7	222.684	21	426.666	47
305		3	max	.218	4	0	18	.079	18	1.729e-03	24	NC	6	NC	1
306			min	-.194	22	-.097	36	-.084	12	-2.529e-03	6	358.081	21	512.429	13
307		4	max	.218	4	.194	21	.163	22	2.716e-03	22	NC	18	NC	1
308			min	-.194	22	-.263	3	-.179	4	-3.14e-03	4	236.053	15	433.984	3
309		5	max	.218	4	.388	21	.544	23	4.377e-03	9	NC	1	NC	1
310			min	-.194	22	-.537	3	-.57	5	-4.087e-03	15	167.116	15	251.972	4
311	M90	1	max	.25	9	.005	22	.269	4	4.928e-03	44	NC	1	NC	1
312			min	-.155	15	-.006	4	-.247	22	-4.023e-03	2	NC	1	NC	1
313		2	max	.25	9	.007	22	.266	4	4.928e-03	44	NC	1	NC	1
314			min	-.155	15	-.007	4	-.243	22	-4.023e-03	2	NC	1	NC	1
315		3	max	.25	9	.008	22	.263	4	4.928e-03	44	NC	1	NC	1
316			min	-.155	15	-.009	4	-.239	22	-4.023e-03	2	NC	1	NC	1
317		4	max	.25	9	.01	10	.261	4	4.928e-03	44	NC	1	NC	1
318			min	-.155	15	-.01	16	-.235	22	-4.023e-03	2	NC	1	NC	1
319		5	max	.25	9	.012	10	.258	4	4.928e-03	44	NC	1	NC	1
320			min	-.155	15	-.011	16	-.23	22	-4.023e-03	2	NC	1	NC	1
321	M91	1	max	.218	3	.241	4	.132	4	8.112e-03	23	NC	1	NC	1
322			min	-.158	21	-.214	22	-.117	22	-8.316e-03	5	NC	1	NC	1
323		2	max	.218	3	.237	4	.129	4	8.112e-03	23	NC	1	NC	1
324			min	-.158	21	-.211	22	-.115	22	-8.316e-03	5	NC	1	NC	1
325		3	max	.218	3	.233	4	.127	4	8.112e-03	23	NC	1	NC	1
326			min	-.158	21	-.207	22	-.113	22	-8.316e-03	5	NC	1	NC	1
327		4	max	.218	3	.229	4	.124	4	8.112e-03	23	NC	1	NC	1
328			min	-.158	21	-.204	22	-.111	22	-8.316e-03	5	NC	1	NC	1
329		5	max	.218	3	.225	4	.122	4	8.112e-03	23	NC	1	NC	1
330			min	-.158	21	-.201	22	-.108	22	-8.316e-03	5	NC	1	NC	1
331	M92	1	max	0	1	0	1	0	1	7.909e-03	8	NC	1	NC	1
332			min	0	1	0	1	0	1	-5.572e-03	14	NC	1	NC	1
333		2	max	0	24	.068	34	.09	3	7.909e-03	8	NC	1	NC	5
334			min	0	6	-.019	16	-.08	21	-5.572e-03	14	1132.127	17	1307.924	2
335		3	max	0	24	.125	33	.163	4	7.909e-03	8	NC	1	NC	17
336			min	0	6	-.047	16	-.146	22	-5.572e-03	14	562.995	17	931.896	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
337		4	max	0	24	.173	9	.222	4	7.909e-03	8	NC	1	NC	5
338			min	0	6	-.094	15	-.201	22	-5.572e-03	14	372.833	17	651.364	6
339		5	max	0	24	.25	9	.269	4	7.909e-03	8	NC	1	NC	1
340			min	0	6	-.155	15	-.247	22	-5.572e-03	14	277.952	17	419.99	6
341	M93	1	max	0	1	0	1	0	1	5.82e-03	21	NC	1	NC	1
342			min	0	1	0	1	0	1	-6.918e-03	3	NC	1	NC	1
343		2	max	0	24	.091	22	.053	2	5.82e-03	21	NC	1	NC	7
344			min	0	18	-.094	4	-.03	20	-6.918e-03	3	2172.679	13	1620.59	10
345		3	max	0	24	.164	22	.106	2	5.82e-03	21	NC	1	NC	7
346			min	0	18	-.173	4	-.065	20	-6.918e-03	3	1080.03	13	1154.67	10
347		4	max	0	24	.213	22	.159	2	5.82e-03	21	NC	1	NC	7
348			min	0	18	-.231	4	-.107	20	-6.918e-03	3	714.891	13	1032.571	70
349		5	max	0	24	.244	22	.218	3	5.82e-03	21	NC	1	NC	1
350			min	0	18	-.275	4	-.158	21	-6.918e-03	3	532.735	13	727.089	70
351	M103	1	max	.695	5	.395	47	.343	25	8.322e-03	25	NC	1	NC	1
352			min	-.752	47	-.056	6	-.373	7	-8.916e-03	7	NC	1	NC	1
353		2	max	.695	5	.402	47	.342	25	8.322e-03	25	NC	1	NC	1
354			min	-.752	47	-.061	6	-.372	7	-8.916e-03	7	NC	1	NC	1
355		3	max	.695	5	.409	47	.342	25	8.322e-03	25	NC	1	NC	1
356			min	-.752	47	-.066	5	-.372	7	-8.916e-03	7	NC	1	NC	1
357		4	max	.695	5	.415	47	.342	25	8.322e-03	25	NC	1	NC	1
358			min	-.752	47	-.072	5	-.372	7	-8.916e-03	7	NC	1	NC	1
359		5	max	.695	5	.422	47	.341	25	8.322e-03	25	NC	1	NC	1
360			min	-.752	47	-.078	5	-.372	7	-8.916e-03	7	NC	1	NC	1
361	M108	1	max	.599	9	.244	43	.277	3	6.839e-03	43	NC	1	NC	1
362			min	-.382	15	-.204	13	-.326	45	-5.967e-03	13	NC	1	NC	1
363		2	max	.599	9	.247	43	.273	3	6.839e-03	43	NC	1	NC	1
364			min	-.382	15	-.202	13	-.327	45	-5.967e-03	13	NC	1	NC	1
365		3	max	.599	9	.25	43	.269	3	6.839e-03	43	NC	1	NC	1
366			min	-.382	15	-.2	13	-.327	45	-5.967e-03	13	NC	1	NC	1
367		4	max	.599	9	.252	43	.264	3	6.839e-03	43	NC	1	NC	1
368			min	-.382	15	-.199	13	-.328	45	-5.967e-03	13	NC	1	NC	1
369		5	max	.599	9	.255	43	.26	3	6.839e-03	43	NC	1	NC	1
370			min	-.382	15	-.197	13	-.329	45	-5.967e-03	13	NC	1	NC	1
371	M109	1	max	1.361	47	.385	47	.321	2	8.028e-03	8	NC	1	NC	1
372			min	-.484	17	-.062	30	-.297	20	-7.879e-03	14	NC	1	NC	1
373		2	max	1.361	47	.395	47	.321	2	8.028e-03	8	NC	1	NC	1
374			min	-.484	17	-.064	6	-.296	20	-7.879e-03	14	NC	1	NC	1
375		3	max	1.361	47	.404	47	.321	3	8.028e-03	8	NC	1	NC	1
376			min	-.484	17	-.068	6	-.296	21	-7.879e-03	14	NC	1	NC	1
377		4	max	1.361	47	.414	47	.322	3	8.028e-03	8	NC	1	NC	1
378			min	-.484	17	-.072	5	-.296	21	-7.879e-03	14	NC	1	NC	1
379		5	max	1.361	47	.423	47	.323	3	8.028e-03	8	NC	1	NC	1
380			min	-.484	17	-.077	5	-.297	21	-7.879e-03	14	NC	1	NC	1
381	M111	1	max	.537	3	.606	5	.156	12	1.083e-02	11	NC	1	NC	1
382			min	-.388	21	-.572	23	-.145	18	-1.071e-02	17	NC	1	NC	1
383		2	max	.537	3	.604	5	.154	12	1.083e-02	11	NC	1	NC	1
384			min	-.388	21	-.569	23	-.144	18	-1.071e-02	17	NC	1	NC	1
385		3	max	.537	3	.601	5	.153	12	1.083e-02	11	NC	1	NC	1
386			min	-.388	21	-.566	23	-.143	18	-1.071e-02	17	NC	1	NC	1
387		4	max	.537	3	.598	5	.152	12	1.083e-02	11	NC	1	NC	1
388			min	-.388	21	-.564	23	-.143	18	-1.071e-02	17	NC	1	NC	1
389		5	max	.537	3	.596	5	.15	12	1.083e-02	11	NC	1	NC	1
390			min	-.388	21	-.561	23	-.142	18	-1.071e-02	17	NC	1	NC	1
391	M75B	1	max	.465	5	.111	6	.314	14	7.294e-03	3	NC	1	NC	1
392			min	-.492	47	-.105	24	-.322	8	-7.117e-03	21	NC	1	NC	1
393		2	max	.465	5	.136	6	.3	14	7.294e-03	3	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
394			min	-.492	47	-.133	24	-.308	8	-7.117e-03	21	NC	1	NC	1
395		3	max	.465	5	.161	6	.286	14	7.294e-03	3	NC	1	NC	1
396			min	-.492	47	-.16	24	-.294	8	-7.117e-03	21	NC	1	NC	1
397		4	max	.465	5	.186	18	.272	14	7.294e-03	3	NC	1	NC	1
398			min	-.492	47	-.188	12	-.28	8	-7.117e-03	21	NC	1	NC	1
399		5	max	.465	5	.212	18	.258	14	7.294e-03	3	NC	1	NC	1
400			min	-.492	47	-.215	12	-.266	8	-7.117e-03	21	NC	1	NC	1
401	M76B	1	max	.758	47	.11	4	.28	2	5.242e-03	19	NC	1	NC	1
402			min	-.327	17	-.109	22	-.275	20	-5.753e-03	12	NC	1	NC	1
403		2	max	.758	47	.137	4	.263	2	5.242e-03	19	NC	1	NC	1
404			min	-.327	17	-.135	22	-.258	20	-5.753e-03	12	NC	1	NC	1
405		3	max	.758	47	.165	4	.245	2	5.242e-03	19	NC	1	NC	1
406			min	-.327	17	-.161	22	-.24	20	-5.753e-03	12	NC	1	NC	1
407		4	max	.758	47	.193	4	.228	2	5.242e-03	19	NC	1	NC	1
408			min	-.327	17	-.187	22	-.223	20	-5.753e-03	12	NC	1	NC	1
409		5	max	.758	47	.22	4	.211	2	5.242e-03	19	NC	1	NC	1
410			min	-.327	17	-.212	22	-.205	20	-5.753e-03	12	NC	1	NC	1
411	M77	1	max	.408	9	.201	18	.196	3	8.438e-03	8	NC	1	NC	1
412			min	-.27	15	-.212	12	-.195	9	-8.216e-03	14	NC	1	NC	1
413		2	max	.408	9	.197	18	.228	3	8.438e-03	8	NC	1	NC	1
414			min	-.27	15	-.206	12	-.225	21	-8.216e-03	14	NC	1	NC	1
415		3	max	.408	9	.192	18	.26	3	8.438e-03	8	NC	1	NC	1
416			min	-.27	15	-.2	12	-.255	21	-8.216e-03	14	NC	1	NC	1
417		4	max	.408	9	.187	18	.292	3	8.438e-03	8	NC	1	NC	1
418			min	-.27	15	-.194	12	-.285	21	-8.216e-03	14	NC	1	NC	1
419		5	max	.408	9	.183	19	.323	3	8.438e-03	8	NC	1	NC	1
420			min	-.27	15	-.189	13	-.315	21	-8.216e-03	14	NC	1	NC	1
421	M78	1	max	.371	3	.403	5	.189	25	1.042e-02	22	NC	1	NC	1
422			min	-.283	21	-.398	23	-.191	7	-1.104e-02	4	NC	1	NC	1
423		2	max	.371	3	.395	5	.199	25	1.042e-02	22	NC	1	NC	1
424			min	-.283	21	-.391	23	-.203	7	-1.104e-02	4	NC	1	NC	1
425		3	max	.371	3	.388	5	.21	25	1.042e-02	22	NC	1	NC	1
426			min	-.283	21	-.384	23	-.215	7	-1.104e-02	4	NC	1	NC	1
427		4	max	.371	3	.387	4	.22	25	1.042e-02	22	NC	1	NC	1
428			min	-.283	21	-.384	22	-.226	7	-1.104e-02	4	NC	1	NC	1
429		5	max	.371	3	.398	4	.23	25	1.042e-02	22	NC	1	NC	1
430			min	-.283	21	-.395	22	-.238	7	-1.104e-02	4	NC	1	NC	1
431	M89A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
432			min	0	1	0	1	0	1	0	1	NC	1	NC	1
433		2	max	.001	4	.004	16	.042	13	1.351e-03	13	NC	1	NC	1
434			min	0	22	-.004	10	-.042	7	-1.216e-03	19	6755.999	16	1344.748	13
435		3	max	.002	4	.009	16	.144	13	2.703e-03	13	NC	1	NC	1
436			min	0	22	-.011	10	-.144	7	-2.431e-03	19	3195.07	16	395.151	13
437		4	max	.003	4	.006	16	.273	25	4.054e-03	13	NC	1	NC	1
438			min	-.001	22	-.011	10	-.274	7	-3.647e-03	19	3092.138	16	208.189	7
439		5	max	.004	4	.005	22	.398	24	5.405e-03	13	NC	8	NC	1
440			min	-.002	22	-.022	28	-.4	7	-4.862e-03	19	2628.07	28	142.665	7
441	M92A	1	max	.17	10	.414	7	.519	25	6.362e-03	8	NC	2	NC	2
442			min	-.162	16	-.295	25	-.529	7	-5.055e-03	14	241.235	9	233.33	3
443		2	max	.17	10	.393	7	.483	25	1.324e-02	11	NC	2	NC	30
444			min	-.162	16	-.283	25	-.49	7	-1.194e-02	17	325.913	9	325.141	3
445		3	max	.17	10	.377	7	.439	25	2.61e-02	11	NC	2	NC	30
446			min	-.162	16	-.275	25	-.443	7	-2.462e-02	17	493.293	9	501.771	3
447		4	max	.17	10	.363	7	.391	25	3.896e-02	11	NC	2	NC	1
448			min	-.162	16	-.269	25	-.392	7	-3.731e-02	17	611.576	49	1018.063	3
449		5	max	.17	10	.351	7	.341	13	5.182e-02	11	NC	1	NC	1
450			min	-.162	16	-.265	25	-.338	19	-5.e-02	17	447.977	49	834.92	63

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
451	M93A	1	max	.319	22	.667	6	.469	13	5.485e-03	18	NC	2	NC	5
452			min	-.325	4	-.665	24	-.287	19	-7.663e-03	12	213.951	10	109.403	4
453		2	max	.319	22	.601	6	.45	13	9.481e-03	15	NC	5	NC	2
454			min	-.325	4	-.598	24	-.28	19	-1.16e-02	9	291.208	10	151.145	4
455		3	max	.319	22	.529	6	.436	13	2.207e-02	14	NC	5	NC	5
456			min	-.325	4	-.525	24	-.277	19	-2.436e-02	8	443.349	10	232.202	4
457		4	max	.319	22	.454	6	.426	13	3.533e-02	14	NC	3	NC	5
458			min	-.325	4	-.449	24	-.277	19	-3.774e-02	8	895.077	10	343.599	13
459		5	max	.319	22	.378	6	.417	13	4.859e-02	14	NC	1	NC	1
460			min	-.325	4	-.371	24	-.278	19	-5.112e-02	8	NC	1	232.659	13
461	M94	1	max	.4	7	.415	19	.932	5	5.192e-03	5	NC	5	NC	1
462			min	-.399	24	-.67	13	-.926	23	-5.133e-03	23	162.338	13	152.802	6
463		2	max	.4	7	.208	19	.432	5	5.152e-03	5	NC	34	NC	1
464			min	-.399	24	-.34	13	-.427	23	-4.812e-03	23	233.159	25	228.08	7
465		3	max	.4	7	.005	22	.004	4	2.571e-03	4	NC	38	NC	1
466			min	-.398	24	-.022	28	-.002	22	-1.827e-03	22	404.218	25	353.106	7
467		4	max	.4	7	.215	25	.253	25	4.035e-03	4	NC	16	NC	1
468			min	-.398	24	-.3	7	-.261	7	-3.48e-03	22	247.622	19	487.16	48
469		5	max	.4	7	.425	25	.52	14	3.759e-03	3	NC	1	NC	3
470			min	-.398	24	-.591	7	-.546	8	-3.428e-03	21	177.218	19	290.485	8
471	M98	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
472			min	0	1	0	1	0	1	0	1	NC	1	NC	1
473		2	max	0	22	.01	22	.1	25	6.262e-04	5	NC	1	NC	1
474			min	-.002	28	-.017	28	-.1	7	-5.453e-04	47	4439.603	4	4697.67	40
475		3	max	0	22	.014	22	.195	25	1.252e-03	5	NC	1	NC	1
476			min	-.003	28	-.026	28	-.196	7	-1.091e-03	47	3163.217	4	2342.517	40
477		4	max	0	22	.01	22	.286	25	1.879e-03	5	NC	1	NC	1
478			min	-.005	28	-.025	28	-.287	7	-1.636e-03	47	4439.603	4	1556.506	40
479		5	max	0	22	.001	22	.374	25	2.505e-03	5	NC	1	NC	1
480			min	-.007	28	-.016	28	-.375	7	-2.181e-03	47	NC	1	1163.892	40
481	M110	1	max	.235	6	.372	19	.559	5	4.867e-03	18	NC	5	NC	1
482			min	-.21	24	-.591	13	-.529	23	-5.329e-03	12	157.919	13	242.346	6
483		2	max	.235	6	.183	19	.186	6	3.256e-03	18	NC	4	NC	1
484			min	-.21	24	-.296	13	-.169	24	-4.126e-03	12	227.572	25	417.718	6
485		3	max	.235	6	.001	22	.081	22	1.797e-03	16	NC	16	NC	1
486			min	-.21	24	-.098	28	-.086	4	-2.599e-03	10	368.717	25	470.06	9
487		4	max	.235	6	.192	25	.142	24	2.401e-03	14	7915.363	60	NC	1
488			min	-.21	24	-.26	7	-.159	6	-2.822e-03	8	241.03	19	411.726	7
489		5	max	.235	6	.38	25	.38	38	3.784e-03	2	NC	1	NC	1
490			min	-.21	24	-.526	7	-.296	8	-3.965e-03	44	171.173	19	260.091	48
491	M112	1	max	.245	13	.255	6	.129	24	7.89e-03	23	NC	1	NC	1
492			min	-.148	19	-.236	24	-.139	6	-8.453e-03	5	NC	1	NC	1
493		2	max	.245	13	.251	6	.126	24	7.89e-03	23	NC	1	NC	1
494			min	-.148	19	-.231	24	-.137	6	-8.453e-03	5	NC	1	NC	1
495		3	max	.245	13	.248	6	.123	24	7.89e-03	23	NC	1	NC	1
496			min	-.148	19	-.226	24	-.136	6	-8.453e-03	5	NC	1	NC	1
497		4	max	.245	13	.245	6	.12	24	7.89e-03	23	NC	1	NC	1
498			min	-.148	19	-.221	24	-.134	6	-8.453e-03	5	NC	1	NC	1
499		5	max	.245	13	.241	6	.118	24	7.89e-03	23	NC	1	NC	1
500			min	-.148	19	-.216	24	-.132	6	-8.453e-03	5	NC	1	NC	1
501	M113	1	max	.217	7	.006	24	.261	24	5.145e-03	38	NC	1	NC	1
502			min	-.158	25	-.006	6	-.293	6	-4.466e-03	8	NC	1	NC	1
503		2	max	.217	7	.007	24	.258	24	5.145e-03	38	NC	1	NC	1
504			min	-.158	25	-.008	6	-.289	6	-4.466e-03	8	NC	1	NC	1
505		3	max	.217	7	.008	24	.255	24	5.145e-03	38	NC	1	NC	1
506			min	-.158	25	-.009	6	-.285	6	-4.466e-03	8	NC	1	NC	1
507		4	max	.217	7	.009	24	.252	24	5.145e-03	38	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
508			min	-.158	25	-.01	6	-.281	6	-4.466e-03	8	NC	1	NC	1
509		5	max	.217	7	.011	24	.249	24	5.145e-03	38	NC	1	NC	1
510			min	-.158	25	-.011	6	-.278	6	-4.466e-03	8	NC	1	NC	1
511	M114	1	max	0	1	0	1	0	1	7.922e-03	13	NC	1	NC	1
512			min	0	1	0	1	0	1	-5.62e-03	19	NC	1	NC	1
513		2	max	0	16	.069	26	.103	6	7.922e-03	13	NC	1	NC	9
514			min	0	10	-.026	20	-.093	24	-5.62e-03	19	2413.249	3	1620.594	6
515		3	max	0	16	.126	26	.188	6	7.922e-03	13	NC	1	NC	9
516			min	0	10	-.058	20	-.17	24	-5.62e-03	19	1198.845	3	938.21	47
517		4	max	0	16	.175	13	.248	6	7.922e-03	13	NC	1	NC	9
518			min	0	10	-.096	20	-.227	24	-5.62e-03	19	792.915	3	603.513	47
519		5	max	0	16	.245	13	.29	6	7.922e-03	13	NC	1	NC	1
520			min	0	10	-.148	19	-.268	24	-5.62e-03	19	590.465	3	437.288	46
521	M115	1	max	0	1	0	1	0	1	5.487e-03	25	NC	1	NC	1
522			min	0	1	0	1	0	1	-6.551e-03	7	NC	1	NC	1
523		2	max	0	16	.087	25	.047	30	5.487e-03	25	NC	1	NC	4
524			min	0	22	-.09	7	-.021	24	-6.551e-03	7	1091.54	23	1307.92	2
525		3	max	0	16	.158	24	.091	6	5.487e-03	25	NC	1	NC	9
526			min	0	22	-.167	6	-.051	24	-6.551e-03	7	542.917	23	931.893	2
527		4	max	0	16	.216	24	.148	7	5.487e-03	25	NC	1	NC	3
528			min	0	22	-.235	6	-.096	25	-6.551e-03	7	359.622	23	901.865	17
529		5	max	0	16	.261	24	.217	7	5.487e-03	25	NC	1	NC	1
530			min	0	22	-.293	6	-.158	25	-6.551e-03	7	268.16	23	555.23	10
531	M116	1	max	.591	13	.606	5	.154	15	1.051e-02	22	NC	1	NC	1
532			min	-.372	19	-.572	23	-.156	9	-1.109e-02	4	NC	1	NC	1
533		2	max	.591	13	.603	5	.152	15	1.051e-02	22	NC	1	NC	1
534			min	-.372	19	-.567	23	-.155	9	-1.109e-02	4	NC	1	NC	1
535		3	max	.591	13	.6	5	.149	15	1.051e-02	22	NC	1	NC	1
536			min	-.372	19	-.563	23	-.153	9	-1.109e-02	4	NC	1	NC	1
537		4	max	.591	13	.597	5	.147	15	1.051e-02	22	NC	1	NC	1
538			min	-.372	19	-.559	23	-.151	9	-1.109e-02	4	NC	1	NC	1
539		5	max	.591	13	.593	5	.144	15	1.051e-02	22	NC	1	NC	1
540			min	-.372	19	-.555	23	-.15	9	-1.109e-02	4	NC	1	NC	1
541	M117	1	max	.526	7	.244	39	.324	49	6.63e-03	39	NC	1	NC	1
542			min	-.38	25	-.223	9	-.32	7	-6.326e-03	21	NC	1	NC	1
543		2	max	.526	7	.246	39	.327	49	6.63e-03	39	NC	1	NC	1
544			min	-.38	25	-.223	9	-.315	7	-6.326e-03	21	NC	1	NC	1
545		3	max	.526	7	.247	39	.329	49	6.63e-03	39	NC	1	NC	1
546			min	-.38	25	-.222	9	-.31	7	-6.326e-03	21	NC	1	NC	1
547		4	max	.526	7	.249	39	.331	49	6.63e-03	39	NC	1	NC	1
548			min	-.38	25	-.222	9	-.305	7	-6.326e-03	21	NC	1	NC	1
549		5	max	.526	7	.25	39	.334	49	6.63e-03	39	NC	1	NC	1
550			min	-.38	25	-.221	9	-.3	7	-6.326e-03	21	NC	1	NC	1
551	M118	1	max	.417	13	.403	5	.229	4	1.217e-02	12	NC	1	NC	1
552			min	-.278	19	-.399	23	-.218	22	-1.19e-02	18	NC	1	NC	1
553		2	max	.417	13	.403	5	.233	3	1.217e-02	12	NC	1	NC	1
554			min	-.278	19	-.398	23	-.225	21	-1.19e-02	18	NC	1	NC	1
555		3	max	.417	13	.403	5	.241	3	1.217e-02	12	NC	1	NC	1
556			min	-.278	19	-.397	23	-.235	21	-1.19e-02	18	NC	1	NC	1
557		4	max	.417	13	.403	5	.249	3	1.217e-02	12	NC	1	NC	1
558			min	-.278	19	-.397	23	-.245	21	-1.19e-02	18	NC	1	NC	1
559		5	max	.417	13	.417	6	.257	3	1.217e-02	12	NC	1	NC	1
560			min	-.278	19	-.408	24	-.255	21	-1.19e-02	18	NC	1	NC	1
561	M119	1	max	.351	7	.175	16	.225	25	7.853e-03	25	NC	1	NC	1
562			min	-.265	25	-.179	10	-.226	7	-8.422e-03	7	NC	1	NC	1
563		2	max	.351	7	.169	15	.253	25	7.853e-03	25	NC	1	NC	1
564			min	-.265	25	-.174	9	-.252	7	-8.422e-03	7	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
565		3	max	.351	7	.167	15	.281	13	7.853e-03	25	NC	1	NC	1
566			min	-.265	25	-.173	9	-.278	19	-8.422e-03	7	NC	1	NC	1
567		4	max	.351	7	.164	15	.308	13	7.853e-03	25	NC	1	NC	1
568			min	-.265	25	-.171	9	-.305	19	-8.422e-03	7	NC	1	NC	1
569		5	max	.351	7	.162	15	.336	13	7.853e-03	25	NC	1	NC	1
570			min	-.265	25	-.17	9	-.331	19	-8.422e-03	7	NC	1	NC	1
571	M86	1	max	.522	2	.348	15	.553	9	8.224e-03	9	NC	1	NC	1
572			min	-.515	20	-.553	9	-.493	15	-5.612e-03	15	NC	1	NC	1
573		2	max	.522	2	.344	15	.568	9	8.224e-03	9	NC	1	NC	1
574			min	-.515	20	-.548	9	-.507	15	-5.612e-03	15	NC	1	NC	1
575		3	max	.522	2	.339	15	.582	9	8.224e-03	9	NC	1	NC	1
576			min	-.515	20	-.544	9	-.522	15	-5.612e-03	15	NC	1	NC	1
577		4	max	.522	2	.335	15	.597	9	8.224e-03	9	NC	1	NC	1
578			min	-.515	20	-.54	9	-.536	15	-5.612e-03	15	NC	1	NC	1
579		5	max	.522	2	.33	15	.611	9	8.224e-03	9	NC	1	NC	1
580			min	-.515	20	-.535	9	-.551	15	-5.612e-03	15	NC	1	NC	1
581	M87	1	max	.33	15	.216	43	.353	45	5.973e-03	13	NC	1	NC	1
582			min	-.535	9	-.135	13	-.229	3	-6.707e-03	43	661.484	48	379.994	38
583		2	max	.33	15	.177	19	.353	21	6.127e-03	13	NC	1	NC	2
584			min	-.535	9	-.182	13	-.379	3	-5.797e-03	19	1109.551	47	553.28	9
585		3	max	.33	15	.23	7	.505	21	6.331e-03	13	NC	1	NC	2
586			min	-.535	9	-.23	25	-.522	3	-6.274e-03	19	1000.363	25	287.912	8
587		4	max	.33	15	.275	18	.68	9	6.466e-03	2	NC	2	NC	2
588			min	-.535	9	-.307	12	-.646	15	-6.497e-03	8	501.876	12	182.087	8
589		5	max	.33	15	.361	18	.87	9	6.466e-03	2	NC	2	NC	2
590			min	-.535	9	-.426	12	-.782	15	-6.497e-03	8	309.3	12	130.668	8
591	M88A	1	max	.553	9	.315	15	.476	20	5.226e-03	19	NC	1	NC	1
592			min	-.493	15	-.504	9	-.483	2	-5.289e-03	13	NC	1	NC	1
593		2	max	.553	9	.332	15	.496	20	5.226e-03	19	NC	1	NC	1
594			min	-.493	15	-.528	9	-.503	2	-5.289e-03	13	NC	1	NC	1
595		3	max	.553	9	.348	15	.515	20	5.226e-03	19	NC	1	NC	1
596			min	-.493	15	-.553	9	-.522	2	-5.289e-03	13	NC	1	NC	1
597		4	max	.553	9	.365	15	.535	20	5.226e-03	19	NC	1	NC	1
598			min	-.493	15	-.578	9	-.541	2	-5.289e-03	13	NC	1	NC	1
599		5	max	.553	9	.382	15	.554	20	5.226e-03	19	NC	1	NC	1
600			min	-.493	15	-.602	9	-.561	2	-5.289e-03	13	NC	1	NC	1
601	M89B	1	max	.82	23	.389	21	.492	21	5.766e-03	21	NC	1	NC	1
602			min	-.83	5	-.536	3	-.531	3	-7.384e-03	3	NC	1	NC	1
603		2	max	.82	23	.383	21	.507	21	5.766e-03	21	NC	1	NC	1
604			min	-.83	5	-.53	3	-.548	3	-7.384e-03	3	NC	1	NC	1
605		3	max	.82	23	.376	21	.523	21	5.766e-03	21	NC	1	NC	1
606			min	-.83	5	-.524	3	-.565	3	-7.384e-03	3	NC	1	NC	1
607		4	max	.82	23	.369	21	.539	21	5.766e-03	21	NC	1	NC	1
608			min	-.83	5	-.518	3	-.582	3	-7.384e-03	3	NC	1	NC	1
609		5	max	.82	23	.362	21	.554	21	5.766e-03	21	NC	1	NC	1
610			min	-.83	5	-.513	3	-.599	3	-7.384e-03	3	NC	1	NC	1
611	M90A	1	max	.362	21	.606	5	.083	19	1.071e-02	17	NC	1	NC	1
612			min	-.512	3	-.572	23	-.086	13	-1.083e-02	11	539.958	40	3895.393	72
613		2	max	.362	21	.687	5	.139	19	1.081e-02	5	NC	1	NC	1
614			min	-.513	3	-.659	23	-.141	13	-1.075e-02	23	700.43	16	1509.415	8
615		3	max	.362	21	.772	4	.208	7	1.097e-02	5	NC	10	NC	1
616			min	-.513	3	-.753	23	-.197	25	-1.066e-02	23	357.046	16	703.09	8
617		4	max	.362	21	.915	4	.296	20	1.101e-02	5	NC	1	NC	35
618			min	-.513	3	-.882	22	-.317	2	-1.064e-02	23	234.357	16	381.607	2
619		5	max	.362	21	1.068	4	.409	20	1.101e-02	5	NC	1	NC	5
620			min	-.513	3	-1.021	22	-.465	2	-1.064e-02	23	170.865	4	240.095	2
621	M91A	1	max	.492	21	.424	21	.896	5	4.552e-03	17	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
622			min	-.531	3	-.58	3	-.884	23	-4.886e-03	11	NC	1	NC	1
623		2	max	.492	21	.407	21	.863	5	4.552e-03	17	NC	1	NC	1
624			min	-.531	3	-.558	3	-.852	23	-4.886e-03	11	NC	1	NC	1
625		3	max	.492	21	.389	21	.83	5	4.552e-03	17	NC	1	NC	1
626			min	-.531	3	-.536	3	-.82	23	-4.886e-03	11	NC	1	NC	1
627		4	max	.492	21	.372	21	.797	5	4.552e-03	17	NC	1	NC	1
628			min	-.531	3	-.514	3	-.788	23	-4.886e-03	11	NC	1	NC	1
629		5	max	.492	21	.355	21	.764	5	4.552e-03	17	NC	1	NC	1
630			min	-.531	3	-.492	3	-.757	23	-4.886e-03	11	NC	1	NC	1
631	M92B	1	max	.71	23	.376	21	.391	21	5.015e-03	21	NC	1	NC	1
632			min	-.728	5	-.524	3	-.394	3	-6.632e-03	3	NC	1	NC	1
633		2	max	.71	23	.372	21	.399	21	5.015e-03	21	NC	1	NC	1
634			min	-.728	5	-.521	3	-.403	3	-6.632e-03	3	NC	1	NC	1
635		3	max	.71	23	.369	21	.407	21	5.015e-03	21	NC	1	NC	1
636			min	-.728	5	-.518	3	-.413	4	-6.632e-03	3	NC	1	NC	1
637		4	max	.71	23	.366	21	.42	22	5.015e-03	21	NC	1	NC	1
638			min	-.728	5	-.516	3	-.427	4	-6.632e-03	3	NC	1	NC	1
639		5	max	.71	23	.362	21	.433	22	5.015e-03	21	NC	1	NC	1
640			min	-.728	5	-.513	3	-.441	4	-6.632e-03	3	NC	1	NC	1
641	M93B	1	max	.431	2	.339	15	.391	21	7.471e-03	9	NC	1	NC	1
642			min	-.425	20	-.544	9	-.394	3	-4.861e-03	15	NC	1	NC	1
643		2	max	.431	2	.337	15	.399	21	7.471e-03	9	NC	1	NC	1
644			min	-.425	20	-.542	9	-.401	3	-4.861e-03	15	NC	1	NC	1
645		3	max	.431	2	.335	15	.406	21	7.471e-03	9	NC	1	NC	1
646			min	-.425	20	-.54	9	-.409	3	-4.861e-03	15	NC	1	NC	1
647		4	max	.431	2	.332	15	.413	21	7.471e-03	9	NC	1	NC	1
648			min	-.425	20	-.537	9	-.416	3	-4.861e-03	15	NC	1	NC	1
649		5	max	.431	2	.33	15	.421	21	7.471e-03	9	NC	1	NC	1
650			min	-.425	20	-.535	9	-.423	3	-4.861e-03	15	NC	1	NC	1
651	M94A	1	max	.859	5	.343	19	.554	13	8.145e-03	13	NC	1	NC	1
652			min	-.851	23	-.549	13	-.492	19	-5.506e-03	19	NC	1	NC	1
653		2	max	.859	5	.336	19	.571	13	8.145e-03	13	NC	1	NC	1
654			min	-.851	23	-.543	13	-.509	19	-5.506e-03	19	NC	1	NC	1
655		3	max	.859	5	.33	19	.587	13	8.145e-03	13	NC	1	NC	1
656			min	-.851	23	-.537	13	-.525	19	-5.506e-03	19	NC	1	NC	1
657		4	max	.859	5	.323	19	.604	13	8.145e-03	13	NC	1	NC	1
658			min	-.851	23	-.53	13	-.542	19	-5.506e-03	19	NC	1	NC	1
659		5	max	.859	5	.317	19	.623	12	8.145e-03	13	NC	1	NC	1
660			min	-.851	23	-.524	13	-.558	19	-5.506e-03	19	NC	1	NC	1
661	M95	1	max	.317	19	.544	5	.075	8	1.103e-02	4	NC	1	NC	1
662			min	-.524	13	-.5	23	-.066	38	-1.044e-02	22	637.344	27	1041.933	46
663		2	max	.317	19	.656	5	.136	8	1.087e-02	5	NC	1	NC	1
664			min	-.524	13	-.631	23	-.128	14	-1.054e-02	23	540.823	12	1327.242	2
665		3	max	.317	19	.776	5	.205	8	1.14e-02	5	NC	26	NC	1
666			min	-.524	13	-.765	23	-.196	14	-1.134e-02	23	277.104	12	681.198	3
667		4	max	.317	19	.907	17	.301	20	1.153e-02	17	NC	1	NC	10
668			min	-.524	13	-.926	11	-.344	2	-1.154e-02	11	185.5	12	332.195	2
669		5	max	.317	19	1.051	17	.412	20	1.153e-02	17	NC	1	NC	10
670			min	-.524	13	-1.102	11	-.509	2	-1.154e-02	11	137.409	12	211.257	2
671	M96	1	max	.554	13	.31	19	.782	23	5.783e-03	23	NC	1	NC	1
672			min	-.492	19	-.5	13	-.79	5	-5.843e-03	5	NC	1	NC	1
673		2	max	.554	13	.326	19	.816	23	5.783e-03	23	NC	1	NC	1
674			min	-.492	19	-.525	13	-.824	5	-5.843e-03	5	NC	1	NC	1
675		3	max	.554	13	.343	19	.851	23	5.783e-03	23	NC	1	NC	1
676			min	-.492	19	-.549	13	-.859	5	-5.843e-03	5	NC	1	NC	1
677		4	max	.554	13	.359	19	.886	23	5.783e-03	23	NC	1	NC	1
678			min	-.492	19	-.574	13	-.894	5	-5.843e-03	5	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
679		5	max	.554	13	.376	19	.92	23	5.783e-03	23	NC	1	NC	1
680			min	-.492	19	-.598	13	-.928	5	-5.843e-03	5	NC	1	NC	1
681	M97	1	max	.523	14	.376	25	.497	25	5.605e-03	25	NC	1	NC	1
682			min	-.536	8	-.521	7	-.534	7	-7.194e-03	7	NC	1	NC	1
683		2	max	.523	14	.372	25	.511	25	5.605e-03	25	NC	1	NC	1
684			min	-.536	8	-.517	7	-.55	7	-7.194e-03	7	NC	1	NC	1
685		3	max	.523	14	.367	25	.526	25	5.605e-03	25	NC	1	NC	1
686			min	-.536	8	-.513	7	-.566	7	-7.194e-03	7	NC	1	NC	1
687		4	max	.523	14	.362	25	.541	25	5.605e-03	25	NC	1	NC	1
688			min	-.536	8	-.51	7	-.582	7	-7.194e-03	7	NC	1	NC	1
689		5	max	.523	14	.358	25	.556	25	5.605e-03	25	NC	1	NC	1
690			min	-.536	8	-.506	7	-.598	7	-7.194e-03	7	NC	1	NC	1
691	M98A	1	max	.358	25	.243	39	.278	7	6.326e-03	21	NC	1	NC	1
692			min	-.506	7	-.198	9	-.386	49	-6.63e-03	39	1148.371	46	263.12	43
693		2	max	.358	25	.208	15	.424	7	6.301e-03	9	NC	1	NC	1
694			min	-.506	7	-.22	9	-.398	25	-6.223e-03	15	2029.268	6	357.995	44
695		3	max	.358	25	.232	15	.552	7	6.547e-03	8	NC	2	NC	2
696			min	-.506	7	-.25	9	-.543	25	-6.183e-03	14	1035.056	6	346.056	19
697		4	max	.358	25	.282	3	.706	7	6.688e-03	8	NC	1	NC	1
698			min	-.506	7	-.276	21	-.67	25	-6.262e-03	14	819.513	4	224.388	7
699		5	max	.358	25	.354	4	.871	7	6.688e-03	8	NC	1	NC	2
700			min	-.506	7	-.321	22	-.806	25	-6.262e-03	14	453.592	4	161.74	8
701	M99A	1	max	.497	25	.41	25	.576	8	4.078e-03	21	NC	1	NC	1
702			min	-.534	7	-.564	7	-.561	14	-4.409e-03	3	NC	1	NC	1
703		2	max	.497	25	.393	25	.556	8	4.078e-03	21	NC	1	NC	1
704			min	-.534	7	-.542	7	-.542	14	-4.409e-03	3	NC	1	NC	1
705		3	max	.497	25	.376	25	.536	8	4.078e-03	21	NC	1	NC	1
706			min	-.534	7	-.521	7	-.523	14	-4.409e-03	3	NC	1	NC	1
707		4	max	.497	25	.36	25	.516	8	4.078e-03	21	NC	1	NC	1
708			min	-.534	7	-.499	7	-.504	14	-4.409e-03	3	NC	1	NC	1
709		5	max	.497	25	.343	25	.496	8	4.078e-03	21	NC	1	NC	1
710			min	-.534	7	-.478	7	-.486	14	-4.409e-03	3	NC	1	NC	1
711	M100A	1	max	.445	14	.367	25	.398	24	4.854e-03	25	NC	1	NC	1
712			min	-.465	8	-.513	7	-.4	7	-6.442e-03	7	NC	1	NC	1
713		2	max	.445	14	.365	25	.406	25	4.854e-03	25	NC	1	NC	1
714			min	-.465	8	-.511	7	-.408	7	-6.442e-03	7	NC	1	NC	1
715		3	max	.445	14	.362	25	.413	25	4.854e-03	25	NC	1	NC	1
716			min	-.465	8	-.51	7	-.416	7	-6.442e-03	7	NC	1	NC	1
717		4	max	.445	14	.36	25	.42	25	4.854e-03	25	NC	1	NC	1
718			min	-.465	8	-.508	7	-.424	7	-6.442e-03	7	NC	1	NC	1
719		5	max	.445	14	.358	25	.428	25	4.854e-03	25	NC	1	NC	1
720			min	-.465	8	-.506	7	-.432	7	-6.442e-03	7	NC	1	NC	1
721	M101A	1	max	.724	5	.33	19	.399	24	7.393e-03	13	NC	1	NC	1
722			min	-.718	23	-.537	13	-.4	7	-4.755e-03	19	NC	1	NC	1
723		2	max	.724	5	.326	19	.414	24	7.393e-03	13	NC	1	NC	1
724			min	-.718	23	-.533	13	-.412	6	-4.755e-03	19	NC	1	NC	1
725		3	max	.724	5	.323	19	.428	24	7.393e-03	13	NC	1	NC	1
726			min	-.718	23	-.53	13	-.427	6	-4.755e-03	19	NC	1	NC	1
727		4	max	.724	5	.32	19	.443	24	7.393e-03	13	NC	1	NC	1
728			min	-.718	23	-.527	13	-.442	6	-4.755e-03	19	NC	1	NC	1
729		5	max	.724	5	.317	19	.458	24	7.393e-03	13	NC	1	NC	1
730			min	-.718	23	-.524	13	-.457	6	-4.755e-03	19	NC	1	NC	1
731	M102A	1	max	.406	20	.481	17	.278	17	6.72e-03	17	NC	1	NC	1
732			min	-.42	13	-1.334	47	-.287	11	-1.818e-02	47	NC	1	NC	1
733		2	max	.406	20	.475	17	.28	17	6.72e-03	17	NC	1	NC	1
734			min	-.42	13	-1.333	47	-.29	11	-1.818e-02	47	NC	1	NC	1
735		3	max	.406	20	.469	17	.282	17	6.72e-03	17	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
736			min	-.42	13	-1.332	47	-.294	11	-1.818e-02	47	NC	1	NC	1
737		4	max	.406	20	.464	17	.283	17	6.72e-03	17	NC	1	NC	1
738			min	-.42	13	-1.331	47	-.297	11	-1.818e-02	47	NC	1	NC	1
739		5	max	.406	20	.458	17	.285	17	6.72e-03	17	NC	1	NC	1
740			min	-.42	13	-1.33	47	-.3	11	-1.818e-02	47	NC	1	NC	1
741	M103B	1	max	.278	17	.521	17	.462	2	4.169e-03	25	NC	1	NC	1
742			min	-.287	11	-1.444	47	-.447	20	-4.495e-03	7	NC	1	NC	1
743		2	max	.278	17	.501	17	.441	2	4.169e-03	25	NC	1	NC	1
744			min	-.287	11	-1.389	47	-.426	20	-4.495e-03	7	NC	1	NC	1
745		3	max	.278	17	.481	17	.42	13	4.169e-03	25	NC	1	NC	1
746			min	-.287	11	-1.334	47	-.406	20	-4.495e-03	7	NC	1	NC	1
747		4	max	.278	17	.461	17	.401	13	4.169e-03	25	NC	1	NC	1
748			min	-.287	11	-1.28	47	-.386	20	-4.495e-03	7	NC	1	NC	1
749		5	max	.278	17	.44	17	.381	13	4.169e-03	25	NC	1	NC	1
750			min	-.287	11	-1.225	47	-.367	19	-4.495e-03	7	NC	1	NC	1
751	M104A	1	max	.736	23	.389	21	.391	21	5.317e-03	21	NC	1	NC	1
752			min	-.752	5	-.536	3	-.401	3	-6.934e-03	3	NC	1	NC	1
753		2	max	.736	23	.383	21	.407	21	5.317e-03	21	NC	1	NC	1
754			min	-.752	5	-.53	3	-.418	3	-6.934e-03	3	NC	1	NC	1
755		3	max	.736	23	.376	21	.422	21	5.317e-03	21	NC	1	NC	1
756			min	-.752	5	-.524	3	-.435	3	-6.934e-03	3	NC	1	NC	1
757		4	max	.736	23	.369	21	.438	21	5.317e-03	21	NC	1	NC	1
758			min	-.752	5	-.518	3	-.452	3	-6.934e-03	3	NC	1	NC	1
759		5	max	.736	23	.362	21	.458	22	5.317e-03	21	NC	1	NC	1
760			min	-.752	5	-.513	3	-.475	4	-6.934e-03	3	NC	1	NC	1
761	M105A	1	max	.391	21	.421	21	.818	5	4.163e-03	17	NC	1	NC	1
762			min	-.401	3	-.577	3	-.8	23	-4.496e-03	11	NC	1	NC	1
763		2	max	.391	21	.405	21	.785	5	4.163e-03	17	NC	1	NC	1
764			min	-.401	3	-.557	3	-.768	23	-4.496e-03	11	NC	1	NC	1
765		3	max	.391	21	.389	21	.752	5	4.163e-03	17	NC	1	NC	1
766			min	-.401	3	-.536	3	-.736	23	-4.496e-03	11	NC	1	NC	1
767		4	max	.391	21	.373	21	.719	5	4.163e-03	17	NC	1	NC	1
768			min	-.401	3	-.515	3	-.704	23	-4.496e-03	11	NC	1	NC	1
769		5	max	.391	21	.357	21	.686	5	4.163e-03	17	NC	1	NC	1
770			min	-.401	3	-.494	3	-.672	23	-4.496e-03	11	NC	1	NC	1
771	M106A	1	max	.464	14	.376	25	.41	24	5.155e-03	25	NC	1	NC	1
772			min	-.482	8	-.521	7	-.416	6	-6.744e-03	7	NC	1	NC	1
773		2	max	.464	14	.372	25	.416	24	5.155e-03	25	NC	1	NC	1
774			min	-.482	8	-.517	7	-.424	7	-6.744e-03	7	NC	1	NC	1
775		3	max	.464	14	.367	25	.428	25	5.155e-03	25	NC	1	NC	1
776			min	-.482	8	-.513	7	-.44	7	-6.744e-03	7	NC	1	NC	1
777		4	max	.464	14	.362	25	.443	25	5.155e-03	25	NC	1	NC	1
778			min	-.482	8	-.51	7	-.456	7	-6.744e-03	7	NC	1	NC	1
779		5	max	.464	14	.358	25	.458	25	5.155e-03	25	NC	1	NC	1
780			min	-.482	8	-.506	7	-.472	7	-6.744e-03	7	NC	1	NC	1
781	M107	1	max	.41	24	.407	25	.522	8	3.689e-03	21	NC	1	NC	1
782			min	-.416	6	-.561	7	-.501	14	-4.02e-03	3	NC	1	NC	1
783		2	max	.41	24	.392	25	.502	8	3.689e-03	21	NC	1	NC	1
784			min	-.416	6	-.541	7	-.483	14	-4.02e-03	3	NC	1	NC	1
785		3	max	.41	24	.376	25	.482	8	3.689e-03	21	NC	1	NC	1
786			min	-.416	6	-.521	7	-.464	14	-4.02e-03	3	NC	1	NC	1
787		4	max	.41	24	.361	25	.462	8	3.689e-03	21	NC	1	NC	1
788			min	-.416	6	-.501	7	-.445	14	-4.02e-03	3	NC	1	NC	1
789		5	max	.41	24	.346	25	.442	8	3.689e-03	21	NC	1	NC	1
790			min	-.416	6	-.48	7	-.426	14	-4.02e-03	3	NC	1	NC	1
791	M108B	1	max	.059	42	.182	17	.135	4	6.686e-03	5	NC	1	NC	1
792			min	-.053	12	-.482	47	-.128	22	-9.67e-03	47	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
793		2	max	.059	42	.176	17	.139	41	6.686e-03	5	NC	1	NC	1
794			min	-.053	12	-.47	47	-.125	23	-9.67e-03	47	NC	1	NC	1
795		3	max	.059	42	.17	17	.148	41	6.686e-03	5	NC	1	NC	1
796			min	-.053	12	-.457	47	-.126	23	-9.67e-03	47	NC	1	NC	1
797		4	max	.059	42	.164	17	.156	41	6.686e-03	5	NC	1	NC	1
798			min	-.053	12	-.444	47	-.128	23	-9.67e-03	47	NC	1	NC	1
799		5	max	.059	42	.158	17	.165	41	6.686e-03	5	NC	1	NC	1
800			min	-.053	12	-.432	47	-.129	23	-9.67e-03	47	NC	1	NC	1
801	M109A	1	max	.135	4	.221	17	.078	13	4.295e-03	49	NC	1	NC	1
802			min	-.128	22	-.54	47	-.078	43	-2.933e-03	7	NC	1	NC	1
803		2	max	.135	4	.201	17	.065	13	4.295e-03	49	NC	1	NC	1
804			min	-.128	22	-.511	47	-.069	43	-2.933e-03	7	NC	1	NC	1
805		3	max	.135	4	.182	17	.053	12	4.295e-03	49	NC	1	NC	1
806			min	-.128	22	-.482	47	-.059	42	-2.933e-03	7	NC	1	NC	1
807		4	max	.135	4	.162	17	.044	12	4.295e-03	49	NC	1	NC	1
808			min	-.128	22	-.453	47	-.05	42	-2.933e-03	7	NC	1	NC	1
809		5	max	.135	4	.142	17	.039	11	4.295e-03	49	NC	1	NC	1
810			min	-.128	22	-.424	47	-.042	41	-2.933e-03	7	NC	1	NC	1
811	M114A	1	max	.346	7	.38	25	.184	4	3.248e-03	7	NC	1	NC	1
812			min	-.4	49	-.526	7	-.174	22	-2.509e-03	25	84.191	2	NC	1
813		2	max	.346	7	.345	24	.139	5	3.458e-03	6	NC	1	NC	1
814			min	-.4	49	-.504	6	-.132	23	-2.65e-03	24	112.366	2	661.361	45
815		3	max	.346	7	.366	24	.148	42	3.814e-03	6	NC	1	NC	1
816			min	-.4	49	-.545	6	-.108	24	-2.898e-03	24	69.391	45	330.664	45
817		4	max	.345	7	.508	47	.196	43	4.17e-03	6	NC	1	NC	1
818			min	-.4	49	-.597	5	-.12	25	-3.447e-03	48	46.24	45	220.428	45
819		5	max	.345	7	.752	47	.246	44	4.526e-03	6	NC	1	NC	1
820			min	-.4	49	-.695	5	-.16	2	-4.506e-03	48	34.666	45	165.312	45
821	M115A	1	max	.288	3	.484	17	.173	8	8.442e-03	46	NC	1	NC	1
822			min	-.401	45	-1.361	47	-.232	38	-3.393e-03	16	65.562	6	124.665	7
823		2	max	.288	3	.397	16	.127	9	6.995e-03	46	NC	1	NC	1
824			min	-.401	45	-1.023	46	-.185	39	-3.208e-03	16	87.483	6	166.326	7
825		3	max	.288	3	.368	16	.112	10	5.548e-03	46	NC	1	NC	1
826			min	-.401	45	-.688	46	-.141	40	-3.023e-03	16	131.337	6	249.665	7
827		4	max	.288	3	.345	15	.133	11	4.1e-03	46	NC	1	NC	1
828			min	-.401	45	-.544	9	-.133	17	-2.838e-03	16	126.288	14	499.617	7
829		5	max	.288	3	.382	15	.175	23	3.772e-03	10	NC	1	NC	1
830			min	-.401	45	-.599	9	-.177	5	-2.652e-03	16	94.637	14	NC	1
831	M116A	1	max	.606	5	.388	21	.156	12	3.369e-03	2	NC	1	NC	1
832			min	-.572	23	-.537	3	-.145	18	-2.655e-03	20	95.971	10	NC	1
833		2	max	.606	5	.356	20	.13	13	3.481e-03	2	NC	1	NC	1
834			min	-.572	23	-.518	2	-.123	19	-2.663e-03	20	128.106	10	1467.948	42
835		3	max	.606	5	.348	20	.118	2	3.593e-03	2	NC	1	NC	1
836			min	-.572	23	-.528	2	-.114	20	-2.671e-03	20	192.398	10	733.709	42
837		4	max	.606	5	.34	20	.126	3	3.705e-03	2	NC	1	NC	1
838			min	-.572	23	-.538	2	-.125	21	-2.679e-03	20	162.357	18	488.921	42
839		5	max	.606	5	.372	19	.154	15	3.817e-03	2	NC	1	NC	1
840			min	-.572	23	-.591	13	-.156	9	-2.687e-03	20	121.638	18	366.543	42
841	M117A	1	max	.544	23	.388	21	.194	22	5.19e-03	21	NC	1	NC	1
842			min	-.57	5	-.537	3	-.218	4	-5.886e-03	3	NC	1	NC	1
843		2	max	.544	23	.382	21	.206	22	5.19e-03	21	NC	1	NC	1
844			min	-.57	5	-.531	3	-.23	4	-5.886e-03	3	NC	1	NC	1
845		3	max	.544	23	.375	21	.219	22	5.19e-03	21	NC	1	NC	1
846			min	-.57	5	-.525	3	-.242	4	-5.886e-03	3	NC	1	NC	1
847		4	max	.544	23	.369	21	.231	22	5.19e-03	21	NC	1	NC	1
848			min	-.57	5	-.519	3	-.254	4	-5.886e-03	3	NC	1	NC	1
849		5	max	.544	23	.362	21	.245	23	5.19e-03	21	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
850			min	-.57	5	-.512	3	-.268	5	-5.886e-03	3	NC	1	NC	1
851	M118A	1	max	.22	2	.352	15	.194	22	6.623e-03	9	NC	1	NC	1
852			min	-.341	44	-.559	9	-.218	4	-5.013e-03	15	NC	1	NC	1
853		2	max	.22	2	.347	15	.191	22	6.623e-03	9	NC	1	NC	1
854			min	-.341	44	-.553	9	-.217	4	-5.013e-03	15	NC	1	NC	1
855		3	max	.22	2	.341	15	.189	22	6.623e-03	9	NC	1	NC	1
856			min	-.341	44	-.547	9	-.216	4	-5.013e-03	15	NC	1	NC	1
857		4	max	.22	2	.336	15	.192	46	6.623e-03	9	NC	1	NC	1
858			min	-.341	44	-.541	9	-.214	4	-5.013e-03	15	NC	1	NC	1
859		5	max	.22	2	.33	15	.201	46	6.623e-03	9	NC	1	NC	1
860			min	-.341	44	-.535	9	-.213	4	-5.013e-03	15	NC	1	NC	1
861	M119A	1	max	.38	38	.38	25	.21	24	5.005e-03	25	NC	1	NC	1
862			min	-.296	8	-.526	7	-.235	6	-5.674e-03	7	NC	1	NC	1
863		2	max	.38	38	.374	25	.21	24	5.005e-03	25	NC	1	NC	1
864			min	-.296	8	-.521	7	-.235	6	-5.674e-03	7	NC	1	NC	1
865		3	max	.38	38	.369	25	.211	24	5.005e-03	25	NC	1	NC	1
866			min	-.296	8	-.516	7	-.235	6	-5.674e-03	7	NC	1	NC	1
867		4	max	.38	38	.363	25	.211	24	5.005e-03	25	NC	1	NC	1
868			min	-.296	8	-.511	7	-.235	6	-5.674e-03	7	NC	1	NC	1
869		5	max	.38	38	.358	25	.211	24	5.005e-03	25	NC	1	NC	1
870			min	-.296	8	-.506	7	-.235	6	-5.674e-03	7	NC	1	NC	1
871	M120	1	max	.496	5	.342	19	.21	24	6.572e-03	13	NC	1	NC	1
872			min	-.469	23	-.552	13	-.235	6	-4.935e-03	19	NC	1	NC	1
873		2	max	.496	5	.336	19	.22	24	6.572e-03	13	NC	1	NC	1
874			min	-.469	23	-.545	13	-.246	6	-4.935e-03	19	NC	1	NC	1
875		3	max	.496	5	.33	19	.23	24	6.572e-03	13	NC	1	NC	1
876			min	-.469	23	-.538	13	-.257	6	-4.935e-03	19	NC	1	NC	1
877		4	max	.496	5	.323	19	.24	24	6.572e-03	13	NC	1	NC	1
878			min	-.469	23	-.531	13	-.268	6	-4.935e-03	19	NC	1	NC	1
879		5	max	.496	5	.317	19	.253	23	6.572e-03	13	NC	1	NC	1
880			min	-.469	23	-.524	13	-.282	5	-4.935e-03	19	NC	1	NC	1
881	M104	1	max	.465	20	.253	45	.726	5	2.222e-02	5	NC	1	NC	1
882			min	-.511	2	-.373	3	-.65	23	-1.891e-02	23	NC	1	NC	1
883		2	max	.465	20	.253	46	.712	5	2.222e-02	5	NC	1	NC	1
884			min	-.511	2	-.321	4	-.636	23	-1.891e-02	23	NC	1	NC	1
885		3	max	.465	20	.253	46	.698	5	2.222e-02	5	NC	1	NC	1
886			min	-.511	2	-.277	4	-.622	23	-1.891e-02	23	NC	1	NC	1
887		4	max	.465	20	.254	47	.683	5	2.222e-02	5	NC	1	NC	1
888			min	-.511	2	-.246	5	-.608	23	-1.891e-02	23	NC	1	NC	1
889		5	max	.465	20	.256	47	.669	5	2.222e-02	5	NC	1	NC	1
890			min	-.511	2	-.235	5	-.594	23	-1.891e-02	23	NC	1	NC	1
891	M105	1	max	.256	47	.523	48	.061	4	5.135e-03	7	NC	1	NC	1
892			min	-.235	5	-.142	6	-.245	46	-5.241e-03	49	95.114	49	324.098	44
893		2	max	.256	47	.25	40	.035	21	5.702e-03	8	NC	1	NC	12
894			min	-.235	5	-.085	10	-.146	39	-5.229e-03	14	130.681	49	494.175	44
895		3	max	.256	47	.198	16	.109	9	6.482e-03	8	7157.517	1	NC	12
896			min	-.235	5	-.214	11	-.107	15	-6.33e-03	14	201.282	49	581.992	3
897		4	max	.256	47	.539	5	.35	20	7.417e-03	7	NC	35	NC	42
898			min	-.235	5	-.483	23	-.372	2	-7.309e-03	25	141.895	5	230.323	3
899		5	max	.256	47	1.084	5	.853	20	8.125e-03	7	NC	8	NC	11
900			min	-.235	5	-.949	23	-.987	2	-8.008e-03	25	78.595	5	93.253	2
901	M106	1	max	.65	23	.318	22	.505	20	1.987e-02	20	NC	1	NC	1
902			min	-.726	5	-.481	4	-.55	2	-2.47e-02	2	NC	1	NC	1
903		2	max	.65	23	.284	46	.485	20	1.987e-02	20	NC	1	NC	1
904			min	-.726	5	-.423	4	-.531	2	-2.47e-02	2	NC	1	NC	1
905		3	max	.65	23	.253	45	.465	20	1.987e-02	20	NC	1	NC	1
906			min	-.726	5	-.373	3	-.511	2	-2.47e-02	2	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
907		4	max	.65	23	.223	45	.445	20	1.987e-02	20	NC	1	NC	1
908			min	-.726	5	-.337	3	-.492	2	-2.47e-02	2	NC	1	NC	1
909		5	max	.65	23	.193	45	.425	20	1.987e-02	20	NC	1	NC	1
910			min	-.726	5	-.3	3	-.472	2	-2.47e-02	2	NC	1	NC	1
911	M107A	1	max	.135	9	.27	47	.242	17	9.809e-03	5	NC	1	NC	1
912			min	-.13	15	-.237	5	-.244	11	-9.927e-03	47	NC	1	NC	1
913		2	max	.135	9	.267	47	.244	17	9.809e-03	5	NC	1	NC	1
914			min	-.13	15	-.237	5	-.246	11	-9.927e-03	47	NC	1	NC	1
915		3	max	.135	9	.263	47	.245	17	9.809e-03	5	NC	1	NC	1
916			min	-.13	15	-.236	5	-.247	11	-9.927e-03	47	NC	1	NC	1
917		4	max	.135	9	.26	47	.247	17	9.809e-03	5	NC	1	NC	1
918			min	-.13	15	-.235	5	-.249	11	-9.927e-03	47	NC	1	NC	1
919		5	max	.135	9	.256	47	.248	17	9.809e-03	5	NC	1	NC	1
920			min	-.13	15	-.235	5	-.25	11	-9.927e-03	47	NC	1	NC	1
921	M108A	1	max	.038	4	.275	47	.422	47	8.247e-03	5	NC	1	NC	1
922			min	-.225	46	-.252	5	-.078	5	-1.178e-02	47	NC	1	NC	1
923		2	max	.038	4	.27	47	.429	47	8.247e-03	5	NC	1	NC	1
924			min	-.225	46	-.248	5	-.082	6	-1.178e-02	47	NC	1	NC	1
925		3	max	.038	4	.266	47	.437	48	8.247e-03	5	NC	1	NC	1
926			min	-.225	46	-.243	5	-.088	6	-1.178e-02	47	NC	1	NC	1
927		4	max	.038	4	.261	47	.445	48	8.247e-03	5	NC	1	NC	1
928			min	-.225	46	-.239	5	-.094	6	-1.178e-02	47	NC	1	NC	1
929		5	max	.038	4	.256	47	.452	48	8.247e-03	5	NC	1	NC	1
930			min	-.225	46	-.235	5	-.1	6	-1.178e-02	47	NC	1	NC	1
931	M109B	1	max	.072	21	.318	47	.117	17	6.145e-03	5	NC	1	NC	1
932			min	-.085	39	-.253	5	-.14	11	-1.1e-02	47	NC	1	NC	1
933		2	max	.072	21	.303	47	.117	17	6.145e-03	5	NC	1	NC	1
934			min	-.085	39	-.249	5	-.141	11	-1.1e-02	47	NC	1	NC	1
935		3	max	.072	21	.287	47	.117	17	6.145e-03	5	NC	1	NC	1
936			min	-.085	39	-.244	5	-.142	11	-1.1e-02	47	NC	1	NC	1
937		4	max	.072	21	.272	47	.118	16	6.145e-03	5	NC	1	NC	1
938			min	-.085	39	-.239	5	-.143	10	-1.1e-02	47	NC	1	NC	1
939		5	max	.072	21	.256	47	.127	16	6.145e-03	5	NC	1	NC	1
940			min	-.085	39	-.235	5	-.153	10	-1.1e-02	47	NC	1	NC	1
941	M110A	1	max	.14	11	.384	47	.104	9	5.248e-03	45	NC	1	NC	1
942			min	-.117	17	-.29	5	-.103	15	-2.743e-03	15	NC	1	NC	1
943		2	max	.14	11	.351	47	.088	21	5.248e-03	45	NC	1	NC	1
944			min	-.117	17	-.272	5	-.094	39	-2.743e-03	15	NC	1	NC	1
945		3	max	.14	11	.318	47	.072	21	5.248e-03	45	NC	1	NC	1
946			min	-.117	17	-.253	5	-.085	39	-2.743e-03	15	NC	1	NC	1
947		4	max	.14	11	.285	47	.056	21	5.248e-03	45	NC	1	NC	1
948			min	-.117	17	-.235	5	-.077	39	-2.743e-03	15	NC	1	NC	1
949		5	max	.14	11	.252	47	.041	22	5.248e-03	45	NC	1	NC	1
950			min	-.117	17	-.216	5	-.069	40	-2.743e-03	15	NC	1	NC	1
951	M111A	1	max	.435	23	.168	22	.671	21	1.448e-02	21	NC	1	NC	1
952			min	-.483	5	-.276	4	-.723	3	-1.663e-02	3	NC	1	NC	1
953		2	max	.435	23	.146	22	.676	21	1.448e-02	21	NC	1	NC	1
954			min	-.483	5	-.241	4	-.729	3	-1.663e-02	3	NC	1	NC	1
955		3	max	.435	23	.127	21	.681	21	1.448e-02	21	NC	1	NC	1
956			min	-.483	5	-.208	3	-.734	3	-1.663e-02	3	NC	1	NC	1
957		4	max	.435	23	.126	21	.685	21	1.448e-02	21	NC	1	NC	1
958			min	-.483	5	-.193	3	-.74	3	-1.663e-02	3	NC	1	NC	1
959		5	max	.435	23	.13	20	.69	21	1.448e-02	21	NC	1	NC	1
960			min	-.483	5	-.182	2	-.746	3	-1.663e-02	3	NC	1	NC	1
961	M112A	1	max	.13	20	.191	4	.151	23	7.735e-03	5	NC	1	NC	1
962			min	-.182	2	-.176	46	-.166	5	-7.628e-03	23	NC	1	1146.296	44
963		2	max	.13	20	.301	4	.201	22	8.476e-03	5	NC	1	NC	5

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
964			min	-.182	2	-.28	22	-.202	4	-8.304e-03	23	874.495	4	939.624	8
965		3	max	.13	20	.388	4	.259	9	9.463e-03	5	NC	26	NC	5
966			min	-.182	2	-.382	22	-.252	15	-9.206e-03	23	449.421	10	488.544	8
967		4	max	.13	20	.619	4	.428	21	8.057e-03	5	NC	31	NC	1
968			min	-.182	2	-.573	22	-.452	3	-7.814e-03	23	224.524	4	244.287	2
969		5	max	.13	20	1.051	4	.738	20	7.651e-03	6	NC	8	NC	1
970			min	-.182	2	-.89	22	-.752	2	-7.462e-03	24	111.719	4	131.145	8
971	M113A	1	max	.671	21	.244	22	.528	5	1.69e-02	6	NC	1	NC	1
972			min	-.723	3	-.366	4	-.479	23	-1.26e-02	24	NC	1	NC	1
973		2	max	.671	21	.206	22	.505	5	1.69e-02	6	NC	1	NC	1
974			min	-.723	3	-.321	4	-.457	23	-1.26e-02	24	NC	1	NC	1
975		3	max	.671	21	.168	22	.483	5	1.69e-02	6	NC	1	NC	1
976			min	-.723	3	-.276	4	-.435	23	-1.26e-02	24	NC	1	NC	1
977		4	max	.671	21	.13	22	.46	5	1.69e-02	6	NC	1	NC	1
978			min	-.723	3	-.231	4	-.413	23	-1.26e-02	24	NC	1	NC	1
979		5	max	.671	21	.106	23	.438	5	1.69e-02	6	NC	1	NC	1
980			min	-.723	3	-.2	5	-.391	23	-1.26e-02	24	NC	1	NC	1
981	M114B	1	max	.225	22	.133	21	.391	21	5.414e-03	21	NC	1	NC	1
982			min	-.229	4	-.183	3	-.394	3	-7.501e-03	3	NC	1	NC	1
983		2	max	.225	22	.131	21	.399	21	5.414e-03	21	NC	1	NC	1
984			min	-.229	4	-.182	3	-.403	3	-7.501e-03	3	NC	1	NC	1
985		3	max	.225	22	.129	21	.408	21	5.414e-03	21	NC	1	NC	1
986			min	-.229	4	-.181	3	-.412	3	-7.501e-03	3	NC	1	NC	1
987		4	max	.225	22	.129	20	.417	22	5.414e-03	21	NC	1	NC	1
988			min	-.229	4	-.18	2	-.424	4	-7.501e-03	3	NC	1	NC	1
989		5	max	.225	22	.13	20	.43	22	5.414e-03	21	NC	1	NC	1
990			min	-.229	4	-.182	2	-.437	4	-7.501e-03	3	NC	1	NC	1
991	M115B	1	max	.094	22	.136	21	.194	22	5.738e-03	21	NC	1	NC	1
992			min	-.108	4	-.193	3	-.218	4	-5.975e-03	3	NC	1	NC	1
993		2	max	.094	22	.133	21	.204	22	5.738e-03	21	NC	1	NC	1
994			min	-.108	4	-.19	3	-.228	4	-5.975e-03	3	NC	1	NC	1
995		3	max	.094	22	.132	20	.213	22	5.738e-03	21	NC	1	NC	1
996			min	-.108	4	-.186	3	-.237	4	-5.975e-03	3	NC	1	NC	1
997		4	max	.094	22	.131	20	.223	22	5.738e-03	21	NC	1	NC	1
998			min	-.108	4	-.184	2	-.247	4	-5.975e-03	3	NC	1	NC	1
999		5	max	.094	22	.13	20	.232	22	5.738e-03	21	NC	1	NC	1
1000			min	-.108	4	-.182	2	-.257	4	-5.975e-03	3	NC	1	NC	1
1001	M116B	1	max	.175	22	.148	21	.28	9	4.946e-03	9	NC	1	NC	1
1002			min	-.189	4	-.196	3	-.275	15	-4.146e-03	15	NC	1	NC	1
1003		2	max	.175	22	.142	21	.294	9	4.946e-03	9	NC	1	NC	1
1004			min	-.189	4	-.191	3	-.289	15	-4.146e-03	15	NC	1	NC	1
1005		3	max	.175	22	.136	21	.316	10	4.946e-03	9	NC	1	NC	1
1006			min	-.189	4	-.187	3	-.313	16	-4.146e-03	15	NC	1	NC	1
1007		4	max	.175	22	.132	20	.339	10	4.946e-03	9	NC	1	NC	1
1008			min	-.189	4	-.183	3	-.337	16	-4.146e-03	15	NC	1	NC	1
1009		5	max	.175	22	.13	20	.362	10	4.946e-03	9	NC	1	NC	1
1010			min	-.189	4	-.182	2	-.361	16	-4.146e-03	15	NC	1	NC	1
1011	M117B	1	max	.28	9	.177	21	.237	4	2.417e-03	17	NC	1	NC	1
1012			min	-.275	15	-.22	3	-.222	22	-2.875e-03	11	NC	1	NC	1
1013		2	max	.28	9	.162	21	.213	4	2.417e-03	17	NC	1	NC	1
1014			min	-.275	15	-.208	3	-.198	22	-2.875e-03	11	NC	1	NC	1
1015		3	max	.28	9	.148	21	.189	4	2.417e-03	17	NC	1	NC	1
1016			min	-.275	15	-.196	3	-.175	22	-2.875e-03	11	NC	1	NC	1
1017		4	max	.28	9	.133	21	.165	4	2.417e-03	17	NC	1	NC	1
1018			min	-.275	15	-.183	3	-.151	22	-2.875e-03	11	NC	1	NC	1
1019		5	max	.28	9	.119	21	.141	4	2.417e-03	17	NC	1	NC	1
1020			min	-.275	15	-.171	3	-.128	22	-2.875e-03	11	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1021	M118B	1	max	.388	25	.201	25	.821	9	2.212e-02	9	NC	1	NC	1
1022			min	-.435	7	-.343	7	-.746	15	-1.883e-02	15	NC	1	NC	1
1023		2	max	.388	25	.156	25	.823	9	2.212e-02	9	NC	1	NC	1
1024			min	-.435	7	-.283	7	-.748	15	-1.883e-02	15	NC	1	NC	1
1025		3	max	.388	25	.13	14	.824	9	2.212e-02	9	NC	1	NC	1
1026			min	-.435	7	-.244	8	-.75	15	-1.883e-02	15	NC	1	NC	1
1027		4	max	.388	25	.114	15	.826	9	2.212e-02	9	NC	1	NC	1
1028			min	-.435	7	-.211	9	-.752	15	-1.883e-02	15	NC	1	NC	1
1029		5	max	.388	25	.125	15	.828	9	2.212e-02	9	NC	1	NC	1
1030			min	-.435	7	-.207	9	-.754	15	-1.883e-02	15	NC	1	NC	1
1031	M119B	1	max	.125	15	.032	12	.213	46	4.029e-03	2	NC	1	NC	1
1032			min	-.207	9	-.029	18	-.245	4	-4.355e-03	44	3359.448	46	766.131	38
1033		2	max	.125	15	.04	4	.305	22	4.844e-03	2	NC	1	NC	53
1034			min	-.207	9	-.028	22	-.327	4	-4.395e-03	20	1712.041	5	619.539	8
1035		3	max	.125	15	.075	4	.409	21	5.93e-03	2	NC	1	NC	39
1036			min	-.206	9	-.068	22	-.425	3	-5.805e-03	20	1000.039	5	339.841	8
1037		4	max	.125	15	.322	17	.691	9	3.336e-03	13	NC	1	NC	38
1038			min	-.207	9	-.331	11	-.633	15	-3.267e-03	19	268.118	11	160.515	8
1039		5	max	.125	15	.901	5	1.184	8	3.016e-03	59	NC	32	NC	5
1040			min	-.207	9	-.849	23	-.996	14	-2.941e-03	65	103.867	5	84.276	8
1041	M120A	1	max	.746	15	.264	14	.403	25	1.847e-02	24	NC	1	NC	1
1042			min	-.821	9	-.427	8	-.45	7	-2.327e-02	6	NC	1	NC	1
1043		2	max	.746	15	.223	25	.395	25	1.847e-02	24	NC	1	NC	1
1044			min	-.821	9	-.375	7	-.442	7	-2.327e-02	6	NC	1	NC	1
1045		3	max	.746	15	.201	25	.388	25	1.847e-02	24	NC	1	NC	1
1046			min	-.821	9	-.343	7	-.435	7	-2.327e-02	6	NC	1	NC	1
1047		4	max	.746	15	.178	25	.38	25	1.847e-02	24	NC	1	NC	1
1048			min	-.821	9	-.31	7	-.427	7	-2.327e-02	6	NC	1	NC	1
1049		5	max	.746	15	.177	24	.372	25	1.847e-02	24	NC	1	NC	1
1050			min	-.821	9	-.297	6	-.42	7	-2.327e-02	6	NC	1	NC	1
1051	M121A	1	max	.168	3	.129	15	.391	21	8.567e-03	9	NC	1	NC	1
1052			min	-.163	21	-.207	9	-.394	3	-5.458e-03	15	NC	1	NC	1
1053		2	max	.168	3	.128	15	.399	21	8.567e-03	9	NC	1	NC	1
1054			min	-.163	21	-.207	9	-.402	3	-5.458e-03	15	NC	1	NC	1
1055		3	max	.168	3	.127	15	.407	21	8.567e-03	9	NC	1	NC	1
1056			min	-.163	21	-.207	9	-.41	3	-5.458e-03	15	NC	1	NC	1
1057		4	max	.168	3	.126	15	.414	21	8.567e-03	9	NC	1	NC	1
1058			min	-.163	21	-.207	9	-.417	3	-5.458e-03	15	NC	1	NC	1
1059		5	max	.168	3	.125	15	.422	21	8.567e-03	9	NC	1	NC	1
1060			min	-.163	21	-.206	9	-.425	3	-5.458e-03	15	NC	1	NC	1
1061	M122	1	max	.132	4	.133	15	.194	22	6.838e-03	9	NC	1	NC	1
1062			min	-.12	22	-.221	9	-.218	4	-5.499e-03	15	NC	1	NC	1
1063		2	max	.132	4	.131	15	.196	22	6.838e-03	9	NC	1	NC	1
1064			min	-.12	22	-.217	9	-.221	4	-5.499e-03	15	NC	1	NC	1
1065		3	max	.132	4	.129	15	.198	22	6.838e-03	9	NC	1	NC	1
1066			min	-.12	22	-.214	9	-.225	4	-5.499e-03	15	NC	1	NC	1
1067		4	max	.132	4	.127	15	.2	22	6.838e-03	9	NC	1	NC	1
1068			min	-.12	22	-.21	9	-.228	4	-5.499e-03	15	NC	1	NC	1
1069		5	max	.132	4	.125	15	.202	22	6.838e-03	9	NC	1	NC	1
1070			min	-.12	22	-.207	9	-.231	4	-5.499e-03	15	NC	1	NC	1
1071	M123	1	max	.144	15	.144	15	.289	22	4.402e-03	8	NC	1	NC	1
1072			min	-.144	9	-.225	9	-.314	4	-4.246e-03	14	NC	1	NC	1
1073		2	max	.144	15	.139	15	.296	22	4.402e-03	8	NC	1	NC	1
1074			min	-.144	9	-.22	9	-.321	4	-4.246e-03	14	NC	1	NC	1
1075		3	max	.144	15	.134	15	.302	22	4.402e-03	8	NC	1	NC	1
1076			min	-.144	9	-.216	9	-.329	4	-4.246e-03	14	NC	1	NC	1
1077		4	max	.144	15	.13	15	.309	22	4.402e-03	8	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1078			min	-.144	9	-.211	9	-.337	4	-4.246e-03	14	NC	1	NC	1
1079		5	max	.144	15	.125	15	.321	21	4.402e-03	8	NC	1	NC	1
1080			min	-.144	9	-.207	9	-.348	3	-4.246e-03	14	NC	1	NC	1
1081	M124	1	max	.314	4	.169	15	.171	3	2.743e-03	13	NC	1	NC	1
1082			min	-.289	22	-.251	9	-.17	21	-2.655e-03	19	NC	1	NC	1
1083		2	max	.314	4	.157	15	.157	15	2.743e-03	13	NC	1	NC	1
1084			min	-.289	22	-.238	9	-.157	9	-2.655e-03	19	NC	1	NC	1
1085		3	max	.314	4	.144	15	.144	15	2.743e-03	13	NC	1	NC	1
1086			min	-.289	22	-.225	9	-.144	9	-2.655e-03	19	NC	1	NC	1
1087		4	max	.314	4	.132	15	.13	15	2.743e-03	13	NC	1	NC	1
1088			min	-.289	22	-.212	9	-.132	9	-2.655e-03	19	NC	1	NC	1
1089		5	max	.314	4	.119	15	.117	15	2.743e-03	13	NC	1	NC	1
1090			min	-.289	22	-.199	9	-.119	9	-2.655e-03	19	NC	1	NC	1
1091	M125	1	max	.288	15	.15	15	.676	25	1.434e-02	25	NC	1	NC	1
1092			min	-.336	9	-.255	9	-.726	7	-1.647e-02	7	NC	1	NC	1
1093		2	max	.288	15	.134	14	.68	25	1.434e-02	25	NC	1	NC	1
1094			min	-.336	9	-.228	8	-.731	7	-1.647e-02	7	NC	1	NC	1
1095		3	max	.288	15	.12	14	.684	25	1.434e-02	25	NC	1	NC	1
1096			min	-.336	9	-.201	8	-.736	7	-1.647e-02	7	NC	1	NC	1
1097		4	max	.288	15	.119	25	.688	25	1.434e-02	25	NC	1	NC	1
1098			min	-.336	9	-.185	7	-.741	7	-1.647e-02	7	NC	1	NC	1
1099		5	max	.288	15	.127	25	.692	25	1.434e-02	25	NC	1	NC	1
1100			min	-.336	9	-.18	7	-.746	7	-1.647e-02	7	NC	1	NC	1
1101	M126	1	max	.127	25	.028	10	.259	6	4.231e-03	8	NC	1	NC	1
1102			min	-.18	7	-.026	40	-.232	24	-4.743e-03	38	3736.344	44	1792.132	27
1103		2	max	.127	25	.028	19	.347	6	4.943e-03	8	NC	1	NC	1
1104			min	-.18	7	-.038	13	-.33	24	-4.755e-03	14	2072.254	11	718.937	2
1105		3	max	.127	25	.062	18	.428	7	5.893e-03	8	NC	1	NC	31
1106			min	-.18	7	-.07	12	-.429	13	-5.611e-03	14	1109.931	11	369.927	2
1107		4	max	.127	25	.255	17	.655	7	3.413e-03	8	NC	1	NC	61
1108			min	-.18	7	-.258	11	-.607	25	-3.114e-03	14	343.329	11	200.847	8
1109		5	max	.127	25	.609	17	1.024	7	2.745e-03	9	NC	8	NC	4
1110			min	-.18	7	-.675	11	-.88	25	-2.706e-03	39	137.821	11	108.688	8
1111	M127	1	max	.676	25	.219	14	.352	9	1.684e-02	10	NC	1	NC	1
1112			min	-.726	7	-.339	8	-.303	15	-1.253e-02	16	NC	1	NC	1
1113		2	max	.676	25	.183	14	.344	9	1.684e-02	10	NC	1	NC	1
1114			min	-.726	7	-.297	8	-.295	15	-1.253e-02	16	NC	1	NC	1
1115		3	max	.676	25	.15	15	.336	9	1.684e-02	10	NC	1	NC	1
1116			min	-.726	7	-.255	9	-.288	15	-1.253e-02	16	NC	1	NC	1
1117		4	max	.676	25	.132	15	.327	9	1.684e-02	10	NC	1	NC	1
1118			min	-.726	7	-.231	9	-.28	15	-1.253e-02	16	NC	1	NC	1
1119		5	max	.676	25	.114	15	.319	9	1.684e-02	10	NC	1	NC	1
1120			min	-.726	7	-.207	9	-.273	15	-1.253e-02	16	NC	1	NC	1
1121	M128	1	max	.171	25	.132	25	.398	24	5.278e-03	25	NC	1	NC	1
1122			min	-.174	7	-.18	7	-.4	7	-7.335e-03	7	NC	1	NC	1
1123		2	max	.171	25	.131	25	.406	25	5.278e-03	25	NC	1	NC	1
1124			min	-.174	7	-.18	7	-.408	7	-7.335e-03	7	NC	1	NC	1
1125		3	max	.171	25	.129	25	.414	25	5.278e-03	25	NC	1	NC	1
1126			min	-.174	7	-.18	7	-.417	7	-7.335e-03	7	NC	1	NC	1
1127		4	max	.171	25	.128	25	.422	25	5.278e-03	25	NC	1	NC	1
1128			min	-.174	7	-.18	7	-.425	7	-7.335e-03	7	NC	1	NC	1
1129		5	max	.171	25	.127	25	.43	25	5.278e-03	25	NC	1	NC	1
1130			min	-.174	7	-.18	7	-.433	7	-7.335e-03	7	NC	1	NC	1
1131	M129	1	max	.126	24	.136	25	.21	24	5.559e-03	25	NC	1	NC	1
1132			min	-.14	6	-.192	7	-.235	6	-5.766e-03	7	NC	1	NC	1
1133		2	max	.126	24	.134	25	.214	24	5.559e-03	25	NC	1	NC	1
1134			min	-.14	6	-.189	7	-.238	6	-5.766e-03	7	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1135		3	max	.126	24	.132	25	.217	24	5.559e-03	25	NC	1	NC	1
1136			min	-.14	6	-.186	7	-.242	6	-5.766e-03	7	NC	1	NC	1
1137		4	max	.126	24	.129	25	.22	24	5.559e-03	25	NC	1	NC	1
1138			min	-.14	6	-.183	7	-.245	6	-5.766e-03	7	NC	1	NC	1
1139		5	max	.126	24	.127	25	.224	24	5.559e-03	25	NC	1	NC	1
1140			min	-.14	6	-.18	7	-.249	6	-5.766e-03	7	NC	1	NC	1
1141	M130	1	max	.146	25	.149	25	.316	12	4.721e-03	13	NC	1	NC	1
1142			min	-.16	7	-.196	7	-.308	18	-3.896e-03	19	NC	1	NC	1
1143		2	max	.146	25	.144	25	.324	12	4.721e-03	13	NC	1	NC	1
1144			min	-.16	7	-.192	7	-.317	18	-3.896e-03	19	NC	1	NC	1
1145		3	max	.146	25	.138	25	.333	12	4.721e-03	13	NC	1	NC	1
1146			min	-.16	7	-.188	7	-.327	18	-3.896e-03	19	NC	1	NC	1
1147		4	max	.146	25	.133	25	.341	12	4.721e-03	13	NC	1	NC	1
1148			min	-.16	7	-.184	7	-.336	18	-3.896e-03	19	NC	1	NC	1
1149		5	max	.146	25	.127	25	.35	12	4.721e-03	13	NC	1	NC	1
1150			min	-.16	7	-.18	7	-.345	18	-3.896e-03	19	NC	1	NC	1
1151	M131	1	max	.316	12	.177	25	.189	7	2.272e-03	21	NC	1	NC	1
1152			min	-.308	18	-.219	7	-.174	25	-2.733e-03	3	NC	1	NC	1
1153		2	max	.316	12	.163	25	.175	7	2.272e-03	21	NC	1	NC	1
1154			min	-.308	18	-.207	7	-.16	25	-2.733e-03	3	NC	1	NC	1
1155		3	max	.316	12	.149	25	.16	7	2.272e-03	21	NC	1	NC	1
1156			min	-.308	18	-.196	7	-.146	25	-2.733e-03	3	NC	1	NC	1
1157		4	max	.316	12	.135	25	.148	6	2.272e-03	21	NC	1	NC	1
1158			min	-.308	18	-.185	7	-.135	24	-2.733e-03	3	NC	1	NC	1
1159		5	max	.316	12	.121	25	.138	6	2.272e-03	21	NC	1	NC	1
1160			min	-.308	18	-.173	7	-.127	24	-2.733e-03	3	NC	1	NC	1
1161	M132	1	max	.553	17	.208	17	.835	13	2.203e-02	13	NC	1	NC	1
1162			min	-.601	11	-.351	11	-.758	19	-1.871e-02	19	NC	1	NC	1
1163		2	max	.553	17	.17	18	.835	13	2.203e-02	13	NC	1	NC	1
1164			min	-.601	11	-.299	12	-.759	19	-1.871e-02	19	NC	1	NC	1
1165		3	max	.553	17	.137	18	.835	13	2.203e-02	13	NC	1	NC	1
1166			min	-.601	11	-.252	12	-.759	19	-1.871e-02	19	NC	1	NC	1
1167		4	max	.553	17	.119	19	.836	13	2.203e-02	13	NC	1	NC	1
1168			min	-.601	11	-.217	13	-.759	19	-1.871e-02	19	NC	1	NC	1
1169		5	max	.553	17	.119	20	.836	13	2.203e-02	13	NC	1	NC	1
1170			min	-.601	11	-.201	2	-.76	19	-1.871e-02	19	NC	1	NC	1
1171	M133	1	max	.119	20	.212	6	.181	5	8.146e-03	5	NC	1	NC	1
1172			min	-.201	2	-.177	24	-.157	23	-7.44e-03	23	1171.923	41	713.655	42
1173		2	max	.119	20	.321	6	.222	6	9.096e-03	5	NC	9	NC	33
1174			min	-.201	2	-.31	24	-.202	24	-8.635e-03	23	708.062	12	983.284	42
1175		3	max	.119	20	.415	6	.266	7	1.036e-02	5	NC	9	NC	31
1176			min	-.201	2	-.407	24	-.253	25	-1.023e-02	23	411.724	12	522.785	2
1177		4	max	.119	20	.651	18	.463	19	1.009e-02	4	NC	56	NC	1
1178			min	-.201	2	-.701	12	-.5	13	-9.957e-03	22	181.582	12	207.593	2
1179		5	max	.119	20	1.129	17	.872	20	1.044e-02	4	NC	8	NC	1
1180			min	-.201	2	-1.319	11	-.918	2	-1.029e-02	22	82.647	11	104.765	2
1181	M134	1	max	.758	19	.303	18	.607	17	1.861e-02	16	NC	1	NC	1
1182			min	-.835	13	-.468	12	-.655	11	-2.341e-02	10	NC	1	NC	1
1183		2	max	.758	19	.253	18	.58	17	1.861e-02	16	NC	1	NC	1
1184			min	-.835	13	-.407	12	-.628	11	-2.341e-02	10	NC	1	NC	1
1185		3	max	.758	19	.208	17	.553	17	1.861e-02	16	NC	1	NC	1
1186			min	-.835	13	-.351	11	-.601	11	-2.341e-02	10	NC	1	NC	1
1187		4	max	.758	19	.177	17	.526	17	1.861e-02	16	NC	1	NC	1
1188			min	-.835	13	-.311	11	-.574	11	-2.341e-02	10	NC	1	NC	1
1189		5	max	.758	19	.147	17	.498	17	1.861e-02	16	NC	1	NC	1
1190			min	-.835	13	-.27	11	-.547	11	-2.341e-02	10	NC	1	NC	1
1191	M135	1	max	.251	5	.124	19	.399	24	8.478e-03	13	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1192			min	-.246	23	-.203	13	-.4	7	-5.339e-03	19	NC	1	NC	1
1193		2	max	.251	5	.122	19	.413	24	8.478e-03	13	NC	1	NC	1
1194			min	-.246	23	-.202	13	-.412	6	-5.339e-03	19	NC	1	NC	1
1195		3	max	.251	5	.12	19	.427	24	8.478e-03	13	NC	1	NC	1
1196			min	-.246	23	-.201	13	-.426	6	-5.339e-03	19	NC	1	NC	1
1197		4	max	.251	5	.118	19	.441	24	8.478e-03	13	NC	1	NC	1
1198			min	-.246	23	-.2	13	-.44	6	-5.339e-03	19	NC	1	NC	1
1199		5	max	.251	5	.119	20	.455	24	8.478e-03	13	NC	1	NC	1
1200			min	-.246	23	-.201	2	-.454	6	-5.339e-03	19	NC	1	NC	1
1201	M136	1	max	.116	6	.127	19	.21	24	6.773e-03	13	NC	1	NC	1
1202			min	-.104	24	-.216	13	-.235	6	-5.404e-03	19	NC	1	NC	1
1203		2	max	.116	6	.124	19	.219	24	6.773e-03	13	NC	1	NC	1
1204			min	-.104	24	-.212	13	-.245	6	-5.404e-03	19	NC	1	NC	1
1205		3	max	.116	6	.122	19	.228	24	6.773e-03	13	NC	1	NC	1
1206			min	-.104	24	-.207	13	-.255	6	-5.404e-03	19	NC	1	NC	1
1207		4	max	.116	6	.12	20	.237	24	6.773e-03	13	NC	1	NC	1
1208			min	-.104	24	-.203	13	-.265	6	-5.404e-03	19	NC	1	NC	1
1209		5	max	.116	6	.119	20	.246	24	6.773e-03	13	NC	1	NC	1
1210			min	-.104	24	-.201	2	-.276	6	-5.404e-03	19	NC	1	NC	1
1211	M137	1	max	.199	18	.133	19	.277	25	4.199e-03	13	NC	1	NC	1
1212			min	-.201	12	-.215	13	-.3	7	-4.076e-03	19	NC	1	NC	1
1213		2	max	.199	18	.129	19	.298	24	4.199e-03	13	NC	1	NC	1
1214			min	-.201	12	-.211	13	-.32	6	-4.076e-03	19	NC	1	NC	1
1215		3	max	.199	18	.125	19	.322	24	4.199e-03	13	NC	1	NC	1
1216			min	-.201	12	-.207	13	-.346	6	-4.076e-03	19	NC	1	NC	1
1217		4	max	.199	18	.121	19	.347	24	4.199e-03	13	NC	1	NC	1
1218			min	-.201	12	-.203	13	-.371	6	-4.076e-03	19	NC	1	NC	1
1219		5	max	.199	18	.119	20	.371	24	4.199e-03	13	NC	1	NC	1
1220			min	-.201	12	-.201	2	-.396	6	-4.076e-03	19	NC	1	NC	1
1221	M138	1	max	.3	7	.158	19	.25	6	2.819e-03	5	NC	1	NC	1
1222			min	-.277	25	-.24	13	-.249	24	-2.739e-03	23	NC	1	NC	1
1223		2	max	.3	7	.146	19	.224	18	2.819e-03	5	NC	1	NC	1
1224			min	-.277	25	-.227	13	-.225	12	-2.739e-03	23	NC	1	NC	1
1225		3	max	.3	7	.133	19	.199	18	2.819e-03	5	NC	1	NC	1
1226			min	-.277	25	-.215	13	-.201	12	-2.739e-03	23	NC	1	NC	1
1227		4	max	.3	7	.121	19	.174	18	2.819e-03	5	NC	1	NC	1
1228			min	-.277	25	-.202	13	-.176	12	-2.739e-03	23	NC	1	NC	1
1229		5	max	.3	7	.109	19	.149	18	2.819e-03	5	NC	1	NC	1
1230			min	-.277	25	-.19	13	-.152	12	-2.739e-03	23	NC	1	NC	1
1231	M124A	1	max	.245	14	.492	47	.23	25	1.28e-02	18	NC	1	NC	1
1232			min	-.249	8	-.465	5	-.24	7	-1.528e-02	12	66.107	3	56.424	46
1233		2	max	.245	14	.337	47	.194	25	1.34e-02	18	NC	1	NC	1
1234			min	-.249	8	-.39	5	-.2	7	-1.57e-02	12	88.149	3	75.284	46
1235		3	max	.245	14	.225	24	.168	24	1.399e-02	18	NC	1	NC	1
1236			min	-.249	8	-.333	6	-.171	6	-1.612e-02	12	132.232	3	113.012	46
1237		4	max	.245	14	.218	25	.153	12	1.458e-02	18	NC	1	NC	1
1238			min	-.249	8	-.316	7	-.152	18	-1.654e-02	12	108.009	20	226.165	46
1239		5	max	.245	14	.265	25	.158	11	1.534e-02	17	NC	1	NC	1
1240			min	-.249	8	-.351	7	-.154	17	-1.721e-02	11	80.975	20	205.84	51
1241	M125A	1	max	.399	23	.278	19	.218	22	1.433e-02	14	NC	1	NC	1
1242			min	-.403	5	-.417	13	-.229	4	-1.675e-02	8	72.058	12	288.163	67
1243		2	max	.399	23	.238	19	.179	21	1.445e-02	14	NC	1	NC	1
1244			min	-.403	5	-.363	13	-.186	3	-1.671e-02	8	96.159	12	385.569	67
1245		3	max	.398	23	.223	20	.153	20	1.456e-02	14	NC	1	NC	1
1246			min	-.403	5	-.332	2	-.156	2	-1.667e-02	8	144.374	12	414.858	59
1247		4	max	.398	23	.229	20	.157	7	1.467e-02	14	NC	1	NC	1
1248			min	-.403	5	-.329	3	-.158	25	-1.662e-02	8	99.757	16	275.463	59

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1249		5	max	.398	23	.283	21	.191	7	1.478e-02	14	NC	1	NC	1
1250			min	-.403	5	-.371	3	-.189	25	-1.658e-02	8	74.746	16	205.851	59
1251	M126A	1	max	.22	20	.27	15	.175	17	1.464e-02	22	NC	1	NC	1
1252			min	-.225	2	-.408	9	-.184	11	-1.707e-02	4	76.661	8	151.564	7
1253		2	max	.22	20	.232	15	.162	17	1.435e-02	22	NC	1	NC	1
1254			min	-.225	2	-.356	9	-.167	11	-1.664e-02	4	102.244	8	202.199	7
1255		3	max	.22	20	.226	16	.166	16	1.406e-02	22	NC	1	NC	1
1256			min	-.225	2	-.385	46	-.168	10	-1.622e-02	4	141.196	25	303.487	7
1257		4	max	.22	20	.256	17	.174	4	1.377e-02	22	NC	1	NC	1
1258			min	-.225	2	-.57	47	-.174	22	-1.579e-02	4	94.117	25	275.449	55
1259		5	max	.22	20	.327	17	.204	3	1.348e-02	22	NC	1	NC	1
1260			min	-.225	2	-.758	47	-.201	21	-1.536e-02	4	70.578	25	205.84	55

Envelope AISI S100-10: ASD Cold Formed Steel Code Checks

Member	Shape	Code ...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Pn/Om[k]	Tn/Om[k]	Mnyy/O...	Mnzz/O...	Cb	Cmyy	Cmzz	Eqn
No Data to Print ...																

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M105	PIPE_2.0	.805	4.5	2	.213	4.5		11	14.916	32.13	1.872	1.872	2...	H1-1b
2	M133	PIPE_2.0	.800	4.5	11	.210	4.5		13	14.916	32.13	1.872	1.872	2...	H1-1b
3	M119B	PIPE_2.0	.791	4.5	5	.180	4.5		9	14.916	32.13	1.872	1.872	2...	H1-1b
4	M8	PIPE_2.0	.588	4.5	2	.149	4.5		11	14.916	32.13	1.872	1.872	2...	H1-1b
5	M112A	PIPE_2.0	.582	4.5	5	.150	4.5		3	14.916	32.13	1.872	1.872	2...	H1-1b
6	M126	PIPE_2.0	.576	4.5	11	.150	4.5		7	14.916	32.13	1.872	1.872	2...	H1-1b
7	M11	PIPE_2.0	.502	4.5	46	.054	.5		40	14.916	32.13	1.872	1.872	2...	H1-1b
8	M69	PIPE_3.5	.455	7.25	7	.182	7.25		2	33.422	78.75	7.954	7.954	1...	H1-1b
9	M89A	HSS4x4x3	.453	0	6	.139	0	z	13	97.541	106.812	12.662	12.662	2...	H1-1b
10	M38	HSS4x4x3	.446	0	10	.140	0	z	9	97.541	106.812	12.662	12.662	2...	H1-1b
11	M71A	PIPE_2.0	.442	12.5	47	.126	4.036		47	6.295	32.13	1.872	1.872	2...	H1-1b
12	M63	PIPE_3.5	.435	7.25	11	.173	7.25		6	33.422	78.75	7.954	7.954	1...	H1-1b
13	M94	PIPE_3.5	.431	7.25	3	.178	7.25		11	33.422	78.75	7.954	7.954	1...	H1-1b
14	M37	HSS4x4x3	.311	0	5	.243	4.503	y	47	97.541	106.812	12.662	12.662	1...	H1-1b
15	M61	L3x3x4	.310	0	2	.265	2.148	z	8	42.124	46.656	1.688	3.756	1...	H2-1
16	M93A	L3x3x4	.310	0	2	.265	2.148	y	8	42.124	46.656	1.688	3.756	1...	H2-1
17	M92A	L3x3x4	.303	0	5	.267	2.148	z	12	42.124	46.656	1.688	3.756	1...	H2-1
18	M62	L3x3x4	.302	0	10	.268	2.148	y	4	42.124	46.656	1.688	3.756	1...	H2-1
19	M67	L3x3x4	.297	0	10	.261	2.148	z	4	42.124	46.656	1.688	3.756	1...	H2-1
20	M68	L3x3x4	.296	0	6	.260	2.148	y	12	42.124	46.656	1.688	3.756	1...	H2-1
21	M87	PIPE_2.0	.219	4.5	10	.068	4.5		10	14.916	32.13	1.872	1.872	2...	H1-1b
22	M95	PIPE_2.0	.215	4.5	37	.076	4.5		13	14.916	32.13	1.872	1.872	2...	H1-1b
23	M5	PIPE_2.0	.212	4.5	29	.066	4.5		5	14.916	32.13	1.872	1.872	2...	H1-1b
24	M98A	PIPE_2.0	.201	4.5	6	.054	4.5		6	14.916	32.13	1.872	1.872	2...	H1-1b
25	M88	PIPE_2.0	.197	3.906	33	.078	3.906		40	6.295	32.13	1.872	1.872	2...	H1-1b
26	M110	PIPE_2.0	.197	3.906	36	.060	8.594		42	6.295	32.13	1.872	1.872	2...	H1-1b
27	M90A	PIPE_2.0	.194	4.5	27	.058	4.5		2	14.916	32.13	1.872	1.872	1...	H1-1b
28	M64A	LL2.5x2.5x...	.115	0	32	.013	0	y	46	41.904	58.32	3.954	2.55	1	H1-1b*
29	M115	L2.5x2.5x3	.115	2.487	2	.008	4.974	y	2	12.979	29.192	.873	1.662	1...	H2-1
30	M98	LL2.5x2.5x...	.115	0	28	.008	5	y	5	41.904	58.32	3.954	2.55	1...	H1-1b*
31	M66A	LL2.5x2.5x...	.115	0	36	.008	5	z	4	41.904	58.32	3.954	2.55	1...	H1-1b*
32	M92	L2.5x2.5x3	.114	2.487	2	.008	4.974	z	8	12.979	29.192	.873	1.662	1...	H2-1
33	M114	L2.5x2.5x3	.097	2.435	23	.006	0	z	18	12.979	29.192	.873	1.662	1...	H2-1
34	M93	L2.5x2.5x3	.095	2.435	17	.006	0	y	4	12.979	29.192	.873	1.662	1...	H2-1
35	M76	L2.5x2.5x3	.091	2.487	6	.006	0	y	18	12.979	29.192	.873	1.662	1...	H2-1

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt ...	phi*Mn ...	phi*Mn ...	Cb	Eqn
36	M75	L2.5x2.5x3	.090	2.487	10	.006	0	z	22	12.979	29.192	.873	1.662	1...	H2-1
37	M125A	L2.5x2.5x3	.041	1.305	2	.007	2.611	y	43	23.061	29.192	.873	1.899	1...	H2-1
38	M126A	L2.5x2.5x3	.035	1.305	10	.043	2.611	y	48	23.061	29.192	.873	1.899	1...	H2-1
39	M124A	L2.5x2.5x3	.035	1.305	6	.025	2.611	y	46	23.061	29.192	.873	1.899	1...	H2-1
40	M116A	PIPE_2.0	.009	1.422	2	.029	0		44	29.162	32.13	1.872	1.872	1...	H1-1b
41	M115A	PIPE_2.0	.008	1.422	28	.120	0		48	29.162	32.13	1.872	1.872	1...	H1-1b
42	M114A	PIPE_2.0	.008	1.422	36	.088	0		46	29.162	32.13	1.872	1.872	1...	H1-1b

SPECIAL CONSTRUCTION NOTE:
SPRINT WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.

SPECIAL CONSTRUCTION NOTE:
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT SPRINT'S RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

Sprint

PROGRAM: DO MACRO UPGRADE EQUIPMENT DEPLOYMENT

SITE NUMBER: CT23XC409

SITE ADDRESS: 154 SAYLE AVENUE PUTNAM, CT 06260

SITE TYPE: EXISTING 175' MONOPOLE

SITE INFORMATION

SITE INFORMATION:

LATITUDE: 41° 55' 46.0" N
(PER SBA RECORDS) 41.92944°

LONGITUDE: -71° 53' 08.0" W
(PER SBA RECORDS) -71.88556°

STRUCTURE HEIGHT: 175 '±

STRUCTURE TYPE: MONOPOLE

APPLICANT:

SPRINT
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

TOWER OWNER:

SBA TOWERS LLC.
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

SBA SITE ID: CT00680-S

SBA SITE NAME: PUTNAM

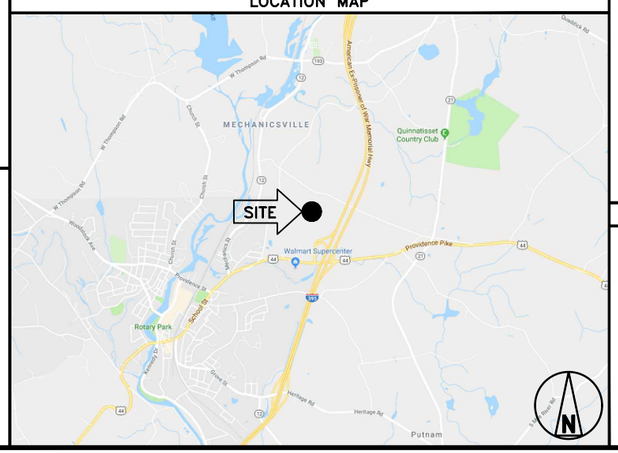
SBA CONTACT: STEPHEN ROTH
(800) 539-4920
sroth@sbasite.com

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

811 Know what's below. Call before you dig.
www.call811.com

AREA MAP

LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- REMOVE (3) PANEL ANTENNAS
- REMOVE (6) 1 5/8" COAX
- RELOCATED (3) EXISTING PANEL ANTENNAS
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) 2.5 GHz RRH'S ON DUAL RRH MOUNT
- RELOCATE (3) 1900 MHz RRH'S ON DUAL RRH MOUNT
- INSTALL (6) 800 MHz RRH'S ON PROPOSED PIPE MOUNT
- INSTALL STRUCTURAL AUGMENTS
- INSTALL (4) HYBRID CABLES
- INSTALL RAN EQUIPMENT INSIDE EXISTING MMBTS CABINET

THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

APPLICABLE CODES

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALL IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE (2012 IBC)
2. TIA-222-G OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2014 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
   - ADA COMPLIANCE NOT REQUIRED.
   - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.

DRAWING INDEX

SHEET NO.	SHEET TITLE	REV.
T-1	TITLE SHEET & PROJECT DATA	0
SP-1	OUTLINE SPECIFICATIONS	0
SP-2	OUTLINE SPECIFICATIONS	0
SP-3	OUTLINE SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	EQUIPMENT & MOUNTING DETAILS	0
A-5	DETAILS	0
E-1	ELECTRICAL & GROUNDING DETAILS	0
RF-1	RF DATA SHEET	0
RF-2	PLUMBING DIAGRAM	0

APPROVALS

TITLE	SIGNATURE	DATE
PROJECT MANAGER:		
CONSTRUCTION:		
RF ENGINEER:		
ZONING/SITE ACQ:		
OPERATIONS:		
TOWER OWNER:		

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
TITLE SHEET
& PROJECT DATA

SHEET NUMBER:
T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

1. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
7. AMERICAN CONCRETE INSTITUTE (ACI)
8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
11. PORTLAND CEMENT ASSOCIATION (PCA)
12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
13. BRICK INDUSTRY ASSOCIATION (BIA)
14. AMERICAN WELDING SOCIETY (AWS)
15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
17. DOOR AND HARDWARE INSTITUTE (DHI)
18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
19. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.

B. COMPANY: SPRINT CORPORATION

C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.

D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.

E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.

C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

NOTE: IN SHORT-FORM SPECIFICATIONS ON THE DRAWINGS, A/E TO INSERT LIST OF APPLICABLE MOPS INCLUDING EN-2012-001, EN-2013-002, EL-0568, AND TS-0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 EXISTING CONDITIONS: NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

A. A COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.

3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.

4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.

5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED

A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

PLANS PREPARED FOR:

Sprint

INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:

SBA

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:

INFINIGY

FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:

CT23XC409

SITE ADDRESS:

154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:

OUTLINE SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.

1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.

1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN

D. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;

1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPs

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

1. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
2. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

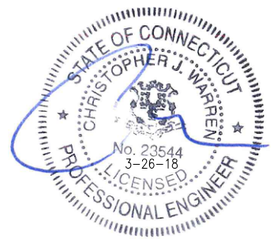
1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:



CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
OUTLINE SPECIFICATIONS

SHEET NUMBER:
SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.

8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.

9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.

10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

11. ALL AVAILABLE JURISDICTIONAL INFORMATION

12. PDF SCAN OF REDLINES PRODUCED IN FIELD

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.

1. CONCRETE MIX AND CYLINDER BREAK REPORTS.

2. STRUCTURAL BACKFILL COMPACTION REPORTS.

3. SITE RESISTANCE TO EARTH TEST.

4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION

5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.

6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;

1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.

2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;

3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.

4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;

6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.

7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.

9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:

1. 1SHELTER AND TOWER OVERVIEW.

2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).

3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).

4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).

5. PHOTOS OF TOWER SECTION STACKING.

6. CONCRETE TESTING / SAMPLES.

7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.

8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.

9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.

10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.

11. COAX CABLE ENTRY INTO SHELTER.

12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.

14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.

15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.

16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.

17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.

18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.

19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.

20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.

21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.

22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

25. ALL BTS GROUND CONNECTIONS.

26. ALL GROUND TEST WELLS.

27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.

28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.

29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.

30. GPS ANTENNAS.

31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.

32. DOGHOUSE/CABLE EXIT FROM ROOF.

33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.

34. MASTER BUS BAR.

35. TELCO BOARD AND NIU.

36. ELECTRICAL DISTRIBUTION WALL.

37. CABLE ENTRY WITH SURGE SUPPRESSION.

38. ENTRANCE TO EQUIPMENT ROOM.

39. COAX WEATHERPROOFING-TOP AND BOTTOM OF TOWER.

40. COAX GROUNDING -TOP AND BOTTOM OF TOWER.

41. ANTENNA AND MAST GROUNDING.

42. LANDSCAPING – WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

PLANS PREPARED FOR:

Sprint

INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:

SBA

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:

INFINIGY

FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:

CT23XC409

SITE ADDRESS:

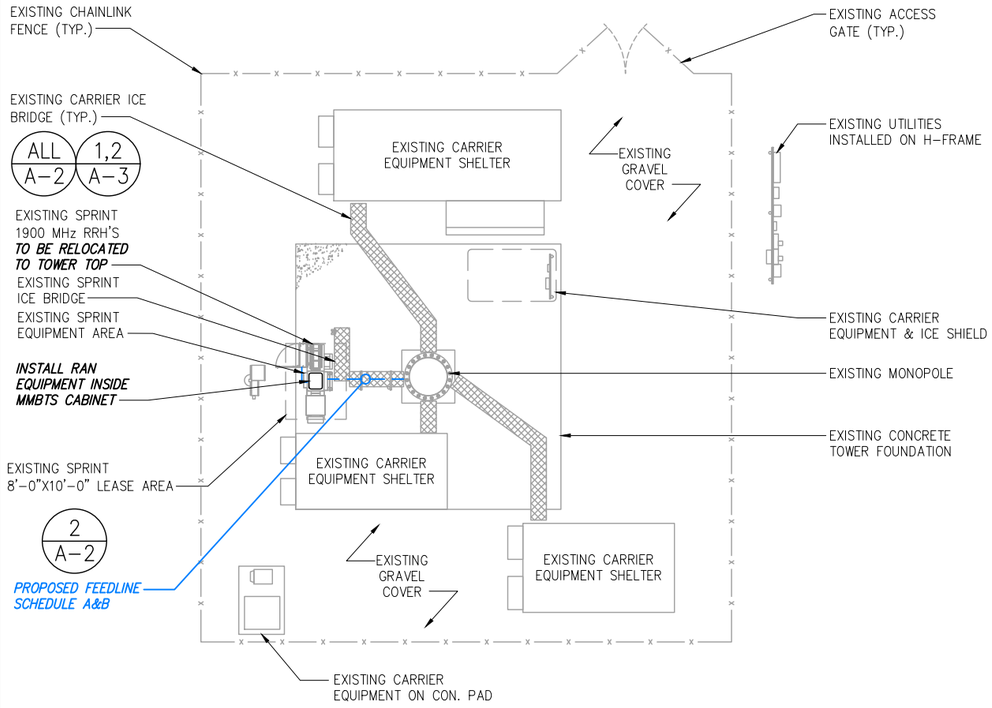
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:

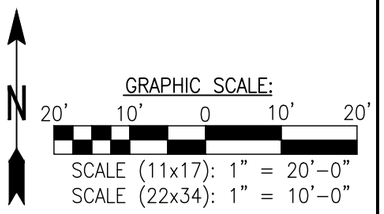
OUTLINE SPECIFICATIONS

SHEET NUMBER:

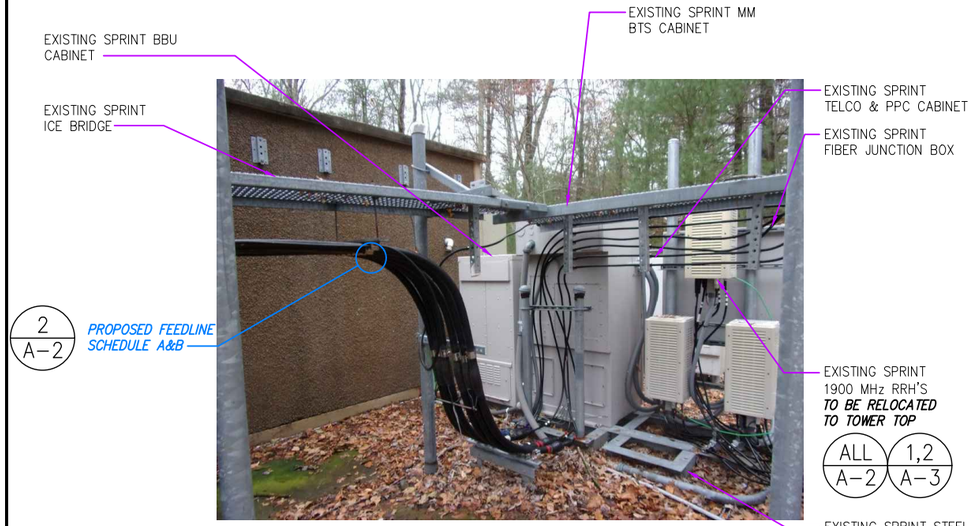
SP-3



INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION AND ARE NOT THE RESULT OF A FIELD SURVEY.



OVERALL SITE PLAN | SCALE: AS NOTED | 1



SOURCE: WESTCHESTER SERVICES 11/15/17

SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint

INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:

SBA

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:

CT23XC409

SITE ADDRESS:

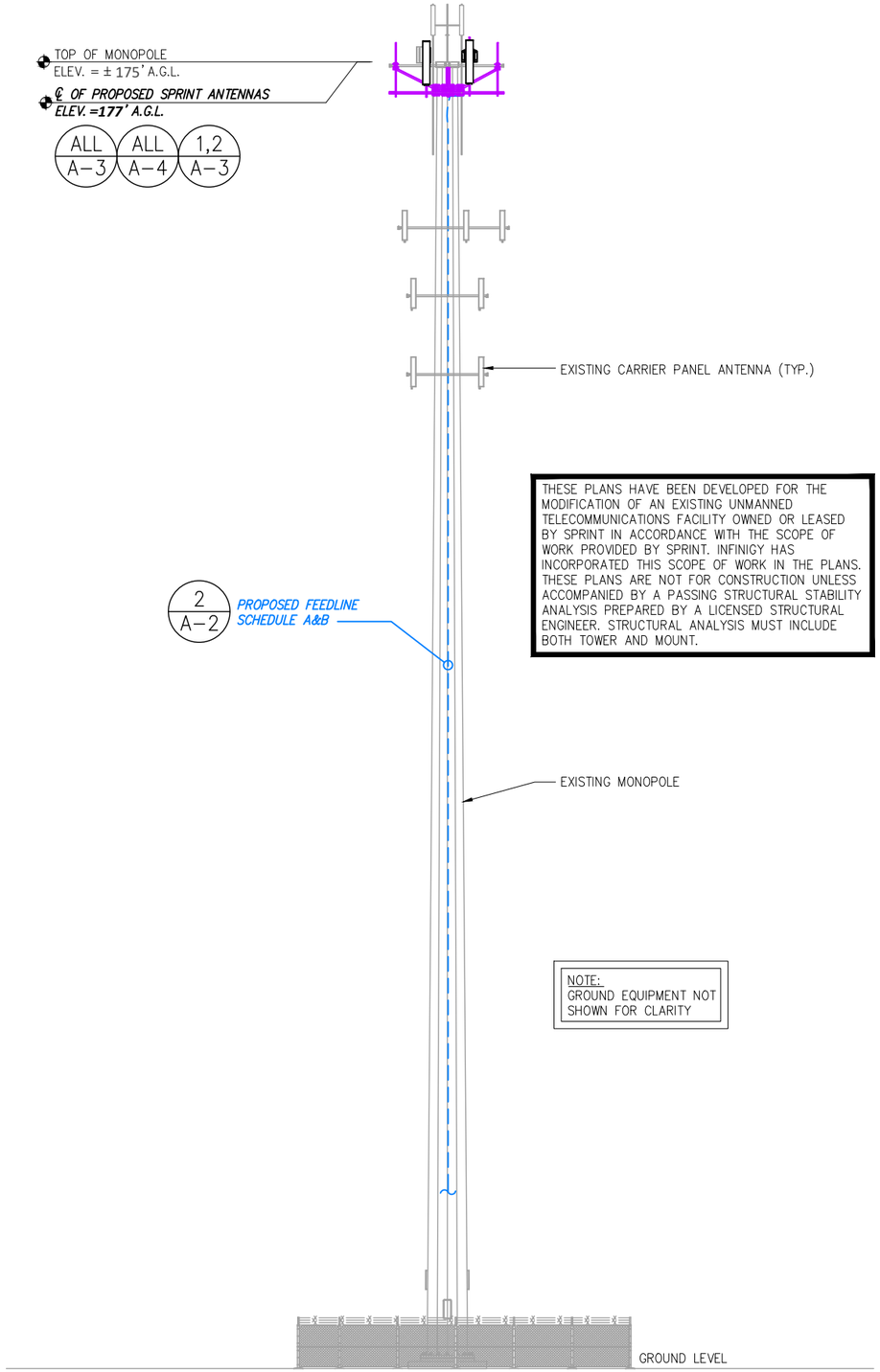
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

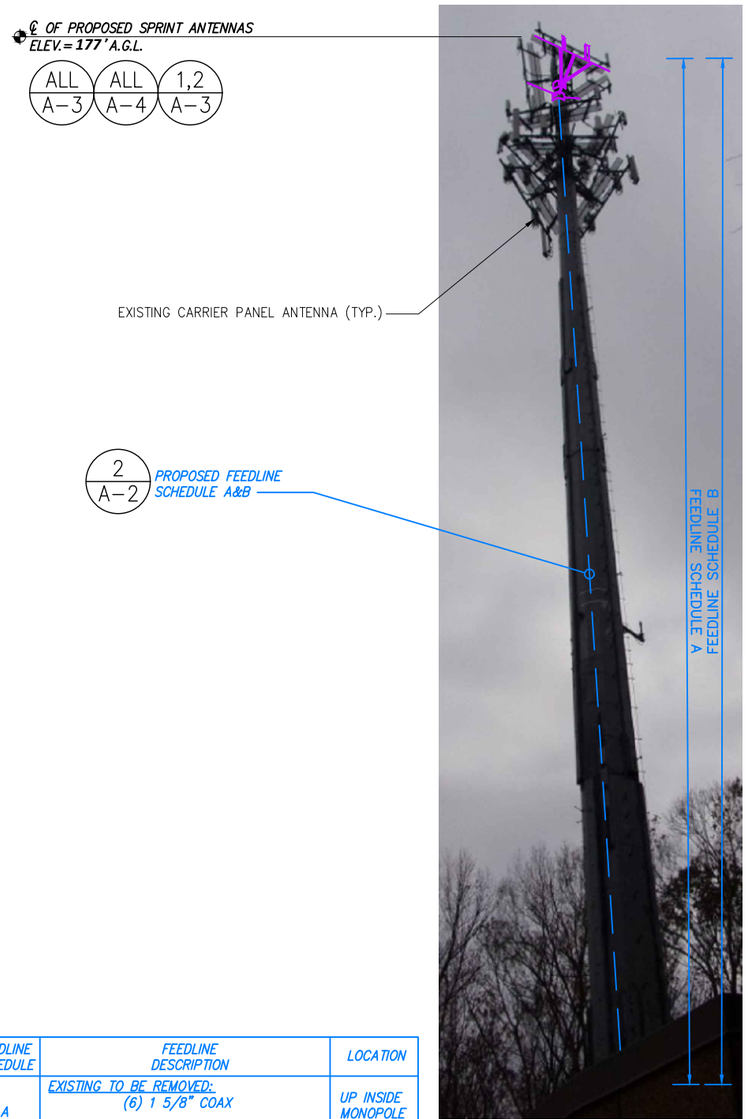
A-1



THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

TOWER ELEVATION | NO SCALE | 1

SPECIAL CONSTRUCTION NOTE:
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT SPRINT'S RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).



SOURCE: WESTCHESTER SERVICES 11/15/17

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO BE REMOVED: (6) 1 5/8" COAX	UP INSIDE MONOPOLE TO RAD
B	PROPOSED: (4) HYBRID TO 180' RAD	UP INSIDE MONOPOLE TO RAD

NOTE:
EXISTING SPRINT EQUIPMENT FEEDLINE INVENTORY BASED ON COLOCATION APPLICATION AND SBA RECORD, NOT FIELD OBSERVATIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

SPECIAL INSTALLATION NOTE:
JUMPERS FROM RRHs TO ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

SITE LOADING CHART | NO SCALE | 2

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

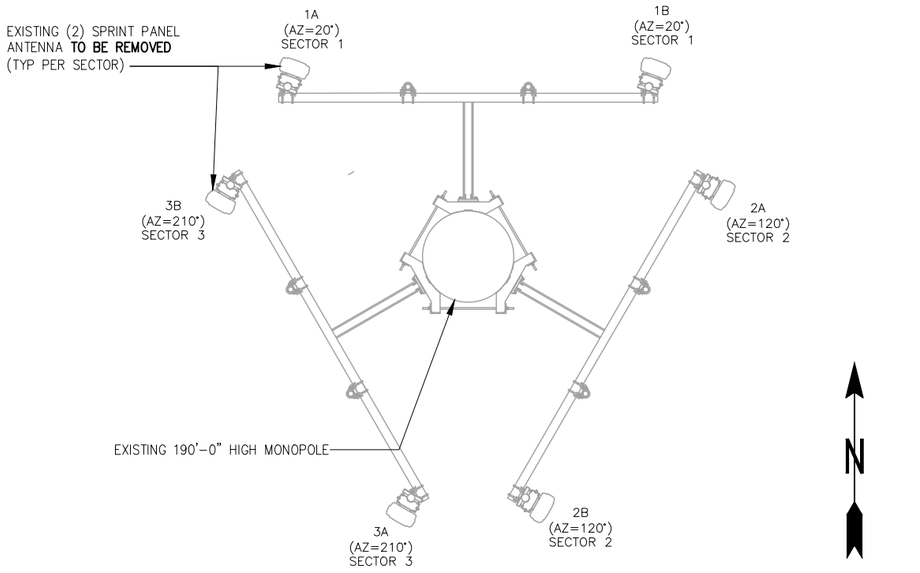
SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
TOWER ELEVATION

SHEET NUMBER:
A-2

SPECIAL CONSTRUCTION NOTE:
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS (STRUCTURAL MODIFICATIONS) AT SPRINT'S RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA–PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS).

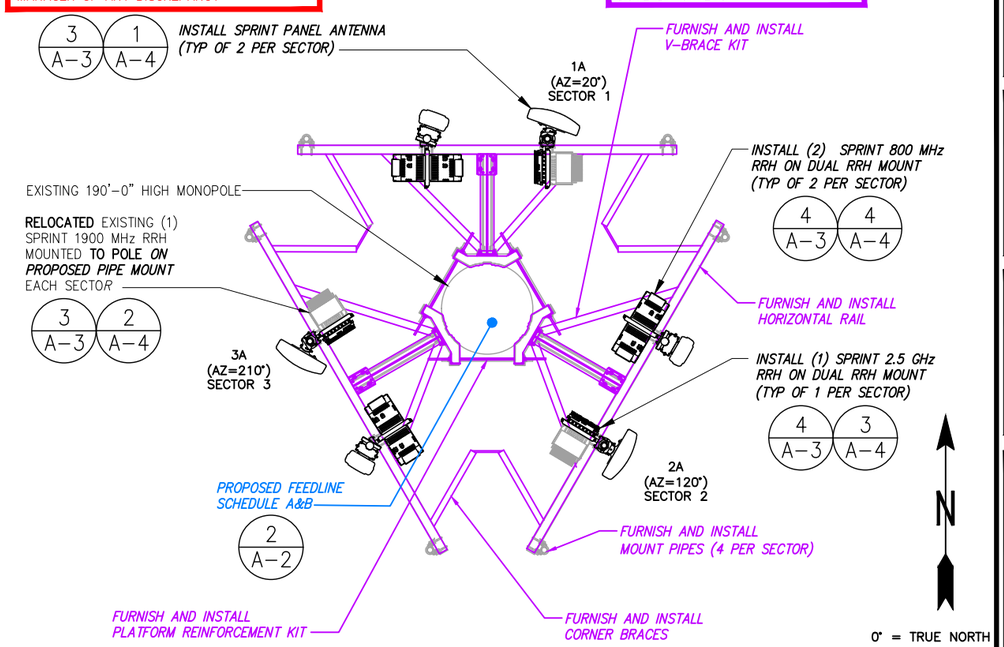


EXISTING ANTENNA & RRH LAYOUT — NO SCALE — 1

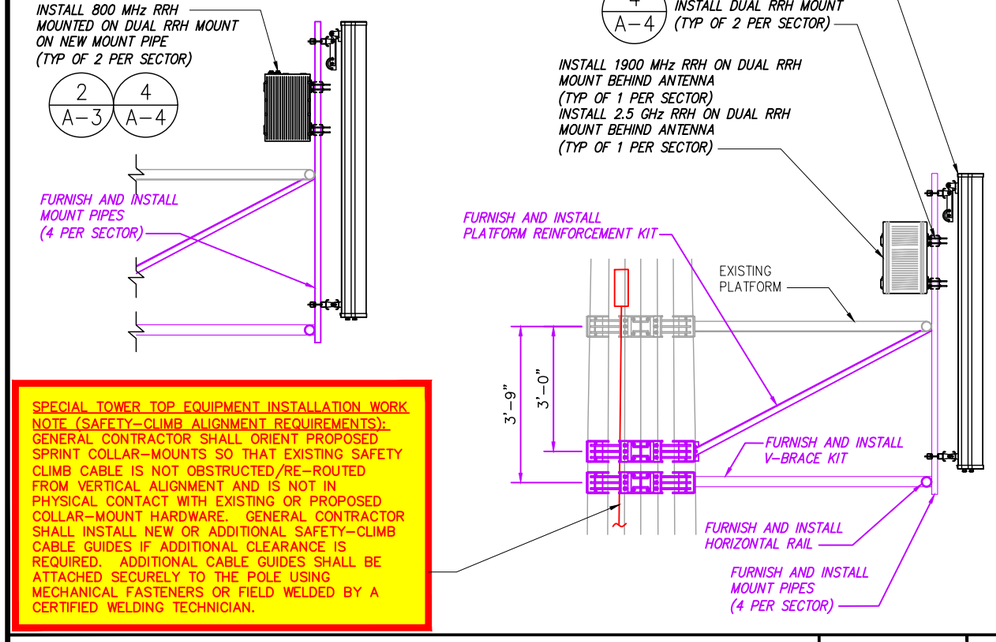
SPECIAL INSTALLATION NOTE:
JUMPERS FROM RRHs TO ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

NOTE:
FOR DETAILS OF MOUNT AUGMENT, REFER TO MOUNT AUGMENT CD'S DONE BY OTHERS.

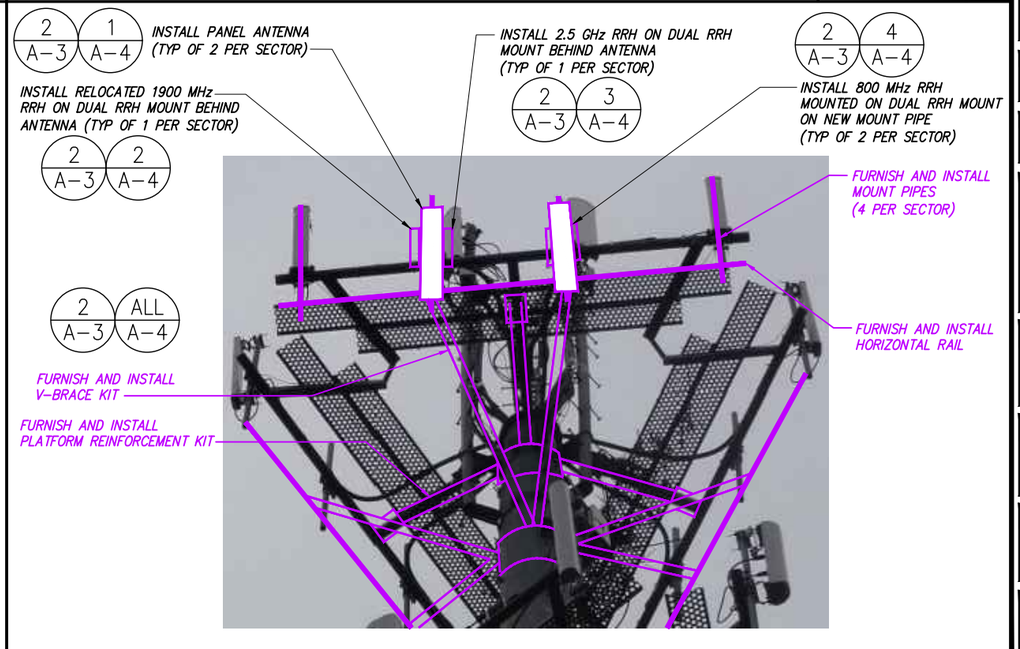


FINAL ANTENNA LAYOUT — NO SCALE — 2



SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY–CLIMB ALIGNMENT REQUIREMENTS):
GENERAL CONTRACTOR SHALL ORIENT PROPOSED SPRINT COLLAR–MOUNTS SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE–ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH EXISTING OR PROPOSED COLLAR–MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY–CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.

TYPICAL MOUNTING DETAIL — NO SCALE — 3



ANTENNA & RRH MOUNT PHOTO DETAIL — NO SCALE — 4

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357–7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251–0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518–690–0790 | Fax: 518–690–0793
www.infinigy.com
JOB NUMBER 526–104

ENGINEERING LICENSE:
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3–26–18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

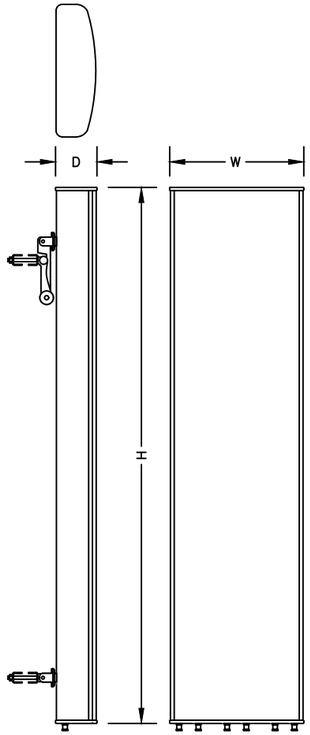
DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

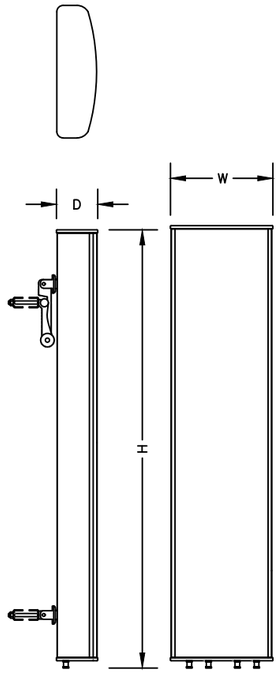
SHEET DESCRIPTION:
ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:
A-3



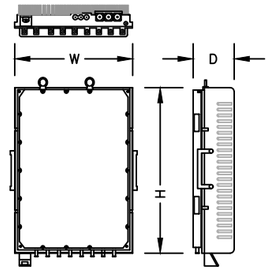
ANTENNA SPECIFICATIONS	
MANUF.	COMMSCOPE
MODEL #	NNVV-65B-R4
HEIGHT	72"
WIDTH	19.6"
DEPTH	7.8"
WEIGHT	84.7± LBS.

ANTENNA DETAIL | NO SCALE | 1



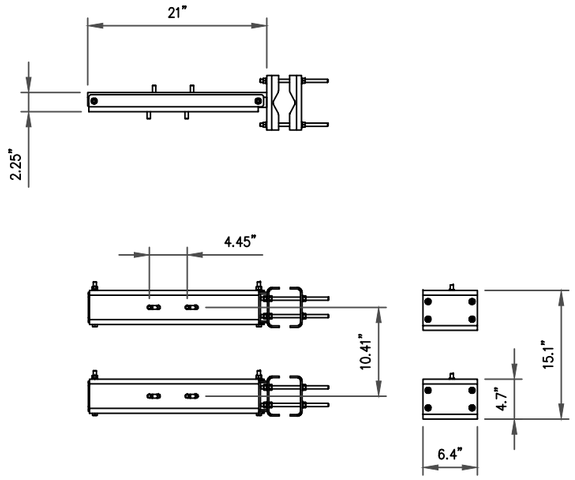
ANTENNA SPECIFICATIONS	
MANUF.	RFS
MODEL #	APXVTM14-ALU-I20
HEIGHT	56.3"
WIDTH	12.6"
DEPTH	6.3"
WEIGHT	56.2± LBS.

ANTENNA DETAIL | NO SCALE | 2

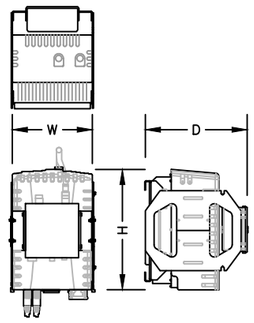


2.5 GHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	TD-RRH8X20-25
HEIGHT	26.1"
WIDTH	18.6"
DEPTH	6.7"
WEIGHT	70± LBS

2.5 RRH | NO SCALE | 3

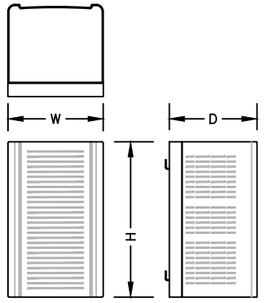


DUAL RRH MOUNT DETAIL | NO SCALE | 4



800 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	800MHZ 2X50W
HEIGHT	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53± LBS

800 MHz RRH | NO SCALE | 5



1900 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	1900 4X45 65MHZ
HEIGHT	25"
WIDTH	11.1"
DEPTH	11.4"
WEIGHT	60± LBS

1900 MHz RRH (EXISTING TO BE RELOCATED) | NO SCALE | 6

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-4

RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	**Hybrid cable** MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft
8 AWG Power	**Hybrid cable** MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	**Hybrid cable** MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	**Hybrid cable** MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

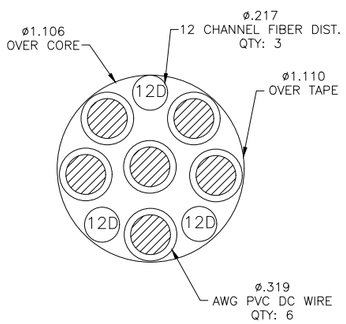
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	**Hybrid Jumper cable** MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	**Hybrid Jumper cable** MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft
6 AWG Power	**Hybrid Jumper cable** MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft
4 AWG Power	**Hybrid Jumper cable** MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

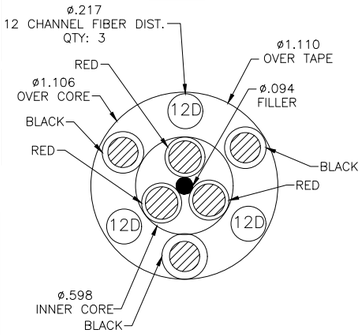
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.

* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20' BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.

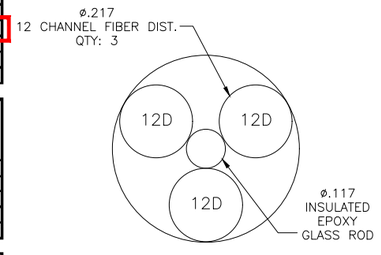
* SPRINT CM TO CONFIRM HYBRID RISER CABLE AND HYBRID JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.



4 AWG



8 & 6 AWG



FIBER ONLY

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

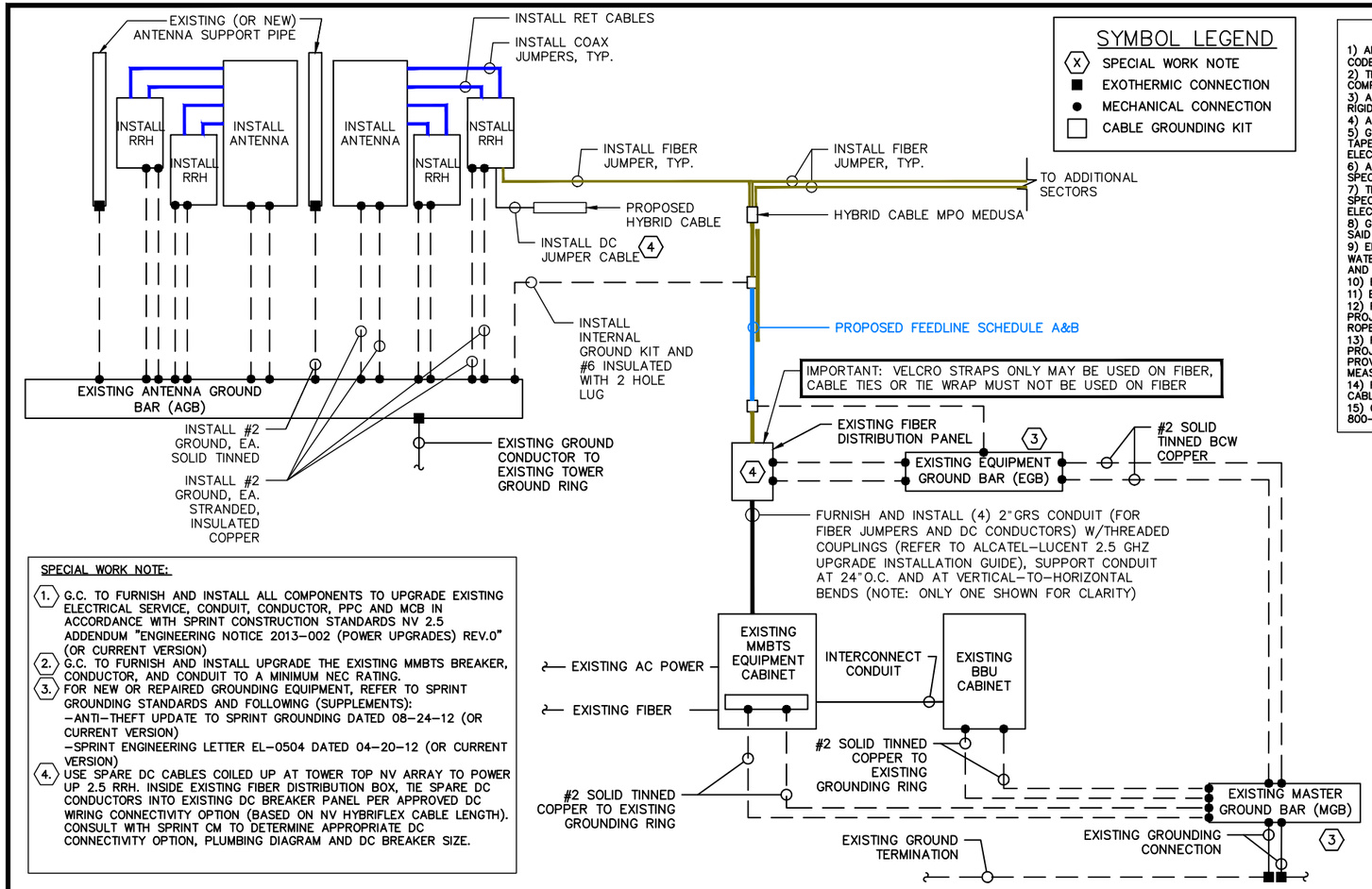
DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
DETAILS

SHEET NUMBER:
A-5



TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

1 / E-1

SCALE: N.T.S.

SPECIAL WORK NOTE:

1. G.C. TO FURNISH AND INSTALL ALL COMPONENTS TO UPGRADE EXISTING ELECTRICAL SERVICE, CONDUIT, CONDUCTOR, PPC AND MCB IN ACCORDANCE WITH SPRINT CONSTRUCTION STANDARDS NV 2.5 ADDENDUM "ENGINEERING NOTICE 2013-002 (POWER UPGRADES) REV.0" (OR CURRENT VERSION)
2. G.C. TO FURNISH AND INSTALL UPGRADE THE EXISTING MMBTS BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING.
3. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
   -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)
   -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
4. USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.

SYMBOL LEGEND

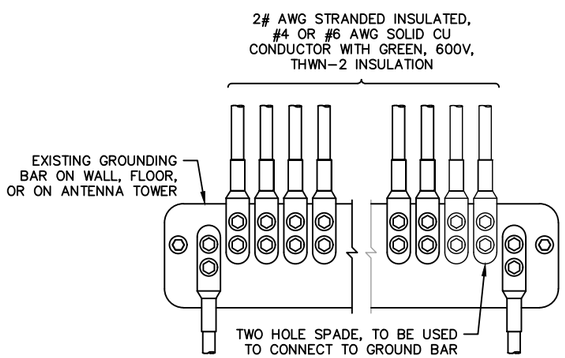
- (X) SPECIAL WORK NOTE
- ■ EXOTHERMIC CONNECTION
- ● MECHANICAL CONNECTION
- □ CABLE GROUNDING KIT

ELECTRICAL NOTES

1) ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2) THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT ROUTING WITH LOCAL UTILITY COMPANIES AND SPRINT CONSTRUCTION MANAGER.
3) ALL CONDUITS ROUTED BELOW GRADE SHALL TRANSITION TO RIGID GALVANIZED ELBOWS WITH RIGID GALVANIZED STEEL CONDUIT ABOVE GRADE.
4) ALL METAL CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
5) GENERAL CONTRACTOR SHALL PROVIDE ALL DIRECT BURIED CONDUITS WITH PLASTIC WARNING TAPE IDENTIFYING CONTENTS. TAPE COLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.
6) ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
7) THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIALS DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
8) GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
9) ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
10) BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
11) ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
12) RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
13) RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
14) FIBER OPTIC CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 770-OPTICAL FIBER CABLES AND RACEWAYS.
15) COMMUNICATIONS CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 800-COMMUNICATIONS SYSTEMS.

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.
2. GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
3. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
4. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX" OR EQUAL.
5. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
6. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
7. ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
8. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
9. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
10. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
11. GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
12. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
13. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
14. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
15. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
16. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
17. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
18. FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
   -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)
   -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)

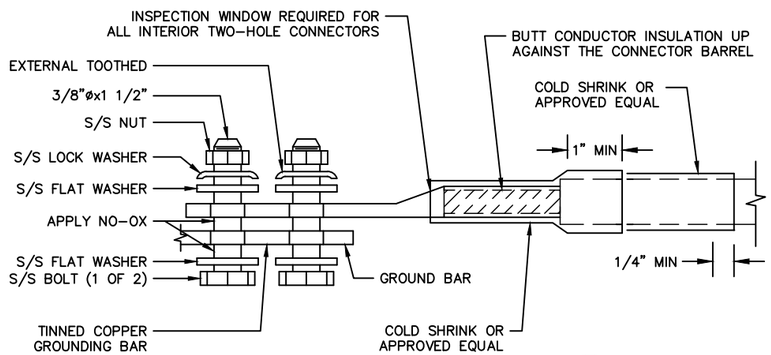


1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

2 / E-1

SCALE: N.T.S.



TWO HOLE LUG

3 / E-1

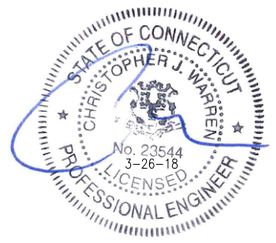
SCALE: N.T.S.

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:



CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:
E-1

SprintVision

RF Design Sheet

Site Identification	
Cascade	CT23XC409
SMS Schedule ID	12323162
SMS Schedule Name	DO Macro Upgrade
PID	
RRU OEM	Alcatel Lucent
Switch OEM	ALU
RFDS Issue Date	2017-08-15 00:00:00.0
RFDS Revision Date	
RFDS Revision	

Filter Analysis Complete	YES
RFDS - Issue Date	08/15/2017
Design Status	Complete
Border Analysis Complete	YES
Project Description	DO Macro Upgrade - Add 800MHz (3G + 4G) and 2500 MHz

Contact Information	
Engineer Email	Bill.M.Hastings@sprint.com
Sprint Badged RF Engineer	Bill Hastings
RF Engineer Email	Bill.M.Hastings@sprint.com
RF Engineer Phone	978-590-9700
RF Manager	Jonathan Hull
RF Manager Email	Jonathan.B.Hull@Sprint.com
RF Manager Phone	617-233-2920

Carrier Count	
2500 LTE	2
1900 LTE	1
1900 EVDO	
1900 Voice	1
800 LTE	1
800 Voice	1

Location Details	
Latitude	41.92944
Longitude	-71.88556
Market	Northern Connecticut
Region	Northeast
City	Putnam
State	CT
Zip Code	CT/06260
County	Windham

2500MHz	3
1900MHz	3
800MHz	3

* DENOTES SPRINT RAD BASED ON SBA PROVIDED STRUCTURAL ANALYSIS

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-4x45-1900	RRH-4x45-1900	RRH-4x45-1900	N/A	N/A	N/A
Weight (lbs)	69.5	69.5	69.5	N/A	N/A	N/A
Dimensions	25 x 12 x 12	25 x 12 x 12	25 x 12 x 12	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-2x50-800	RRH-2x50-800	RRH-2x50-800	N/A	N/A	N/A
Weight (lbs)	69.1	69.1	69.1	N/A	N/A	N/A
Dimensions	16 x 13 x 10	16 x 13 x 10	16 x 13 x 10	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	2	2	2	0	0	0
Trunk Cable 1						
Model Number	Hybriflex	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	1	N/A	N/A	N/A	N/A	N/A
Dimensions (in.)	1.54	N/A	N/A	N/A	N/A	N/A
Manufacturer	ALU	N/A	N/A	N/A	N/A	N/A

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	APXVTM14-ALU-I20	APXVTM14-ALU-I20	APXVTM14-ALU-I20			
Weight (lbs)	56.2	56.2	56.2	N/A	N/A	N/A
Dimensions	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	N/A	N/A	N/A
Manufacturer	RFS	RFS	RFS	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	2.5 Jumper 8	2.5 Jumper 8	2.5 Jumper 8	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	20	120	210	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	166.9619476	166.9619476	166.9619476	N/A	N/A	N/A
Antenna 1 Electrical DT	2	2	2	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	NNVV-65B-R4	NNVV-65B-R4	NNVV-65B-R4			
Weight (lbs)	84.7	84.7	84.7	N/A	N/A	N/A
Dimensions	72 x 19.6 x 7.8	72 x 19.6 x 7.8	72 x 19.6 x 7.8	N/A	N/A	N/A
Manufacturer	CommScope	CommScope	CommScope	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	800/1900 Jumper 4	800/1900 Jumper 4	800/1900 Jumper 4	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	20	120	210	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	166.9619476 *180	166.9619476 *180	166.9619476 *180	N/A	N/A	N/A
Antenna 1 Electrical DT	3	3	3	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

A&E Drawing Requirements

10/09/2017 (WR): RFDS revised to modify RRU location to "GM to Standard".

PLANS PREPARED FOR:
Sprint
INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

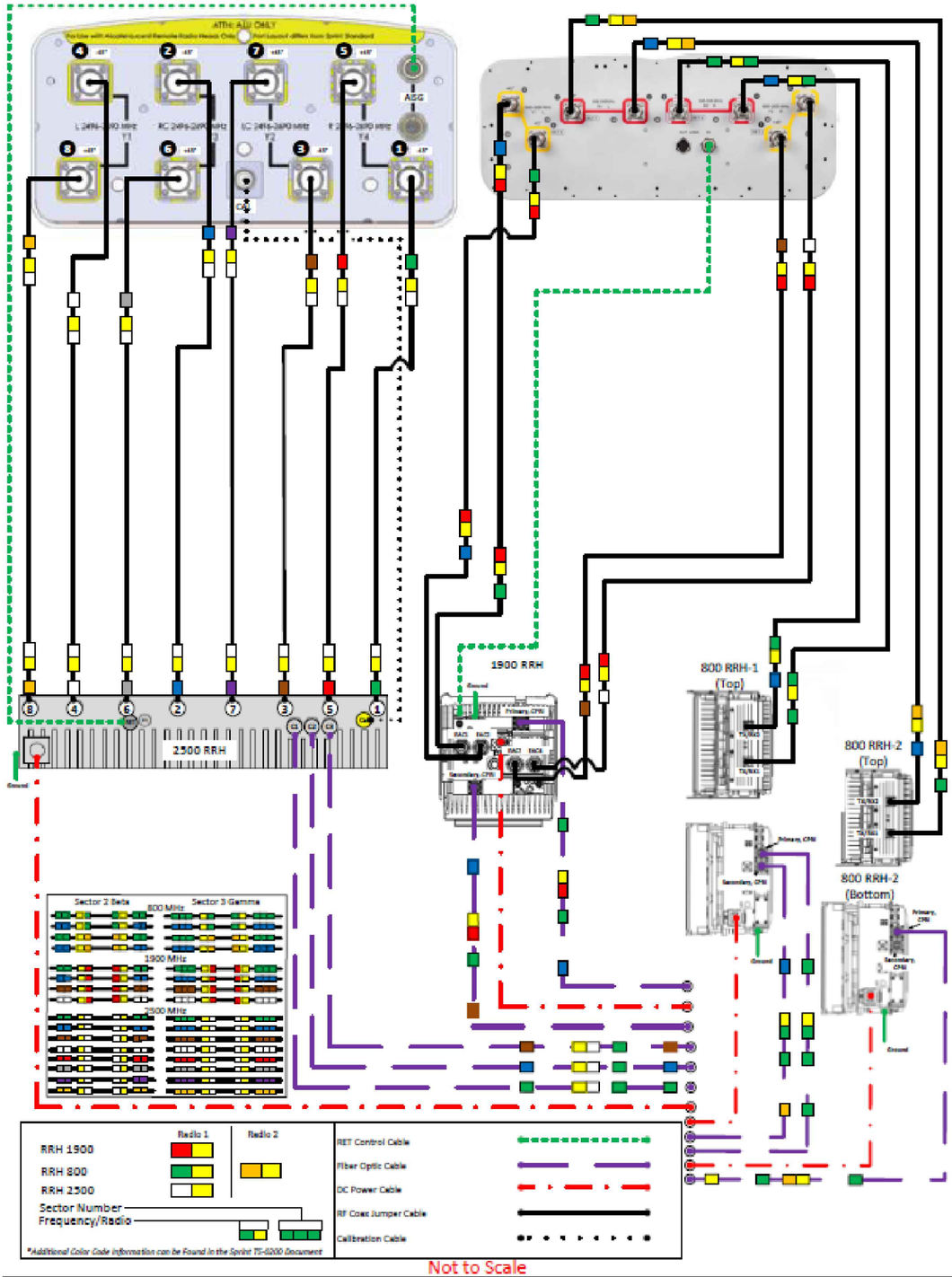
SITE NUMBER:
CT23XC409

SITE ADDRESS:
154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:
RF DATA SHEET

SHEET NUMBER:
RF-1

ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



Not to Scale

PLUMBING DIAGRAM | NO SCALE | 1

PLANS PREPARED FOR:

Sprint

INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:

SBA

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

PLANS PREPARED BY:

INFINIGY

FROM ZERO TO INFINIGY
the solutions are endless

1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
3-26-18
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/19/18	RCD	0

SITE NUMBER:

CT23XC409

SITE ADDRESS:

154 SAYLE AVENUE
PUTNAM, CT 06260

SHEET DESCRIPTION:

PLUMBING DIAGRAM

SHEET NUMBER:

RF-2

CT23XC409
DO MACRO EQUIPMENT DEPLOYMENT

MOUNT AUGMENTATION @ 180'

MONOPOLE TOWER

PUTNAM, CT
WINDHAM COUNTY

SITE INFORMATION

STRUCTURE TYPE:	MONOPOLE
MOUNT TYPE:	T-ARMS
LATITUDE:	41.92944 (NAD 83)
LONGITUDE:	-71.88556 (NAD 83)
CITY, STATE:	PUTNAM, CT
COUNTY:	WINDHAM
SBA SITE:	CT00680-S Putnam

COORDINATES ARE FOR NAVIGATIONAL PURPOSES ONLY, NOT TO 1A ACCURACY.

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR THE LABOR & MATERIALS FOR THE DISCREPANCIES.

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE AND DESIGN STANDARD: 2012 IBC / TIA-222-G / 2016 CT

RIGGING PLAN REQUIRED

THIS SET OF PLANS DOES "NOT" CONSTITUTE A RIGGING PLAN.

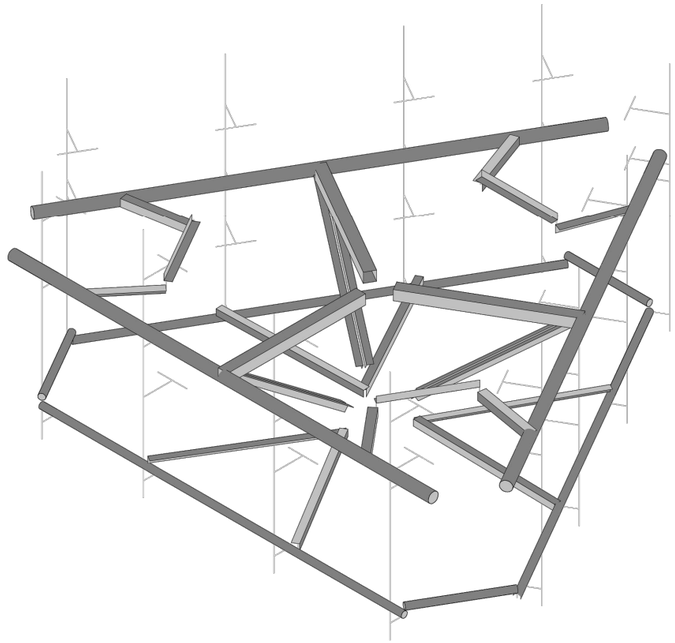
A PROPER RIGGING PLAN SHALL BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER PRIOR TO PROCEEDING ON ANY AUGMENTATIONS SHOWN HEREIN.

GENERAL DESIGN NOTES

1. THIS PLAN HAS BEEN DESIGNED UTILIZING THE CORRESPONDING MOUNT STRUCTURAL ANALYSIS.
2. THESE PLANS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222, ASCE 7, AWS, ACI, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE-MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.
3. ALL STRUCTURE INFORMATION OBTAINED IN THE FORM OF FROM INFORMATION PROVIDED BY THE CLIENT. CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED DOCUMENTS. CONTRACTOR SHALL ISSUE A REQUEST FOR INFORMATION (RFI) IN THE EVENT ANY DISCREPANCIES ARE DISCOVERED BETWEEN THESE DOCUMENTS AND THE AS-BUILT CONDITIONS IN THE FIELD IN A SITE VISIT THAT SHALL BE PERFORMED PRIOR TO STARTING FABRICATION OR CONSTRUCTION.
4. ALL MATERIALS UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS.
5. ALL PRODUCT OR MATERIAL SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER SUITABLE TO DETERMINE IF SUBSTITUTE IS ACCEPTABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
6. PROVIDE STRUCTURAL STEEL SHOP DRAWING(S) TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION (ONLY IF SPECIFICALLY REQUESTED BY ENGINEER).
7. UNLESS NOTED OTHERWISE, ALL NEW MEMBERS AND REINFORCING SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.
8. ANY CONTRACTOR-CAUSED DAMAGE TO PROPERTY OF THE LAND OWNER, PROPERTY OF THE STRUCTURE OWNER, PROPERTY OF THE CUSTOMER, SITE FENCING OR GATES, ANY AND ALL UTILITY AND/OR SERVICE LINES, SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE REPAIRED OR REPLACED AT THE SOLE COST OF THE CONTRACTOR AND SHALL BE ACCOMPLISHED BY THE CONTRACTOR OR SUBCONTRACTOR AS APPROVED BY THE ENGINEER OF RECORD AND LAND OWNER. DAMAGE TO EQUIPMENT OR PROPERTY OF ANY KIND BELONGING TO OTHER COMPANIES (BESIDES THE INDICATED CUSTOMER) SHALL BE ADDRESSED BY THE CONTRACTOR WITH THE COMPANIES THAT OWN THE DAMAGED ITEMS.

SHEET INDEX

MOUNT AUGMENTATION CONFIGURATION



AUGMENTATION SCOPE

AUGMENT ALL SECTORS OF CARRIER'S EXISTING MOUNT INSTALLATION AS REQUIRED (UNLESS NOTED OTHERWISE)

Sprint
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
P: 800.357.7641

SBA
134 FLANDERS RD., SUITE 125
WESTBOROUGH, MA 01581
P: 508.251.0720

GEOSTRUCTURAL
PO BOX 2621, BOISE, ID 83701
P: 530.539.4787
E: CONTACT@GEOSTRUCTURAL.COM
WWW.GEOSTRUCTURAL.COM

REVISIONS:

0	04/15/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32156
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:

MOUNT AUGMENTATION

CT23XC409

PUTNAM, CT

LATITUDE: 41.92944
LONGITUDE: -71.88556

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

S1

CONTRACTOR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, ALL CONTRACTORS AND SUBCONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW STRUCTURE OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND STRUCTURE/TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED AUGMENTATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGEMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR STRUCTURE OWNER ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM ANY SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO THE STRUCTURE OWNER.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE AUGMENTATIONS, THE ENGINEER OF RECORD SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. THE CONTRACTOR SHALL SOLICIT AND HIRE THE SERVICES OF A QUALIFIED AUGMENTATION INSPECTOR PRIOR TO BEGINNING CONSTRUCTION. THE AUGMENTATION INSPECTOR MAY BE AN EMPLOYEE OF THE CONTRACTOR'S FIRM, HOWEVER THE INSPECTOR'S ONLY DUTIES SHALL BE INSPECTION, TESTING, AND REPORT CREATION AS REQUIRED ON THE "AUGMENTATION INSPECTION NOTES" SHEET.
4. THE CONTRACTOR SHALL NOTIFY THE TOWER OWNER OF THE PLANNED CONSTRUCTION & INSPECTION SCHEDULE, AS WELL AS ANY CHANGES TO THE SCHEDULE, WITHIN TWO BUSINESS DAYS OF THE COMPLETION OF THE SCHEDULE OR SCHEDULE REVISION BOTH PRIOR TO BEGINNING CONSTRUCTION AND DURING CONSTRUCTION AS THE SCHEDULE CHANGES. THE STRUCTURE OWNER WHEN THE WORK HAS BEEN COMPLETED WITHIN 2 BUSINESS DAYS OF THE COMPLETION OF THE WORK AND ASSOCIATED AUGMENTATION INSPECTIONS & TESTING (WHEN APPLICABLE).
5. IT IS ASSUMED THAT ANY STRUCTURAL AUGMENTATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE STRUCTURE OWNER AND ENGINEER INCLUDING BUT NOT LIMITED TO TOWER CLIMBER AND RESCUE CLIMBER CERTIFICATIONS, ET CETERA.
6. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
7. CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE STRUCTURE OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR SHALL PROVIDE SHORING AND BRACING AS REQUIRED DURING CONSTRUCTION TO ENSURE STABILITY. DESIGN AND SEQUENCING OF CONSTRUCTION SHORING AND BRACING IS OUTSIDE THE SCOPE OF THIS WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, GUYING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.

BOLTS

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED GALVANIZED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED FROM SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES, WITH BOLT HEADS FACING DOWN WHERE APPLICABLE.
3. ALL BOLTS AT EVERY CONNECTION SHALL BE INSTALLED SNUG-TIGHT UNTIL THE SECTION IS FULLY COMPACTED AND ALL PLIES ARE JOINED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT" METHOD. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG-TIGHT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1½ TURNS BEYOND SNUG-TIGHT.
5. ALL BOLTED CONNECTIONS SHALL USE LOCK WASHERS.

STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC STEEL CONSTRUCTION MANUAL AND SECTION 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES UNLESS OTHERWISE NOTED:
   - CHANNELS & ANGLES ..... ASTM A36, (Fy = 36 KSI)
   - PLATES ..... ASTM A36, (Fy = 36 KSI)
   - PIPES ..... ASTM A53 GR.B, (Fy = 35 KSI)
   - HSS ROUND ..... ASTM A500 GR.B, (Fy = 42 KSI)
   - HSS RECTANGULAR ..... ASTM A500 GR.B, (Fy = 46 KSI)
   - STRUCTURAL BOLTS ..... ASTM A325
   - U-BOLTS ..... ASTM A307 GR.A
   - NUTS FOR BOLTS ..... ASTM A563 (THREADING TO MATCH BOLT)
   - WASHERS FOR BOLTS ..... ASTM F436
   - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS PER THE TIA CODE:
   - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
   - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
   - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
   - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH AND COLD GALVANIZED.
5. ALL WELDING WORK SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY. WELDING ELECTRODES SHALL BE E70XX.
6. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO AISC SPECS AND CODES, LATEST EDITION.
7. UPON REQUEST, THE CONTRACTOR SHALL SUBMIT DETAILED, ENGINEERED, COORDINATED AND CHECKED SHOP DRAWINGS FOR ALL STRUCTURAL STEEL TO THE ENGINEER OF RECORD TO REVIEW FOR COMPLIANCE WITH DESIGN INTENT PRIOR TO THE START OF FABRICATION AND/OR ERECTION.
8. TORCH-CUTTING OF ANY KIND SHALL NOT BE PERMITTED.
9. ALL BOLT HOLES SHALL BE STANDARD SIZE BOLT HOLES PER AISC 360, UNLESS OTHERWISE NOTED. ALL HOLES SHALL BE SHOP DRILLED OR SUB-PUNCHED AND REAMED. BURNING OF HOLES IS NOT PERMITTED. WHERE SLOTTED OR OVERSIZE HOLES ARE SPECIFIED ON THE DRAWINGS, EXTRA-THICK ASTM F436 PLATE WASHERS SHALL BE USED (3/16" MINIMUM THICKNESS) WITH A DIAMETER SUITABLE TO COVER THE EXTENTS OF THE SLOT OR HOLE. BOLTS SHALL BE HEAVY-HEX WHERE AVAILABLE IN THE SIZE AND GRADE SPECIFIED, OTHERWISE BOLTS SHALL BE HEX HEAD CAP SCREWS.
10. ALL STEEL HARDWARE, INCLUDING ADHESIVE OR EMBEDDED ANCHOR BOLTS AND THEIR ACCESSORIES, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 (EXCEPT BOLTS SMALLER THAN ½" SHALL CONFORM TO FE/ZN 3 AT PER ASTM F1941 WHERE HOT-DIP GALVANIZED BOLTS ARE NOT AVAILABLE). ALL STEEL MEMBERS, INCLUDING WELDMENTS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR DAMAGE TO GALVANIZED COATINGS USING ASTM A780 PROCEDURES WITH A ZINC RICH PAINT (SUCH AS ZINC GALVILITE) FOR GALVANIZING DAMAGED BY HANDLING, TRANSPORTING, CUTTING, WELDING, OR BOLTING. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED. CALL OUT HOLES REQUIRED FOR HOT-DIP GALVANIZING ON SHOP DRAWINGS.
11. MEMBERS SHALL BE SHOP-FABRICATED AND WELDED TO THE EXTENT PRACTICABLE IN ORDER TO REDUCE FIELD INSTALLATION COSTS.

CONSTRUCTION INSPECTION CHECKLIST

CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	CONSTRUCTION INSPECTIONS
	THIRD-PARTY CERTIFIED WELD INSPECTION (INCLUDING IBC SPECIAL INSPECTIONS)
√	GALVANIZING REPAIR MATERIAL PREPARATION, INSPECTION, & PAINT APPLICATION
√	PRIME CONTRACTOR'S AS-BUILT DOCUMENTS (SIGNED & DATED)
√	FABRICATION INSPECTION
√	MATERIAL TEST REPORT(S) / MILL CERTIFICATE(S)
√	PACKING SLIPS FOR STRUCTURAL MATERIALS

NOMINAL HOLE DIMENSIONS

BOLT Ø	STANDARD HOLE Ø
1/2"Ø	9/16"Ø
5/8"Ø	11/16"Ø
3/4"Ø	13/16"Ø
7/8"Ø	15/16"Ø
1"Ø	1 1/16"Ø

Sprint
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
P: 800.357.7641

SBA
134 FLANDERS RD., SUITE 125
WESTBOROUGH, MA 01581
P: 508.251.0720

GEOSTRUCTURAL
PO BOX 2621, BOISE, ID 83701
P: 530.539.4787
E: CONTACT@GEOSTRUCTURAL.COM
WWW.GEOSTRUCTURAL.COM

REVISIONS:

0	04/15/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION:

MOUNT AUGMENTATION

CT23XC409

PUTNAM, CT

LATITUDE: 41.92944
LONGITUDE: -71.88556

SHEET TITLE:

NOTES AND SPECIFICATIONS

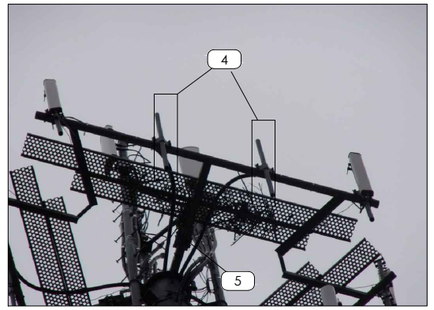
SHEET NUMBER:

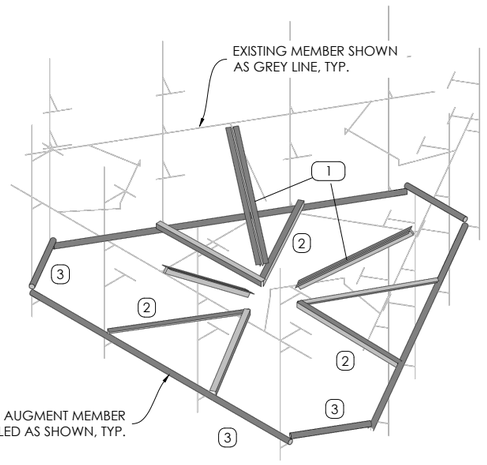
S2

T-ARMS @ 180' AUGMENTATION

NEW MOUNT AUGMENTATIONS

1	PLATFORM REINFORCEMENT KIT SITEPRO1 PART# PRK-1245L. ATTACH PRK COLLAR TO MONOPOLE SHAFT ~3.0' BELOW EXISTING STANDOFF CENTERLINE AND DOUBLE ANGLE KICKER BRACKET TO STANDOFF MEMBER END NEAR THE FACE RAIL OF THE MOUNT AS SHOWN PER MANUF. SPECS. [(1) KIT TOTAL]
2	HANDRAIL COMPONENTS - V-BRACE KIT SITEPRO1 PART# PRK-SFS-H-L. ATTACH COLLAR MOUNT TO MONOPOLE SHAFT ~4.0' BELOW EXISTING STANDOFF CENTERLINE. NOTE: IF THE PRK-SFS-H-L KIT IS NOT AVAILABLE, PROVIDE (6) TOTAL L2½x2½x3/16 x ~8' LONG REPLACEMENT ANGLES, FIELD-CUT AND DRILL TO SUIT. [(1) KIT TOTAL]
3	HANDRAIL COMPONENTS ▪ PIPE2.0STD X 12.5' HORIZ. RAIL, [(3) TOTAL]. ATTACH SFS-H-L KIT ANGLES TO NEW HORIZ. RAIL. ▪ PIPE2.0STD X ~4' LONG CORNER BRACES, [(3) TOTAL]. ATTACH TO NEW HORIZ. RAIL W/ (6) SITEPRO1 PART# PUCK BRACKETS. ▪ PIPE2.0STD MOUNT PIPES, [(12) TOTAL] W/ SITEPRO1 SCX **x** -K, [(24) TOTAL] CROSS-OVER PLATES. ATTACH ALL MOUNT PIPES TO EXISTING AND NEW HORIZ. RAILS.
4	· PANEL ANTENNAS TO BE INSTALLED IN POSITIONS 2 AND 3. RRH UNITS TO BE INSTALLED ON DUAL SWIVEL BRACKETS BEHIND PANEL ANTENNAS IN POSITIONS 2 AND 3.
5	NOTE: IN ORDER FOR THE SPECIFIED MODIFICATIONS TO PERFORM AS DESIGNED AND TO "FIT-UP" THE EXISTING NUDD T-ARM MOUNTS MUST BE APPROPRIATELY ROTATED ON STANDOFF MEMBER SUCH THAT THEY ARE PERPENDICULAR TO THE FACE OF THE TOWER (T-ARM STANDOFF TUBE AND COLLAR STANDOFF MEMBER TO BE COLINEAR). PANEL ANTENNA AZIMUTHS WILL NEED TO BE ADJUSTED TO OBTAIN DESIRED AZIMUTHS.
	AUGMENTATIONS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY NEW EQUIPMENT.

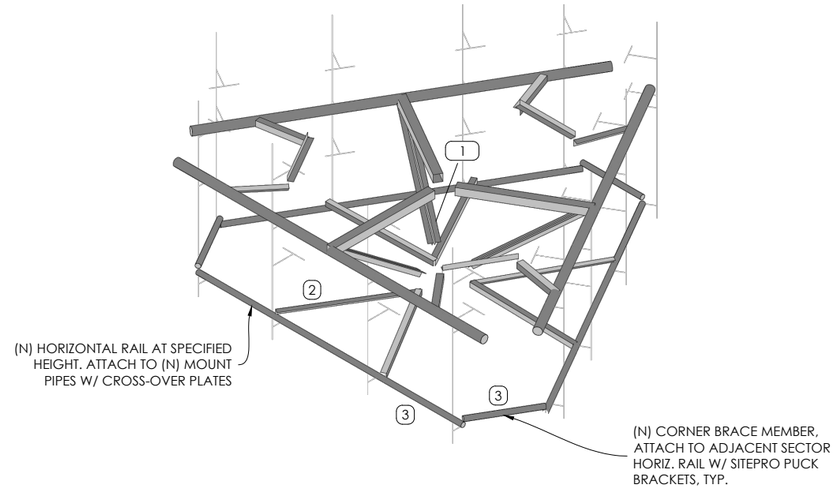




MOUNT AUGMENTATION ISOLATION
SCALE: N.T.S.

CONSTRUCTION NOTES

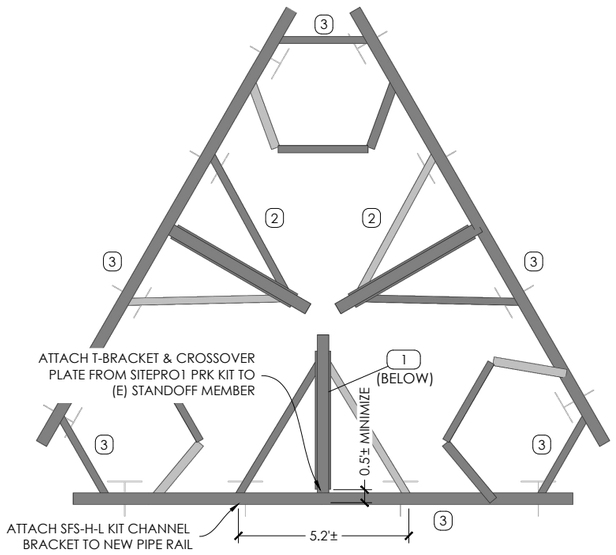
1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD-VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
3. CONTRACTOR TO COORDINATE THE TEMPORARY REMOVAL/RELOCATION/REPLACEMENT OF ELEMENTS (E.G. COAX, CLIPS, TMAs, ETC.) CONNECTED TO, OR IN THE DIRECT PATH, OF NEW AUGMENTATION MEMBERS.



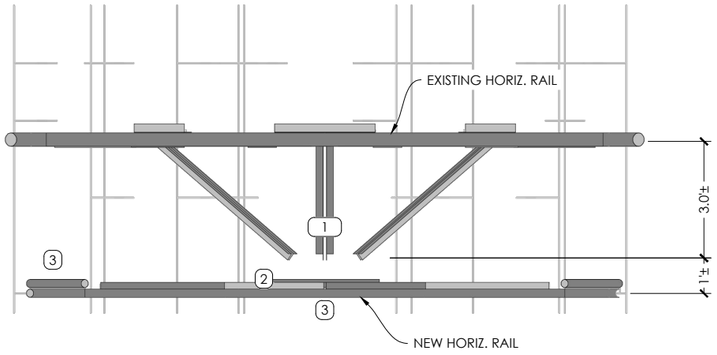
AUGMENTED MOUNT ISOMETRIC
SCALE: N.T.S.

INSTALLATION NOTES

1. AUGMENT MEMBER(S) MAY NEED TO BE FIELD-CUT TO LENGTH TO ACCOMMODATE THIS INSTALLATION. CONTRACTOR TO CUT AND DRILL TO SUIT AS REQUIRED AND APPLY (2) COATS OF COLD-GALV. COMPOUND TO CUT MEMBER ENDS.
2. CONTRACTOR TO CHECK ALL EXISTING MEMBER CONNECTION BOLTS, PARTICULARLY STANDOFF TO TOWER BOLTS, FOR PROPER INSTALLATION AND TIGHTNESS.
3. COORDINATE PLACEMENT OF NEW AUGMENT MEMBERS WITH EXISTING TOWER AND CLIMBING FACILITY ELEMENTS (E.G. STEP PEGS, COAX PORTS, ETC.)
4. REFER TO CONSTRUCTION DRAWINGS (BY OTHERS) AND MOUNT STRUCTURAL ANALYSIS FOR APPROVED INSTALLATION LOCATIONS AND QUANTITIES OF APPURTENANCES.



AUGMENTED MOUNT PLAN
SCALE: N.T.S.



AUGMENTED MOUNT FRONT ELEVATION
SCALE: N.T.S.

Sprint
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
P: 800.357.7641

SBA
134 FLANDERS RD., SUITE 125
WESTBOROUGH, MA 01581
P: 508.251.0720

GEOSTRUCTURAL
PO BOX 2621, BOISE, ID 83701
P: 530.539.4787
E: CONTACT@GEOSTRUCTURAL.COM
WWW.GEOSTRUCTURAL.COM

REVISIONS:

0	04/15/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: DWG

STATE OF CONNECTICUT
GREGORY DURGIN
No. 32155
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION:

MOUNT AUGMENTATION

CT23XC409

PUTNAM, CT

LATITUDE: 41.92944
LONGITUDE: -71.88556

SHEET TITLE:

AUGMENTATIONS, SECTIONS & DETAILS

SHEET NUMBER:

S3