



Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

August 8, 2017

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



RE: **Notice of Exempt Modification for Sprint 2.5 Rework Crown Site BU: 876369**
Sprint Site ID: CT33XC021
64 Hungerford Lane, Harwinton, CT 06791
Latitude: 41° 45' 26.15" / Longitude: -73° 3' 9.20"

ORIGINAL

Dear Ms. Bachman:

AT&T currently maintains three (3) antennas at the 125-foot level of the existing 178-foot monopole at 64 Hungerford Lane in Harwinton, CT. The tower is owned by Crown Castle. The property is owned by the Connoisseur Media of Connecticut LLC. Sprint intends to install three (3) antennas, three (3) RRHs, and one (1) hybrid cable.

A request for original zoning documents was sent to the Town of Harwinton but has not been answered.

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.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Michael R. Criss, First Selectman, Town of Harwinton, the Planning Commission, as well as the property owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification 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 Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

Melanie A. Bachman

August 8, 2017

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6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

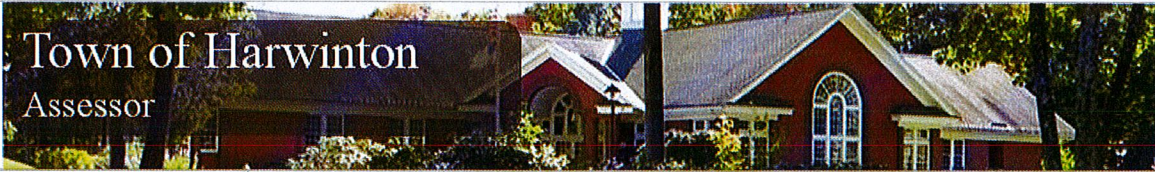
cc: Mr. Michael R. Criss, First Selectman
Town of Harwinton
100 Bentley Drive, PO Box 66
Harwinton CT, 06791

Planning Commission
100 Bentley Drive, PO Box 66
Harwinton CT, 06791

Connoisseur Media of Connecticut LLC
180 Post Road East Suite 201
Westport, CT 06880

Town of Harwinton

Assessor



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Owner and Parcel Information

| | | | |
|--------------------------------|--|---------------------|----------------------|
| Owner Name | CONNOISSEUR MEDIA OF CONNECTICUT LLC | Today's Date | August 3, 2017 |
| Mailing Address | 180 POST RD EAST SUITE 201 WESTPORT, CT 06880 | Parcel ID | 341 (Account #: 595) |
| Location Address | 64 HUNGERFORD LA | Census Tract | 2984 |
| Map / Block / Lot | D5 / 02 / 0032 | Acreage | 40.28 |
| Use Class / Description | 2-1 COMM LAND | Utilities | |
| Assessing Neighborhood | 0001A | | |

Current Appraised Value Information

| Building Value | XF Value | OB Value | Land Value | Special Land Value | Total Appraised Value | Net Appraised Value | Current Assessment |
|----------------|----------|----------|------------|--------------------|-----------------------|---------------------|--------------------|
| \$ 35,280 | \$ 0 | \$ 3,950 | \$ 367,850 | | \$ 407,080 | \$ 407,080 | \$ 284,960 |

Assessment History

| Year | Building | OB/Misc | Land | Total Assessment |
|---------|-----------|----------|------------|------------------|
| Current | \$ 24,700 | \$ 2,760 | \$ 257,500 | \$ 284,960 |
| 2016 | \$ 24,700 | \$ 2,760 | \$ 257,500 | \$ 284,960 |
| 2015 | \$ 24,700 | \$ 2,760 | \$ 257,500 | \$ 284,960 |

Land Information

| Use | Class | Zoning | Area | Value |
|-----------|-------|--------|----------|------------|
| COMM LAND | C | CR2 | 2 AC | \$ 130,510 |
| EX ACRES | R | | 38.28 AC | \$ 237,340 |

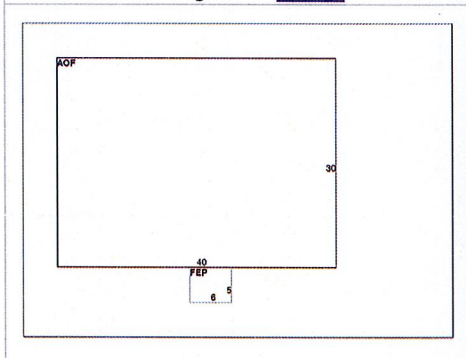
Commercial Building Information

| Style | Year Built | Eff Year Built | Gross Area | Stories | Grade | Exterior Wall | Interior Wall | Wall Height | # Units |
|----------------|----------------|----------------|------------|----------------|--------------|---------------|---------------|-------------|------------|
| Office Bldg | 1964 | 1964 | 1,230 | 1 | Average +20 | Brick/Masonry | Drywall/Sheet | 8 | 1 |
| Roof Cover | Roof Structure | Floor Type | Heat Type | Heat Fuel | AC Type | Sprinkler | Construction | Plumbing | Comm Walls |
| Asph/F Gls/Cmp | Gable/Hip | Quarry Tile | Oil | Forced Air-Duc | HEAT/AC PKGS | % | MASONRY | LIGHT | 100% |

Building Sub Areas

| Code | Description | Living Area | Gross Area | Effective Area |
|---------------|-------------------|--------------|--------------|----------------|
| AOF | Office, (Average) | 1,200 | 1,200 | |
| FEP | Enclosed Porch | 0 | 30 | |
| Totals | | 1,200 | 1,230 | 1,220 |

Building Sketch [Enlarge](#)



Building Photo [Enlarge](#)



Out Buildings / Extra Features

| Description | Sub Description | Area | Year Built | Value |
|----------------|-----------------|----------|------------|----------|
| SHED FRAME AVE | | 360 S.F. | 2004 | \$ 3,730 |
| PATIO GOOD | | 36 S.F. | 2000 | \$ 220 |

Sale Information

| Sale Date | Sale Price | Deed Book/Page | Sale Qualification | Reason | Vacant or Improved | Owner |
|------------|------------|----------------|--------------------|--------|--------------------|--|
| 07/09/2014 | \$ 407,080 | 0243/1029 | Qualified | | Improved | CONNOISSEUR MEDIA OF CONNECTICUT LLC |
| 07/23/1997 | | 0145/0372 | Qualified | | | BUCKLEY BROADCASTING CORP OF CT C/O WDRC |
| 01/09/1997 | | 0145/0216 | Unqualified | | Improved | USA |
| 07/24/1985 | | 0101/0665 | Unqualified | | Improved | CONSUMER SERVICE RADIO INC |

Permit Information

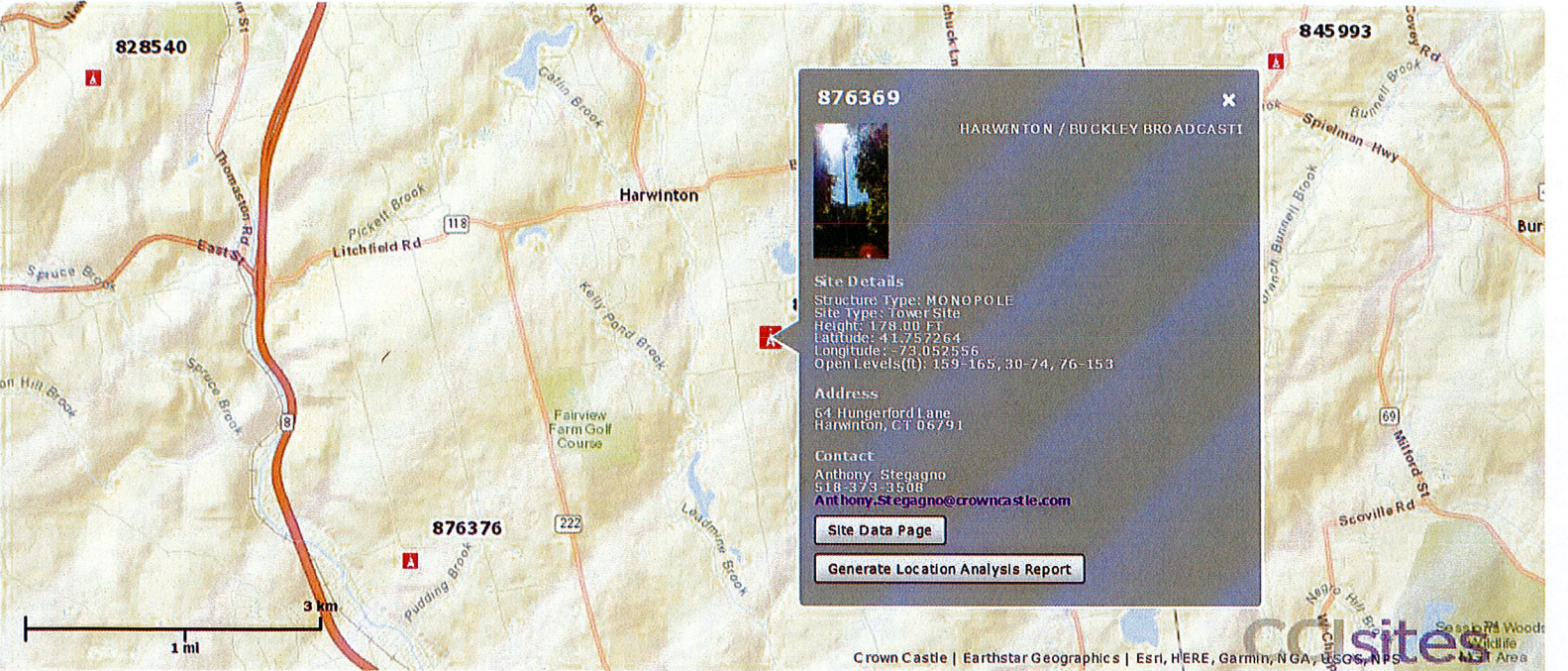
| Permit ID | Issue Date | Type | Description | Amount | Inspection Date | % Complete | Date Complete | Comments |
|-----------|------------|------|-----------------------|-----------|-----------------|------------|---------------|----------|
| | 11/30/2015 | | CERTIFICATE OF APPROV | | | 0 | | |
| 9417 | 10/24/2014 | | MODIFICATIONS | \$ 20,000 | | 0 | | |
| 8721 | 11/29/2012 | | CELL TOWER MODIFICAT | \$ 25,000 | | 0 | | |

| | | | | | | | |
|------|------------|--|----------------------|-----------|--|---|-------------------------|
| 8703 | 11/21/2012 | | ANTENNAS | \$ 12,000 | | 0 | |
| 8619 | 10/02/2012 | | REPLACE 6 ANTENNAS O | \$ 10,000 | | 0 | |
| CO | 04/17/2006 | | CO ISSUED | | | 0 | |
| 6239 | 01/17/2006 | | | \$ 50,000 | | 0 | PREFAB CONCRETE SHELTER |

| | | | | | |
|--|---------------------------------|-----------------------------|-----------------------------------|--|--------------------------------|
| Recent Sales in Neighborhood | Previous Parcel | Next Parcel | Field Definitions | Return to Main Search Page | Harwinton Home |
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876369 ✕

HARWINTON / BUCKLEY BRO ADCASTI



Site Details
 Structure Type: MONOPOLE
 Site Type: Tower Site
 Height: 178.00 FT
 Latitude: 41.757264
 Longitude: -73.052556
 Open Levels (ft): 159-165, 30-74, 76-153

Address
 64 Hungerford Lane
 Harwinton, CT 06791

Contact
 Anthony Stegagno
 518-373-3508
Anthony.Stegagno@crowncastle.com

[Site Data Page](#)

[Generate Location Analysis Report](#)

Hanlon, Dashanna

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 09, 2017 2:07 PM
To: Hanlon, Dashanna
Subject: FedEx Shipment 779864751392 Delivered

This tracking update has been requested by:

Company Name: Crown Castle
Name: Amanda Goodall
E-mail: dashanna.hanlon@crowncastle.com

Our records indicate that the following shipment has been delivered:

Reference: 1766.6680
Ship date: Aug 8, 2017
Signed for by: S.SLANSON
Delivery location: HARWINTON, CT
Delivered to: Receptionist/Front Desk
Delivery date: Wed, 8/9/2017 2:03 pm
Service type: FedEx Standard Overnight
Packaging type: FedEx Envelope
Number of pieces: 1
Weight: 0.50 lb.
Special handling/Services: Deliver Weekday
Standard transit: 8/9/2017 by 3:00 pm

Tracking number: 779864751392

| Shipper Information | Recipient Information |
|---------------------|-----------------------|
| Woburn | HARWINTON |
| MA | CT |
| US | US |

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 1:06 PM CDT on 08/09/2017.

All weights are estimated.

The shipment is scheduled for delivery on or before the scheduled delivery displayed above. FedEx does not determine money-back guarantee or delay claim requests based on the scheduled delivery. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx customer support representative.

To track the status of this shipment online, please use the following:

<https://www.fedex.com/apps/fedextrack/?action=track&tracknumbers=779864751392&language=en&opco=FX&clientype=ivothet>

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

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Thank you for your business.

Hanlon, Dashanna

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 09, 2017 2:04 PM
To: Hanlon, Dashanna
Subject: FedEx Shipment 779864859890 Delivered

This tracking update has been requested by:

Company Name: Crown Castle
Name: Amanda Goodall
E-mail: dashanna.hanlon@crowncastle.com

Our records indicate that the following shipment has been delivered:

Reference: 1766.6680
Ship date: Aug 8, 2017
Signed for by: S.SMITH
Delivery location: WESTPORT, CT
Delivered to: Receptionist/Front Desk
Delivery date: Wed, 8/9/2017 2:02 pm
Service type: FedEx Standard Overnight
Packaging type: FedEx Envelope
Number of pieces: 1
Weight: 0.50 lb.
Special handling/Services: Deliver Weekday
Standard transit: 8/9/2017 by 3:00 pm

Tracking number: 779864859890

| Shipper Information | Recipient Information |
|---------------------|-----------------------|
| Woburn | WESTPORT |
| MA | CT |
| US | US |

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 1:04 PM CDT on 08/09/2017.

All weights are estimated.

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To track the status of this shipment online, please use the following:

<https://www.fedex.com/apps/fedextrack/?action=track&tracknumbers=779864859890&language=en&opco=FX&clientype=ivothor>

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

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Aman

779864722970

Ship date:
Tue 8/08/2017

Crown Castle
Amanda Goodall
12 Gill Street
Woburn, MA US 01801
339 205-7017

Delivered
Signed for by: S. SLANSON



Actual delivery:
Wed 8/09/2017 2:03 pm

Town of Harwinton
Mr. Michael R. Criss
PO Box 66
100 Bentley Drive
HARWINTON, CT US 06791
860 485-9051

Travel History

| Date/Time | Activity | Location |
|--------------------------------|------------------------------------|----------------|
| - 8/09/2017 - Wednesday | | |
| 2:03 pm | Delivered | HARWINTON, CT |
| 8:51 am | On FedEx vehicle for delivery | WATERTOWN, CT |
| 8:05 am | At local FedEx facility | WATERTOWN, CT |
| 4:00 am | Departed FedEx location | NEWARK, NJ |
| - 8/08/2017 - Tuesday | | |
| 11:28 pm | Arrived at FedEx location | NEWARK, NJ |
| 8:05 pm | Left FedEx origin facility | WILMINGTON, MA |
| 6:23 pm | Picked up | WILMINGTON, MA |
| 2:38 pm | Shipment information sent to FedEx | |

Shipment Facts

| | | | |
|-------------------|----------------------|--------------------------|--------------------------|
| Tracking number | 779864722970 | Service | FedEx Standard Overnight |
| Reference | 1766.6680 | Weight | 0.5 lbs / 0.23 kgs |
| Delivery attempts | 1 | Delivered To | Receptionist/Front Desk |
| Total pieces | 1 | Total shipment weight | 0.5 lbs / 0.23 kgs |
| Terms | Not Available | Shipper reference | 1766.6680 |
| Packaging | FedEx Envelope | Special handling section | Deliver Weekday |
| Standard transit | 8/09/2017 by 3:00 pm | | |

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Date: June 19, 2017

Charles Trask
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: Structural Analysis Report

Carrier Designation: *Sprint PCS Co-Locate*
Carrier Site Number: CT33XC021

Crown Castle Designation:
Crown Castle BU Number: 876369
Crown Castle Site Name: HARWINTON / BUCKLEY BROADCAST
Crown Castle JDE Job Number: 442064
Crown Castle Work Order Number: 1418096
Crown Castle Application Number: 393582 Rev. 3

Engineering Firm Designation: **Crown Castle Project Number:** 1418096

Site Data: 64 Hungerford Lane, Harwinton, Litchfield County, CT
Latitude 41° 45' 26.15", Longitude -73° 3' 9.2"
178 Foot - Monopole Tower

Dear Charles Trask,

Crown Castle is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1418096, in accordance with application 393582, revision 3.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing loading, respectively.

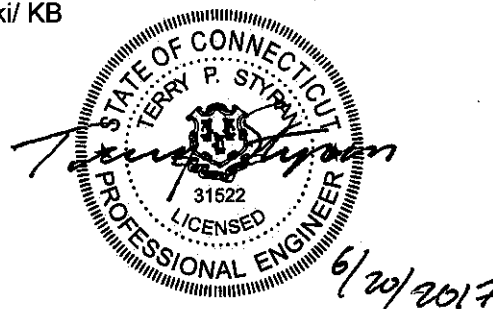
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Crown Castle appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Mark E. Mlynarski/ KB

Respectfully submitted by:



Terry P. Styran, P.E.
Senior Project Engineer
tnxTower Report - version

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1) INTRODUCTION

This tower is a 178 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in November of 2007. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 40 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C.

Table 1 - Proposed Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|--------------------------------|----------------------|---------------------|------|
| 178.0 | 180.0 | 3 | alcatel lucent | TD-RRH8x20-25 | 1 | 1-1/4 | - |
| | | 3 | rfs celwave | APXVTM14-ALU-I20 w/ Mount Pipe | | | |

Table 2 - Existing Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|----------------------|-------------------------------------|----------------------|------------------------------------|------|
| 178.0 | 180.0 | 3 | rfs celwave | APXVSP18-C-A20 w/ Mount Pipe | 3 | 1-1/4 | 1 |
| | 178.0 | 9 | rfs celwave | ACU-A20-N | | | |
| | | 1 | tower mounts | Platform Mount [LP 713-1] | | | |
| 176.0 | 176.0 | 3 | alcatel lucent | 800 EXTERNAL NOTCH FILTER | - | - | 1 |
| | | 3 | alcatel lucent | TME-1900MHz RRH | | | |
| | | 3 | alcatel lucent | TME-800MHZ RRH | | | |
| | | 1 | tower mounts | Side Arm Mount [SO 102-3] | | | |
| 168.0 | 170.0 | 3 | antel | BXA-171085-12BF-2 w/ Mount Pipe | 12 | 1-5/8 | 1 |
| | | 3 | antel | BXA-70063-6CF-2 w/ Mount Pipe | | | |
| | | 6 | antel | LPA-80080/6CF w/ Mount Pipe | | | |
| | 168.0 | 6 | rfs celwave | FD9R6004/2C-3L | | | |
| | | 1 | tower mounts | Platform Mount [LP 304-1] | | | |
| 156.0 | 158.0 | 3 | ericsson | RRUS 11 B12 | 1 2 12 1 | 3/8 7/16 1-5/8 2" Conduit | 1 |
| | | 1 | kathrein | 800 10764 w/ Mount Pipe | | | |
| | | 1 | kmw communications | AM-X-CD-14-65-00T-RET w/ Mount Pipe | | | |
| | | 1 | kmw communications | AM-X-CD-16-65-00T-RET w/ Mount Pipe | | | |
| | | 6 | powerwave | 7770.00 w/ Mount Pipe | | | |

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) | Note |
|---------------------|----------------------------|--------------------|------------------------|---------------------------|----------------------|---------------------|------|
| | 156.0 | 1 | technologies raycap | TME-DC6-48-60-18-8F | | | |
| | | 6 | powerwave technologies | LGP13519 | | | |
| | | 6 | powerwave technologies | LGP2140X | | | |
| | | 1 | tower mounts | Platform Mount [LP 303-1] | | | |
| 75.0 | 76.0 | 1 | lucent | KS24019-L112A | 1 | 1/2 | 1 |
| | 75.0 | 1 | tower mounts | Side Arm Mount [SO 701-1] | | | |

Notes:
 1) Existing Equipment

Table 3 - Design Antenna and Cable Information

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Manufacturer | Antenna Model | Number of Feed Lines | Feed Line Size (in) |
|---------------------|----------------------------|--------------------|----------------------|---------------|----------------------|---------------------|
| 178 | 178 | 12 | DAPA | 48000 | | - |
| 168 | 168 | 12 | DAPA | 48000 | | - |
| 158 | 158 | 12 | DAPA | 48000 | | - |
| 148 | 148 | 12 | DAPA | 48000 | | - |
| 138 | 138 | 12 | DAPA | 48000 | | - |
| 128 | 128 | 12 | DAPA | 48000 | | - |

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

| Document | Remarks | Reference | Source |
|--|--------------------------------|-----------|----------|
| 4-GEOTECHNICAL REPORTS | Dr. Clarence Welti, P.E., P.C. | 1532983 | CCISITES |
| 4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS | EEI | 2150286 | CCISITES |
| 4-TOWER MANUFACTURER DRAWINGS | EEI | 2150280 | CCISITES |

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

| Section No. | Elevation (ft) | Component Type | Size | Critical Element | P (K) | SF*P_allow (K) | % Capacity | Pass / Fail |
|-------------|-------------------|----------------|---------------------|------------------|---------|----------------|------------|-------------|
| L1 | 178 - 129.87 | Pole | TP29.64x19.5x0.25 | 1 | -11.099 | 1621.220 | 64.5 | Pass |
| L2 | 129.87 - 84.8307 | Pole | TP38.5x28.245x0.375 | 2 | -20.328 | 3273.250 | 60.3 | Pass |
| L3 | 84.8307 - 41.2839 | Pole | TP46.8x36.64x0.438 | 3 | -33.166 | 4612.200 | 59.3 | Pass |
| L4 | 41.2839 - 0 | Pole | TP54.5x44.591x0.5 | 4 | -52.320 | 6240.200 | 56.0 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L1) | 64.5 | Pass |
| | | | | | | Rating = | 64.5 | Pass |

Table 6 - Tower Component Stresses vs. Capacity – LC5

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|-------|------------------------------------|----------------|------------|-------------|
| 1 | Anchor Rods | 0 | 58.1 | Pass |
| 1 | Base Plate | 0 | 64.5 | Pass |
| 1 | Base Foundation (Structure) | 0 | 68.7 | Pass |
| 1 | Base Foundation (Soil Interaction) | 0 | 85.1 | Pass |

| | |
|---|--------------|
| Structure Rating (max from all components) = | 85.1% |
|---|--------------|

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A
TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

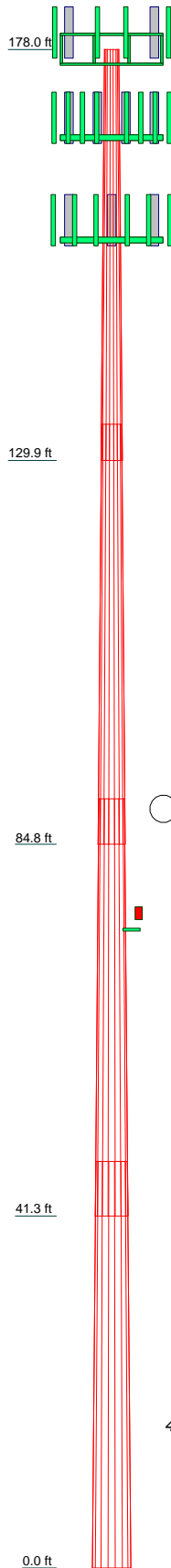
| TYPE | ELEVATION | TYPE | ELEVATION |
|---------------------------------|-----------|-------------------------------------|-----------|
| APXVSP18-C-A20 w/ Mount Pipe | 178 | BXA-70063-6CF-2 w/ Mount Pipe | 168 |
| APXVSP18-C-A20 w/ Mount Pipe | 178 | BXA-70063-6CF-2 w/ Mount Pipe | 168 |
| APXVSP18-C-A20 w/ Mount Pipe | 178 | BXA-171085-12BF-2 w/ Mount Pipe | 168 |
| (3) ACU-A20-N | 178 | BXA-171085-12BF-2 w/ Mount Pipe | 168 |
| (3) ACU-A20-N | 178 | BXA-171085-12BF-2 w/ Mount Pipe | 168 |
| (3) ACU-A20-N | 178 | (2) FD9R6004/2C-3L | 168 |
| APXVTM14-ALU-I20 w/ Mount Pipe | 178 | (2) FD9R6004/2C-3L | 168 |
| APXVTM14-ALU-I20 w/ Mount Pipe | 178 | (2) FD9R6004/2C-3L | 168 |
| APXVTM14-ALU-I20 w/ Mount Pipe | 178 | Platform Mount [LP 304-1] | 168 |
| TD-RRH8x20-25 | 178 | (2) 7770.00 w/ Mount Pipe | 156 |
| TD-RRH8x20-25 | 178 | (2) 7770.00 w/ Mount Pipe | 156 |
| TD-RRH8x20-25 | 178 | (2) 7770.00 w/ Mount Pipe | 156 |
| TD-RRH8x20-25 | 178 | (2) 7770.00 w/ Mount Pipe | 156 |
| (2) 6' x 2" Mount Pipe | 178 | AM-X-CD-16-65-00T-RET w/ Mount Pipe | 156 |
| (2) 6' x 2" Mount Pipe | 178 | 800 10764 w/ Mount Pipe | 156 |
| (2) 6' x 2" Mount Pipe | 178 | AM-X-CD-14-65-00T-RET w/ Mount Pipe | 156 |
| Miscellaneous [NA 507-1] | 178 | Platform Mount [LP 713-1] | 178 |
| Platform Mount [LP 713-1] | 178 | 800 EXTERNAL NOTCH FILTER | 176 |
| 800 EXTERNAL NOTCH FILTER | 176 | 800 EXTERNAL NOTCH FILTER | 176 |
| 800 EXTERNAL NOTCH FILTER | 176 | 800 EXTERNAL NOTCH FILTER | 176 |
| TME-800MHZ RRH | 176 | TME-800MHZ RRH | 176 |
| TME-800MHZ RRH | 176 | TME-800MHZ RRH | 176 |
| TME-800MHZ RRH | 176 | TME-800MHZ RRH | 176 |
| TME-1900MHz RRH | 176 | TME-1900MHz RRH | 176 |
| TME-1900MHz RRH | 176 | TME-1900MHz RRH | 176 |
| TME-1900MHz RRH | 176 | TME-1900MHz RRH | 176 |
| 6' x 2" Mount Pipe | 176 | 6' x 2" Mount Pipe | 176 |
| 6' x 2" Mount Pipe | 176 | 6' x 2" Mount Pipe | 176 |
| 6' x 2" Mount Pipe | 176 | 6' x 2" Mount Pipe | 176 |
| Side Arm Mount [SO 102-3] | 176 | Side Arm Mount [SO 102-3] | 176 |
| (2) LPA-80080/6CF w/ Mount Pipe | 168 | (2) LPA-80080/6CF w/ Mount Pipe | 168 |
| (2) LPA-80080/6CF w/ Mount Pipe | 168 | (2) LPA-80080/6CF w/ Mount Pipe | 168 |
| (2) LPA-80080/6CF w/ Mount Pipe | 168 | (2) LPA-80080/6CF w/ Mount Pipe | 168 |
| BXA-70063-6CF-2 w/ Mount Pipe | 168 | BXA-70063-6CF-2 w/ Mount Pipe | 168 |
| | | TME-DC6-48-60-18-8F | 156 |
| | | (2) LGP2140X | 156 |
| | | (2) LGP2140X | 156 |
| | | (2) LGP2140X | 156 |
| | | (2) LGP2140X | 156 |
| | | RRUS 11 B12 | 156 |
| | | RRUS 11 B12 | 156 |
| | | RRUS 11 B12 | 156 |
| | | (2) LGP13519 | 156 |
| | | (2) LGP13519 | 156 |
| | | (2) LGP13519 | 156 |
| | | 6' x 2" Mount Pipe | 156 |
| | | 6' x 2" Mount Pipe | 156 |
| | | 6' x 2" Mount Pipe | 156 |
| | | Platform Mount [LP 303-1] | 156 |
| | | KS24019-L112A | 75 |
| | | Side Arm Mount [SO 701-1] | 75 |

MATERIAL STRENGTH

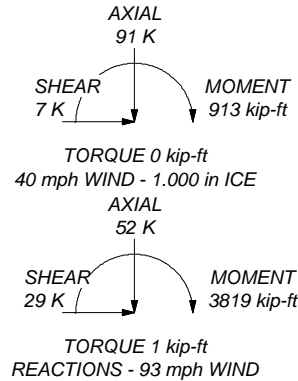
| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---------|--------|--------|-------|----|----|
| A572-65 | 65 ksi | 80 ksi | | | |

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 64.5%



ALL REACTIONS
ARE FACTORED



| | | | | | | |
|--------------------|--------|--------|--------|--------|---------|------|
| Section | 1 | 2 | 3 | 4 | A572-65 | 31.9 |
| Length (ft) | 48.130 | 49.289 | 48.880 | 47.701 | | |
| Number of Sides | 18 | 18 | 18 | 18 | | |
| Thickness (in) | 0.250 | 0.375 | 0.438 | 0.500 | | |
| Socket Length (ft) | 4.250 | 5.333 | 6.417 | 6.417 | | |
| Top Dia (in) | 19.500 | 28.245 | 36.640 | 44.591 | | |
| Bot Dia (in) | 29.640 | 38.500 | 46.800 | 54.500 | | |
| Grade | | | | | | |
| Weight (K) | 3.2 | 6.6 | 9.5 | 12.6 | | |

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-2254

| | | | |
|--|-------------------------------|------------|--|
| Job: BU# 876369 | | | |
| Project: WO# 1418096 | | | |
| Client: Crown Castle | Drawn by: Kibreab Gebremariam | App'd: | |
| Code: TIA-222-G | Date: 06/19/17 | Scale: NTS | |
| Path: C:\Users\kgebremariam\Desktop\C\876369.eri | | | |
| Dwg No. E-1 | | | |

Tower Input Data

There is a pole section.
 This tower is designed using the TIA-222-G standard.
 The following design criteria apply:

- 1) Tower is located in Litchfield County, Connecticut.
- 2) Basic wind speed of 93 mph.
- 3) Structure Class II.
- 4) Exposure Category C.
- 5) Topographic Category 1.
- 6) Crest Height 0.000 ft.
- 7) Nominal ice thickness of 1.000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56.000 pcf.
- 10) A wind speed of 40 mph is used in combination with ice.
- 11) Temperature drop of 50.000 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|--|---|
| Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder | Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

Tapered Pole Section Geometry

| Section | Elevation <small>ft</small> | Section Length <small>ft</small> | Splice Length <small>ft</small> | Number of Sides | Top Diameter <small>in</small> | Bottom Diameter <small>in</small> | Wall Thickness <small>in</small> | Bend Radius <small>in</small> | Pole Grade |
|---------|--------------------------------|--|---------------------------------------|-----------------------|--------------------------------------|---|--|-------------------------------------|---------------------|
| L1 | 178.000- 129.870 | 48.130 | 4.250 | 18 | 19.500 | 29.640 | 0.250 | 1.000 | A572-65 (65 ksi) |
| L2 | 129.870- 84.831 | 49.289 | 5.333 | 18 | 28.245 | 38.500 | 0.375 | 1.500 | A572-65 (65 ksi) |
| L3 | 84.831-41.284 | 48.880 | 6.417 | 18 | 36.640 | 46.800 | 0.438 | 1.750 | A572-65 (65 ksi) |
| L4 | 41.284-0.000 | 47.701 | | 18 | 44.591 | 54.500 | 0.500 | 2.000 | A572-65 (65 ksi) |

Tapered Pole Properties

| Section | Tip Dia. in | Area in ² | I in ⁴ | r in | C in | I/C in ³ | J in ⁴ | I/Q in ² | w in | w/t |
|---------|----------------|-------------------------|----------------------|---------|---------|------------------------|----------------------|------------------------|---------|--------|
| L1 | 19.801 | 15.275 | 715.116 | 6.834 | 9.906 | 72.190 | 1431.173 | 7.639 | 2.992 | 11.968 |
| | 30.097 | 23.321 | 2544.973 | 10.433 | 15.057 | 169.021 | 5093.294 | 11.663 | 4.777 | 19.107 |
| L2 | 29.578 | 33.172 | 3255.132 | 9.894 | 14.348 | 226.866 | 6514.547 | 16.589 | 4.311 | 11.496 |
| | 39.094 | 45.378 | 8333.073 | 13.534 | 19.558 | 426.070 | 16677.111 | 22.693 | 6.116 | 16.309 |
| L3 | 38.331 | 50.272 | 8324.332 | 12.852 | 18.613 | 447.225 | 16659.618 | 25.141 | 5.679 | 12.98 |
| | 47.522 | 64.380 | 17483.282 | 16.459 | 23.774 | 735.383 | 34989.569 | 32.196 | 7.467 | 17.067 |
| L4 | 46.633 | 69.973 | 17185.937 | 15.652 | 22.652 | 758.681 | 34394.487 | 34.993 | 6.968 | 13.936 |
| | 55.341 | 85.698 | 31571.532 | 19.170 | 27.686 | 1140.343 | 63184.607 | 42.857 | 8.712 | 17.424 |

| Tower Elevation | Gusset Area (per face) ft ² | Gusset Thickness in | Gusset Grade | Adjust. Factor A _r | Adjust. Factor A _r | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals in | Double Angle Stitch Bolt Spacing Horizontal in | Double Angle Stitch Bolt Spacing Redundants in |
|------------------------|--|------------------------|--------------|----------------------------------|----------------------------------|--------------|---|--|--|
| L1 178.000- 129.870 | | | | 1 | 1 | 1 | | | |
| L2 129.870- 84.831 | | | | 1 | 1 | 1 | | | |
| L3 84.831- 41.284 | | | | 1 | 1 | 1 | | | |
| L4 41.284- 0.000 | | | | 1 | 1 | 1 | | | |

Feed Line/Linear Appurtenances - Entered As Round Or Flat

| Description | Sector | Component Type | Placement ft | Total Number | Number Per Row | Start/End Position | Width or Diameter in | Perimeter in | Weight klf |
|-----------------------------|--------|----------------------|-----------------|--------------|----------------|-----------------------|----------------------------|-----------------|---------------|
| *** LDF4-50A(1/2) *** | C | Surface Ar (CaAa) | 75.000 - 0.000 | 1 | 1 | 0.100 0.100 | 0.630 | | 0.000 |

Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | C _A A _A ft ² /ft | Weight klf |
|--------------------------------------|-------------|--------------|----------------|-----------------|--------------|---|-------------------------|
| *** HB114-1-0813U4- M5J(1-1/4) | C | No | Inside Pole | 178.000 - 0.000 | 3 | No Ice 1/2" Ice 1" Ice 0.000 0.000 0.000 | 0.001 0.001 0.001 |
| HB114-21U3M12- XXXF(1-1/4) | C | No | Inside Pole | 178.000 - 0.000 | 1 | No Ice 1/2" Ice 1" Ice 0.000 0.000 0.000 | 0.001 0.001 0.001 |
| *** LDF7-50A(1-5/8) | C | No | Inside Pole | 168.000 - 0.000 | 12 | No Ice 1/2" Ice 1" Ice 0.000 0.000 0.000 | 0.001 0.001 0.001 |
| *** LDF7-50A(1-5/8) | C | No | Inside Pole | 156.000 - 0.000 | 12 | No Ice 1/2" Ice 1" Ice 0.000 0.000 0.000 | 0.001 0.001 0.001 |
| FB-L98B-002- 75000(3/8) | C | No | Inside Pole | 156.000 - 0.000 | 1 | No Ice 1/2" Ice 1" Ice 0.000 0.000 0.000 | 0.000 0.000 0.000 |
| WR-VG122ST- | C | No | Inside Pole | 156.000 - 0.000 | 2 | No Ice 0.000 | 0.000 |

| Description | Face or Leg | Allow Shield | Component Type | Placement ft | Total Number | C _{AA} A _A ft ² /ft | Weight klf |
|------------------|-------------|--------------|----------------|-----------------|--------------|---|---------------|
| BRDA(7/16) | | | | | 1/2" Ice | 0.000 | 0.000 |
| | | | | | 1" Ice | 0.000 | 0.000 |
| 2" Rigid Conduit | C | No | Inside Pole | 156.000 - 0.000 | 1 | No Ice | 0.003 |
| | | | | | 1/2" Ice | 0.000 | 0.003 |
| | | | | | 1" Ice | 0.000 | 0.003 |
| *** | | | | | | | |

Feed Line/Linear Appurtenances Section Areas

| Tower Section n | Tower Elevation ft | Face | A _R ft ² | A _F ft ² | C _{AA} A _A In Face ft ² | C _{AA} A _A Out Face ft ² | Weight K |
|--------------------|-----------------------|------|-----------------------------------|-----------------------------------|--|---|-------------|
| L1 | 178.000-129.870 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.946 |
| L2 | 129.870-84.831 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 1.245 |
| L3 | 84.831-41.284 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 2.124 | 0.000 | 1.209 |
| L4 | 41.284-0.000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 2.601 | 0.000 | 1.147 |

Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section n | Tower Elevation ft | Face or Leg | Ice Thickness in | A _R ft ² | A _F ft ² | C _{AA} A _A In Face ft ² | C _{AA} A _A Out Face ft ² | Weight K |
|--------------------|-----------------------|-------------|---------------------|-----------------------------------|-----------------------------------|--|---|-------------|
| L1 | 178.000-129.870 | A | 2.331 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.946 |
| L2 | 129.870-84.831 | A | 2.249 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 1.245 |
| L3 | 84.831-41.284 | A | 2.133 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 17.288 | 0.000 | 1.475 |
| L4 | 41.284-0.000 | A | 1.910 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | | 0.000 | 0.000 | 20.209 | 0.000 | 1.444 |

Feed Line Center of Pressure

| Section | Elevation ft | CP _X in | CP _Z in | CP _X Ice in | CP _Z Ice in |
|---------|-----------------|-----------------------|-----------------------|------------------------------|------------------------------|
| L1 | 178.000-129.870 | 0.000 | 0.000 | 0.000 | 0.000 |
| L2 | 129.870-84.831 | 0.000 | 0.000 | 0.000 | 0.000 |
| L3 | 84.831-41.284 | -0.015 | 0.072 | -0.104 | 0.490 |
| L4 | 41.284-0.000 | -0.019 | 0.091 | -0.127 | 0.597 |

Shielding Factor Ka

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | K _a No Ice | K _a Ice |
|---------------|----------------------|---------------|-------------------------|-----------------------|--------------------|
| L2 | 12 | LDF4-50A(1/2) | 84.83 - 75.00 | 1.0000 | 1.0000 |
| L3 | 12 | LDF4-50A(1/2) | 41.28 - 75.00 | 1.0000 | 1.0000 |

Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustmen t ° | Placement ft | | C _{AA} Front ft ² | C _{AA} Side ft ² | Weight K |
|-----------------------------------|-------------|-------------|--|-----------------------------|-----------------|----------|---|--|-------------|
| APXVSPP18-C-A20 w/ Mount Pipe | A | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 8.262 | 6.946 | 0.083 |
| | | | | | | 1/2" Ice | 8.822 | 8.127 | 0.151 |
| | | | | | | 1" Ice | 9.346 | 9.021 | 0.227 |
| | | | | | | | | | |
| APXVSPP18-C-A20 w/ Mount Pipe | B | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 8.262 | 6.946 | 0.083 |
| | | | | | | 1/2" Ice | 8.822 | 8.127 | 0.151 |
| | | | | | | 1" Ice | 9.346 | 9.021 | 0.227 |
| | | | | | | | | | |
| APXVSPP18-C-A20 w/ Mount Pipe | C | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 8.262 | 6.946 | 0.083 |
| | | | | | | 1/2" Ice | 8.822 | 8.127 | 0.151 |
| | | | | | | 1" Ice | 9.346 | 9.021 | 0.227 |
| | | | | | | | | | |
| (3) ACU-A20-N | A | From Leg | 4.000 0.000 0.000 | 0.000 | 178.000 | No Ice | 0.067 | 0.117 | 0.001 |
| | | | | | | 1/2" Ice | 0.104 | 0.162 | 0.002 |
| | | | | | | 1" Ice | 0.148 | 0.215 | 0.004 |
| | | | | | | | | | |
| (3) ACU-A20-N | B | From Leg | 4.000 0.000 0.000 | 0.000 | 178.000 | No Ice | 0.067 | 0.117 | 0.001 |
| | | | | | | 1/2" Ice | 0.104 | 0.162 | 0.002 |
| | | | | | | 1" Ice | 0.148 | 0.215 | 0.004 |
| | | | | | | | | | |
| (3) ACU-A20-N | C | From Leg | 4.000 0.000 0.000 | 0.000 | 178.000 | No Ice | 0.067 | 0.117 | 0.001 |
| | | | | | | 1/2" Ice | 0.104 | 0.162 | 0.002 |
| | | | | | | 1" Ice | 0.148 | 0.215 | 0.004 |
| | | | | | | | | | |
| APXVTM14-ALU-I20 w/ Mount Pipe | A | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 6.580 | 4.959 | 0.077 |
| | | | | | | 1/2" Ice | 7.031 | 5.754 | 0.132 |
| | | | | | | 1" Ice | 7.473 | 6.472 | 0.193 |
| | | | | | | | | | |
| APXVTM14-ALU-I20 w/ Mount Pipe | B | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 6.580 | 4.959 | 0.077 |
| | | | | | | 1/2" Ice | 7.031 | 5.754 | 0.132 |
| | | | | | | 1" Ice | 7.473 | 6.472 | 0.193 |
| | | | | | | | | | |
| APXVTM14-ALU-I20 w/ Mount Pipe | C | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 6.580 | 4.959 | 0.077 |
| | | | | | | 1/2" Ice | 7.031 | 5.754 | 0.132 |
| | | | | | | 1" Ice | 7.473 | 6.472 | 0.193 |
| | | | | | | | | | |
| TD-RRH8x20-25 | A | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 4.045 | 1.535 | 0.070 |
| | | | | | | 1/2" Ice | 4.298 | 1.714 | 0.097 |
| | | | | | | 1" Ice | 4.557 | 1.901 | 0.128 |
| | | | | | | | | | |
| TD-RRH8x20-25 | B | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 4.045 | 1.535 | 0.070 |
| | | | | | | 1/2" Ice | 4.298 | 1.714 | 0.097 |
| | | | | | | 1" Ice | 4.557 | 1.901 | 0.128 |
| | | | | | | | | | |
| TD-RRH8x20-25 | C | From Leg | 4.000 0.000 2.000 | 0.000 | 178.000 | No Ice | 4.045 | 1.535 | 0.070 |
| | | | | | | 1/2" Ice | 4.298 | 1.714 | 0.097 |
| | | | | | | 1" Ice | 4.557 | 1.901 | 0.128 |
| | | | | | | | | | |

| Description | Face or Leg | Offset Type | Offsets: | | Azimuth Adjustment ° | Placement ft | C _{AA} | | Weight K | |
|----------------------------------|-------------|-------------|------------|---------------|-------------------------|-----------------|--------------------------|-------------------------|-------------|-------|
| | | | Horz ft | Lateral ft | | | Front ft ² | Side ft ² | | |
| (2) 6' x 2" Mount Pipe | A | From Leg | 4.000 | 0.000 | 0.000 | 178.000 | 1" Ice | | | |
| | | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| | | | | | | | 1/2" | 1.925 | 1.925 | 0.033 |
| (2) 6' x 2" Mount Pipe | B | From Leg | 4.000 | 0.000 | 0.000 | 178.000 | Ice | 2.294 | 2.294 | 0.048 |
| | | | | | | | 1" Ice | | | |
| | | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| (2) 6' x 2" Mount Pipe | C | From Leg | 4.000 | 0.000 | 0.000 | 178.000 | 1/2" | 1.925 | 1.925 | 0.033 |
| | | | | | | | Ice | 2.294 | 2.294 | 0.048 |
| | | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| Miscellaneous [NA 507-1] | C | None | | | 0.000 | 178.000 | 1" Ice | | | |
| | | | | | | | No Ice | 4.800 | 4.800 | 0.245 |
| | | | | | | | 1/2" | 6.700 | 6.700 | 0.294 |
| Platform Mount [LP 713-1] | C | None | | | 0.000 | 178.000 | Ice | 8.600 | 8.600 | 0.343 |
| | | | | | | | 1" Ice | | | |
| | | | | | | | No Ice | 31.270 | 31.270 | 1.510 |
| *** 800 EXTERNAL NOTCH FILTER | A | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1/2" | 0.763 | 0.398 | 0.017 |
| | | | | | | | Ice | 0.873 | 0.483 | 0.024 |
| | | | | | | | No Ice | 0.660 | 0.321 | 0.011 |
| 800 EXTERNAL NOTCH FILTER | B | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1" Ice | | | |
| | | | | | | | No Ice | 0.660 | 0.321 | 0.011 |
| | | | | | | | 1/2" | 0.763 | 0.398 | 0.017 |
| 800 EXTERNAL NOTCH FILTER | C | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | Ice | 0.873 | 0.483 | 0.024 |
| | | | | | | | 1" Ice | | | |
| | | | | | | | No Ice | 0.660 | 0.321 | 0.011 |
| TME-800MHZ RRH | A | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1/2" | 0.763 | 0.398 | 0.017 |
| | | | | | | | Ice | 0.873 | 0.483 | 0.024 |
| | | | | | | | No Ice | 0.660 | 0.321 | 0.011 |
| TME-800MHZ RRH | B | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1" Ice | | | |
| | | | | | | | No Ice | 2.134 | 1.773 | 0.053 |
| | | | | | | | 1/2" | 2.320 | 1.946 | 0.074 |
| TME-800MHZ RRH | C | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | Ice | 2.512 | 2.127 | 0.098 |
| | | | | | | | 1" Ice | | | |
| | | | | | | | No Ice | 2.134 | 1.773 | 0.053 |
| TME-1900MHz RRH | A | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1/2" | 2.320 | 1.946 | 0.074 |
| | | | | | | | Ice | 2.512 | 2.127 | 0.098 |
| | | | | | | | No Ice | 2.134 | 1.773 | 0.053 |
| TME-1900MHz RRH | B | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1" Ice | | | |
| | | | | | | | No Ice | 2.907 | 3.801 | 0.044 |
| | | | | | | | 1/2" | 3.145 | 4.065 | 0.075 |
| TME-1900MHz RRH | C | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | Ice | 3.391 | 4.337 | 0.110 |
| | | | | | | | 1" Ice | | | |
| | | | | | | | No Ice | 2.907 | 3.801 | 0.044 |
| 6' x 2" Mount Pipe | A | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1/2" | 3.145 | 4.065 | 0.075 |
| | | | | | | | Ice | 3.391 | 4.337 | 0.110 |
| | | | | | | | No Ice | 2.907 | 3.801 | 0.044 |
| 6' x 2" Mount Pipe | B | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | 1" Ice | | | |
| | | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| | | | | | | | 1/2" | 1.925 | 1.925 | 0.033 |
| 6' x 2" Mount Pipe | C | From Leg | 1.000 | 0.000 | 0.000 | 176.000 | Ice | 2.294 | 2.294 | 0.048 |
| | | | | | | | 1" Ice | | | |
| | | | | | | | No Ice | 1.425 | 1.425 | 0.022 |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment ° | Placement ft | | C _{AA} Front ft ² | C _{AA} Side ft ² | Weight K |
|---------------------------------|-------------|-------------|---|-------------------------|-----------------|--------|---|--|-------------|
| 6' x 2" Mount Pipe | C | From Leg | 1.000 0.000 0.000 | 0.000 | 176.000 | 1" Ice | | | |
| | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| | | | | | | 1/2" | 1.925 | 1.925 | 0.033 |
| | | | | | | Ice | 2.294 | 2.294 | 0.048 |
| | | | | | | 1" Ice | | | |
| | | | | | | No Ice | 3.000 | 3.000 | 0.081 |
| Side Arm Mount [SO 102-3] | C | None | | 0.000 | 176.000 | 1/2" | 3.480 | 3.480 | 0.111 |
| | | | | | | Ice | 3.960 | 3.960 | 0.141 |
| | | | | | | 1" Ice | | | |
| *** | | | | | | | | | |
| (2) LPA-80080/6CF w/ Mount Pipe | A | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | No Ice | 4.564 | 10.259 | 0.046 |
| | | | | | | 1/2" | 5.105 | 11.427 | 0.113 |
| | | | | | | Ice | 5.612 | 12.312 | 0.187 |
| (2) LPA-80080/6CF w/ Mount Pipe | B | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | 1" Ice | | | |
| | | | | | | No Ice | 4.564 | 10.259 | 0.046 |
| | | | | | | 1/2" | 5.105 | 11.427 | 0.113 |
| (2) LPA-80080/6CF w/ Mount Pipe | C | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | Ice | 5.612 | 12.312 | 0.187 |
| | | | | | | 1" Ice | | | |
| | | | | | | No Ice | 4.564 | 10.259 | 0.046 |
| (2) LPA-80080/6CF w/ Mount Pipe | | | | | | 1/2" | 5.105 | 11.427 | 0.113 |
| | | | | | | Ice | 5.612 | 12.312 | 0.187 |
| | | | | | | 1" Ice | | | |
| BXA-70063-6CF-2 w/ Mount Pipe | A | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | No Ice | 7.806 | 5.801 | 0.042 |
| | | | | | | 1/2" | 8.357 | 6.953 | 0.103 |
| | | | | | | Ice | 8.872 | 7.819 | 0.171 |
| BXA-70063-6CF-2 w/ Mount Pipe | B | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | 1" Ice | | | |
| | | | | | | No Ice | 7.806 | 5.801 | 0.042 |
| | | | | | | 1/2" | 8.357 | 6.953 | 0.103 |
| BXA-70063-6CF-2 w/ Mount Pipe | C | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | Ice | 8.872 | 7.819 | 0.171 |
| | | | | | | 1" Ice | | | |
| | | | | | | No Ice | 7.806 | 5.801 | 0.042 |
| BXA-70063-6CF-2 w/ Mount Pipe | | | | | | 1/2" | 8.357 | 6.953 | 0.103 |
| | | | | | | Ice | 8.872 | 7.819 | 0.171 |
| | | | | | | 1" Ice | | | |
| BXA-171085-12BF-2 w/ Mount Pipe | A | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | No Ice | 4.971 | 5.228 | 0.040 |
| | | | | | | 1/2" | 5.521 | 6.389 | 0.086 |
| | | | | | | Ice | 6.036 | 7.261 | 0.139 |
| BXA-171085-12BF-2 w/ Mount Pipe | B | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | 1" Ice | | | |
| | | | | | | No Ice | 4.971 | 5.228 | 0.040 |
| | | | | | | 1/2" | 5.521 | 6.389 | 0.086 |
| BXA-171085-12BF-2 w/ Mount Pipe | C | From Leg | 4.000 0.000 2.000 | 0.000 | 168.000 | Ice | 6.036 | 7.261 | 0.139 |
| | | | | | | 1" Ice | | | |
| | | | | | | No Ice | 4.971 | 5.228 | 0.040 |
| BXA-171085-12BF-2 w/ Mount Pipe | | | | | | 1/2" | 5.521 | 6.389 | 0.086 |
| | | | | | | Ice | 6.036 | 7.261 | 0.139 |
| | | | | | | 1" Ice | | | |
| (2) FD9R6004/2C-3L | A | From Leg | 4.000 0.000 0.000 | 0.000 | 168.000 | No Ice | 0.314 | 0.076 | 0.003 |
| | | | | | | 1/2" | 0.386 | 0.119 | 0.005 |
| | | | | | | Ice | 0.466 | 0.169 | 0.009 |
| (2) FD9R6004/2C-3L | B | From Leg | 4.000 0.000 0.000 | 0.000 | 168.000 | 1" Ice | | | |
| | | | | | | No Ice | 0.314 | 0.076 | 0.003 |
| | | | | | | 1/2" | 0.386 | 0.119 | 0.005 |
| (2) FD9R6004/2C-3L | C | From Leg | 4.000 0.000 0.000 | 0.000 | 168.000 | Ice | 0.466 | 0.169 | 0.009 |
| | | | | | | 1" Ice | | | |
| | | | | | | No Ice | 0.314 | 0.076 | 0.003 |
| Platform Mount [LP 304-1] | C | None | | 0.000 | 168.000 | 1/2" | 22.440 | 22.440 | 1.625 |
| | | | | | | Ice | 27.420 | 27.420 | 1.900 |
| | | | | | | 1" Ice | | | |
| *** | | | | | | | | | |
| (2) 7770.00 w/ Mount Pipe | A | From Leg | 4.000 0.000 | 0.000 | 156.000 | No Ice | 5.746 | 4.254 | 0.055 |
| | | | | | | 1/2" | 6.179 | 5.014 | 0.103 |

| Description | Face or Leg | Offset Type | Offsets: | | | Azimuth Adjustment | Placement | C _{AA} _{Front} | C _{AA} _{Side} | Weight |
|-------------------------------------|-------------|-------------|----------|---------|---------|--------------------|-----------|----------------------------------|---------------------------------|--------|
| | | | Horz | Lateral | Vert | | | | | |
| | | | ft | ft | ft | ° | ft | ft ² | ft ² | K |
| | | | 2.000 | | | | Ice | 6.607 | 5.711 | 0.157 |
| (2) 7770.00 w/ Mount Pipe | B | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 5.746 | 4.254 | 0.055 |
| | | | 0.000 | | | | No Ice | 6.179 | 5.014 | 0.103 |
| | | | 2.000 | | | | 1/2" | 6.607 | 5.711 | 0.157 |
| | | | | | | | Ice | | | |
| (2) 7770.00 w/ Mount Pipe | C | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 5.746 | 4.254 | 0.055 |
| | | | 0.000 | | | | No Ice | 6.179 | 5.014 | 0.103 |
| | | | 2.000 | | | | 1/2" | 6.607 | 5.711 | 0.157 |
| | | | | | | | Ice | | | |
| AM-X-CD-16-65-00T-RET w/ Mount Pipe | A | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 8.262 | 6.304 | 0.074 |
| | | | 0.000 | | | | No Ice | 8.822 | 7.479 | 0.139 |
| | | | 2.000 | | | | 1/2" | 9.346 | 8.368 | 0.212 |
| | | | | | | | Ice | | | |
| 800 10764 w/ Mount Pipe | B | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 5.712 | 4.294 | 0.064 |
| | | | 0.000 | | | | No Ice | 6.127 | 4.992 | 0.112 |
| | | | 2.000 | | | | 1/2" | 6.543 | 5.662 | 0.166 |
| | | | | | | | Ice | | | |
| AM-X-CD-14-65-00T-RET w/ Mount Pipe | C | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 5.232 | 4.015 | 0.035 |
| | | | 0.000 | | | | No Ice | 5.618 | 4.633 | 0.080 |
| | | | 2.000 | | | | 1/2" | 6.012 | 5.257 | 0.131 |
| | | | | | | | Ice | | | |
| TME-DC6-48-60-18-8F | A | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 1.266 | 1.266 | 0.020 |
| | | | 0.000 | | | | No Ice | 1.456 | 1.456 | 0.035 |
| | | | 2.000 | | | | 1/2" | 1.658 | 1.658 | 0.053 |
| | | | | | | | Ice | | | |
| (2) LGP2140X | A | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 1.080 | 0.358 | 0.019 |
| | | | 0.000 | | | | No Ice | 1.214 | 0.454 | 0.026 |
| | | | 0.000 | | | | 1/2" | 1.355 | 0.556 | 0.035 |
| | | | | | | | Ice | | | |
| (2) LGP2140X | B | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 1.080 | 0.358 | 0.019 |
| | | | 0.000 | | | | No Ice | 1.214 | 0.454 | 0.026 |
| | | | 0.000 | | | | 1/2" | 1.355 | 0.556 | 0.035 |
| | | | | | | | Ice | | | |
| (2) LGP2140X | C | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 1.080 | 0.358 | 0.019 |
| | | | 0.000 | | | | No Ice | 1.214 | 0.454 | 0.026 |
| | | | 0.000 | | | | 1/2" | 1.355 | 0.556 | 0.035 |
| | | | | | | | Ice | | | |
| RRUS 11 B12 | A | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 2.833 | 1.182 | 0.051 |
| | | | 0.000 | | | | No Ice | 3.043 | 1.330 | 0.072 |
| | | | 2.000 | | | | 1/2" | 3.259 | 1.485 | 0.095 |
| | | | | | | | Ice | | | |
| RRUS 11 B12 | B | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 2.833 | 1.182 | 0.051 |
| | | | 0.000 | | | | No Ice | 3.043 | 1.330 | 0.072 |
| | | | 2.000 | | | | 1/2" | 3.259 | 1.485 | 0.095 |
| | | | | | | | Ice | | | |
| RRUS 11 B12 | C | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 2.833 | 1.182 | 0.051 |
| | | | 0.000 | | | | No Ice | 3.043 | 1.330 | 0.072 |
| | | | 2.000 | | | | 1/2" | 3.259 | 1.485 | 0.095 |
| | | | | | | | Ice | | | |
| (2) LGP13519 | A | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 0.290 | 0.181 | 0.005 |
| | | | 0.000 | | | | No Ice | 0.362 | 0.241 | 0.008 |
| | | | 0.000 | | | | 1/2" | 0.441 | 0.310 | 0.012 |
| | | | | | | | Ice | | | |
| (2) LGP13519 | B | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 0.290 | 0.181 | 0.005 |
| | | | 0.000 | | | | No Ice | 0.362 | 0.241 | 0.008 |
| | | | 0.000 | | | | 1/2" | 0.441 | 0.310 | 0.012 |
| | | | | | | | Ice | | | |
| (2) LGP13519 | C | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 0.290 | 0.181 | 0.005 |
| | | | 0.000 | | | | No Ice | 0.362 | 0.241 | 0.008 |
| | | | 0.000 | | | | 1/2" | 0.441 | 0.310 | 0.012 |
| | | | | | | | Ice | | | |
| 6' x 2" Mount Pipe | A | From Leg | 4.000 | 0.000 | 156.000 | | 1" Ice | 1.425 | 1.425 | 0.022 |
| | | | 0.000 | | | | No Ice | 1.925 | 1.925 | 0.033 |
| | | | 0.000 | | | | 1/2" | 2.294 | 2.294 | 0.048 |
| | | | | | | | Ice | | | |

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral Vert ft ft ft | Azimuth Adjustment t ° | Placement ft | | C _{AA} Front ft ² | C _{AA} Side ft ² | Weight K |
|---------------------------|-------------|-------------|---|------------------------------|-----------------|----------|---|--|-------------|
| 6' x 2" Mount Pipe | B | From Leg | 4.000 0.000 0.000 | 0.000 | 156.000 | 1" Ice | | | |
| | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| | | | | | | 1/2" Ice | 1.925 | 1.925 | 0.033 |
| 6' x 2" Mount Pipe | C | From Leg | 4.000 0.000 0.000 | 0.000 | 156.000 | 1" Ice | | | |
| | | | | | | No Ice | 1.425 | 1.425 | 0.022 |
| | | | | | | 1/2" Ice | 1.925 | 1.925 | 0.033 |
| Platform Mount [LP 303-1] | C | None | | 0.000 | 156.000 | 1" Ice | | | |
| | | | | | | No Ice | 14.660 | 14.660 | 1.250 |
| | | | | | | 1/2" Ice | 18.870 | 18.870 | 1.481 |
| *** KS24019-L112A | B | From Leg | 2.000 0.000 1.000 | 0.000 | 75.000 | 1" Ice | | | |
| | | | | | | No Ice | 0.100 | 0.100 | 0.005 |
| | | | | | | 1/2" Ice | 0.180 | 0.180 | 0.006 |
| Side Arm Mount [SO 701-1] | B | From Leg | 1.000 0.000 0.000 | 0.000 | 75.000 | 1" Ice | | | |
| | | | | | | No Ice | 0.850 | 1.670 | 0.065 |
| | | | | | | 1/2" Ice | 1.140 | 2.340 | 0.079 |
| *** | | | | | | 1" Ice | | | |
| | | | | | | No Ice | 1.430 | 3.010 | 0.093 |
| | | | | | | 1" Ice | | | |

Load Combinations

| Comb. No. | Description |
|-----------|--|
| 1 | Dead Only |
| 2 | 1.2 Dead+1.6 Wind 0 deg - No Ice |
| 3 | 0.9 Dead+1.6 Wind 0 deg - No Ice |
| 4 | 1.2 Dead+1.6 Wind 30 deg - No Ice |
| 5 | 0.9 Dead+1.6 Wind 30 deg - No Ice |
| 6 | 1.2 Dead+1.6 Wind 60 deg - No Ice |
| 7 | 0.9 Dead+1.6 Wind 60 deg - No Ice |
| 8 | 1.2 Dead+1.6 Wind 90 deg - No Ice |
| 9 | 0.9 Dead+1.6 Wind 90 deg - No Ice |
| 10 | 1.2 Dead+1.6 Wind 120 deg - No Ice |
| 11 | 0.9 Dead+1.6 Wind 120 deg - No Ice |
| 12 | 1.2 Dead+1.6 Wind 150 deg - No Ice |
| 13 | 0.9 Dead+1.6 Wind 150 deg - No Ice |
| 14 | 1.2 Dead+1.6 Wind 180 deg - No Ice |
| 15 | 0.9 Dead+1.6 Wind 180 deg - No Ice |
| 16 | 1.2 Dead+1.6 Wind 210 deg - No Ice |
| 17 | 0.9 Dead+1.6 Wind 210 deg - No Ice |
| 18 | 1.2 Dead+1.6 Wind 240 deg - No Ice |
| 19 | 0.9 Dead+1.6 Wind 240 deg - No Ice |
| 20 | 1.2 Dead+1.6 Wind 270 deg - No Ice |
| 21 | 0.9 Dead+1.6 Wind 270 deg - No Ice |
| 22 | 1.2 Dead+1.6 Wind 300 deg - No Ice |
| 23 | 0.9 Dead+1.6 Wind 300 deg - No Ice |
| 24 | 1.2 Dead+1.6 Wind 330 deg - No Ice |
| 25 | 0.9 Dead+1.6 Wind 330 deg - No Ice |
| 26 | 1.2 Dead+1.0 Ice+1.0 Temp |
| 27 | 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp |
| 28 | 1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp |
| 29 | 1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp |
| 30 | 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp |
| 31 | 1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp |

| Comb. No. | Description |
|-----------|--|
| 32 | 1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp |
| 33 | 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp |
| 34 | 1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp |
| 35 | 1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp |
| 36 | 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp |
| 37 | 1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp |
| 38 | 1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp |
| 39 | Dead+Wind 0 deg - Service |
| 40 | Dead+Wind 30 deg - Service |
| 41 | Dead+Wind 60 deg - Service |
| 42 | Dead+Wind 90 deg - Service |
| 43 | Dead+Wind 120 deg - Service |
| 44 | Dead+Wind 150 deg - Service |
| 45 | Dead+Wind 180 deg - Service |
| 46 | Dead+Wind 210 deg - Service |
| 47 | Dead+Wind 240 deg - Service |
| 48 | Dead+Wind 270 deg - Service |
| 49 | Dead+Wind 300 deg - Service |
| 50 | Dead+Wind 330 deg - Service |

Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Axial K | Major Axis Moment kip-ft | Minor Axis Moment kip-ft |
|-------------|-------------------|----------------|------------------|-----------------|---------|--------------------------|--------------------------|
| L1 | 178 - 129.87 | Pole | Max Tension | 1 | 0.000 | 0.000 | 0.000 |
| | | | Max. Compression | 26 | -34.501 | -0.254 | 1.407 |
| | | | Max. Mx | 8 | -11.104 | -604.662 | 0.144 |
| | | | Max. My | 2 | -11.099 | -0.069 | 605.454 |
| | | | Max. Vy | 8 | 18.007 | -604.662 | 0.144 |
| | | | Max. Vx | 2 | -18.035 | -0.069 | 605.454 |
| | | | Max. Torque | 9 | | | 0.688 |
| L2 | 129.87 - 84.8307 | Pole | Max Tension | 1 | 0.000 | 0.000 | 0.000 |
| | | | Max. Compression | 26 | -47.977 | -0.254 | 1.407 |
| | | | Max. Mx | 8 | -20.332 | -1480.897 | 0.011 |
| | | | Max. My | 2 | -20.328 | 0.079 | 1482.924 |
| | | | Max. Vy | 8 | 21.876 | -1480.897 | 0.011 |
| | | | Max. Vx | 2 | -21.904 | 0.079 | 1482.924 |
| | | | Max. Torque | 9 | | | 0.685 |
| L3 | 84.8307 - 41.2839 | Pole | Max Tension | 1 | 0.000 | 0.000 | 0.000 |
| | | | Max. Compression | 26 | -66.020 | -0.525 | 0.784 |
| | | | Max. Mx | 8 | -33.168 | -2494.364 | 0.178 |
| | | | Max. My | 2 | -33.166 | -0.394 | 2497.757 |
| | | | Max. Vy | 8 | 25.742 | -2494.364 | 0.178 |
| | | | Max. Vx | 2 | -25.788 | -0.394 | 2497.757 |
| | | | Max. Torque | 9 | | | 0.682 |
| L4 | 41.2839 - 0 | Pole | Max Tension | 1 | 0.000 | 0.000 | 0.000 |
| | | | Max. Compression | 26 | -91.381 | -0.376 | 0.081 |
| | | | Max. Mx | 8 | -52.320 | -3813.159 | 0.740 |
| | | | Max. My | 2 | -52.320 | -0.972 | 3818.703 |
| | | | Max. Vy | 8 | 29.295 | -3813.159 | 0.740 |
| | | | Max. Vx | 2 | -29.339 | -0.972 | 3818.703 |
| | | | Max. Torque | 11 | | | 0.611 |

Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| Pole | Max. Vert | 27 | 91.381 | -0.005 | 6.595 |
| | Max. H _x | 21 | 39.254 | 29.260 | -0.012 |

| Location | Condition | Gov. Load Comb. | Vertical K | Horizontal, X K | Horizontal, Z K |
|----------|---------------------|-----------------|------------|-----------------|-----------------|
| | Max. H _z | 3 | 39.254 | -0.012 | 29.305 |
| | Max. M _x | 2 | 3818.703 | -0.012 | 29.305 |
| | Max. M _z | 8 | 3813.159 | -29.260 | 0.012 |
| | Max. Torsion | 11 | 0.610 | -25.334 | -14.642 |
| | Min. Vert | 11 | 39.254 | -25.334 | -14.642 |
| | Min. H _x | 9 | 39.254 | -29.260 | 0.012 |
| | Min. H _z | 15 | 39.254 | 0.012 | -29.305 |
| | Min. M _x | 14 | -3818.418 | 0.012 | -29.305 |
| | Min. M _z | 20 | -3812.427 | 29.260 | -0.012 |
| | Min. Torsion | 23 | -0.607 | 25.334 | 14.642 |

Tower Mast Reaction Summary

| Load Combination | Vertical K | Shear _x K | Shear _z K | Overtuning Moment, M _x kip-ft | Overtuning Moment, M _z kip-ft | Torque kip-ft |
|------------------------------------|------------|----------------------|----------------------|--|--|---------------|
| Dead Only | 43.616 | 0.000 | 0.000 | -0.105 | -0.287 | 0.000 |
| 1.2 Dead+1.6 Wind 0 deg - No Ice | 52.339 | 0.012 | -29.305 | -3818.703 | -0.972 | 0.221 |
| 0.9 Dead+1.6 Wind 0 deg - No Ice | 39.254 | 0.012 | -29.305 | -3768.466 | -0.875 | 0.224 |
| 1.2 Dead+1.6 Wind 30 deg - No Ice | 52.339 | 14.641 | -25.385 | -3307.421 | -1907.283 | -0.092 |
| 0.9 Dead+1.6 Wind 30 deg - No Ice | 39.254 | 14.641 | -25.385 | -3263.916 | -1882.125 | -0.092 |
| 1.2 Dead+1.6 Wind 60 deg - No Ice | 52.339 | 25.346 | -14.663 | -1909.951 | -3302.645 | -0.381 |
| 0.9 Dead+1.6 Wind 60 deg - No Ice | 39.254 | 25.346 | -14.663 | -1884.818 | -3259.141 | -0.384 |
| 1.2 Dead+1.6 Wind 90 deg - No Ice | 52.339 | 29.260 | -0.012 | -0.740 | -3813.159 | -0.570 |
| 0.9 Dead+1.6 Wind 90 deg - No Ice | 39.254 | 29.260 | -0.012 | -0.702 | -3762.933 | -0.574 |
| 1.2 Dead+1.6 Wind 120 deg - No Ice | 52.339 | 25.334 | 14.642 | 1908.629 | -3302.031 | -0.605 |
| 0.9 Dead+1.6 Wind 120 deg - No Ice | 39.254 | 25.334 | 14.642 | 1883.572 | -3258.530 | -0.610 |
| 1.2 Dead+1.6 Wind 150 deg - No Ice | 52.339 | 14.620 | 25.373 | 3306.533 | -1906.227 | -0.477 |
| 0.9 Dead+1.6 Wind 150 deg - No Ice | 39.254 | 14.620 | 25.373 | 3263.107 | -1881.071 | -0.482 |
| 1.2 Dead+1.6 Wind 180 deg - No Ice | 52.339 | -0.012 | 29.305 | 3818.418 | 0.238 | -0.220 |
| 0.9 Dead+1.6 Wind 180 deg - No Ice | 39.254 | -0.012 | 29.305 | 3768.260 | 0.335 | -0.223 |
| 1.2 Dead+1.6 Wind 210 deg - No Ice | 52.339 | -14.641 | 25.385 | 3307.141 | 1906.543 | 0.095 |
| 0.9 Dead+1.6 Wind 210 deg - No Ice | 39.254 | -14.641 | 25.385 | 3263.714 | 1881.581 | 0.095 |
| 1.2 Dead+1.6 Wind 240 deg - No Ice | 52.339 | -25.346 | 14.663 | 1909.679 | 3301.906 | 0.384 |
| 0.9 Dead+1.6 Wind 240 deg - No Ice | 39.254 | -25.346 | 14.663 | 1884.622 | 3258.598 | 0.386 |
| 1.2 Dead+1.6 Wind 270 deg - No Ice | 52.339 | -29.260 | 0.012 | 0.470 | 3812.427 | 0.569 |
| 0.9 Dead+1.6 Wind 270 deg - No Ice | 39.254 | -29.260 | 0.012 | 0.508 | 3762.395 | 0.574 |
| 1.2 Dead+1.6 Wind 300 deg - No Ice | 52.339 | -25.334 | -14.642 | -1908.904 | 3301.306 | 0.602 |
| 0.9 Dead+1.6 Wind 300 deg - No Ice | 39.254 | -25.334 | -14.642 | -1883.769 | 3257.996 | 0.607 |
| 1.2 Dead+1.6 Wind 330 deg - No Ice | 52.339 | -14.620 | -25.373 | -3306.815 | 1905.501 | 0.475 |
| 0.9 Dead+1.6 Wind 330 deg - No Ice | 39.254 | -14.620 | -25.373 | -3263.310 | 1880.537 | 0.479 |

| Load Combination | Vertical | Shear _x | Shear _z | Overturning Moment, M _x | Overturning Moment, M _z | Torque |
|--|----------|--------------------|--------------------|------------------------------------|------------------------------------|--------|
| | K | K | K | kip-ft | kip-ft | kip-ft |
| 1.2 Dead+1.0 Ice+1.0 Temp | 91.381 | 0.000 | -0.000 | -0.081 | -0.376 | 0.000 |
| 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp | 91.381 | 0.005 | -6.595 | -912.193 | -0.858 | 0.068 |
| 1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp | 91.381 | 3.299 | -5.713 | -790.285 | -456.642 | 0.017 |
| 1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp | 91.381 | 5.709 | -3.302 | -456.611 | -790.188 | -0.039 |
| 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp | 91.381 | 6.589 | -0.005 | -0.653 | -912.049 | -0.084 |
| 1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp | 91.381 | 5.703 | 3.293 | 455.415 | -789.775 | -0.107 |
| 1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp | 91.381 | 3.290 | 5.708 | 789.390 | -455.926 | -0.101 |
| 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp | 91.381 | -0.005 | 6.595 | 911.711 | -0.032 | -0.068 |
| 1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp | 91.381 | -3.299 | 5.713 | 789.803 | 455.751 | -0.017 |
| 1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp | 91.381 | -5.709 | 3.302 | 456.130 | 789.297 | 0.039 |
| 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp | 91.381 | -6.589 | 0.005 | 0.172 | 911.158 | 0.084 |
| 1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp | 91.381 | -5.703 | -3.293 | -455.896 | 788.884 | 0.107 |
| 1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp | 91.381 | -3.290 | -5.708 | -789.872 | 455.036 | 0.101 |
| Dead+Wind 0 deg - Service | 43.616 | 0.003 | -6.821 | -883.077 | -0.446 | 0.052 |
| Dead+Wind 30 deg - Service | 43.616 | 3.408 | -5.909 | -764.853 | -441.235 | -0.023 |
| Dead+Wind 60 deg - Service | 43.616 | 5.900 | -3.413 | -441.720 | -763.878 | -0.092 |
| Dead+Wind 90 deg - Service | 43.616 | 6.811 | -0.003 | -0.261 | -881.921 | -0.136 |
| Dead+Wind 120 deg - Service | 43.616 | 5.897 | 3.408 | 441.236 | -763.737 | -0.144 |
| Dead+Wind 150 deg - Service | 43.616 | 3.403 | 5.906 | 764.471 | -440.991 | -0.113 |
| Dead+Wind 180 deg - Service | 43.616 | -0.003 | 6.821 | 882.835 | -0.164 | -0.052 |
| Dead+Wind 210 deg - Service | 43.616 | -3.408 | 5.909 | 764.612 | 440.625 | 0.023 |
| Dead+Wind 240 deg - Service | 43.616 | -5.900 | 3.413 | 441.480 | 763.267 | 0.092 |
| Dead+Wind 270 deg - Service | 43.616 | -6.811 | 0.003 | 0.020 | 881.312 | 0.136 |
| Dead+Wind 300 deg - Service | 43.616 | -5.897 | -3.408 | -441.477 | 763.127 | 0.144 |
| Dead+Wind 330 deg - Service | 43.616 | -3.403 | -5.906 | -764.713 | 440.381 | 0.113 |

Solution Summary

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|---------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 1 | 0.000 | -43.616 | 0.000 | 0.000 | 43.616 | 0.000 | 0.000% |
| 2 | 0.012 | -52.339 | -29.305 | -0.012 | 52.339 | 29.305 | 0.000% |
| 3 | 0.012 | -39.254 | -29.305 | -0.012 | 39.254 | 29.305 | 0.000% |
| 4 | 14.641 | -52.339 | -25.385 | -14.641 | 52.339 | 25.385 | 0.000% |
| 5 | 14.641 | -39.254 | -25.385 | -14.641 | 39.254 | 25.385 | 0.000% |
| 6 | 25.346 | -52.339 | -14.663 | -25.346 | 52.339 | 14.663 | 0.000% |
| 7 | 25.346 | -39.254 | -14.663 | -25.346 | 39.254 | 14.663 | 0.000% |
| 8 | 29.260 | -52.339 | -0.012 | -29.260 | 52.339 | 0.012 | 0.000% |
| 9 | 29.260 | -39.254 | -0.012 | -29.260 | 39.254 | 0.012 | 0.000% |
| 10 | 25.334 | -52.339 | 14.642 | -25.334 | 52.339 | -14.642 | 0.000% |
| 11 | 25.334 | -39.254 | 14.642 | -25.334 | 39.254 | -14.642 | 0.000% |
| 12 | 14.620 | -52.339 | 25.373 | -14.620 | 52.339 | -25.373 | 0.000% |
| 13 | 14.620 | -39.254 | 25.373 | -14.620 | 39.254 | -25.373 | 0.000% |
| 14 | -0.012 | -52.339 | 29.305 | 0.012 | 52.339 | -29.305 | 0.000% |
| 15 | -0.012 | -39.254 | 29.305 | 0.012 | 39.254 | -29.305 | 0.000% |

| Load Comb. | Sum of Applied Forces | | | Sum of Reactions | | | % Error |
|------------|-----------------------|---------|---------|------------------|--------|---------|---------|
| | PX K | PY K | PZ K | PX K | PY K | PZ K | |
| 16 | -14.641 | -52.339 | 25.385 | 14.641 | 52.339 | -25.385 | 0.000% |
| 17 | -14.641 | -39.254 | 25.385 | 14.641 | 39.254 | -25.385 | 0.000% |
| 18 | -25.346 | -52.339 | 14.663 | 25.346 | 52.339 | -14.663 | 0.000% |
| 19 | -25.346 | -39.254 | 14.663 | 25.346 | 39.254 | -14.663 | 0.000% |
| 20 | -29.260 | -52.339 | 0.012 | 29.260 | 52.339 | -0.012 | 0.000% |
| 21 | -29.260 | -39.254 | 0.012 | 29.260 | 39.254 | -0.012 | 0.000% |
| 22 | -25.334 | -52.339 | -14.642 | 25.334 | 52.339 | 14.642 | 0.000% |
| 23 | -25.334 | -39.254 | -14.642 | 25.334 | 39.254 | 14.642 | 0.000% |
| 24 | -14.620 | -52.339 | -25.373 | 14.620 | 52.339 | 25.373 | 0.000% |
| 25 | -14.620 | -39.254 | -25.373 | 14.620 | 39.254 | 25.373 | 0.000% |
| 26 | 0.000 | -91.381 | 0.000 | -0.000 | 91.381 | 0.000 | 0.000% |
| 27 | 0.005 | -91.381 | -6.594 | -0.005 | 91.381 | 6.595 | 0.000% |
| 28 | 3.299 | -91.381 | -5.713 | -3.299 | 91.381 | 5.713 | 0.000% |
| 29 | 5.709 | -91.381 | -3.302 | -5.709 | 91.381 | 3.302 | 0.000% |
| 30 | 6.589 | -91.381 | -0.005 | -6.589 | 91.381 | 0.005 | 0.000% |
| 31 | 5.703 | -91.381 | 3.292 | -5.703 | 91.381 | -3.293 | 0.000% |
| 32 | 3.290 | -91.381 | 5.708 | -3.290 | 91.381 | -5.708 | 0.000% |
| 33 | -0.005 | -91.381 | 6.594 | 0.005 | 91.381 | -6.595 | 0.000% |
| 34 | -3.299 | -91.381 | 5.713 | 3.299 | 91.381 | -5.713 | 0.000% |
| 35 | -5.709 | -91.381 | 3.302 | 5.709 | 91.381 | -3.302 | 0.000% |
| 36 | -6.589 | -91.381 | 0.005 | 6.589 | 91.381 | -0.005 | 0.000% |
| 37 | -5.703 | -91.381 | -3.292 | 5.703 | 91.381 | 3.293 | 0.000% |
| 38 | -3.290 | -91.381 | -5.708 | 3.290 | 91.381 | 5.708 | 0.000% |
| 39 | 0.003 | -43.616 | -6.821 | -0.003 | 43.616 | 6.821 | 0.000% |
| 40 | 3.408 | -43.616 | -5.909 | -3.408 | 43.616 | 5.909 | 0.000% |
| 41 | 5.900 | -43.616 | -3.413 | -5.900 | 43.616 | 3.413 | 0.000% |
| 42 | 6.811 | -43.616 | -0.003 | -6.811 | 43.616 | 0.003 | 0.000% |
| 43 | 5.897 | -43.616 | 3.408 | -5.897 | 43.616 | -3.408 | 0.000% |
| 44 | 3.403 | -43.616 | 5.906 | -3.403 | 43.616 | -5.906 | 0.000% |
| 45 | -0.003 | -43.616 | 6.821 | 0.003 | 43.616 | -6.821 | 0.000% |
| 46 | -3.408 | -43.616 | 5.909 | 3.408 | 43.616 | -5.909 | 0.000% |
| 47 | -5.900 | -43.616 | 3.413 | 5.900 | 43.616 | -3.413 | 0.000% |
| 48 | -6.811 | -43.616 | 0.003 | 6.811 | 43.616 | -0.003 | 0.000% |
| 49 | -5.897 | -43.616 | -3.408 | 5.897 | 43.616 | 3.408 | 0.000% |
| 50 | -3.403 | -43.616 | -5.906 | 3.403 | 43.616 | 5.906 | 0.000% |

Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|------------------|------------|------------------|------------------------|-----------------|
| 1 | Yes | 4 | 0.00000001 | 0.00000001 |
| 2 | Yes | 5 | 0.00000001 | 0.00001446 |
| 3 | Yes | 4 | 0.00000001 | 0.00034542 |
| 4 | Yes | 6 | 0.00000001 | 0.00012039 |
| 5 | Yes | 5 | 0.00000001 | 0.00091798 |
| 6 | Yes | 6 | 0.00000001 | 0.00012165 |
| 7 | Yes | 5 | 0.00000001 | 0.00092798 |
| 8 | Yes | 5 | 0.00000001 | 0.00003436 |
| 9 | Yes | 4 | 0.00000001 | 0.00048706 |
| 10 | Yes | 6 | 0.00000001 | 0.00011971 |
| 11 | Yes | 5 | 0.00000001 | 0.00091277 |
| 12 | Yes | 6 | 0.00000001 | 0.00012152 |
| 13 | Yes | 5 | 0.00000001 | 0.00092696 |
| 14 | Yes | 5 | 0.00000001 | 0.00001436 |
| 15 | Yes | 4 | 0.00000001 | 0.00034499 |
| 16 | Yes | 6 | 0.00000001 | 0.00012113 |
| 17 | Yes | 5 | 0.00000001 | 0.00092384 |
| 18 | Yes | 6 | 0.00000001 | 0.00011986 |
| 19 | Yes | 5 | 0.00000001 | 0.00091395 |
| 20 | Yes | 5 | 0.00000001 | 0.00003430 |
| 21 | Yes | 4 | 0.00000001 | 0.00048645 |
| 22 | Yes | 6 | 0.00000001 | 0.00012183 |
| 23 | Yes | 5 | 0.00000001 | 0.00092955 |
| 24 | Yes | 6 | 0.00000001 | 0.00012003 |
| 25 | Yes | 5 | 0.00000001 | 0.00091525 |

| | | | | |
|----|-----|---|------------|------------|
| 26 | Yes | 4 | 0.00000001 | 0.00001300 |
| 27 | Yes | 5 | 0.00011706 | 0.00091702 |
| 28 | Yes | 6 | 0.00000001 | 0.00020655 |
| 29 | Yes | 6 | 0.00000001 | 0.00020694 |
| 30 | Yes | 5 | 0.00011698 | 0.00091489 |
| 31 | Yes | 6 | 0.00000001 | 0.00020463 |
| 32 | Yes | 6 | 0.00000001 | 0.00020533 |
| 33 | Yes | 5 | 0.00011688 | 0.00091068 |
| 34 | Yes | 6 | 0.00000001 | 0.00020478 |
| 35 | Yes | 6 | 0.00000001 | 0.00020440 |
| 36 | Yes | 5 | 0.00011697 | 0.00091304 |
| 37 | Yes | 6 | 0.00000001 | 0.00020651 |
| 38 | Yes | 6 | 0.00000001 | 0.00020579 |
| 39 | Yes | 4 | 0.00000001 | 0.00007212 |
| 40 | Yes | 4 | 0.00000001 | 0.00062459 |
| 41 | Yes | 4 | 0.00000001 | 0.00064347 |
| 42 | Yes | 4 | 0.00000001 | 0.00007996 |
| 43 | Yes | 4 | 0.00000001 | 0.00061330 |
| 44 | Yes | 4 | 0.00000001 | 0.00064028 |
| 45 | Yes | 4 | 0.00000001 | 0.00007200 |
| 46 | Yes | 4 | 0.00000001 | 0.00063333 |
| 47 | Yes | 4 | 0.00000001 | 0.00061448 |
| 48 | Yes | 4 | 0.00000001 | 0.00007983 |
| 49 | Yes | 4 | 0.00000001 | 0.00064532 |
| 50 | Yes | 4 | 0.00000001 | 0.00061834 |

Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|----------------------|------------------------|-----------------|-----------|------------|
| L1 | 178 - 129.87 | 32.925 | 39 | 1.822 | 0.001 |
| L2 | 134.12 - 84.8307 | 17.663 | 39 | 1.370 | 0.001 |
| L3 | 90.1641 - 41.2839 | 7.456 | 39 | 0.825 | 0.000 |
| L4 | 47.7005 - 0 | 1.998 | 39 | 0.387 | 0.000 |

Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|------------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 178.000 | APXVSP18-C-A20 w/ Mount Pipe | 39 | 32.925 | 1.822 | 0.001 | 30915 |
| 176.000 | 800 EXTERNAL NOTCH FILTER | 39 | 32.179 | 1.803 | 0.001 | 30915 |
| 168.000 | (2) LPA-80080/6CF w/ Mount Pipe | 39 | 29.210 | 1.726 | 0.001 | 15457 |
| 156.000 | (2) 7770.00 w/ Mount Pipe | 39 | 24.862 | 1.607 | 0.001 | 7025 |
| 75.000 | KS24019-L112A | 39 | 5.041 | 0.654 | 0.000 | 5384 |

Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|----------------------|------------------------|-----------------|-----------|------------|
| L1 | 178 - 129.87 | 142.247 | 2 | 7.880 | 0.006 |
| L2 | 134.12 - 84.8307 | 76.394 | 2 | 5.930 | 0.003 |
| L3 | 90.1641 - 41.2839 | 32.263 | 2 | 3.570 | 0.001 |
| L4 | 47.7005 - 0 | 8.645 | 2 | 1.676 | 0.000 |

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|-------------|-----------------|------------------------|-----------------|-----------|------------|
|-------------|-----------------|------------------------|-----------------|-----------|------------|

Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|-----------------|---------------------------------|-----------------|------------------|-----------|------------|---------------------------|
| 178.000 | APXVSP18-C-A20 w/ Mount Pipe | 2 | 142.247 | 7.880 | 0.006 | 7386 |
| 176.000 | 800 EXTERNAL NOTCH FILTER | 2 | 139.032 | 7.797 | 0.006 | 7386 |
| 168.000 | (2) LPA-80080/6CF w/ Mount Pipe | 2 | 126.224 | 7.464 | 0.006 | 3692 |
| 156.000 | (2) 7770.00 w/ Mount Pipe | 2 | 107.467 | 6.952 | 0.005 | 1675 |
| 75.000 | KS24019-L112A | 2 | 21.812 | 2.831 | 0.001 | 1249 |

Compression Checks

Pole Design Data

| Section No. | Elevation ft | Size | L ft | L_u ft | KI/r | A in^2 | P_u K | ϕP_n K | Ratio $\frac{P_u}{\phi P_n}$ |
|-------------|--------------------------|---------------------|---------|-------------|--------|-------------|------------|-----------------|---------------------------------|
| L1 | 178 - 129.87 (1) | TP29.64x19.5x0.25 | 48.130 | 0.000 | 0.0 | 22.611 | -11.099 | 1621.220 | 0.007 |
| L2 | 129.87 - 84.8307 (2) | TP38.5x28.245x0.375 | 49.289 | 0.000 | 0.0 | 44.057 | -20.328 | 3273.250 | 0.006 |
| L3 | 84.8307 - 41.2839 (3) | TP46.8x36.64x0.438 | 48.880 | 0.000 | 0.0 | 62.528 | -33.166 | 4612.200 | 0.007 |
| L4 | 41.2839 - 0 (4) | TP54.5x44.591x0.5 | 47.701 | 0.000 | 0.0 | 85.698 | -52.320 | 6240.200 | 0.008 |

Pole Bending Design Data

| Section No. | Elevation ft | Size | M_{ux} kip-ft | ϕM_{nx} kip-ft | Ratio $\frac{M_{ux}}{\phi M_{nx}}$ | M_{uy} kip-ft | ϕM_{ny} kip-ft | Ratio $\frac{M_{uy}}{\phi M_{ny}}$ |
|-------------|--------------------------|---------------------|--------------------|-------------------------|---------------------------------------|--------------------|-------------------------|---------------------------------------|
| L1 | 178 - 129.87 (1) | TP29.64x19.5x0.25 | 605.454 | 949.083 | 0.638 | 0.000 | 949.083 | 0.000 |
| L2 | 129.87 - 84.8307 (2) | TP38.5x28.245x0.375 | 1482.925 | 2485.850 | 0.597 | 0.000 | 2485.850 | 0.000 |
| L3 | 84.8307 - 41.2839 (3) | TP46.8x36.64x0.438 | 2497.758 | 4262.767 | 0.586 | 0.000 | 4262.767 | 0.000 |
| L4 | 41.2839 - 0 (4) | TP54.5x44.591x0.5 | 3818.700 | 6919.617 | 0.552 | 0.000 | 6919.617 | 0.000 |

Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual V_u K | ϕV_n K | Ratio $\frac{V_u}{\phi V_n}$ | Actual T_u kip-ft | ϕT_n kip-ft | Ratio $\frac{T_u}{\phi T_n}$ |
|-------------|-----------------|-------------------|-------------------|-----------------|---------------------------------|------------------------|----------------------|---------------------------------|
| L1 | 178 - 129.87 | TP29.64x19.5x0.25 | 18.035 | 800.800 | 0.023 | 0.040 | 1900.492 | 0.000 |

| Section No. | Elevation ft | Size | Actual V_u K | ϕV_n K | Ratio $\frac{V_u}{\phi V_n}$ | Actual T_u kip-ft | ϕT_n kip-ft | Ratio $\frac{T_u}{\phi T_n}$ |
|-------------|--------------------------------|---------------------|----------------------|-----------------|---------------------------------|---------------------------|----------------------|---------------------------------|
| L2 | (1) 129.87 - 84.8307 (2) | TP38.5x28.245x0.375 | 21.904 | 1616.330 | 0.014 | 0.040 | 4977.783 | 0.000 |
| L3 | 84.8307 - 41.2839 (3) | TP46.8x36.64x0.438 | 25.788 | 2306.100 | 0.011 | 0.222 | 8536.000 | 0.000 |
| L4 | 41.2839 - 0 (4) | TP54.5x44.591x0.5 | 29.339 | 3120.100 | 0.009 | 0.221 | 13856.167 | 0.000 |

Pole Interaction Design Data

| Section No. | Elevation ft | Ratio P_u ϕP_n | Ratio M_{ux} ϕM_{nx} | Ratio M_{uy} ϕM_{ny} | Ratio V_u ϕV_n | Ratio T_u ϕT_n | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|-------------|--------------------------|------------------------------|------------------------------------|------------------------------------|------------------------------|------------------------------|--------------------------|---------------------------|----------|
| L1 | 178 - 129.87 (1) | 0.007 | 0.638 | 0.000 | 0.023 | 0.000 | 0.645 | 1.000 | 4.8.2 |
| L2 | 129.87 - 84.8307 (2) | 0.006 | 0.597 | 0.000 | 0.014 | 0.000 | 0.603 | 1.000 | 4.8.2 |
| L3 | 84.8307 - 41.2839 (3) | 0.007 | 0.586 | 0.000 | 0.011 | 0.000 | 0.593 | 1.000 | 4.8.2 |
| L4 | 41.2839 - 0 (4) | 0.008 | 0.552 | 0.000 | 0.009 | 0.000 | 0.560 | 1.000 | 4.8.2 |

Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P K | ϕP_{allow} K | % Capacity | Pass Fail |
|-----------------|----------------------|-------------------|---------------------|---------------------|---------|-----------------------|---------------|--------------|
| L1 | 178 - 129.87 | Pole | TP29.64x19.5x0.25 | 1 | -11.099 | 1621.220 | 64.5 | Pass |
| L2 | 129.87 - 84.8307 | Pole | TP38.5x28.245x0.375 | 2 | -20.328 | 3273.250 | 60.3 | Pass |
| L3 | 84.8307 - 41.2839 | Pole | TP46.8x36.64x0.438 | 3 | -33.166 | 4612.200 | 59.3 | Pass |
| L4 | 41.2839 - 0 | Pole | TP54.5x44.591x0.5 | 4 | -52.320 | 6240.200 | 56.0 | Pass |
| Summary | | | | | | | | |
| Pole (L1) | | | | | | | 64.5 | Pass |
| RATING = | | | | | | | 64.5 | Pass |

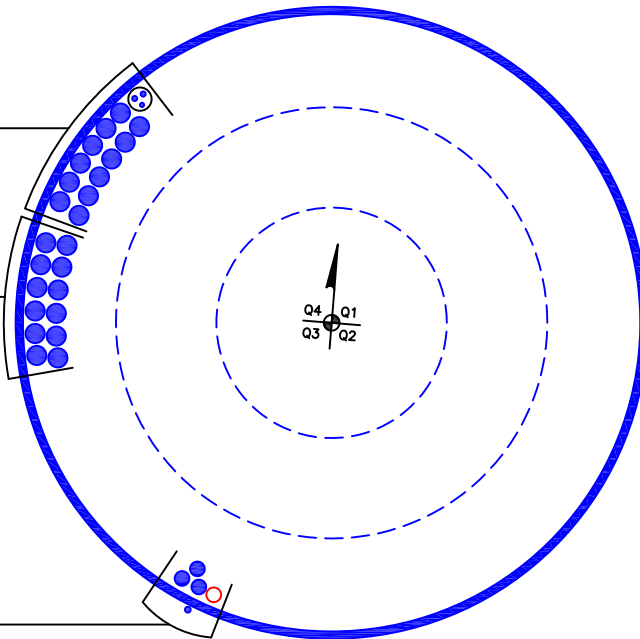
APPENDIX B
BASE LEVEL DRAWING



(INSTALLED—IN 2" CONDUIT)
(1) 3/8" TO 156 FT LEVEL
(2) 7/16" TO 156 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 156 FT LEVEL

(INSTALLED)
(12) 1-5/8" TO 168 FT LEVEL

(PROPOSED)
(1) 1-1/4" TO 178 FT LEVEL
(INSTALLED)
(1) 1/2" TO 75 FT LEVEL
(3) 1-1/4" TO 178 FT LEVEL



APPENDIX C
ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev G

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: 876369
 Site Name: 1418096
 App #: 393582 Rev. 3

Pole Manufacturer: *Other*

Anchor Rod Data

Qty: 20
 Diam: 2.25 in
 Rod Material: A615-J
 Strength (Fu): 100 ksi
 Yield (Fy): 75 ksi
 Bolt Circle: 63 in

Plate Data

Diam: 69 in
 Thick: 2.25 in
 Grade: 60 ksi
 Single-Rod B-eff: 8.65 in

Stiffener Data (Welding at both sides)

Config: 0 *
 Weld Type:
 Groove Depth: <-- Disregard
 Groove Angle: <-- Disregard
 Fillet H. Weld: in
 Fillet V. Weld: in
 Width: in
 Height: in
 Thick: in
 Notch: in
 Grade: ksi
 Weld str.: ksi

Pole Data

Diam: 54.5 in
 Thick: 0.5 in
 Grade: 65 ksi
 # of Sides: 18 "0" IF Round
 Fu: 80 ksi
 Reinf. Fillet Weld: 0 "0" if None

Reactions

| | | |
|---------------|------|------------------|
| Mu: | 3819 | ft-kips |
| Axial, Pu: | 52 | kips |
| Shear, Vu: | 29 | kips |
| Eta Factor, η | 0.5 | TIA G (Fig. 4-4) |

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/η): 151.0 Kips
 Allowable Axial, Φ*Fu*Anet: 260.0 Kips
 Anchor Rod Stress Ratio: 58.1% **Pass**

Rigid

AISC LRFD

φ*Tn

Base Plate Results

Base Plate Stress: 34.8 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 64.5% **Pass**

Flexural Check

Rigid

AISC LRFD

φ*Fy

Y.L. Length:

31.60

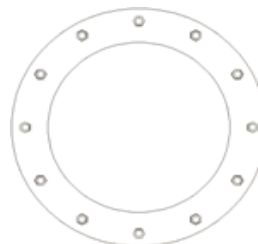
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Pier and Pad Foundation



BU # : 876369
Site Name: HARWINTON / BU
App. Number: 393582 Rev. 3

TIA-222 Revision: G
Tower Type: Monopole

Block Foundation?:

| Superstructure Analysis Reactions | | |
|-----------------------------------|------|---------|
| Compression, P_{comp} : | 52 | kips |
| Base Shear, V_{u_comp} : | 29 | kips |
| | | |
| Moment, M_u : | 3819 | ft-kips |
| Tower Height, H : | 178 | ft |
| | | |
| BP Dist. Above Fdn, bp_{dist} : | 3 | in |

| Foundation Analysis Checks | | | | |
|--------------------------------------|----------|---------|--------|-------|
| | Capacity | Demand | Rating | Check |
| <i>Lateral (Sliding) (kips)</i> | 211.42 | 29.00 | 13.7% | Pass |
| <i>Bearing Pressure (ksf)</i> | 6.00 | 2.11 | 35.2% | Pass |
| <i>Overtuning (kip*ft)</i> | 4752.06 | 4043.75 | 85.1% | Pass |
| <i>Pier Flexure (Comp.) (kip*ft)</i> | 5751.97 | 3949.50 | 68.7% | Pass |
| | | | | |
| <i>Pier Compression (kip)</i> | 18370.97 | 78.85 | 0.4% | Pass |
| <i>Pad Flexure (kip*ft)</i> | 7160.11 | 2163.29 | 30.2% | Pass |
| <i>Pad Shear - 1-way (kips)</i> | 869.56 | 267.92 | 30.8% | Pass |
| <i>Pad Shear - 2-way (kips)</i> | 1878.12 | 78.85 | 4.2% | Pass |

Soil Rating: 85.1%
Structural Rating: 68.7%

| Pier Properties | | |
|----------------------------------|----------|----|
| Pier Shape: | Circular | |
| Pier Diameter, $dpier$: | 7.0 | ft |
| Ext. Above Grade, E : | 1 | ft |
| Pier Rebar Size, Sc : | 8 | |
| Pier Rebar Quantity, mc : | 46 | |
| Pier Tie/Spiral Size, St : | 4 | |
| Pier Tie/Spiral Quantity, mt : | 16 | |
| Pier Reinforcement Type: | Tie | |
| Pier Clear Cover, cc_{pier} : | 3 | in |

| Pad Properties | | |
|-------------------------------|------|----|
| Depth, D : | 6.5 | ft |
| Pad Width, W : | 28.0 | ft |
| Pad Thickness, T : | 3.0 | ft |
| Pad Rebar Size, Sp : | 8 | |
| Pad Rebar Quantity, mp : | 68 | |
| Pad Clear Cover, cc_{pad} : | 3 | in |

| Material Properties | | |
|--|-------|-----|
| Rebar Grade, Fy : | 60000 | psi |
| Concrete Compressive Strength, $F'c$: | 3000 | psi |
| Dry Concrete Density, δc : | 150 | pcf |

| Soil Properties | | |
|-------------------------------------|-------|---------|
| Total Soil Unit Weight, γ : | 75 | pcf |
| Ultimate Gross Bearing, Q_{ult} : | 8.000 | ksf |
| Cohesion, C_u : | 0.000 | ksf |
| Friction Angle, ϕ : | 38 | degrees |
| SPT Blow Count, N_{blows} : | 24 | |
| Base Friction, μ : | 0.6 | |
| Neglected Depth, N : | 3.3 | ft |
| Groundwater Depth, gw : | 2 | ft |

<--Toggle between Gross and Net

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: 876369
 Site Name: HARWINTON / BUCKLEY BROADCAST I
 App #: 393582 Rev. 3

| Loads Already Factored | |
|------------------------|------|
| For M (WL): | 1.00 |
| For P (DL): | 1.00 |

| Pier Properties | |
|----------------------------|------------------------|
| Concrete: | |
| Pier Diameter = | 7.0 ft |
| Concrete Area = | 5541.8 in ² |
| Reinforcement: | |
| Clear Cover to Tie = | 3.00 in |
| Horiz. Tie Bar Size = | 4 |
| Vert. Cage Diameter = | 6.33 ft |
| Vert. Cage Diameter = | 76.00 in |
| Vertical Bar Size = | 8 |
| Bar Diameter = | 1.00 in |
| Bar Area = | 0.79 in ² |
| Number of Bars = | 46 |
| As Total = | 36.34 in ² |
| A s/ Aconc, Rho: | 0.0066 0.66% |

ACI 10.5, ACI 21.10.4, and IBC 1810.
 Min As for Flexural, Tension Controlled, Shafts:
 $(3) * (\text{Sqrt}(f'c) / Fy) = 0.0027$
 $200 / Fy = 0.0033$

Minimum Rho Check:
 Actual Req'd Min. Rho: 0.33% Flexural
 Provided Rho: 0.66% **OK**

| Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn): | | |
|--|---------|---------|
| Max Pu = ($\phi=0.65$) Pn. | | |
| Pn per ACI 318 (10-2) | 8434.01 | kips |
| at Mu=($\phi=0.65$)Mn= | 5152.97 | ft-kips |
| | | |
| Max Tu, ($\phi=0.9$) Tn = | 1962.36 | kips |
| at Mu= $\phi=(0.90)$ Mn= | 0.00 | ft-kips |

| Maximum Shaft Superimposed Forces | | |
|-----------------------------------|--------|------------------|
| TIA Revision: | G | |
| Max. Factored Shaft Mu: | 3949.5 | ft-kips (* Note) |
| Max. Factored Shaft Pu: | 52 | kips |
| Max Axial Force Type: | Comp. | |

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

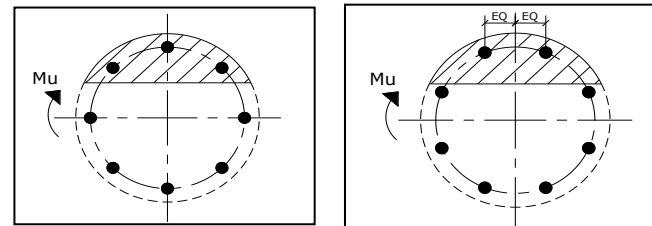
| Load Factor | Shaft Factored Loads | |
|-------------|----------------------|----------------|
| 1.00 | Mu: | 3949.5 ft-kips |
| 1.00 | Pu: | 52 kips |

| Material Properties | | |
|--|---------|-----|
| Concrete Comp. strength, f'c = | 3000 | psi |
| Reinforcement yield strength, Fy = | 60 | ksi |
| Reinforcing Modulus of Elasticity, E = | 29000 | ksi |
| Reinforcement yield strain = | 0.00207 | |
| Limiting compressive strain = | 0.003 | |
| ACI 318 Code | | |
| Select Analysis ACI Code= | 2005 | |

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1 Case 2

Dist. From Edge to Neutral Axis: **14.24** in
 Extreme Steel Strain, ϵ_t : **0.0138**
 $\epsilon_t > 0.0050$, Tension Controlled
 Reduction Factor, ϕ : **0.900**

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ Pn = Pu: 46.80 kips
 Drilled Shaft Moment Capacity, ϕ Mn: **5751.97** ft-kips
 Drilled Shaft Superimposed Mu: **3949.50** ft-kips

| | |
|--|--------------|
| (Mu/ϕMn, Drilled Shaft Flexure CSR: | 68.7% |
|--|--------------|

CCISeismic - Design Category

Per 2012/2015 IBC

Site BU: 876369
 Work Order: 1418096
 Application: 393582 Rev. 3



| | Degrees | Minutes | Seconds | |
|--|----------------|---------|---------|-----------------------------------|
| Site Latitude = | 41 | 45 | 26.15 | 41.7573 degrees |
| Site Longitude = | -73 | 3 | 9.20 | -73.0526 degrees |
| Ground Supported Structure = | Yes | | | |
| Structure Class = | II | | | (Table 2-1) |
| Site Class = | D - Stiff Soil | | | (Table 2-11) |
| Spectral response acceleration short periods, S_s = | 0.184 | | | USGS Seismic Tool |
| Spectral response acceleration 1 s period, S_1 = | 0.065 | | | |
| Importance Factor, I = | 1.0 | | | (Table 2-3) |
| Acceleration-based site coefficient, F_a = | 1.6 | | | (Table 2-12) |
| Velocity-based site coefficient, F_v = | 2.4 | | | (Table 2-13) |
| Design spectral response acceleration short period, S_{DS} = | 0.195 | | | (2.7.6) |
| Design spectral response acceleration 1 s period, S_{D1} = | 0.104 | | | (2.7.6) |
| Seismic Design Category - Short Period Response = | B | | | ASCE 7-05 Table 11.6-1 |
| Seismic Design Category - 1s Period Response = | B | | | ASCE 7-05 Table 11.6-2 |
| Worst Case Seismic Design Category = | B | | | ASCE 7-05 Tables 11.6-1 and 6-2 |



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

SPRINT Existing Facility

Site ID: CT33XC021

Harwinton/Buckley Broadcasting
64 Hungerford Lane
Harwinton, CT 06791

July 23, 2017

EBI Project Number: 6217003216

| Site Compliance Summary | |
|---|------------------|
| Compliance Status: | COMPLIANT |
| Site total MPE% of FCC general population allowable limit: | 4.57 % |



July 23, 2017

SPRINT

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

Emissions Analysis for Site: **CT33XC021 – Harwinton/Buckley Broadcasting**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **64 Hungerford Lane, Harwinton, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 850 MHz Band is approximately $567 \mu\text{W}/\text{cm}^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is $1000 \mu\text{W}/\text{cm}^2$. 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 **64 Hungerford Lane, Harwinton, 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 20 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 **RFS APXVSP18-C-A20** and **RFS APXVTM14-C-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 **180 feet** above ground level (AGL) for **Sector A**, **180 feet** above ground level (AGL) for **Sector B** and **180 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: | RFS APXVSP18-C-A20 | Make / Model: | RFS APXVSP18-C-A20 | Make / Model: | RFS APXVSP18-C-A20 |
| Gain: | 13.4 / 15.9 dBd | Gain: | 13.4 / 15.9 dBd | Gain: | 13.4 / 15.9 dBd |
| Height (AGL): | 180 feet | Height (AGL): | 180 feet | Height (AGL): | 180 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): | 220 Watts | Total TX Power(W): | 220 Watts | Total TX Power(W): | 220 Watts |
| ERP (W): | 7,537.38 | ERP (W): | 7,537.38 | ERP (W): | 7,537.38 |
| Antenna A1 MPE% | 1.01 % | Antenna B1 MPE% | 1.01 % | Antenna C1 MPE% | 1.01 % |
| Antenna #: | 2 | Antenna #: | 2 | Antenna #: | 2 |
| Make / Model: | RFS APXVTM14-C-I20 | Make / Model: | RFS APXVTM14-C-I20 | Make / Model: | RFS APXVTM14-C-I20 |
| Gain: | 15.9 dBd | Gain: | 15.9 dBd | Gain: | 15.9 dBd |
| Height (AGL): | 180 feet | Height (AGL): | 180 feet | Height (AGL): | 180 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% | 0.74 % | Antenna B2 MPE% | 0.74 % | Antenna C2 MPE% | 0.74 % |

| Site Composite MPE% | |
|--------------------------|---------------|
| Carrier | MPE% |
| SPRINT – Max per sector | 1.75 % |
| Verizon Wireless | 1.43 % |
| AT&T | 1.39 % |
| Site Total MPE %: | 4.57 % |

| | |
|------------------------|---------------|
| SPRINT Sector A Total: | 1.75 % |
| SPRINT Sector B Total: | 1.75 % |
| SPRINT Sector C Total: | 1.75 % |
| Site Total: | 4.57 % |

| SPRINT _ Max Values per Frequency Band / Technology | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density ($\mu\text{W}/\text{cm}^2$) | Frequency (MHz) | Allowable MPE ($\mu\text{W}/\text{cm}^2$) | Calculated % MPE |
|---|------------|-------------------------|---------------|---|-----------------|---|------------------|
| Sprint 850 MHz CDMA | 1 | 437.55 | 180 | 0.52 | 850 MHz | 567 | 0.09% |
| Sprint 850 MHz LTE | 2 | 437.55 | 180 | 1.04 | 850 MHz | 567 | 0.18% |
| Sprint 1900 MHz (PCS) CDMA | 5 | 622.47 | 180 | 3.70 | 1900 MHz (PCS) | 1000 | 0.37% |
| Sprint 1900 MHz (PCS) LTE | 2 | 1,556.18 | 180 | 3.70 | 1900 MHz (PCS) | 1000 | 0.37% |
| Sprint 2500 MHz (BRS) LTE | 8 | 778.09 | 180 | 7.39 | 2500 MHz (BRS) | 1000 | 0.74% |
| | | | | | | Total: | 1.75% |



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: | 1.75 % |
| Sector B: | 1.75 % |
| Sector C: | 1.75 % |
| SPRINT Maximum Total (per sector): | 1.75 % |
| | |
| Site Total: | 4.57 % |
| | |
| Site Compliance Status: | COMPLIANT |

The anticipated composite MPE value for this site assuming all carriers present is **4.57 %** 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.