4545 East River Road, Suite 320
West Henrietta, NY 14586

December 30, 2019

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

RE: **Notice of Exempt Modification for Verizon:**
Crown Castle Site ID: 806353
128 Mather Street, Wilton, CT 06897
Lat: 41° 14′ 18.34″ / Long: -73° 25′ 26.44″

Dear Ms. Bachman:

Verizon currently maintains twelve (12) total antennas at the 162-foot mount on the existing 180-foot self-support tower, located at 128 Mather Street in Wilton. The tower is owned by Crown Castle and the property is owned by the Town of Wilton. Verizon now intends to add three (3) antennas and three (3) RRUs to existing configuration.

Tower modifications:

- Add three (3) CBRS antennas
- Add three (3) new RRUs
- Add three (3) BSAMNT antenna mounts

Ground modifications:

- None

Melanie A. Bachman

The facility was approved by the Connecticut Siting Council on May 3, 1988 via a Decision and Order.

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 Lynne Vanderslice, First Selectwoman for the Town of Wilton, as well as Robert Nerney, Planning Director for the Town of Wilton.

Additionally:

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.

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

For the foregoing reasons, Verizon 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 my attention at the address listed below.

Sincerely,

Richard Zajac
Network Real Estate Specialist
4545 East River Road, Suite 320
West Henrietta, NY 14586
585-445-5896
richard.zajac@crowncastle.com

Melanie A. Bachman

cc:

Lynne Vanderslice, First Selectwoman
Town of Wilton
Town Hall – Selectwoman's Office
238 Danbury Road
Wilton, CT 06897
203.563.0100

Robert Nerney, AICP, Planning Director
Town of Wilton
Town Hall – Planning Department
238 Danbury Road
Wilton, CT 06897
203.563.0185

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
4545 EAST RIVER ROAD
SUITE 320
WEST HENRIETTA, NY 14568
UNITED STATES US

SHIP DATE: 30DEC19
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **LYNNE VANDERSLICE**
WILTON TOWN HALL
SELECTWOMANS OFFICE
238 DANBURY ROAD
WILTON CT 06897
(203) 563-0100 REF: 1734.7680
INV:
PO: DEPT:

567J2/18DD/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7773 5922 8638**

TUE - 31 DEC 3:00P
STANDARD OVERNIGHT

XH DXRA

DSR
06897
CT-US **SWF**

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

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

ORIGIN ID:ONHA (585) 445-5896
RICHARD ZAJAC
CROWN CASTLE
4545 EAST RIVER ROAD
SUITE 320
WEST HENRIETTA, NY 14568
UNITED STATES US

SHIP DATE: 30DEC19
ACTWGT: 1.00 LB
CAD: 104924194/INET4160

BILL SENDER

TO **ROBERT NERNEY, AICP**
TOWN OF WILTON
PLANNING DEPARTMENT
238 DANBURY ROAD
WILTON CT 06897
(203) 563-0185 REF: 1734.7680
INV:
PO: DEPT:

567J2/18DD/05A2

FedEx Express

J192119091901uv

TRK# 0201 **7773 5925 8365**

TUE - 31 DEC 3:00P
STANDARD OVERNIGHT

XH DXRA

DSR
06897
CT-US **SWF**

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

Exhibit A

Original Facility Approval

DOCKET NO. 94 - AN APPLICATION OF METRO MOBILE CTS OF FAIRFIELD COUNTY, INC., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR CELLULAR TELEPHONE ANTENNAS AND ASSOCIATED EQUIPMENT IN THE TOWN OF WILTON, CONNECTICUT.	:	Connecticut Siting Council May 3, 1988

DECISION AND ORDER

Pursuant to the foregoing opinion, the Connecticut Siting Council finds that the effects associated with the construction and operation of a cellular monopole structure at the alternative Mather Street site, including effects on the natural environment, ecological balance, public health and safety, scenic, historic and recreational values, forests and parks, air and water purity and fish and wildlife, are not significant either alone or cumulatively with other effects, are not in conflict with the policies of the state concerning such effects, and are not sufficient reason to deny the application, and therefore, directs that a Certificate of Environmental Compatibility and Public Need, as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to Metro Mobile CTS of Fairfield County, Inc. (Metro Mobile) for the construction, operation, and maintenance of a cellular telephone tower site and associated equipment at the "Wilton-D/AA" site on Mather Street in Wilton, Connecticut.

The proposed "D-Wilton" site on Richdale Drive and alternative "D/A Wilton" site on Quail Ridge Road are hereby denied.

The facility shall be constructed, operated, and maintained as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole or lattice tower, as determined by the Council in approving the development and management plan, and be no taller than necessary to provide the proposed service, and in no event shall exceed a total height of 193 feet, including antennas and associated equipment.

2. The facility shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations.

3. Unless necessary to comply with condition number two, above, no lights shall be installed on this tower.

4. The Certificate Holder shall prepare a development and management (d&m) plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The d&m plan shall provide monopole and lattice tower foundation design specifications and plans for permanent evergreen screening around the outside perimeter of the eight-foot chain link fence which will surround the site.

5. The Certificate Holder shall provide the Council with the results of additional subsurface reconnaissance at the proposed site prior to the commencement of any construction at this site.

6. The Certificate Holder or its successor shall notify the Council if and when directional antennas or any equipment other than that listed in this application are added to this facility.

7. The Certificate Holder or its successor shall permit public or private entities to share space on the tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

8. If this facility does not provide, or permanently ceases to provide, cellular service following the completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication for any new use shall be made to the Council before any such new use is made.

9. The Certificate Holder shall comply with any future radio frequency (RF) standards promulated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.

10. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the issuance of this Decision and Order, or within three years of the completion of any appeal taken in this Decision and Order.

Pursuant to Section 16-50p, we hereby direct that a copy of the Decision and Order be served on each person listed below. A notice of issuance shall be published in the Norwalk Hour and the Wilton Bulletin.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of State Agencies.

The parties or intervenors to this proceeding are:

Metro Mobile CTS of Fairfield County, Inc. (Party)
50 Rockland Road
South Norwalk, CT 06854
Attn: Michael Riley

Howard L. Slater, Esq. (Its Attorney)
Jennifer Young Gaudet, Esq.
Byrne, Slater, Sandler, Shulman & Rouse, P.C.
330 Main Street
Hartford, CT 06103

Fleischman and Walsh, P.C. (Representative)
1725 N. Street, N.W.
Washington, D.C. 20036
Attn: Richard Rubin, Esq.

PEACE, Inc. (Party)

Ann Caggiano (Representative)
President
PEACE, Inc.
33 Honey Hill Trail
Wilton, CT 06897

Town of Wilton (Party)

Edward C. Desmond (Representative)
First Selectman
Town of Wilton
Town Hall
238 Danbury Road
Wilton, CT 06897

Joseph C. Lee, Esq. (Its Attorney)
Alice A. Bruno, Esq.
Tyler Cooper & Alcorn
205 Church Street
P.O. Box 1936
New Haven, CT 06509

Margaret Doheny (Party)
21 Richdale Drive
Wilton, CT 06897

SNET Cellular, Inc. (Intervenor)

Donald R. Chapman, Vice President (Representative)
Operations
SNET Cellular, Inc.
555 Long Wharf Drive
New Haven, CT 06511

Peter J. Tyrrell (Its Attorney)
Senior Attorney
SNET Cellular, Inc.
227 Church Street
Room 1021
New Haven, CT 06506

Ogden Bigelow (Intervenor)
25 Hidden Lake Road
Wilton, CT 06897

John Jordon (Party)
32 Mayapple Road
Wilton, CT 06897

Veronica Tella (Party)
41 Honey Hill Trail
Wilton, CT 06897

Betsy Mitchell (Party)
125 Catalpa Road
Wilton, CT 06897
(SERVICE WAIVED)

1390E

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket 94 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 3rd day of May, 1988.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner Peter Boucher Designee: Roland Miller	Yes
Commissioner Leslie Carothers Designee: Brian Emerick	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
William H. Smith	Yes
Colin C. Tait	Absent

1395E-2

Exhibit B

Property Card

MATHER ST

Location	MATHER ST	**Mblu**	23/ / 23/ /
Acct#	5165,3335	**Owner**	WILTON TOWN OF
Assessment	$6,999,790	**Appraisal**	$9,999,700
PID	1065	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$45,500	$9,954,200	$9,999,700
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$31,850	$6,967,940	$6,999,790

Owner of Record

Owner	WILTON TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	238 DANBURY RD WILTON, CT 06897	**Book & Page**	1151/0195
		Sale Date	02/02/1999
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
WILTON TOWN OF	$0		1151/0195	00	02/02/1999
	$0		0112/0179	00	05/01/1965

Building Information

Building 1 : Section 1

Year Built:	
Living Area:	0
Replacement Cost:	$0
Building Percent Good:	
Replacement Cost Less Depreciation:	$0

Building Attributes

Field	Description
Style	Vacant Land
Model	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Elevator	
Fireplaces	
Sauna	
Spa/Jet Tub	
Whirlpool Tub	
Cath. Ceil	

Building Photo

(http://images.vgsi.com/photos/WiltonCTPhotos//default.jpg)

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Building 2 : Section 1

Year Built: 1988
Living Area: 1,200
Replacement Cost: $62,291
Building Percent Good: 73
Replacement Cost Less Depreciation: $45,500

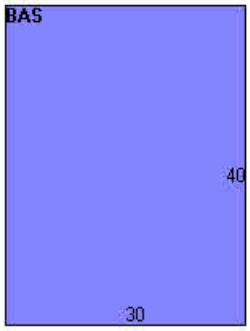
Building Attributes : Bldg 2 of 2	
Field	**Description**
STYLE	Service Shop
MODEL	Commercial
Grade	Below Average
Occupancy	1

Building Photo

(http://images.vgsi.com/photos/WiltonCTPhotos//\00\00\78/11.j

Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Enam Mtl Shing
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Dirt/None
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Type	None
Bldg Use	Ex Com MDL-96
Fireplace	
Elevator	
Cath Ceil	
Sauna	
1st Floor Use:	21I
Heat/AC	None
Frame Type	Steel
Baths/Plumbing	None
Ceiling/Wall	Sus Ceil Min W
Rooms/Prtns	Average
Wall Height	11
% Comn Wall	0

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,200	1,200
		1,200	1,200

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	21V
Description	Ex Com MDL-00
Zone	R-2
Neighborhood	4000
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	74.12
Frontage	
Depth	
Assessed Value	$6,967,940
Appraised Value	$9,954,200

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

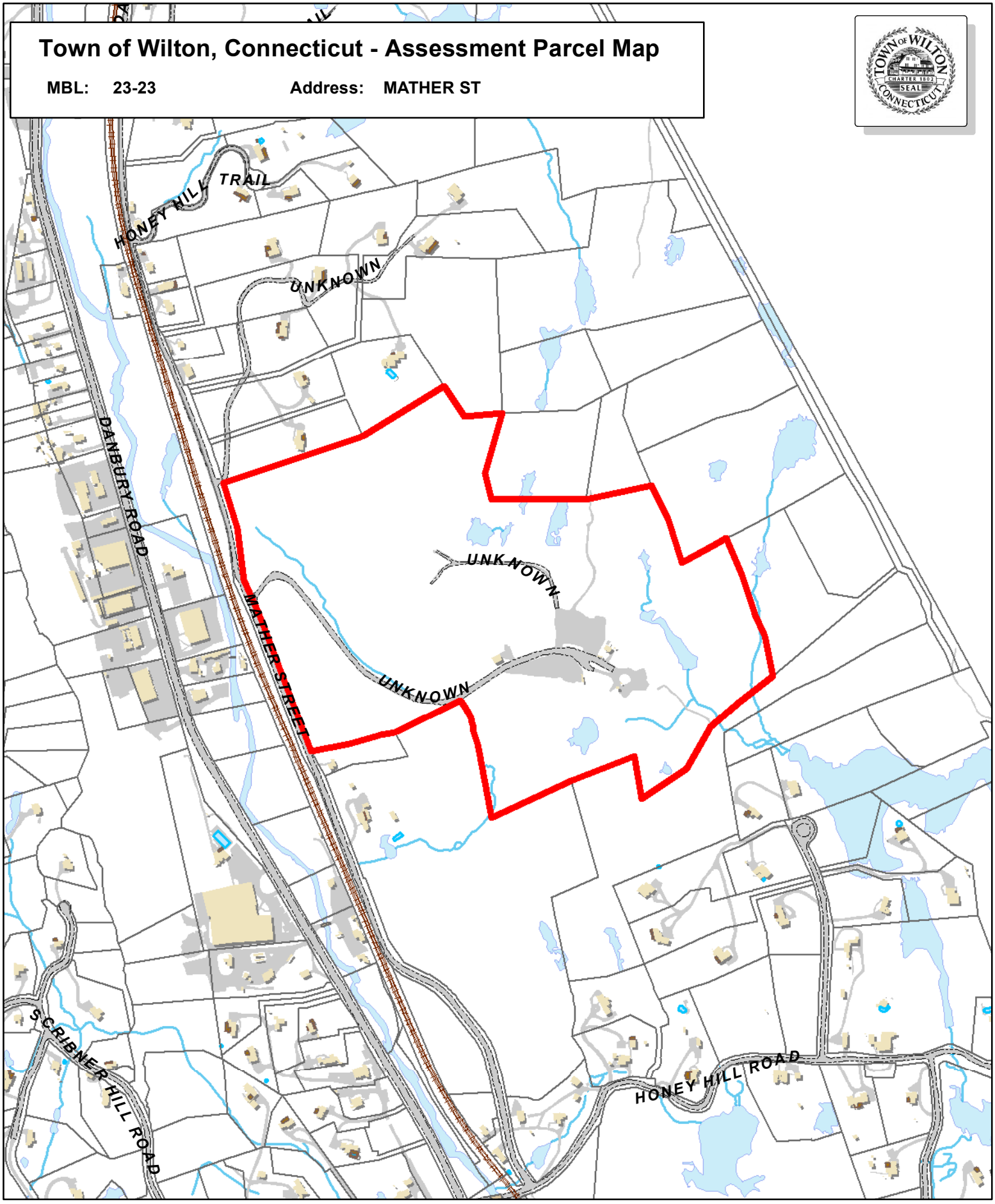
Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$45,500	$9,954,200	$9,999,700
2014	$45,500	$9,954,200	$9,999,700
2013	$45,500	$9,954,200	$9,999,700

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$31,850	$6,967,940	$6,999,790
2014	$31,850	$6,967,940	$6,999,790
2013	$31,850	$6,967,940	$6,999,790

Town of Wilton, Connecticut - Assessment Parcel Map

MBL: 23-23 **Address:** MATHER ST



N W E S

Approximate Scale:

1 inch = 600 feet

Disclaimer:
This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Wilton and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Grand List Date: Oct 2017

0 350 700 1,050 Feet

Exhibit C

Construction Drawings

verizon

WILTON CT
128 MATHER STREET
WILTON, CT 06897

PROJECT SUMMARY

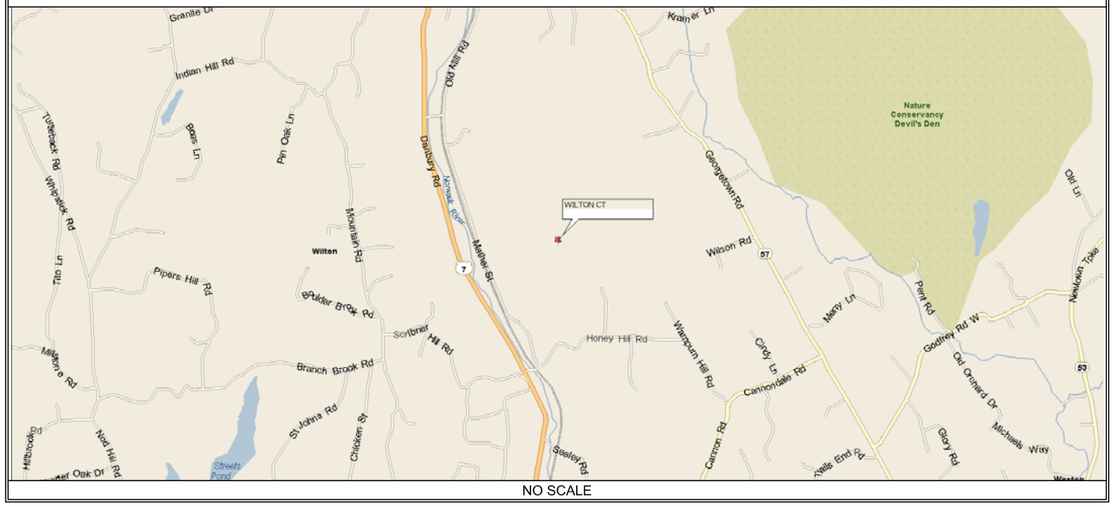
SITE NAME:	WILTON CT
SITE ADDRESS:	128 MATHER STREET WILTON, CT 06897
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DR CANONSBURG, PA 15317
BU NUMBER:	806353
MAP NUMBER:	23
LOT NUMBER:	23
CUSTOMER/APPLICANT:	VERIZON WIRELESS 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
CONTACT:	ANDREW LEONE (617) 620-4175
NAD83	
LATITUDE:	41° 14' 18.34 N
LONGITUDE:	73° 25' 26.44" W
ELEVATION:	431'
CURRENT ZONING:	R-2
A&E FIRM:	B+T GROUP 1717 S. BOULDER, SUITE 300 TULSA, OK 74119 STEVE THORNHILL (918) 587-4630
OCCUPANCY TYPE:	UNMANNED
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

CODE COMPLIANCE

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

CODE TYPE	CODE
BUILDING	2018 CT SBC
STRUCTURAL	2018 CT SBC
MECHANICAL	2018 CT SBC
ELECTRICAL	NEC 2017

LOCATION MAP



NO SCALE

DRIVING DIRECTIONS

DEPART FROM BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 17, TURN RIGHT ONTO RAMP. TAKE RAMP (LEFT) ONTO CT-15 [WILBUR CROSS PKWY]. AT EXIT 41, KEEP LEFT ONTO RAMP. TURN LEFT ONTO CT-33 [WILTON RD]. KEEP STRAIGHT ONTO US-7 [CT-33]. TURN RIGHT ONTO HONEY HILL RD. TURN LEFT ONTO MATHER ST. BEAR RIGHT ONTO ACCESS ROAD AND ARRIVE AT WILTON CT.

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	2
A-1	COMPOUND PLAN AND TOWER ELEVATION	2
A-2	EQUIPMENT DETAILS	2

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
OWNER:		
R.F. ENGINEER:		
CONSTRUCTION MGR.:		
LEASING & ZONING:		
VERIZON WIRELESS:		

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

DO NOT SCALE DRAWINGS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11x17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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

811

B+T GRP

verizon
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

WILTON CT
128 MATHER STREET
WILTON, CT 06897
EXISTING SELF-SUPPORT TOWER

PROJECT NO: 102920.003.01
CHECKED BY: RMC

ISSUED FOR:

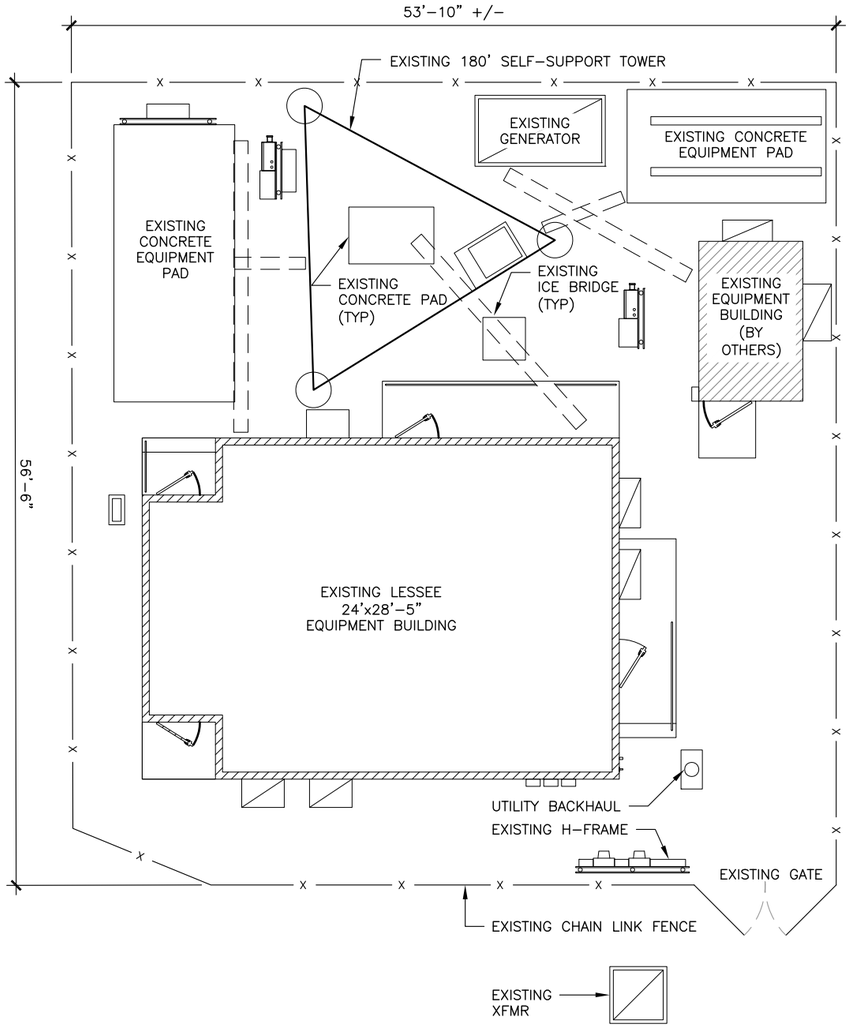
REV	DATE	DRWN	DESCRIPTION
0	10/7/19	RFC	CONSTRUCTION
1	10/28/19	RFC	CONSTRUCTION
2	12/12/19	GEH	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
12/12/19

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: T-1
REVISION: 2

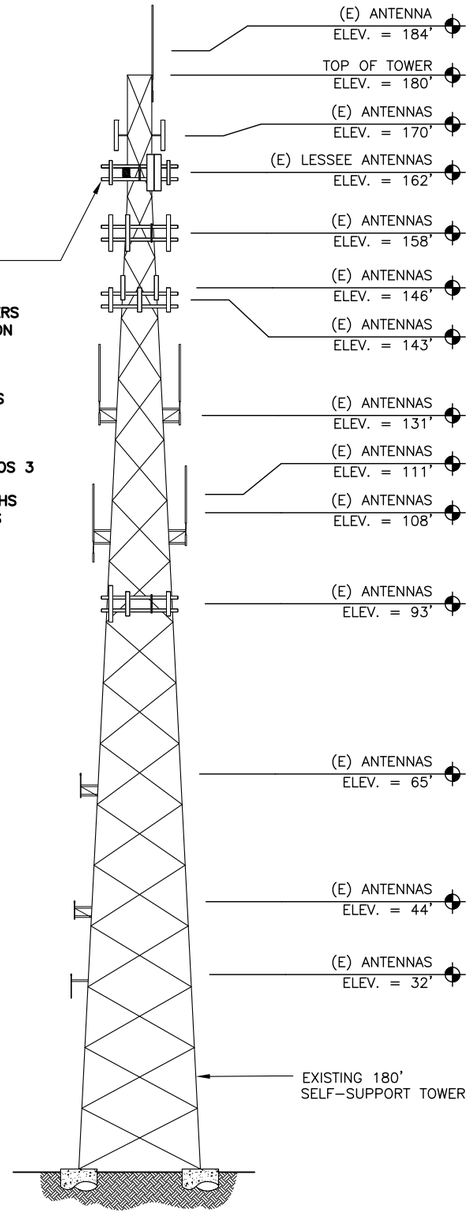


1 COMPOUND PLAN
SCALE: 0' 4' 8' 16' 32'

N

NOTES:
1. CONTRACTOR TO VERIFY EXACT COAX AND ANTENNA INSTALLATION AND ANTENNA HEIGHT WITH LATEST RF DATA SHEETS PRIOR TO INSTALLATION.
2. STRUCTURAL ANALYSIS DONE BY OTHERS.
3. VERIZON SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED STATE STRUCTURAL ENGINEER CERTIFYING THAT THE EXISTING TOWER AND PROPOSED IMPROVEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL NEW WORK THAT WILL BE DONE IN COMPLIANCE WITH THE CURRENT EDITION OF BUILDING CODES AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY AND ALL IMPROVEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWING OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.CAP AND WEATHERPROFF UNUSED ANTENNA PORTS.
4. ESTIMATED HYBRIFLEX CABLE LENGTH: 216' (EACH RUN)

EXISTING TO REMAIN:
(6) JAHH-65B-R3B ANTENNAS
(6) APL868013 ANTENNAS
(3) CBC78T-DS-43-2X DIPLEXERS
(2) DB-T1-6Z-8AB-0Z JUNCTION BOXES WITH
(2) HYBRID CABLES
(6) 1 5/8" COAX CABLES
(3) B2/B66A RFV01U-D1A RRHS
(3) B5/B13 RFV01U-D2A RRHS
(3) SECTOR MOUNTS
EXISTING TO BE RELOCATED:
(3) APL868013 ANTENNAS TO POS 3
PROPOSED:
(3) CBRS RRH-RT4401-48A RRHS
(3) XXDWMM-12.5-65-8T-CBRS ANTENNAS
(3) BSAMNT-SBS-2-2 ANTENNA MOUNTS



2 FINAL TOWER ELEVATION
SCALE: 0' 4' 8' 16' 32'

B+T GRP

verizon
400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

WILTON CT

128 MATTHER STREET
WILTON, CT 06897

EXISTING SELF-SUPPORT TOWER

PROJECT NO: 102920.003.01
CHECKED BY: RMC

ISSUED FOR:

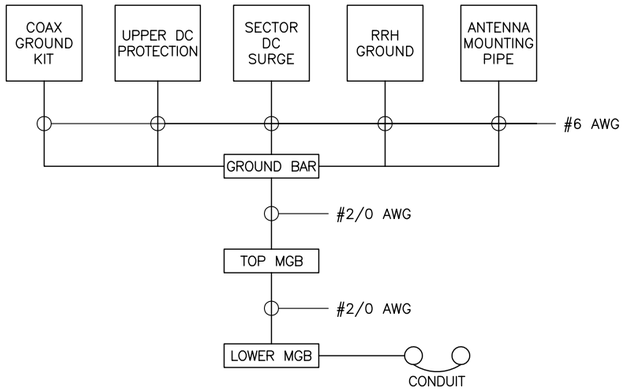
REV	DATE	DRWN	DESCRIPTION
0	10/7/19	RFC	CONSTRUCTION
1	10/28/19	RFC	CONSTRUCTION
2	12/12/19	GEH	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT 31627 LICENSED PROFESSIONAL ENGINEER
12/12/19

SHEET NUMBER: A-1
REVISION: 2

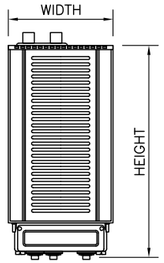
NOTE:
1. INSTALL ALL EQUIPMENT, MOUNTING BRACKETS AND HARDWARE ACCORDING WITH MANUFACTURE'S RECOMMENDATIONS.
2. GROUND DISTRIBUTION BOXES, MOUNTING PIPES AND RRHs IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS.
3. INSTALLED EQUIPMENT AND MOUNTING BRACKETS SHALL NOT INTERFERE WITH CLIMBING ACCESS NOR ANT INSTALLED SAFETY DEVICES.
4. EQUIPMENT TO BE INSTALLED AT VERIZON'S RAD. CENTER IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS (ANALYSIS BY OTHERS).



NOTE:
1. BOND ANTENNA GROUNDING KIT CABLES TO TOP CIBE.
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIBE.
3. TYPICAL FOR ALL SECTORS.

1 GROUNDING SCHEMATIC DIAGRAM
SCALE: N.T.S.

REMOTE RADIO HEAD DIMENSIONS (INCHES)				
MODEL	HEIGHT	WIDTH	DEPTH	WEIGHT
CBRS RRH–RT4401–48A	16.2"	11.4"	5.5"	23.1 LBS



2 RRH SPECIFICATIONS
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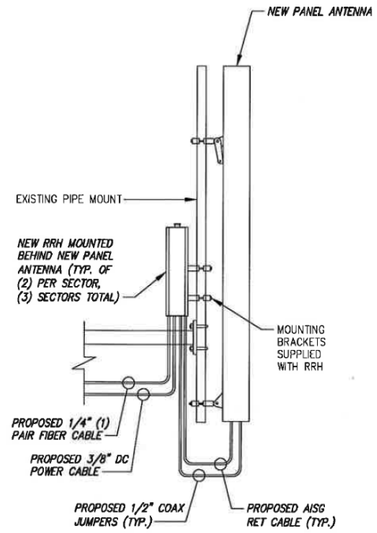
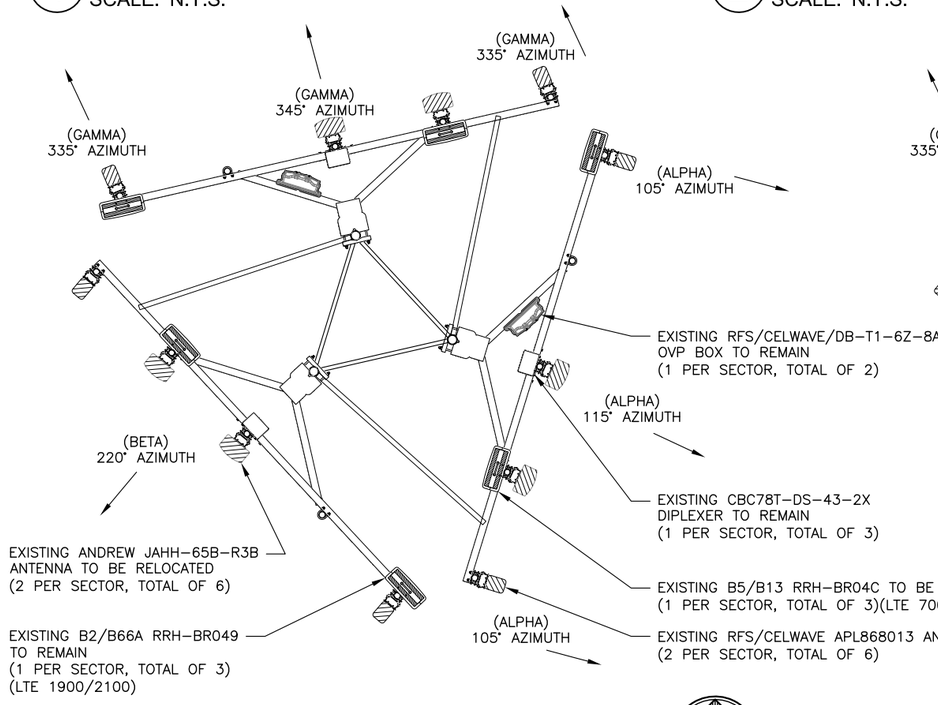
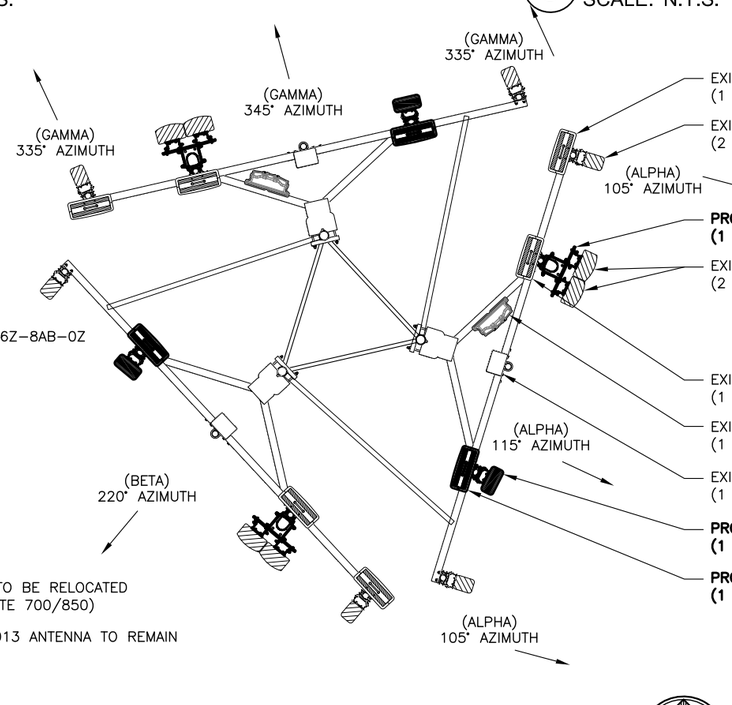


3 ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



4 EXISTING ANTENNA ORIENTATION
SCALE: N.T.S.



5 PROPOSED ANTENNA ORIENTATION
SCALE: N.T.S.

B+T GRP

verizon

400 FRIBERG PARKWAY
WESTBOROUGH, MA 01581
PH: (508) 330-3300

WILTON CT

128 MATHER STREET
WILTON, CT 06897

EXISTING SELF-SUPPORT TOWER

PROJECT NO:	102920.003.01
CHECKED BY:	RMC

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	10/7/19	RFC	CONSTRUCTION
1	10/28/19	RFC	CONSTRUCTION
2	12/12/19	GEH	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER:	REVISION:
A-2	2

Exhibit D

Structural Analysis Report

Date: **October 02, 2019**

Amanda D Brown
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Carrier Site Number:	NG1976
	Carrier Site Name:	WILTON CT
Crown Castle Designation:	**Crown Castle BU Number:**	806353
	Crown Castle Site Name:	BRG 124 943066
	Crown Castle JDE Job Number:	589777
	Crown Castle Work Order Number:	1793090
	Crown Castle Order Number:	504546 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	102920.004.01
Site Data:	**128 Mather Street, Wilton, Fairfield County, CT** **Latitude *41° 14' 18.34"*, Longitude *-73° 25' 26.44"*** **180 Foot - Self Support Tower**	

Dear Amanda D Brown,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

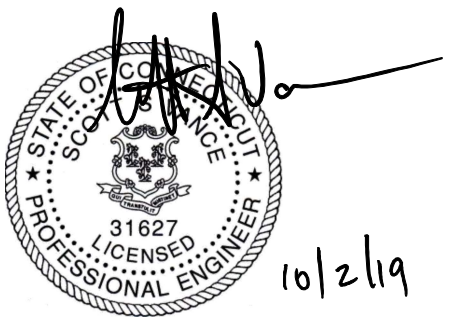
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity-84.3%**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Jacob Johnson, E.I.T.

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2020



Scott S. Vance, P.E.

tnxTower Report - version 8.0.5.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft. Self-Support tower designed by FWT in May of 1988. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-D. This tower has been modified multiple times in the past and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
164.0	166.0	3	Commscope	CBC78TDS-43-2X	8	1-5/8
		6	Commscope	JAHH-65B-R3B		
		6	Rfs Celwave	APL868013-42T0		
		2	Rfs Celwave	DB-T1-6Z-8AB-0Z		
		3	Samsung Telecom.	20W CBRS		
		3	Samsung Telecom.	CBRS		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
	164.0	1	--	Sector Mount [SM 702-3] (16')		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
178.0	184.0	1	Rfs Celwave	PD10017	2	7/8
170.0	171.0	3	Kathrein	800 10504	6	1-5/8
	170.0	3	Kathrein	860 10025	1	1/4
		1	--	Side Arm Mount [SO 103-3]		
154.0	158.0	3	Powerwave Tech.	7770.00	12	1-5/8
		3	Powerwave Tech.	P65-15-XLH-RR		
		3	Quintel Tech.	QS66512-2		
	154.0	1	--	Sector Mount [SM 602-3]		
	150.0	3	Ericsson	RRUS 11	4	5/8
		3	Ericsson	RRUS 32		
		3	Ericsson	RRUS 32 B2	2	3/8
		3	Kaelus	DBC0061F1V51-2		
		6	Powerwave Tech.	LGP21401		
		3	Powerwave Tech.	TT19-08BP111-001		
		2	Raycap	DC6-48-60-18-8F		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145.0	146.0	3	Alcatel Lucent	800 External Notch Filter	--	--
		3	Alcatel Lucent	800MHZ 2X50W RRH		
		3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ		
143.0	147.0	3	Alcatel Lucent	TD-RRH8x20-25	3	1-1/4
	143.0	9	Rfs Celwave	ACU-A20-N		
		3	Rfs Celwave	APXVSPP18-C-A20		
		3	Rfs Celwave	APXVTM14-C-120		
		1	--	Sector Mount [SM 401-3]		
124.0	131.0	2	Rfs Celwave	1142-2C	2	1/2
	124.0	2	--	Side Arm Mount [SO 303-1]		
104.0	111.0	1	Rfs Celwave	1142-2C	1 1	7/8 1/2
	108.0	1	Rfs Celwave	220-3BN		
	104.0	1	--	Side Arm Mount [SO 302-1]		
		1	--	Side Arm Mount [SO 303-1]		
93.0	93.0	3	Ericsson	AIR 32 B2a/B66Aa	4 6	1-5/8 1-1/4
		3	Ericsson	ERICSSON AIR 21 B2A B4P		
		3	Ericsson	KRY 112 144/1		
		3	Ericsson	RADIO 4449 B12/B71		
		3	Rfs Celwave	APXVAARR24_43-U-NA20		
		1	--	Sector Mount [SM 404-3]		
62.0	65.0	1	Gps	GPS_A	1	1/2
	62.0	1	--	Side Arm Mount [SO 305-1]		
42.0	44.0	1	Gps	GPS_A	1	1/2
	42.0	1	--	Side Arm Mount [SO 305-1]		
31.0	32.0	1	Gps	GPS_A	1	1/2
	31.0	1	--	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Online Order Information	Verizon Wireless Co-Locate, Rev# 0	504546	CCI Sites
Tower Manufacturer Drawing	Paul J. Ford/FWT, Date: 05/06/1988	217757	CCI Sites
Mount Analysis Report	PJF, Date: 09/25/2019	8677278	CCI Sites
Tower Modification Drawing	HEB, Proj. No: 98124A w/ FDH Foundation Mapping, Proj. No: 1207103EN1	3290324	CCI Sites
Tower Modification Drawing	APT, Job No: CT105271	801524	CCI Sites
Tower Modification Drawing	PJF, Date: 12/08/2009	2434484	CCI Sites
Post Modification Inspection	PJF, Date: 01/11/2010	2575710	CCI Sites
Tower Modification Drawing	Destek, Date: 01/13/2016	6061656	CCI Sites
Post Modification Inspection	SGS, Date: 10/21/2016	6515894	CCI Sites
Foundation Mapping	FWT, Date: 05/31/1988	262285	CCI Sites
Geotech Report	FDH, Project No: 09-04219E G1	262283	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 09/20/2019	CCI Sites

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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) The tower and structures were built and have been maintained in accordance with the manufacturer's specification.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Mount areas and weights are assumed based on photographs provided.
4) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically and must be replaced if damaged or cracked. Refer to crown document ENG-BUL-10323, Tower Base Plate Grout Inspection and Classification.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	180 - 168	Leg	P2x0.154	2	-2.469	29.380	8.4	Pass
T2	168 - 160	Leg	P2x0.154 (GR)	26	-10.855	40.351	26.9	Pass
T3	160 - 140	Leg	P3x0.216 (GR)	41	-45.645	91.364	50.0	Pass
T4	140 - 120	Leg	P3.5x.318 (GR)	68	-78.369	128.240	61.1	Pass
T5	120 - 100	Leg	P4x.337 (GR)	89	-108.113	165.049	65.5 71.8 (b)	Pass
T6	100 - 80	Leg	P5x0.375 (GR)	109	116.201	202.153	57.5	Pass
T7	80 - 60	Leg	P6x0.432	131	-167.318	238.435	70.2 80.4 (b)	Pass
T8	60 - 40	Leg	P6x0.432	146	-196.770	238.435	82.5	Pass
T9	40 - 20	Leg	P6x0.432	160	-225.139	266.933	84.3	Pass
T10	20 - 0	Leg	P8x.5	181	-254.414	386.074	65.9	Pass
T1	180 - 168	Diagonal	L2x1 1/2x3/16	10	-0.602	15.935	3.8 6.6 (b)	Pass
T2	168 - 160	Diagonal	L2x1 1/2x3/16	29	-2.617	15.935	16.4 30.3 (b)	Pass
T3	160 - 140	Diagonal	L2x1 1/2x3/16	43	-3.881	10.157	38.2 46.2 (b)	Pass
T4	140 - 120	Diagonal	L2x2x3/16	70	-4.571	9.511	48.1 55.5 (b)	Pass
T5	120 - 100	Diagonal	L2 1/2x2x3/16	91	-4.934	9.472	52.1	Pass
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	112	-6.025	10.923	55.2 58.2 (b)	Pass
T7	80 - 60	Diagonal	L3x3x3/16	133	-7.220	11.950	60.4 62.4 (b)	Pass
T8	60 - 40	Diagonal	L3 1/2x3x1/4	148	-7.723	15.837	48.8 53.3 (b)	Pass
T9	40 - 20	Diagonal	L3 1/2x3x1/4	163	-8.994	12.837	70.1	Pass
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	184	-9.307	14.867	62.6 64.2 (b)	Pass
T9	40 - 20	Secondary	L3 1/2x3 1/2x1/4	169	-3.904	23.697	16.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
		Horizontal					42.1 (b)	
T1	180 - 168	Top Girt	L2x1 1/2x3/16	6	-0.107	10.904	1.0 1.7 (b)	Pass
							Summary	
						Leg (T9)	84.3	Pass
						Diagonal (T9)	70.1	Pass
						Secondary Horizontal (T9)	42.1	Pass
						Top Girt (T1)	1.7	Pass
						Bolt Checks	82.6	Pass
						Rating =	84.3	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	34.5	Pass
1	Base Foundation (Structural)	Base	43.1	Pass
1	Base Foundation (Soil Interaction)	Base	81.7	Pass

Structure Rating (max from all components) =	84.3%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5.

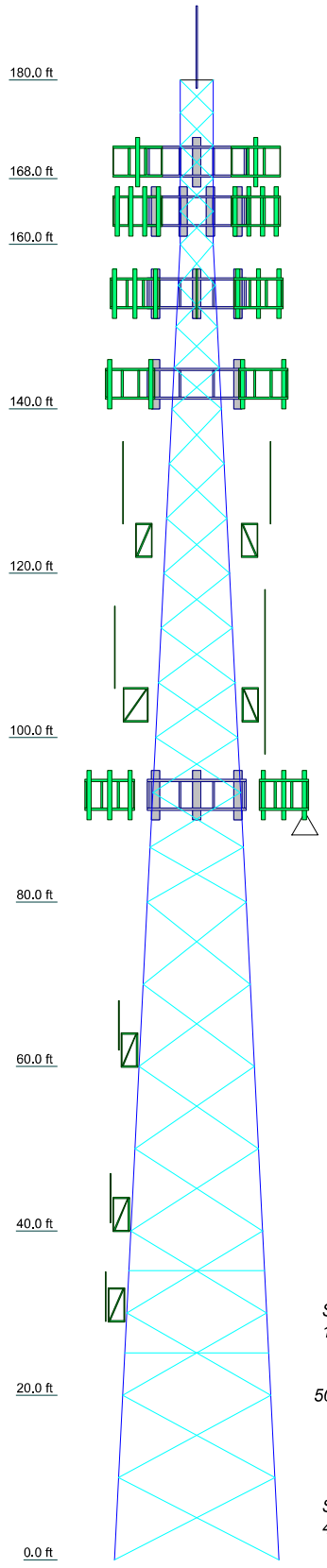
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	
Legs	P2x0.154	A	P3x0.216 (GR)	P3.5x.318 (GR)	P4x.337 (GR)	P5x0.375 (GR)	P6x0.432			P8x.5	
Leg Grade	A53-B-35										
Diagonals	L2x1 1/2x3/16			L2x2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16	L3 1/2x3x1/4		L3 1/2x3 1/2x1/4	
Diagonal Grade	A36										
Top Girts	L2x1 1/2x3/16					N.A.					
Sec. Horizontals	N.A.								L3 1/2x3 1/2x1/4	N.A.	
Face Width (ft)	4			6	8	10	12	14	16	18	20
# Panels @ (ft)	5 @ 4		4 @ 5		9 @ 6.66667				8 @ 10		
Weight (K)	0.4	0.3	1.4	1.9	2.4	3.4	2.7	3.2	3.9	4.5	24.1



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2x0.154 (GR)		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. Grouted pipe f'c is 7.000 ksi
9. TIA-222-H Annex S
10. TOWER RATING: 84.3%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 262 K
SHEAR: 27 K

UPLIFT: -218 K
SHEAR: 24 K

AXIAL 145 K
SHEAR 12 K
MOMENT 1310 kip-ft

TORQUE 12 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 65 K
SHEAR 43 K
MOMENT 4167 kip-ft

TORQUE 45 kip-ft
REACTIONS - 120 mph WIND

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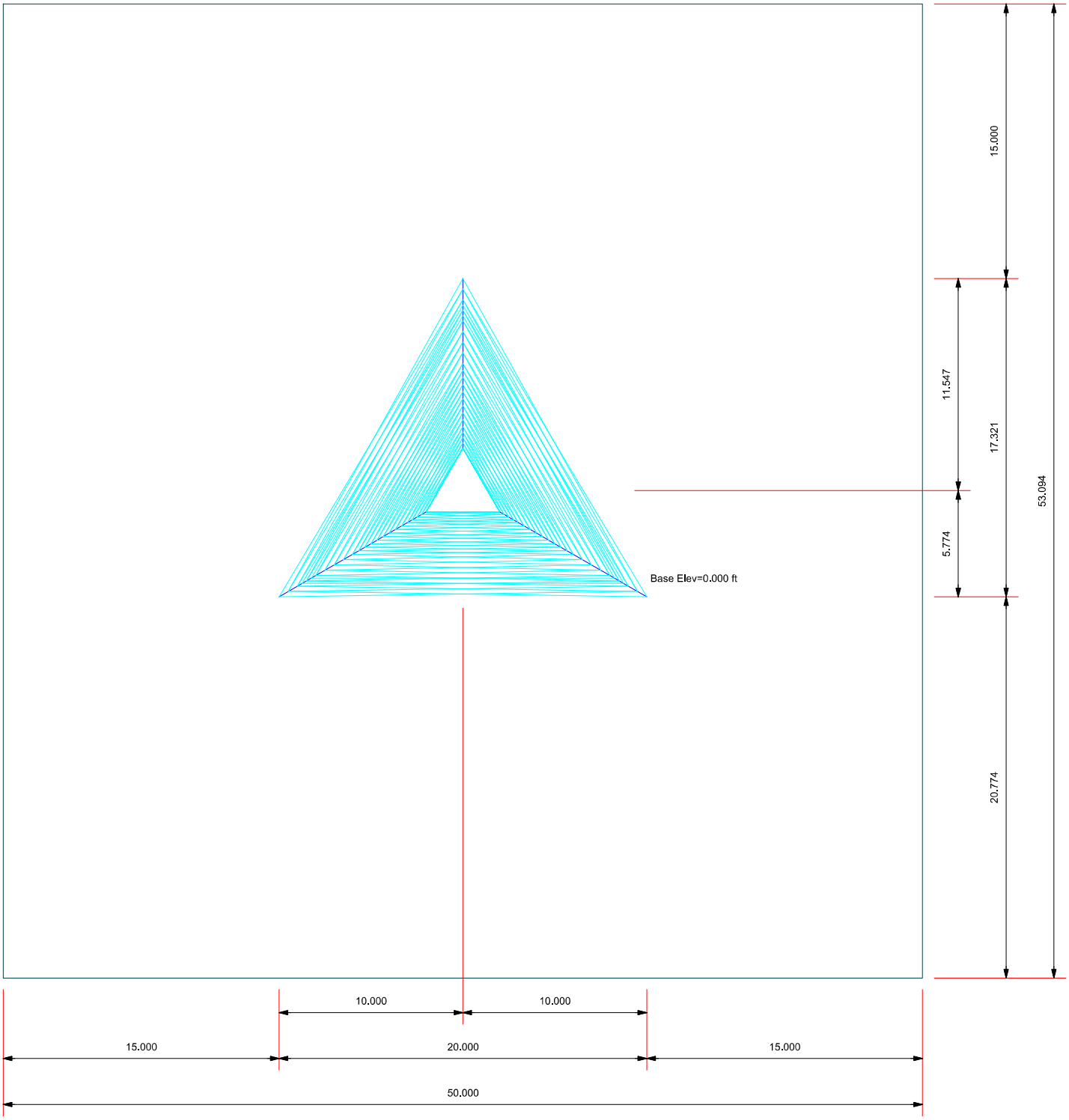
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 102920.004.01 - BRG 124 943066, CT (BU# 80635		
Project:		
Client: Crown Castle	Drawn by: Shathanand	App'd:
Code: TIA-222-H	Date: 10/02/19	Scale: NTS
Path:		Dwg No. E-1

Plot Plan
Total Area - 0.06 Acres



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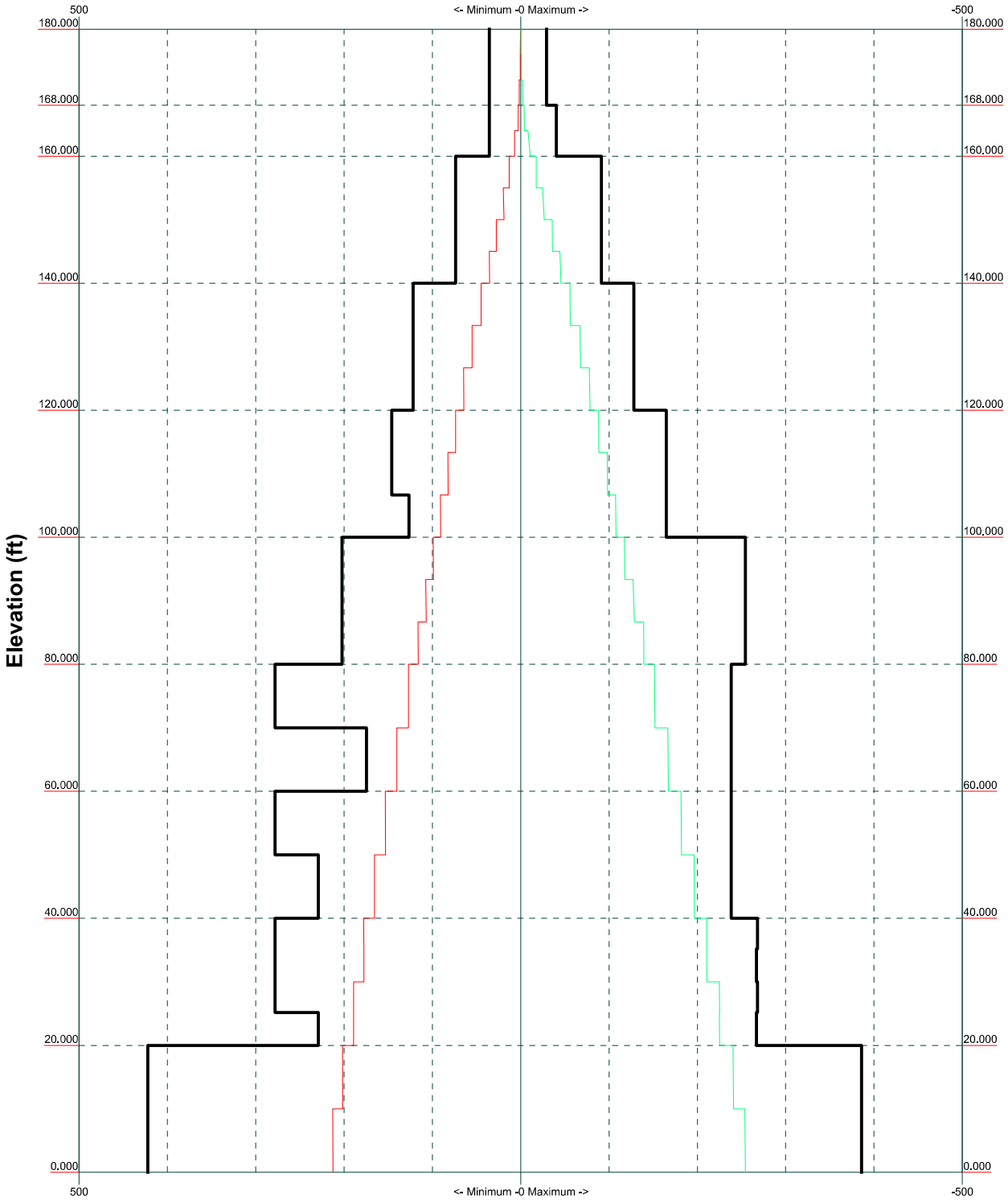
Job: ***102920.004.01 - BRG 124 943066, CT (BU# 80635***)		
Project:		
Client: Crown Castle	Drawn by: Shathanand	App'd:
Code: TIA-222-H	Date: 10/02/19	Scale: NTS
Path:		Dwg No. E-2

TIA-222-H - 120 mph/50 mph 1.500 in Ice Exposure B

Leg Capacity ——— **Leg Compression (K)**



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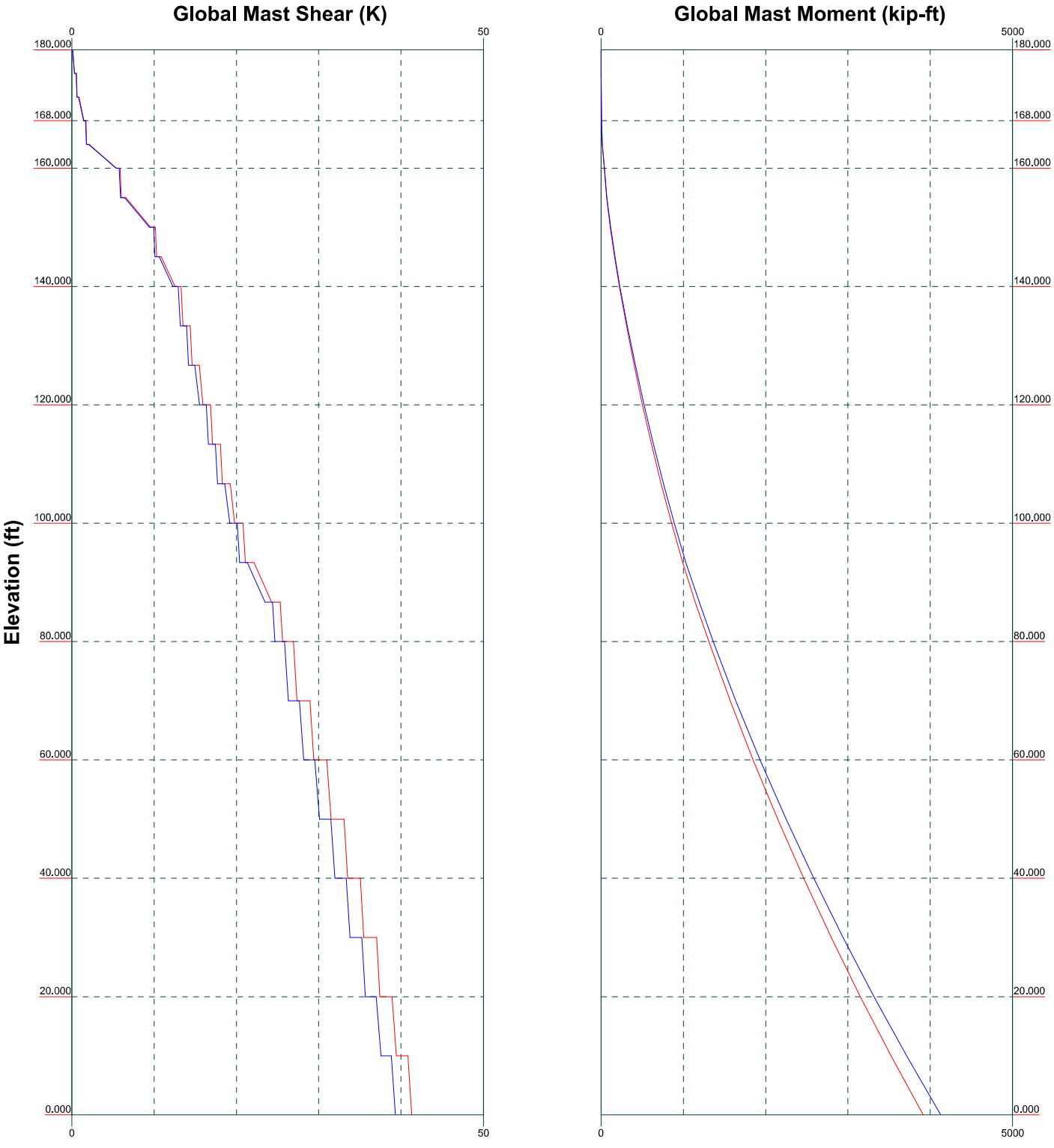
Job: 102920.004.01 - BRG 124 943066, CT (BU# 80635		
Project:		
Client: Crown Castle	Drawn by: Shathanand	App'd:
Code: TIA-222-H	Date: 10/02/19	Scale: NTS
Path:		Dwg No. E-3

TIA-222-H - 120 mph/50 mph 1.500 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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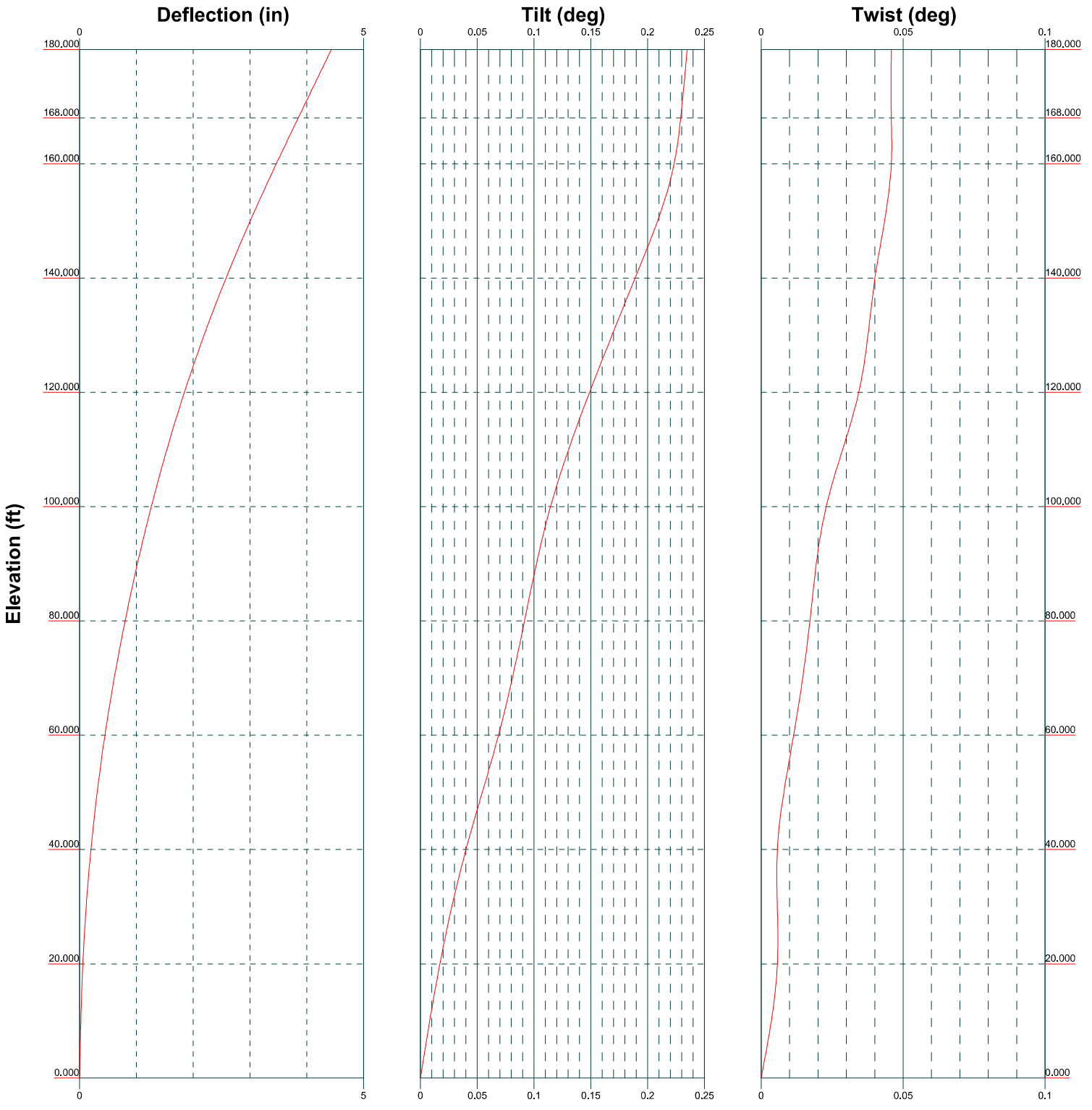
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 102920.004.01 - BRG 124 943066, CT (BU# 80635		
Project:		
Client: Crown Castle	Drawn by: Shathanand	App'd:
Code: TIA-222-H	Date: 10/02/19	Scale: NTS
Path:		Dwg No. E-4

TIA-222-H - Service - 60 mph

Maximum Values



B+T GRP

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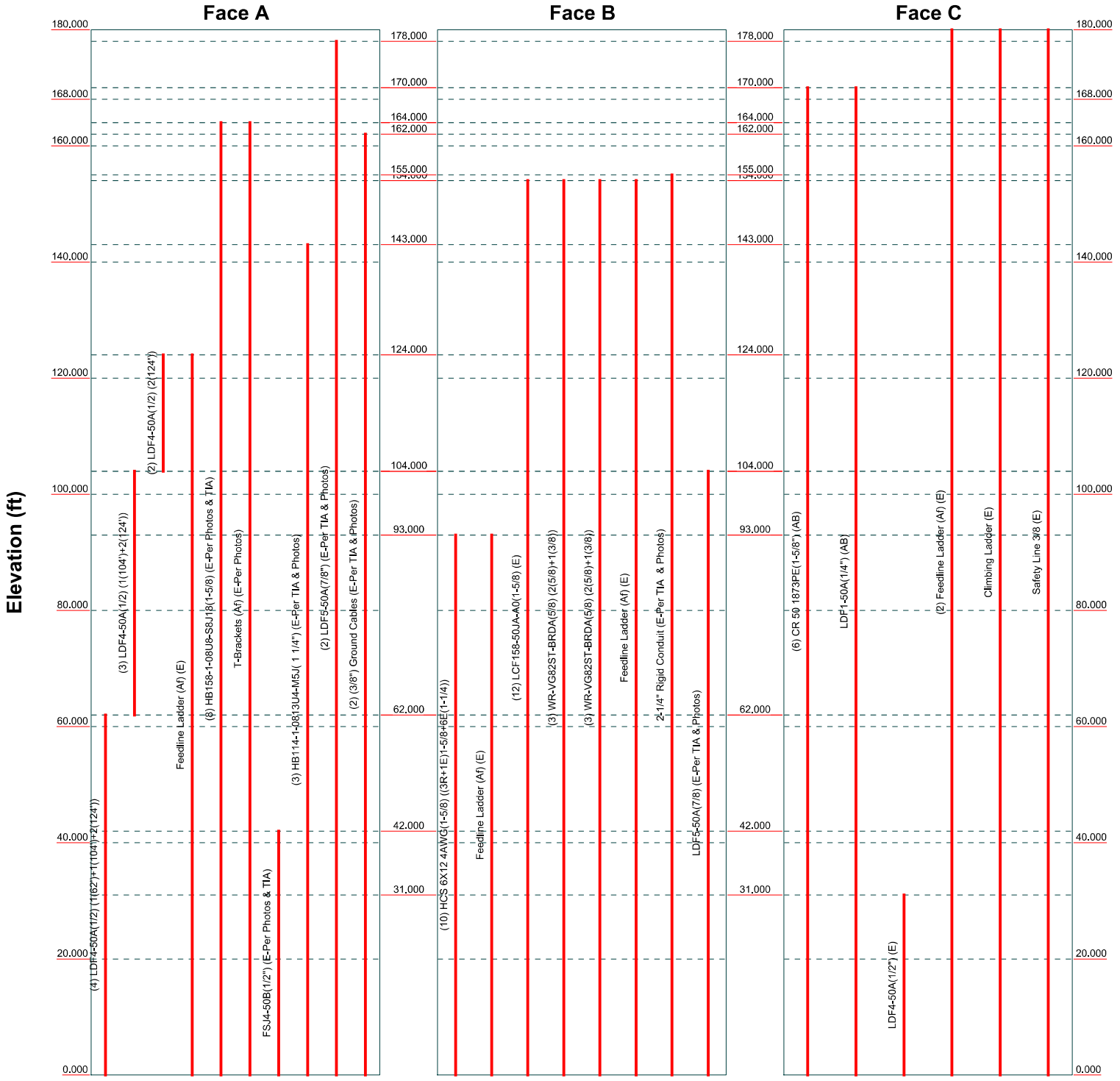
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: *102920.004.01 - BRG 124 943066, CT (BU# 80635*		
Project:		
Client: Crown Castle	Drawn by: Shathanand	App'd:
Code: TIA-222-H	Date: 10/02/19	Scale: NTS
Path:		Dwg No. E-5

Feed Line Distribution Chart
0' - 180'

Round | Flat | App In Face | App Out Face | Truss Leg



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Phone: (918) 587-4630
FAX: (918) 295-0265

Job: *102920.004.01 - BRG 124 943066, CT (BU# 80635*		
Project:		
Client: Crown Castle	Drawn by: Shathanand	App'd:
Code: TIA-222-H	Date: 10/02/19	Scale: NTS
Path:		Dwg No. E-7

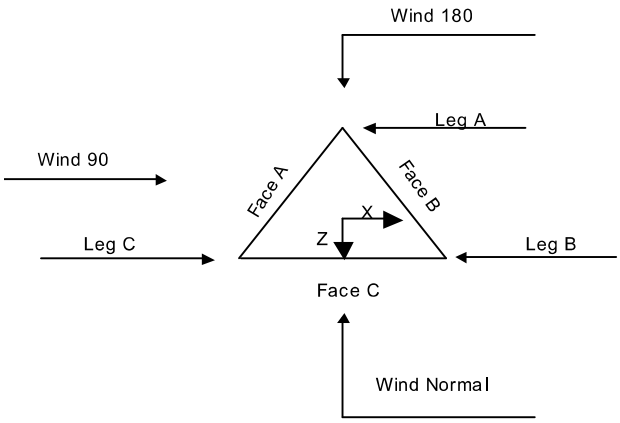
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 4.000 ft at the top and 20.000 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Tower base elevation above sea level: 426.000 ft.
Basic wind speed of 120 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
Grouted pipe f'_c is 7.000 ksi.
Pressures are calculated at each section.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Stress ratio used in tower member design is 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.000-168.000			4.000	1	12.000
T2	168.000-160.000			4.000	1	8.000
T3	160.000-140.000			4.000	1	20.000
T4	140.000-120.000			6.000	1	20.000
T5	120.000-100.000			8.000	1	20.000
T6	100.000-80.000			10.000	1	20.000
T7	80.000-60.000			12.000	1	20.000
T8	60.000-40.000			14.000	1	20.000
T9	40.000-20.000			16.000	1	20.000
T10	20.000-0.000			18.000	1	20.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.000-168.000	4.000	X Brace	No	No	0.000	0.000
T2	168.000-160.000	4.000	X Brace	No	No	0.000	0.000
T3	160.000-140.000	5.000	X Brace	No	No	0.000	0.000
T4	140.000-120.000	6.667	X Brace	No	No	0.000	0.000
T5	120.000-100.000	6.667	X Brace	No	No	0.000	0.000
T6	100.000-80.000	6.667	X Brace	No	No	0.000	0.000
T7	80.000-60.000	10.000	X Brace	No	No	0.000	0.000
T8	60.000-40.000	10.000	X Brace	No	No	0.000	0.000
T9	40.000-20.000	10.000	X Brace	No	Yes	0.000	0.000
T10	20.000-0.000	10.000	X Brace	No	No	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-168.000	Pipe	P2x0.154	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T2 168.000-160.000	Grouted Pipe	P2x0.154	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T3 160.000-140.000	Grouted Pipe	P3x0.216	A53-B-35 (35 ksi)	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)
T4 140.000-120.000	Grouted Pipe	P3.5x.318	A53-B-35 (35 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T5 120.000-100.000	Grouted Pipe	P4x.337	A53-B-35 (35 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 100.000-80.000	Grouted Pipe	P5x0.375	A53-B-35 (35 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 80.000-60.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 60.000-40.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T9 40.000-20.000	Pipe	P6x0.432	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)
T10 20.000-0.000	Pipe	P8x.5	A53-B-35 (35 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.000-168.000	Single Angle	L2x1 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 40.000-20.000	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.000-168.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 168.000-160.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T3 160.000-140.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T4 140.000-120.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T5 120.000-100.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T6 100.000-80.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T7 80.000-60.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.000-40.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T9 40.000-20.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T10 20.000-0.000	0.000	0.375	A36 (36 ksi)	1.05	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 180.000-168.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 168.000-160.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.000-140.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.000-120.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.000-100.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.000-80.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.000-60.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.000-40.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.000-20.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 0.5	1 1
T10 20.000-0.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 180.000-168.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 168.000-160.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 160.000-140.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 140.000-120.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T5 120.000-100.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 100.000-80.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 80.000-60.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 60.000-40.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 40.000-20.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 20.000-0.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.000-168.000	Flange	0.000 A325N	0	0.625 A325N	1	0.625 A325N	1	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T2 168.000-160.000	Flange	0.625 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T3 160.000-140.000	Flange	0.625 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T4 140.000-120.000	Flange	0.750 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T5 120.000-100.000	Flange	0.750 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T6 100.000-80.000	Flange	0.875 A490N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T7 80.000-60.000	Flange	0.875 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T8 60.000-40.000	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0
T9 40.000-20.000	Flange	1.000 A325N	4	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.500 A325N	1
T10 20.000-0.000	Flange	1.500 A36	0	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.000 A325N	0

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
P2x0.154 (GR)	35.000	1.075	3.356	10.647	4768.962	40914.218	53.581
P3x0.216 (GR)	35.000	2.228	7.393	22.984	4768.962	41656.327	54.738
P3.5x.318 (GR)	35.000	3.678	8.888	31.033	4768.962	38218.387	49.377
P4x.337 (GR)	35.000	4.407	11.497	38.949	4768.962	38951.934	50.521
P5x0.375 (GR)	35.000	6.112	18.194	58.701	4768.962	40356.758	52.712

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
$													
CR 50 1873PE(1-5/8") (AB)	C	No	No	Ar (CaAa)	170.000 - 0.000	0.000	-0.3	6	4	0.850 0.750	1.980		0.001
LDF1-50A(1/4") (AB)	C	No	No	Ar (CaAa)	170.000 - 0.000	3.000	-0.283	1	1	0.850 0.750	0.345		0.000
LDF4-50A(1/2") (E)	C	No	No	Ar (CaAa)	31.000 - 0.000	-1.000	-0.34	1	1	0.850 0.750	0.630		0.000
Feedline Ladder (Af) (E)	C	No	No	Af (CaAa)	180.000 - 0.000	-1.000	-0.33	2	1	3.000	3.000		0.008
$													
Climbing Ladder (E)	C	No	No	Af (CaAa)	180.000 - 0.000	0.000	0.025	1	1	3.000	3.000		0.008
Safety Line 3/8 (E)	C	No	No	Ar (CaAa)	180.000 - 0.000	0.000	0.025	1	1	0.375	0.375		0.000
$													
HCS 6X12 4AWG(1-5/8) ((3R+1E)1-5/8 +6E(1-1/4))	B	No	No	Ar (CaAa)	93.000 - 0.000	0.000	0.1	10	10	0.850 0.750	1.660		0.002
Feedline Ladder (Af) (E)	B	No	No	Af (CaAa)	93.000 - 0.000	0.000	0.075	1	1	3.000	3.000		0.008
$													
LCF158-50JA-A0(1-5/8) (E)	B	No	No	Ar (CaAa)	154.000 - 0.000	0.000	0.3	12	6	0.850 0.750	1.980		0.001
WR-VG82ST-BRDA(5/8) (2(5/8)+1(3/8))	B	No	No	Ar (CaAa)	154.000 - 0.000	0.000	0.365	3	2	0.500	0.645		0.000
WR-VG82ST-BRDA(5/8) (2(5/8)+1(3/8))	B	No	No	Ar (CaAa)	154.000 - 0.000	5.500	0.3	3	3	0.850 0.750	0.645		0.000
Feedline Ladder (Af) (E)	B	No	No	Af (CaAa)	154.000 - 0.000	0.000	0.32	1	1	3.000	3.000		0.008

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
2-1/4" Rigid Conduit (E-Per TIA & Photos) ***$***	B	No	No	Ar (CaAa)	155.000 - 0.000	0.000	0.385	1	1	0.850 0.750	2.250		0.003
LDF5-50A(7/8) (E-Per TIA & Photos) ***$***	B	No	No	Ar (CaAa)	104.000 - 0.000	0.000	0.34	1	1	0.850 0.750	1.090		0.000
LDF4-50A(1/2) (1(62')+1(104')+2(124'))	A	No	No	Ar (CaAa)	62.000 - 0.000	0.000	-0.1	4	2	0.500	0.630		0.000
LDF4-50A(1/2) (1(104')+2(124'))	A	No	No	Ar (CaAa)	104.000 - 62.000	0.000	-0.1	3	2	0.500	0.630		0.000
LDF4-50A(1/2) (2(124'))	A	No	No	Ar (CaAa)	124.000 - 104.000	0.000	-0.1	2	2	0.500	0.630		0.000
Feedline Ladder (Af) (E) ***$***	A	No	No	Af (CaAa)	124.000 - 0.000	0.000	0	1	1	3.000	3.000		0.008
HB158-1-08U8-S8J18(1-5/8) (E-Per Photos & TIA)	A	No	No	Ar (CaAa)	164.000 - 0.000	0.000	0.1	8	4	0.850 0.750	1.980		0.001
T-Brackets (Af) (E-Per Photos) ***	A	No	No	Af (CaAa)	164.000 - 0.000	0.000	0.1	1	1	1.000	1.000		0.008
FSJ4-50B(1/2") (E-Per Photos & TIA) ***	A	No	No	Ar (CaAa)	42.000 - 0.000	0.000	0.03	1	1	0.850 0.750	0.520		0.000
HB114-1-0813U4-M5J(1 1/4") (E-Per TIA & Photos) ***	A	No	No	Ar (CaAa)	143.000 - 0.000	0.000	0.05	3	3	0.850 0.750	1.540		0.001
LDF5-50A(7/8") (E-Per TIA & Photos) ***$***	A	No	No	Ar (CaAa)	178.000 - 0.000	5.500	0.11	2	2	0.850 0.750	1.090		0.000
(3/8") Ground Cables (E-Per TIA & Photos) ***$***	A	No	No	Ar (CaAa)	162.000 - 0.000	0.000	-0.15	2	2	0.200	0.440		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
$								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.000-168.000	A	0.000	0.000	2.180	0.000	0.007
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	20.895	0.000	0.315
T2	168.000-160.000	A	0.000	0.000	8.923	0.000	0.081
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	22.080	0.000	0.244
T3	160.000-140.000	A	0.000	0.000	42.519	0.000	0.403
		B	0.000	0.000	49.057	0.000	0.323
		C	0.000	0.000	55.200	0.000	0.609
T4	140.000-120.000	A	0.000	0.000	52.877	0.000	0.499
		B	0.000	0.000	69.760	0.000	0.457
		C	0.000	0.000	55.200	0.000	0.609
T5	120.000-100.000	A	0.000	0.000	63.145	0.000	0.639
		B	0.000	0.000	70.196	0.000	0.458
		C	0.000	0.000	55.200	0.000	0.609
T6	100.000-80.000	A	0.000	0.000	64.153	0.000	0.641
		B	0.000	0.000	100.020	0.000	0.885
		C	0.000	0.000	55.200	0.000	0.609
T7	80.000-60.000	A	0.000	0.000	64.279	0.000	0.642
		B	0.000	0.000	115.140	0.000	1.111
		C	0.000	0.000	55.200	0.000	0.609
T8	60.000-40.000	A	0.000	0.000	65.517	0.000	0.645
		B	0.000	0.000	115.140	0.000	1.111
		C	0.000	0.000	55.200	0.000	0.609
T9	40.000-20.000	A	0.000	0.000	66.453	0.000	0.647
		B	0.000	0.000	115.140	0.000	1.111
		C	0.000	0.000	55.893	0.000	0.611
T10	20.000-0.000	A	0.000	0.000	66.453	0.000	0.647
		B	0.000	0.000	115.140	0.000	1.111
		C	0.000	0.000	56.460	0.000	0.612

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.000-168.000	A	1.506	0.000	0.000	9.127	0.000	0.082
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	38.379	0.000	0.786
T2	168.000-160.000	A	1.497	0.000	0.000	18.229	0.000	0.286
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	40.061	0.000	0.740
T3	160.000-140.000	A	1.483	0.000	0.000	83.152	0.000	1.354
		B		0.000	0.000	79.940	0.000	1.336
		C		0.000	0.000	99.797	0.000	1.838
T4	140.000-120.000	A	1.462	0.000	0.000	110.534	0.000	1.704
		B		0.000	0.000	112.856	0.000	1.875
		C		0.000	0.000	99.232	0.000	1.817
T5	120.000-100.000	A	1.438	0.000	0.000	134.318	0.000	2.065
		B		0.000	0.000	113.756	0.000	1.871
		C		0.000	0.000	98.582	0.000	1.793
T6	100.000-80.000	A	1.410	0.000	0.000	134.590	0.000	2.054
		B		0.000	0.000	173.928	0.000	2.945
		C		0.000	0.000	97.816	0.000	1.765
T7	80.000-60.000	A	1.375	0.000	0.000	133.102	0.000	2.018
		B		0.000	0.000	201.938	0.000	3.440
		C		0.000	0.000	96.878	0.000	1.732
T8	60.000-40.000	A	1.329	0.000	0.000	131.805	0.000	1.989
		B		0.000	0.000	200.025	0.000	3.365
		C		0.000	0.000	95.658	0.000	1.689
T9	40.000-20.000	A	1.263	0.000	0.000	134.450	0.000	1.970
		B		0.000	0.000	197.245	0.000	3.259
		C		0.000	0.000	97.356	0.000	1.661
T10	20.000-0.000	A	1.132	0.000	0.000	128.350	0.000	1.827
		B		0.000	0.000	191.734	0.000	3.052
		C		0.000	0.000	96.150	0.000	1.560

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.000-168.000	1.378	4.328	0.954	3.560
T2	168.000-160.000	2.602	3.567	1.875	3.404
T3	160.000-140.000	6.026	3.146	5.569	3.363
T4	140.000-120.000	8.219	3.646	7.618	3.728
T5	120.000-100.000	8.051	3.743	7.246	3.790
T6	100.000-80.000	11.338	3.161	10.723	3.389
T7	80.000-60.000	14.004	3.060	13.348	3.339
T8	60.000-40.000	14.701	3.310	14.507	3.662
T9	40.000-20.000	14.047	3.322	14.250	3.711
T10	20.000-0.000	17.024	4.054	16.781	4.456

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	CR 50 1873PE(1-5/8")	168.00 - 170.00	0.6000	0.5105
T1	3	LDF1-50A(1/4")	168.00 - 170.00	0.6000	0.5105
T1	5	Feedline Ladder (Af)	168.00 - 180.00	0.6000	0.5105
T1	7	Climbing Ladder	168.00 - 180.00	0.6000	0.5105
T1	8	Safety Line 3/8	168.00 - 180.00	0.6000	0.5105
T1	39	LDF5-50A(7/8")	168.00 - 178.00	0.6000	0.5105
T2	2	CR 50 1873PE(1-5/8")	160.00 - 168.00	0.6000	0.5422
T2	3	LDF1-50A(1/4")	160.00 - 168.00	0.6000	0.5422
T2	5	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.5422
T2	7	Climbing Ladder	160.00 - 168.00	0.6000	0.5422
T2	8	Safety Line 3/8	160.00 - 168.00	0.6000	0.5422
T2	32	HB158-1-08U8-S8J18(1-5/8)	160.00 - 164.00	0.6000	0.5422
T2	33	T-Brackets (Af)	160.00 - 164.00	0.6000	0.5422
T2	39	LDF5-50A(7/8")	160.00 - 168.00	0.6000	0.5422
T2	41	(3/8") Ground Cables	160.00 - 162.00	0.6000	0.5422
T3	2	CR 50 1873PE(1-5/8")	140.00 - 160.00	0.6000	0.6000
T3	3	LDF1-50A(1/4")	140.00 - 160.00	0.6000	0.6000
T3	5	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	7	Climbing Ladder	140.00 - 160.00	0.6000	0.6000
T3	8	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	16	LCF158-50JA-A0(1-5/8)	140.00 - 154.00	0.6000	0.6000
T3	17	WR-VG82ST-BRDA(5/8)	140.00 - 154.00	0.6000	0.6000
T3	19	WR-VG82ST-BRDA(5/8)	140.00 - 154.00	0.6000	0.6000
T3	21	Feedline Ladder (Af)	140.00 - 154.00	0.6000	0.6000
T3	22	2-1/4" Rigid Conduit	140.00 - 155.00	0.6000	0.6000
T3	32	HB158-1-08U8-S8J18(1-5/8)	140.00 - 160.00	0.6000	0.6000
T3	33	T-Brackets (Af)	140.00 - 160.00	0.6000	0.6000
T3	37	HB114-1-0813U4-M5J(1 1/4")	140.00 - 143.00	0.6000	0.6000
T3	39	LDF5-50A(7/8")	140.00 - 160.00	0.6000	0.6000
T3	41	(3/8") Ground Cables	140.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	2	CR 50 1873PE(1-5/8")	120.00 - 160.00	0.6000	0.6000
T4	3	LDF1-50A(1/4")	120.00 - 140.00	0.6000	0.6000
T4	5	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	7	Climbing Ladder	120.00 - 140.00	0.6000	0.6000
T4	8	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T4	16	LCF158-50JA-A0(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	17	WR-VG82ST-BRDA(5/8)	120.00 - 140.00	0.6000	0.6000
T4	19	WR-VG82ST-BRDA(5/8)	120.00 - 140.00	0.6000	0.6000
T4	21	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	22	2-1/4" Rigid Conduit	120.00 - 140.00	0.6000	0.6000
T4	28	LDF4-50A(1/2)	120.00 - 124.00	0.6000	0.6000
T4	29	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.6000
T4	32	HB158-1-08U8-S8J18(1-5/8)	120.00 - 140.00	0.6000	0.6000
T4	33	T-Brackets (Af)	120.00 - 140.00	0.6000	0.6000
T4	37	HB114-1-0813U4-M5J(1 1/4")	120.00 - 140.00	0.6000	0.6000
T4	39	LDF5-50A(7/8")	120.00 - 140.00	0.6000	0.6000
T4	41	(3/8") Ground Cables	120.00 - 140.00	0.6000	0.6000
T5	2	CR 50 1873PE(1-5/8")	100.00 - 120.00	0.6000	0.6000
T5	3	LDF1-50A(1/4")	100.00 - 120.00	0.6000	0.6000
T5	5	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	7	Climbing Ladder	100.00 - 120.00	0.6000	0.6000
T5	8	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T5	16	LCF158-50JA-A0(1-5/8)	100.00 - 120.00	0.6000	0.6000
T5	17	WR-VG82ST-BRDA(5/8)	100.00 - 120.00	0.6000	0.6000
T5	19	WR-VG82ST-BRDA(5/8)	100.00 - 120.00	0.6000	0.6000
T5	21	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	22	2-1/4" Rigid Conduit	100.00 - 120.00	0.6000	0.6000
T5	24	LDF5-50A(7/8)	100.00 - 104.00	0.6000	0.6000
T5	27	LDF4-50A(1/2)	100.00 - 104.00	0.6000	0.6000
T5	28	LDF4-50A(1/2)	104.00 - 120.00	0.6000	0.6000
T5	29	Feedline Ladder (Af)	100.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	32	HB158-1-08U8-S8J18(1-5/8)	120.00 100.00 - 120.00	0.6000	0.6000
T5	33	T-Brackets (Af)	100.00 - 120.00	0.6000	0.6000
T5	37	HB114-1-0813U4-M5J(1 1/4")	100.00 - 120.00	0.6000	0.6000
T5	39	LDF5-50A(7/8")	100.00 - 120.00	0.6000	0.6000
T5	41	(3/8") Ground Cables	100.00 - 120.00	0.6000	0.6000
T6	2	CR 50 1873PE(1-5/8")	80.00 - 100.00	0.6000	0.6000
T6	3	LDF1-50A(1/4")	80.00 - 100.00	0.6000	0.6000
T6	5	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	7	Climbing Ladder	80.00 - 100.00	0.6000	0.6000
T6	8	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T6	11	HCS 6X12 4AWG(1-5/8)	80.00 - 93.00	0.6000	0.6000
T6	14	Feedline Ladder (Af)	80.00 - 93.00	0.6000	0.6000
T6	16	LCF158-50JA-A0(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	17	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.6000	0.6000
T6	19	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.6000	0.6000
T6	21	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	22	2-1/4" Rigid Conduit	80.00 - 100.00	0.6000	0.6000
T6	24	LDF5-50A(7/8)	80.00 - 100.00	0.6000	0.6000
T6	27	LDF4-50A(1/2)	80.00 - 100.00	0.6000	0.6000
T6	29	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T6	32	HB158-1-08U8-S8J18(1-5/8)	80.00 - 100.00	0.6000	0.6000
T6	33	T-Brackets (Af)	80.00 - 100.00	0.6000	0.6000
T6	37	HB114-1-0813U4-M5J(1 1/4")	80.00 - 100.00	0.6000	0.6000
T6	39	LDF5-50A(7/8")	80.00 - 100.00	0.6000	0.6000
T6	41	(3/8") Ground Cables	80.00 - 100.00	0.6000	0.6000
T7	2	CR 50 1873PE(1-5/8")	60.00 - 80.00	0.6000	0.6000
T7	3	LDF1-50A(1/4")	60.00 - 80.00	0.6000	0.6000
T7	5	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	7	Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T7	8	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T7	11	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	14	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	16	LCF158-50JA-A0(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	17	WR-VG82ST-BRDA(5/8)	60.00 - 80.00	0.6000	0.6000
T7	19	WR-VG82ST-BRDA(5/8)	60.00 - 80.00	0.6000	0.6000
T7	21	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	22	2-1/4" Rigid Conduit	60.00 - 80.00	0.6000	0.6000
T7	24	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.6000
T7	26	LDF4-50A(1/2)	60.00 - 62.00	0.6000	0.6000
T7	27	LDF4-50A(1/2)	62.00 - 80.00	0.6000	0.6000
T7	29	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	32	HB158-1-08U8-S8J18(1-5/8)	60.00 - 80.00	0.6000	0.6000
T7	33	T-Brackets (Af)	60.00 - 80.00	0.6000	0.6000
T7	37	HB114-1-0813U4-M5J(1 1/4")	60.00 - 80.00	0.6000	0.6000
T7	39	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T7	41	(3/8") Ground Cables	60.00 - 80.00	0.6000	0.6000
T8	2	CR 50 1873PE(1-5/8")	40.00 - 60.00	0.6000	0.6000
T8	3	LDF1-50A(1/4")	40.00 - 60.00	0.6000	0.6000
T8	5	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	7	Climbing Ladder	40.00 - 60.00	0.6000	0.6000
T8	8	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	11	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	14	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	16	LCF158-50JA-A0(1-5/8)	40.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	17	WR-VG82ST-BRDA(5/8)	40.00 - 60.00	0.6000	0.6000
T8	19	WR-VG82ST-BRDA(5/8)	40.00 - 60.00	0.6000	0.6000
T8	21	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	22	2-1/4" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T8	24	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.6000
T8	26	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T8	29	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	32	HB158-1-08U8-S8J18(1-5/8)	40.00 - 60.00	0.6000	0.6000
T8	33	T-Brackets (Af)	40.00 - 60.00	0.6000	0.6000
T8	35	FSJ4-50B(1/2")	40.00 - 42.00	0.6000	0.6000
T8	37	HB114-1-0813U4-M5J(1 1/4")	40.00 - 60.00	0.6000	0.6000
T8	39	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T8	41	(3/8") Ground Cables	40.00 - 60.00	0.6000	0.6000
T9	2	CR 50 1873PE(1-5/8")	20.00 - 40.00	0.6000	0.6000
T9	3	LDF1-50A(1/4")	20.00 - 40.00	0.6000	0.6000
T9	4	LDF4-50A(1/2")	20.00 - 31.00	0.6000	0.6000
T9	5	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	7	Climbing Ladder	20.00 - 40.00	0.6000	0.6000
T9	8	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	11	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	14	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	16	LCF158-50JA-A0(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	17	WR-VG82ST-BRDA(5/8)	20.00 - 40.00	0.6000	0.6000
T9	19	WR-VG82ST-BRDA(5/8)	20.00 - 40.00	0.6000	0.6000
T9	21	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	22	2-1/4" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T9	24	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.6000
T9	26	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T9	29	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	32	HB158-1-08U8-S8J18(1-5/8)	20.00 - 40.00	0.6000	0.6000
T9	33	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T9	35	FSJ4-50B(1/2")	20.00 - 40.00	0.6000	0.6000
T9	37	HB114-1-0813U4-M5J(1 1/4")	20.00 - 40.00	0.6000	0.6000
T9	39	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T9	41	(3/8") Ground Cables	20.00 - 40.00	0.6000	0.6000
T10	2	CR 50 1873PE(1-5/8")	0.00 - 20.00	0.6000	0.6000
T10	3	LDF1-50A(1/4")	0.00 - 20.00	0.6000	0.6000
T10	4	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T10	5	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	7	Climbing Ladder	0.00 - 20.00	0.6000	0.6000
T10	8	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T10	11	HCS 6X12 4AWG(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	14	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	16	LCF158-50JA-A0(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	17	WR-VG82ST-BRDA(5/8)	0.00 - 20.00	0.6000	0.6000
T10	19	WR-VG82ST-BRDA(5/8)	0.00 - 20.00	0.6000	0.6000
T10	21	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	22	2-1/4" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T10	24	LDF5-50A(7/8)	0.00 - 20.00	0.6000	0.6000
T10	26	LDF4-50A(1/2)	0.00 - 20.00	0.6000	0.6000
T10	29	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T10	32	HB158-1-08U8-S8J18(1-5/8)	0.00 - 20.00	0.6000	0.6000
T10	33	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T10	35	FSJ4-50B(1/2")	0.00 - 20.00	0.6000	0.6000
T10	37	HB114-1-0813U4-M5J(1 1/4")	0.00 - 20.00	0.6000	0.6000
T10	39	LDF5-50A(7/8")	0.00 - 20.00	0.6000	0.6000
T10	41	(3/8") Ground Cables	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PD10017	A	From Leg	0.500	0.000	178.000	No Ice	4.114	4.114	0.025
(E-Leg Mounted)			0.000			1/2" Ice	5.641	5.641	0.055
			6.000			1" Ice	7.185	7.185	0.095
						2" Ice	10.323	10.323	0.203
$									
800 10504 w/ Mount Pipe	A	From Leg	2.000	0.000	170.000	No Ice	2.690	2.260	0.038
(AB)			0.000			1/2" Ice	3.120	2.680	0.067
			1.000			1" Ice	3.560	3.120	0.105
						2" Ice	4.490	4.030	0.206
800 10504 w/ Mount Pipe	B	From Leg	2.000	0.000	170.000	No Ice	2.690	2.260	0.038
(AB)			0.000			1/2" Ice	3.120	2.680	0.067
			1.000			1" Ice	3.560	3.120	0.105
						2" Ice	4.490	4.030	0.206
800 10504 w/ Mount Pipe	C	From Leg	2.000	0.000	170.000	No Ice	2.690	2.260	0.038
(AB)			0.000			1/2" Ice	3.120	2.680	0.067
			1.000			1" Ice	3.560	3.120	0.105
						2" Ice	4.490	4.030	0.206
860 10025	A	From Leg	2.000	0.000	170.000	No Ice	0.142	0.121	0.001
(AB)			0.000			1/2" Ice	0.196	0.173	0.003
			0.000			1" Ice	0.259	0.231	0.005
						2" Ice	0.408	0.376	0.014
860 10025	B	From Leg	2.000	0.000	170.000	No Ice	0.142	0.121	0.001
(AB)			0.000			1/2" Ice	0.196	0.173	0.003
			0.000			1" Ice	0.259	0.231	0.005
						2" Ice	0.408	0.376	0.014
860 10025	C	From Leg	2.000	0.000	170.000	No Ice	0.142	0.121	0.001
(AB)			0.000			1/2" Ice	0.196	0.173	0.003
			0.000			1" Ice	0.259	0.231	0.005
						2" Ice	0.408	0.376	0.014
6' x 2" Mount Pipe	A	From Leg	2.000	0.000	170.000	No Ice	1.425	1.425	0.022
(AB-Empty)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	2.000	0.000	170.000	No Ice	1.425	1.425	0.022
(AB-Empty)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	2.000	0.000	170.000	No Ice	1.425	1.425	0.022
(AB-Empty)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
Side Arm Mount [SO 103-3]	C	None		0.000	170.000	No Ice	7.640	7.640	0.234
(AB)						1/2" Ice	8.800	8.800	0.360
						1" Ice	10.160	10.160	0.517
						2" Ice	13.360	13.360	0.937
$									
(2) APL868013-42T0 w/	A	From Leg	4.000	0.000	164.000	No Ice	2.630	4.130	0.030
Mount Pipe			0.000			1/2" Ice	3.070	4.600	0.064
(E)			2.000			1" Ice	3.530	5.090	0.106
						2" Ice	4.490	6.110	0.214
(2) APL868013-42T0 w/	B	From Leg	4.000	0.000	164.000	No Ice	2.630	4.130	0.030
Mount Pipe			0.000			1/2" Ice	3.070	4.600	0.064
(E)			2.000			1" Ice	3.530	5.090	0.106
						2" Ice	4.490	6.110	0.214

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) APL868013-42T0 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.630 3.070 3.530 4.490	4.130 4.600 5.090 6.110	0.030 0.064 0.106 0.214
(2) JAHH-65B-R3B w/ Mount Pipe (E)	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
(2) JAHH-65B-R3B w/ Mount Pipe (E)	B	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
(2) JAHH-65B-R3B w/ Mount Pipe (E)	C	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 5.970 6.450 7.440	4.380 4.840 5.300 6.260	0.096 0.169 0.254 0.457
RFV01U-D1A (E)	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A (E)	B	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
RFV01U-D1A (E)	C	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.250 1.393 1.543 1.865	0.084 0.103 0.124 0.175
CBC78TDS-43-2X (E)	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.368 0.446 0.531 0.723	0.512 0.605 0.705 0.927	0.021 0.027 0.035 0.057
CBC78TDS-43-2X (E)	B	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.368 0.446 0.531 0.723	0.512 0.605 0.705 0.927	0.021 0.027 0.035 0.057
CBC78TDS-43-2X (E)	C	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.368 0.446 0.531 0.723	0.512 0.605 0.705 0.927	0.021 0.027 0.035 0.057
20W CBRS (E)	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.857 0.975 1.101 1.374	0.420 0.510 0.608 0.833	0.019 0.026 0.034 0.058
20W CBRS (E)	B	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.857 0.975 1.101 1.374	0.420 0.510 0.608 0.833	0.019 0.026 0.034 0.058
20W CBRS (E)	C	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.857 0.975 1.101 1.374	0.420 0.510 0.608 0.833	0.019 0.026 0.034 0.058
(2) RFV01U-D2A (E)	A	From Leg	4.000 0.000 2.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.875 2.045 2.223 2.601	1.013 1.145 1.284 1.585	0.070 0.087 0.106 0.153
RFV01U-D2A	B	From Leg	4.000	0.000	164.000	No Ice	1.875	1.013	0.070

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	2.045	1.145	0.087
			2.000			1" Ice	2.223	1.284	0.106
						2" Ice	2.601	1.585	0.153
DB-T1-6Z-8AB-0Z	B	From Leg	4.000	0.000	164.000	No Ice	4.800	2.000	0.044
(E)			0.000			1/2" Ice	5.070	2.193	0.080
			2.000			1" Ice	5.348	2.393	0.120
						2" Ice	5.926	2.815	0.213
DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	164.000	No Ice	4.800	2.000	0.044
(E)			0.000			1/2" Ice	5.070	2.193	0.080
			2.000			1" Ice	5.348	2.393	0.120
						2" Ice	5.926	2.815	0.213
CBRS w/ Mount Pipe	A	From Leg	4.000	0.000	164.000	No Ice	1.714	1.168	0.032
(P)			0.000			1/2" Ice	1.934	1.437	0.050
			2.000			1" Ice	2.166	1.723	0.072
						2" Ice	2.664	2.351	0.127
CBRS w/ Mount Pipe	B	From Leg	4.000	0.000	164.000	No Ice	1.714	1.168	0.032
(P)			0.000			1/2" Ice	1.934	1.437	0.050
			2.000			1" Ice	2.166	1.723	0.072
						2" Ice	2.664	2.351	0.127
CBRS w/ Mount Pipe	C	From Leg	4.000	0.000	164.000	No Ice	1.714	1.168	0.032
(P)			0.000			1/2" Ice	1.934	1.437	0.050
			2.000			1" Ice	2.166	1.723	0.072
						2" Ice	2.664	2.351	0.127
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	164.000	No Ice	1.425	1.425	0.022
(E-Per MA)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	164.000	No Ice	1.425	1.425	0.022
(E-Per MA)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	164.000	No Ice	1.425	1.425	0.022
(E-Per MA)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
Sector Mount [SM 702-3]	C	None		0.000	164.000	No Ice	47.865	47.865	1.909
(E-Area Increased to Match						1/2" Ice	62.031	62.031	2.805
16' Mount Per MA)						1" Ice	76.025	76.025	3.959
						2" Ice	112.467	112.467	7.021
$									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	154.000	No Ice	5.746	4.254	0.055
(E)			0.000			1/2" Ice	6.179	5.014	0.103
			4.000			1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	154.000	No Ice	5.746	4.254	0.055
(E)			0.000			1/2" Ice	6.179	5.014	0.103
			4.000			1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	154.000	No Ice	5.746	4.254	0.055
(E)			0.000			1/2" Ice	6.179	5.014	0.103
			4.000			1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
P65-15-XLH-RR w/ Mount	A	From Leg	4.000	0.000	154.000	No Ice	5.304	3.665	0.048
Pipe			0.000			1/2" Ice	5.692	4.278	0.092
(E)			4.000			1" Ice	6.087	4.902	0.142
						2" Ice	6.903	6.188	0.262
P65-15-XLH-RR w/ Mount	B	From Leg	4.000	0.000	154.000	No Ice	5.304	3.665	0.048

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pipe			0.000			1/2" Ice	5.692	4.278	0.092
(E)			4.000			1" Ice	6.087	4.902	0.142
						2" Ice	6.903	6.188	0.262
P65-15-XLH-RR w/ Mount Pipe	C	From Leg	4.000	0.000	154.000	No Ice	5.304	3.665	0.048
			0.000			1/2" Ice	5.692	4.278	0.092
(E)			4.000			1" Ice	6.087	4.902	0.142
						2" Ice	6.903	6.188	0.262
(2) LGP21401	A	From Leg	4.000	0.000	154.000	No Ice	1.104	0.207	0.014
(E)			0.000			1/2" Ice	1.239	0.274	0.021
			-4.000			1" Ice	1.381	0.348	0.030
						2" Ice	1.688	0.521	0.055
(2) LGP21401	B	From Leg	4.000	0.000	154.000	No Ice	1.104	0.207	0.014
(E)			0.000			1/2" Ice	1.239	0.274	0.021
			-4.000			1" Ice	1.381	0.348	0.030
						2" Ice	1.688	0.521	0.055
(2) LGP21401	C	From Leg	4.000	0.000	154.000	No Ice	1.104	0.207	0.014
(E)			0.000			1/2" Ice	1.239	0.274	0.021
			-4.000			1" Ice	1.381	0.348	0.030
						2" Ice	1.688	0.521	0.055
RRUS 11	A	From Leg	4.000	0.000	154.000	No Ice	2.791	1.192	0.051
(E)			0.000			1/2" Ice	2.998	1.340	0.072
			-4.000			1" Ice	3.213	1.496	0.095
						2" Ice	3.666	1.839	0.153
RRUS 11	B	From Leg	4.000	0.000	154.000	No Ice	2.791	1.192	0.051
(E)			0.000			1/2" Ice	2.998	1.340	0.072
			-4.000			1" Ice	3.213	1.496	0.095
						2" Ice	3.666	1.839	0.153
RRUS 11	C	From Leg	4.000	0.000	154.000	No Ice	2.791	1.192	0.051
(E)			0.000			1/2" Ice	2.998	1.340	0.072
			-4.000			1" Ice	3.213	1.496	0.095
						2" Ice	3.666	1.839	0.153
DC6-48-60-18-8F	A	From Leg	4.000	0.000	154.000	No Ice	1.212	1.212	0.033
(E)			0.000			1/2" Ice	1.892	1.892	0.055
			-4.000			1" Ice	2.105	2.105	0.080
						2" Ice	2.570	2.570	0.138
QS66512-2 w/ Mount Pipe	A	From Leg	4.000	0.000	154.000	No Ice	4.040	4.180	0.137
(R)			0.000			1/2" Ice	4.420	4.570	0.206
			4.000			1" Ice	4.820	4.970	0.287
						2" Ice	5.630	5.790	0.482
QS66512-2 w/ Mount Pipe	B	From Leg	4.000	0.000	154.000	No Ice	4.040	4.180	0.137
(R)			0.000			1/2" Ice	4.420	4.570	0.206
			4.000			1" Ice	4.820	4.970	0.287
						2" Ice	5.630	5.790	0.482
QS66512-2 w/ Mount Pipe	C	From Leg	4.000	0.000	154.000	No Ice	4.040	4.180	0.137
(R)			0.000			1/2" Ice	4.420	4.570	0.206
			4.000			1" Ice	4.820	4.970	0.287
						2" Ice	5.630	5.790	0.482
TT19-08BP111-001	A	From Leg	4.000	0.000	154.000	No Ice	0.545	0.442	0.016
(R)			0.000			1/2" Ice	0.641	0.530	0.022
			-4.000			1" Ice	0.743	0.626	0.029
						2" Ice	0.971	0.840	0.049
TT19-08BP111-001	B	From Leg	4.000	0.000	154.000	No Ice	0.545	0.442	0.016
(R)			0.000			1/2" Ice	0.641	0.530	0.022
			-4.000			1" Ice	0.743	0.626	0.029
						2" Ice	0.971	0.840	0.049
TT19-08BP111-001	C	From Leg	4.000	0.000	154.000	No Ice	0.545	0.442	0.016
(R)			0.000			1/2" Ice	0.641	0.530	0.022

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-4.000			1" Ice	0.743	0.626	0.029
						2" Ice	0.971	0.840	0.049
RRUS 32	A	From Leg	4.000	0.000	154.000	No Ice	2.857	1.777	0.055
(R)			0.000			1/2" Ice	3.083	1.968	0.077
			-4.000			1" Ice	3.316	2.166	0.103
						2" Ice	3.805	2.583	0.165
RRUS 32	B	From Leg	4.000	0.000	154.000	No Ice	2.857	1.777	0.055
(R)			0.000			1/2" Ice	3.083	1.968	0.077
			-4.000			1" Ice	3.316	2.166	0.103
						2" Ice	3.805	2.583	0.165
RRUS 32	C	From Leg	4.000	0.000	154.000	No Ice	2.857	1.777	0.055
(R)			0.000			1/2" Ice	3.083	1.968	0.077
			-4.000			1" Ice	3.316	2.166	0.103
						2" Ice	3.805	2.583	0.165
RRUS 32 B2	A	From Leg	4.000	0.000	154.000	No Ice	2.731	1.668	0.053
(R)			0.000			1/2" Ice	2.953	1.855	0.074
			-4.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B2	B	From Leg	4.000	0.000	154.000	No Ice	2.731	1.668	0.053
(R)			0.000			1/2" Ice	2.953	1.855	0.074
			-4.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B2	C	From Leg	4.000	0.000	154.000	No Ice	2.731	1.668	0.053
(R)			0.000			1/2" Ice	2.953	1.855	0.074
			-4.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
DBC0061F1V51-2	A	From Leg	4.000	0.000	154.000	No Ice	0.433	0.413	0.025
(R)			0.000			1/2" Ice	0.518	0.496	0.031
			-4.000			1" Ice	0.609	0.586	0.038
						2" Ice	0.815	0.788	0.057
DBC0061F1V51-2	B	From Leg	4.000	0.000	154.000	No Ice	0.433	0.413	0.025
(R)			0.000			1/2" Ice	0.518	0.496	0.031
			-4.000			1" Ice	0.609	0.586	0.038
						2" Ice	0.815	0.788	0.057
DBC0061F1V51-2	C	From Leg	4.000	0.000	154.000	No Ice	0.433	0.413	0.025
(R)			0.000			1/2" Ice	0.518	0.496	0.031
			-4.000			1" Ice	0.609	0.586	0.038
						2" Ice	0.815	0.788	0.057
DC6-48-60-18-8F	A	From Leg	4.000	0.000	154.000	No Ice	1.212	1.212	0.033
(R)			0.000			1/2" Ice	1.892	1.892	0.055
			-4.000			1" Ice	2.105	2.105	0.080
						2" Ice	2.570	2.570	0.138
8' x 2" Mount Pipe	A	From Leg	4.000	0.000	154.000	No Ice	1.900	1.900	0.029
(E-For TME's Per Photos)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000	0.000	154.000	No Ice	1.900	1.900	0.029
(E-For TME's Per Photos)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	C	From Leg	4.000	0.000	154.000	No Ice	1.900	1.900	0.029
(E-For TME's Per Photos)			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	154.000	No Ice	1.425	1.425	0.022
(E-For TME's Per Photos)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	154.000	No Ice	1.425	1.425	0.022
(E-For TME's Per Photos)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	154.000	No Ice	1.425	1.425	0.022
(E-For TME's Per Photos)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
Sector Mount [SM 602-3]	C	None		0.000	154.000	No Ice	32.100	32.100	1.541
(E)						1/2" Ice	39.560	39.560	2.122
						1" Ice	47.210	47.210	2.841
						2" Ice	63.520	63.520	4.686
Pipe Mount [PM 601-3]	C	None		0.000	154.000	No Ice	3.170	3.170	0.195
(E-Mount attachement)						1/2" Ice	3.790	3.790	0.232
						1" Ice	4.420	4.420	0.279
						2" Ice	5.760	5.760	0.401
$									
800 EXTERNAL NOTCH	A	From Leg	1.000	0.000	145.000	No Ice	0.660	0.321	0.011
FILTER			0.000			1/2" Ice	0.763	0.398	0.017
(E-Leg Mounted Per CAD)			1.000			1" Ice	0.873	0.483	0.024
						2" Ice	1.115	0.674	0.045
800 EXTERNAL NOTCH	B	From Leg	1.000	0.000	145.000	No Ice	0.660	0.321	0.011
FILTER			0.000			1/2" Ice	0.763	0.398	0.017
(E-Leg Mounted Per CAD)			1.000			1" Ice	0.873	0.483	0.024
						2" Ice	1.115	0.674	0.045
800 EXTERNAL NOTCH	C	From Leg	1.000	0.000	145.000	No Ice	0.660	0.321	0.011
FILTER			0.000			1/2" Ice	0.763	0.398	0.017
(E-Leg Mounted Per CAD)			1.000			1" Ice	0.873	0.483	0.024
						2" Ice	1.115	0.674	0.045
PCS 1900MHZ	A	From Leg	1.000	0.000	145.000	No Ice	2.322	2.238	0.060
4X45W-65MHZ			0.000			1/2" Ice	2.527	2.441	0.083
(E-Leg Mounted Per CAD)			1.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHZ	B	From Leg	1.000	0.000	145.000	No Ice	2.322	2.238	0.060
4X45W-65MHZ			0.000			1/2" Ice	2.527	2.441	0.083
(E-Leg Mounted Per CAD)			1.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
PCS 1900MHZ	C	From Leg	1.000	0.000	145.000	No Ice	2.322	2.238	0.060
4X45W-65MHZ			0.000			1/2" Ice	2.527	2.441	0.083
(E-Leg Mounted Per CAD)			1.000			1" Ice	2.739	2.651	0.110
						2" Ice	3.185	3.093	0.173
800MHZ 2X50W RRH	A	From Leg	1.000	0.000	145.000	No Ice	2.134	1.773	0.053
(E-Leg Mounted Per CAD)			0.000			1/2" Ice	2.320	1.946	0.074
			1.000			1" Ice	2.512	2.127	0.098
						2" Ice	2.920	2.510	0.157
800MHZ 2X50W RRH	B	From Leg	1.000	0.000	145.000	No Ice	2.134	1.773	0.053
(E-Leg Mounted Per CAD)			0.000			1/2" Ice	2.320	1.946	0.074
			1.000			1" Ice	2.512	2.127	0.098
						2" Ice	2.920	2.510	0.157
800MHZ 2X50W RRH	C	From Leg	1.000	0.000	145.000	No Ice	2.134	1.773	0.053
(E-Leg Mounted Per CAD)			0.000			1/2" Ice	2.320	1.946	0.074
			1.000			1" Ice	2.512	2.127	0.098
						2" Ice	2.920	2.510	0.157
$									
APXVTM14-C-120	A	From Leg	4.000	0.000	143.000	No Ice	4.120	2.060	0.056
(E)			0.000			1/2" Ice	4.520	2.420	0.096

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	4.930	2.800	0.140
						2" Ice	5.800	3.600	0.246
APXVTM14-C-120 (E)	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.120 4.520 4.930 5.800	2.060 2.420 2.800 3.600	0.056 0.096 0.140 0.246
APXVTM14-C-120 (E)	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.120 4.520 4.930 5.800	2.060 2.420 2.800 3.600	0.056 0.096 0.140 0.246
APXVSPP18-C-A20 (E)	A	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.660 5.120 5.600 6.580	3.110 3.550 4.000 4.940	0.070 0.121 0.180 0.315
APXVSPP18-C-A20 (E)	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.660 5.120 5.600 6.580	3.110 3.550 4.000 4.940	0.070 0.121 0.180 0.315
APXVSPP18-C-A20 (E)	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.660 5.120 5.600 6.580	3.110 3.550 4.000 4.940	0.070 0.121 0.180 0.315
TD-RRH8x20-25 (E-CL Per Photos)	A	From Leg	4.000 0.000 4.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.045 4.298 4.557 5.098	1.535 1.714 1.901 2.295	0.070 0.097 0.128 0.201
TD-RRH8x20-25 (E-CL Per Photos)	B	From Leg	4.000 0.000 4.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.045 4.298 4.557 5.098	1.535 1.714 1.901 2.295	0.070 0.097 0.128 0.201
TD-RRH8x20-25 (E-CL Per Photos)	C	From Leg	4.000 0.000 4.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.045 4.298 4.557 5.098	1.535 1.714 1.901 2.295	0.070 0.097 0.128 0.201
(3) ACU-A20-N (E)	A	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.067 0.104 0.148 0.259	0.117 0.162 0.215 0.343	0.001 0.002 0.004 0.012
(3) ACU-A20-N (E)	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.067 0.104 0.148 0.259	0.117 0.162 0.215 0.343	0.001 0.002 0.004 0.012
(3) ACU-A20-N (E)	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.067 0.104 0.148 0.259	0.117 0.162 0.215 0.343	0.001 0.002 0.004 0.012
5' x 2" Pipe Mount (E-Empty)	A	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.188 1.496 1.807 2.458	1.188 1.496 1.807 2.458	0.018 0.027 0.040 0.076
5' x 2" Pipe Mount (E-Empty)	B	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.188 1.496 1.807 2.458	1.188 1.496 1.807 2.458	0.018 0.027 0.040 0.076
5' x 2" Pipe Mount (E-Empty)	C	From Leg	4.000 0.000 0.000	0.000	143.000	No Ice 1/2" Ice 1" Ice	1.188 1.496 1.807	1.188 1.496 1.807	0.018 0.027 0.040

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.458	2.458	0.076
Sector Mount [SM 401-3]	C	None		0.000	143.000	No Ice	17.820	17.820	0.804
(E-8' Per TIA / 2MP Per Sector)						1/2" Ice	25.010	25.010	1.143
						1" Ice	32.110	32.110	1.600
						2" Ice	46.160	46.160	2.869
$									
1142-2C	B	From Leg	6.000	0.000	124.000	No Ice	2.092	2.092	0.024
(E)			0.000			1/2" Ice	3.374	3.374	0.041
			7.000			1" Ice	4.673	4.673	0.066
						2" Ice	7.320	7.320	0.140
1142-2C	C	From Leg	6.000	0.000	124.000	No Ice	2.092	2.092	0.024
(E)			0.000			1/2" Ice	3.374	3.374	0.041
			7.000			1" Ice	4.673	4.673	0.066
						2" Ice	7.320	7.320	0.140
Side Arm Mount [SO 303-1]	B	From Leg	3.000	0.000	124.000	No Ice	1.080	5.310	0.115
(E)			0.000			1/2" Ice	1.630	7.570	0.158
			0.000			1" Ice	2.210	9.930	0.217
						2" Ice	3.440	15.190	0.379
Side Arm Mount [SO 303-1]	C	From Leg	3.000	0.000	124.000	No Ice	1.080	5.310	0.115
(E)			0.000			1/2" Ice	1.630	7.570	0.158
			0.000			1" Ice	2.210	9.930	0.217
						2" Ice	3.440	15.190	0.379
$									
220-3BN	B	From Leg	4.000	0.000	104.000	No Ice	5.720	5.720	0.024
(E-Per TIA & Photos)			0.000			1/2" Ice	7.831	7.831	0.066
			4.000			1" Ice	9.959	9.959	0.120
						2" Ice	14.265	14.265	0.270
1142-2C	C	From Leg	6.000	0.000	104.000	No Ice	2.092	2.092	0.024
(E-Per TIA & Photos)			0.000			1/2" Ice	3.374	3.374	0.041
			7.000			1" Ice	4.673	4.673	0.066
						2" Ice	7.320	7.320	0.140
Side Arm Mount [SO 302-1]	B	From Leg	2.000	0.000	104.000	No Ice	0.810	3.310	0.055
(E-Per TIA & Photos)			0.000			1/2" Ice	1.300	5.000	0.083
			0.000			1" Ice	1.810	6.800	0.122
						2" Ice	2.910	10.990	0.233
Side Arm Mount [SO 303-1]	C	From Leg	3.000	0.000	104.000	No Ice	1.080	5.310	0.115
(E-Per TIA & Photos)			0.000			1/2" Ice	1.630	7.570	0.158
			0.000			1" Ice	2.210	9.930	0.217
						2" Ice	3.440	15.190	0.379
$									
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	93.000	No Ice	6.329	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
						2" Ice	8.117	8.591	0.383
ERICSSON AIR 21 B2A	B	From Leg	4.000	0.000	93.000	No Ice	6.329	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
						2" Ice	8.117	8.591	0.383
ERICSSON AIR 21 B2A	C	From Leg	4.000	0.000	93.000	No Ice	6.329	5.642	0.112
B4P w/ Mount Pipe			0.000			1/2" Ice	6.775	6.426	0.169
(E)			0.000			1" Ice	7.214	7.131	0.233
						2" Ice	8.117	8.591	0.383
KRY 112 144/1	A	From Leg	4.000	0.000	93.000	No Ice	0.350	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
						2" Ice	0.698	0.456	0.032
KRY 112 144/1	B	From Leg	4.000	0.000	93.000	No Ice	0.350	0.175	0.011

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
						2" Ice	0.698	0.456	0.032
KRY 112 144/1	C	From Leg	4.000	0.000	93.000	No Ice	0.350	0.175	0.011
(E)			0.000			1/2" Ice	0.426	0.234	0.014
			0.000			1" Ice	0.509	0.301	0.019
						2" Ice	0.698	0.456	0.032
AIR 32 B2a/B66Aa	A	From Leg	4.000	0.000	93.000	No Ice	6.510	4.712	0.132
(R)			0.000			1/2" Ice	6.887	5.068	0.178
			0.000			1" Ice	7.271	5.431	0.229
						2" Ice	8.060	6.178	0.348
AIR 32 B2a/B66Aa	B	From Leg	4.000	0.000	93.000	No Ice	6.510	4.712	0.132
(R)			0.000			1/2" Ice	6.887	5.068	0.178
			0.000			1" Ice	7.271	5.431	0.229
						2" Ice	8.060	6.178	0.348
AIR 32 B2a/B66Aa	C	From Leg	4.000	0.000	93.000	No Ice	6.510	4.712	0.132
(R)			0.000			1/2" Ice	6.887	5.068	0.178
			0.000			1" Ice	7.271	5.431	0.229
						2" Ice	8.060	6.178	0.348
APXVAARR24_43-U-NA20	A	From Leg	4.000	0.000	93.000	No Ice	14.670	5.320	0.153
(R)			0.000			1/2" Ice	15.430	5.990	0.266
			0.000			1" Ice	16.210	6.680	0.387
						2" Ice	17.810	8.080	0.656
APXVAARR24_43-U-NA20	B	From Leg	4.000	0.000	93.000	No Ice	14.670	5.320	0.153
(R)			0.000			1/2" Ice	15.430	5.990	0.266
			0.000			1" Ice	16.210	6.680	0.387
						2" Ice	17.810	8.080	0.656
APXVAARR24_43-U-NA20	C	From Leg	4.000	0.000	93.000	No Ice	14.670	5.320	0.153
(R)			0.000			1/2" Ice	15.430	5.990	0.266
			0.000			1" Ice	16.210	6.680	0.387
						2" Ice	17.810	8.080	0.656
RADIO 4449 B12/B71	A	From Leg	4.000	0.000	93.000	No Ice	1.643	1.152	0.075
(R)			0.000			1/2" Ice	1.803	1.291	0.091
			0.000			1" Ice	1.971	1.436	0.110
						2" Ice	2.328	1.749	0.156
RADIO 4449 B12/B71	B	From Leg	4.000	0.000	93.000	No Ice	1.643	1.152	0.075
(R)			0.000			1/2" Ice	1.803	1.291	0.091
			0.000			1" Ice	1.971	1.436	0.110
						2" Ice	2.328	1.749	0.156
RADIO 4449 B12/B71	C	From Leg	4.000	0.000	93.000	No Ice	1.643	1.152	0.075
(R)			0.000			1/2" Ice	1.803	1.291	0.091
			0.000			1" Ice	1.971	1.436	0.110
						2" Ice	2.328	1.749	0.156
Sector Mount [SM 404-3] (E-14.5' Per MA / 2MP Per Sector)	C	None		0.000	93.000	No Ice	20.430	20.430	0.920
						1/2" Ice	28.680	28.680	1.311
						1" Ice	36.800	36.800	1.839
						2" Ice	52.850	52.850	3.305
$									
GPS_A	C	From Leg	3.000	0.000	62.000	No Ice	0.255	0.255	0.001
(E)			0.000			1/2" Ice	0.320	0.320	0.005
			3.000			1" Ice	0.393	0.393	0.010
						2" Ice	0.561	0.561	0.025
Side Arm Mount [SO 305-1]	C	From Leg	1.500	0.000	62.000	No Ice	0.530	1.520	0.030
(E)			0.000			1/2" Ice	0.780	2.070	0.044
			0.000			1" Ice	1.060	2.660	0.064
						2" Ice	1.730	3.910	0.125
$									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
GPS_A	C	From Leg	3.000	0.000	42.000	No Ice	0.255	0.255	0.001
(E)			0.000			1/2" Ice	0.320	0.320	0.005
			2.000			1" Ice	0.393	0.393	0.010
						2" Ice	0.561	0.561	0.025
Side Arm Mount [SO 305-1]	C	From Leg	1.500	0.000	42.000	No Ice	0.530	1.520	0.030
(E)			0.000			1/2" Ice	0.780	2.070	0.044
			0.000			1" Ice	1.060	2.660	0.064
						2" Ice	1.730	3.910	0.125
$									
GPS_A	C	From Leg	3.000	0.000	31.000	No Ice	0.255	0.255	0.001
(E)			0.000			1/2" Ice	0.320	0.320	0.005
			1.000			1" Ice	0.393	0.393	0.010
						2" Ice	0.561	0.561	0.025
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	31.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
$									
(2) 3'x8" Knife Plate	A	From Leg	0.000	0.000	20.000	No Ice	2.333	0.250	0.048
(E-Mod (6061656))			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
						2" Ice	3.501	1.250	0.072
(2) 3'x8" Knife Plate	B	From Leg	0.000	0.000	20.000	No Ice	2.333	0.250	0.048
(E-Mod (6061656))			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
						2" Ice	3.501	1.250	0.072
(2) 3'x8" Knife Plate	C	From Leg	0.000	0.000	20.000	No Ice	2.333	0.250	0.048
(E-Mod (6061656))			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
						2" Ice	3.501	1.250	0.072
(2) 3'x8" Knife Plate	A	From Leg	0.000	0.000	60.000	No Ice	2.333	0.250	0.048
(E-Mod (6061656))			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
						2" Ice	3.501	1.250	0.072
(2) 3'x8" Knife Plate	B	From Leg	0.000	0.000	60.000	No Ice	2.333	0.250	0.048
(E-Mod (6061656))			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
						2" Ice	3.501	1.250	0.072
(2) 3'x8" Knife Plate	C	From Leg	0.000	0.000	60.000	No Ice	2.333	0.250	0.048
(E-Mod (6061656))			0.000			1/2" Ice	2.625	0.500	0.054
			0.000			1" Ice	2.917	0.750	0.060
						2" Ice	3.501	1.250	0.072
$									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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
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
T1	180 - 168	Leg	Max Tension	7	1.686	-0.066	0.027
			Max. Compression	10	-2.469	-0.054	-0.030
			Max. Mx	20	-0.261	0.125	0.007
			Max. My	16	-0.496	0.062	-0.122
			Max. Vy	20	-0.117	0.125	0.007
			Max. Vx	14	0.120	0.029	-0.117
		Diagonal	Max Tension	11	0.549	0.000	0.000
			Max. Compression	22	-0.602	0.000	0.000
			Max. Mx	34	-0.062	0.013	0.000
			Max. My	24	0.492	0.006	-0.002
			Max. Vy	34	-0.015	0.013	0.000
			Max. Vx	24	-0.001	0.005	-0.002
		Top Girt	Max Tension	18	0.137	0.000	0.000
			Max. Compression	23	-0.107	0.000	0.000
			Max. Mx	26	0.046	-0.020	0.000
			Max. Vy	26	0.020	0.000	0.000
T2	168 - 160	Leg	Max Tension	7	6.803	0.012	-0.038
			Max. Compression	10	-10.855	0.010	0.011
			Max. Mx	20	-0.470	0.125	0.007
			Max. My	16	-2.272	0.076	-0.146
			Max. Vy	20	1.099	0.005	0.051
			Max. Vx	14	-1.098	-0.001	-0.033
		Diagonal	Max Tension	21	2.508	0.000	0.000
			Max. Compression	8	-2.617	0.000	0.000
			Max. Mx	29	0.546	0.021	-0.001
			Max. My	24	2.454	0.010	-0.005
			Max. Vy	29	-0.018	0.021	-0.001
			Max. Vx	24	-0.002	0.010	-0.005
T3	160 - 140	Leg	Max Tension	7	35.466	-0.262	-0.020
			Max. Compression	10	-45.645	0.282	-0.002
			Max. Mx	22	18.683	-0.463	-0.011
			Max. My	20	-3.966	-0.022	0.581
			Max. Vy	14	-0.894	-0.461	0.015
			Max. Vx	8	0.769	-0.026	0.189
		Diagonal	Max Tension	20	3.821	0.000	0.000
			Max. Compression	20	-3.881	0.000	0.000
			Max. Mx	31	0.877	0.023	-0.002
			Max. My	4	2.025	0.011	-0.004
			Max. Vy	31	-0.020	0.022	0.002
			Max. Vx	4	0.001	0.000	0.000
T4	140 - 120	Leg	Max Tension	7	64.551	-0.258	-0.083
			Max. Compression	10	-78.369	0.292	-0.045
			Max. Mx	22	42.994	-0.332	0.000
			Max. My	4	-5.903	-0.029	-0.422
			Max. Vy	3	0.095	0.262	-0.027
			Max. Vx	19	0.178	-0.134	0.332
		Diagonal	Max Tension	20	4.589	0.000	0.000
			Max. Compression	20	-4.618	0.000	0.000
			Max. Mx	31	0.965	0.033	-0.004
			Max. My	28	1.004	0.029	-0.005
			Max. Vy	29	0.027	0.030	-0.005
			Max. Vx	28	0.002	0.000	0.000
T5	120 - 100	Leg	Max Tension	7	90.752	-0.327	-0.080
			Max. Compression	10	-108.113	0.405	-0.037
			Max. Mx	11	-105.797	0.407	-0.038
			Max. My	16	-9.308	0.002	0.547
			Max. Vy	14	-0.103	-0.332	0.033
			Max. Vx	19	0.173	-0.172	0.402

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	20	4.885	0.000	0.000
			Max. Compression	20	-4.934	0.000	0.000
			Max. Mx	31	0.998	0.053	-0.006
			Max. My	29	0.984	0.048	-0.006
			Max. Vy	33	0.037	0.048	-0.006
			Max. Vx	29	0.002	0.000	0.000
T6	100 - 80	Leg	Max Tension	7	116.201	-0.420	-0.021
			Max. Compression	10	-139.601	0.773	0.012
			Max. Mx	18	-138.863	0.788	0.084
			Max. My	16	-12.900	0.011	0.673
			Max. Vy	22	-0.707	-0.532	-0.016
			Max. Vx	16	0.657	-0.015	0.352
		Diagonal	Max Tension	20	6.054	0.000	0.000
			Max. Compression	20	-6.025	0.000	0.000
			Max. Mx	31	1.474	0.065	-0.008
			Max. My	29	-1.555	0.057	-0.009
			Max. Vy	29	0.047	0.065	-0.009
			Max. Vx	29	0.003	0.000	0.000
T7	80 - 60	Leg	Max Tension	7	140.337	-0.641	-0.067
			Max. Compression	10	-167.318	1.032	0.012
			Max. Mx	18	-166.705	1.053	0.126
			Max. My	4	-13.446	-0.088	-1.037
			Max. Vy	18	-0.129	1.053	0.126
			Max. Vx	4	0.183	-0.088	-1.037
		Diagonal	Max Tension	20	7.169	0.000	0.000
			Max. Compression	20	-7.220	0.000	0.000
			Max. Mx	31	1.760	0.111	0.015
			Max. My	34	1.798	0.107	0.016
			Max. Vy	29	0.063	0.110	0.013
			Max. Vx	34	-0.004	0.000	0.000
T8	60 - 40	Leg	Max Tension	7	165.640	-0.879	-0.065
			Max. Compression	10	-196.770	-0.121	0.006
			Max. Mx	18	-181.391	1.053	0.126
			Max. My	4	-16.438	-0.073	-0.959
			Max. Vy	22	-0.176	-0.896	-0.021
			Max. Vx	16	0.163	0.046	0.782
		Diagonal	Max Tension	20	7.656	0.000	0.000
			Max. Compression	20	-7.723	0.000	0.000
			Max. Mx	31	2.011	0.163	0.021
			Max. My	34	2.100	0.156	0.022
			Max. Vy	29	0.083	0.154	0.020
			Max. Vx	34	-0.005	0.000	0.000
T9	40 - 20	Leg	Max Tension	7	189.303	1.448	-0.043
			Max. Compression	18	-225.139	-0.376	0.055
			Max. Mx	18	-210.637	3.149	-0.020
			Max. My	8	-16.016	-0.398	1.847
			Max. Vy	18	-1.119	3.102	-0.023
			Max. Vx	4	0.476	-0.424	-1.825
		Diagonal	Max Tension	7	8.076	0.104	-0.003
			Max. Compression	18	-8.994	0.000	0.000
			Max. Mx	31	1.060	0.194	0.014
			Max. My	28	-1.844	0.145	-0.018
			Max. Vy	29	0.089	0.169	-0.015
			Max. Vx	28	-0.004	0.000	0.000
		Secondary Horizontal	Max Tension	18	3.904	0.000	0.000
			Max. Compression	18	-3.904	0.071	0.007
			Max. Mx	36	-0.410	0.166	0.033
			Max. My	30	-0.115	0.136	0.037
			Max. Vy	35	-0.091	0.141	0.034
			Max. Vx	30	-0.006	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T10	20 - 0	Leg	Max Tension	7	212.694	-1.649	-0.062
			Max. Compression	18	-254.414	0.000	-0.000
			Max. Mx	35	-112.620	4.076	-0.036
			Max. My	8	-18.895	-0.145	2.342
			Max. Vy	31	-0.740	-3.127	-0.001
			Max. Vx	4	-0.364	-0.144	-2.326
		Diagonal	Max Tension	20	8.611	0.000	0.000
			Max. Compression	18	-9.307	0.000	0.000
			Max. Mx	29	0.038	0.245	-0.026
			Max. My	28	3.435	0.171	-0.031
			Max. Vy	29	0.099	0.245	-0.026
			Max. Vx	28	0.005	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	261.695	24.280	-12.780
	Max. H_x	18	261.695	24.280	-12.780
	Max. H_z	7	-218.451	-20.965	10.927
	Min. Vert	7	-218.451	-20.965	10.927
	Min. H_x	7	-218.451	-20.965	10.927
	Min. H_z	18	261.695	24.280	-12.780
Leg B	Max. Vert	10	260.228	-23.037	-13.409
	Max. H_x	23	-210.433	19.654	11.439
	Max. H_z	23	-210.433	19.654	11.439
	Min. Vert	23	-210.433	19.654	11.439
	Min. H_x	10	260.228	-23.037	-13.409
	Min. H_z	10	260.228	-23.037	-13.409
Leg A	Max. Vert	2	247.353	0.814	25.502
	Max. H_x	20	21.084	2.544	1.604
	Max. H_z	2	247.353	0.814	25.502
	Min. Vert	15	-202.648	-0.746	-21.679
	Min. H_x	11	-103.129	-2.487	-11.389
	Min. H_z	15	-202.648	-0.746	-21.679

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	53.794	0.000	0.000	9.978	-31.192	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	64.553	-0.051	-39.919	-3911.580	-32.968	26.718
0.9 Dead+1.0 Wind 0 deg - No Ice	48.415	-0.051	-39.919	-3914.573	-23.611	26.718
1.2 Dead+1.0 Wind 30 deg - No Ice	64.553	20.024	-34.896	-3399.433	-1995.412	44.836
0.9 Dead+1.0 Wind 30 deg - No Ice	48.415	20.024	-34.896	-3402.427	-1986.055	44.836
1.2 Dead+1.0 Wind 60 deg - No Ice	64.553	35.829	-20.750	-2014.550	-3536.313	36.228
0.9 Dead+1.0 Wind 60 deg - No Ice	48.415	35.829	-20.750	-2017.543	-3526.955	36.228
1.2 Dead+1.0 Wind 90 deg - No Ice	64.553	41.978	0.051	16.435	-4127.899	12.365
0.9 Dead+1.0 Wind 90 deg - No Ice	48.415	41.978	0.051	13.442	-4118.541	12.365
1.2 Dead+1.0 Wind 120 deg - No Ice	64.553	36.124	20.979	2068.756	-3579.800	-2.696
0.9 Dead+1.0 Wind 120 deg - No Ice	48.415	36.124	20.979	2065.763	-3570.442	-2.696
1.2 Dead+1.0 Wind 150 deg - No Ice	64.553	19.081	33.161	3330.865	-1947.151	-8.841
0.9 Dead+1.0 Wind 150 deg - No Ice	48.415	19.081	33.161	3327.872	-1937.793	-8.841
1.2 Dead+1.0 Wind 180 deg - No Ice	64.553	0.051	38.069	3792.492	-41.893	-26.718
0.9 Dead+1.0 Wind 180 deg - No Ice	48.415	0.051	38.069	3789.499	-32.535	-26.718
1.2 Dead+1.0 Wind 210 deg - No Ice	64.553	-20.024	34.896	3423.380	1920.551	-44.836
0.9 Dead+1.0 Wind 210 deg - No Ice	48.415	-20.024	34.896	3420.387	1929.909	-44.836
1.2 Dead+1.0 Wind 240 deg - No Ice	64.553	-37.431	21.675	2110.014	3585.323	-36.228
0.9 Dead+1.0 Wind 240 deg - No Ice	48.415	-37.431	21.675	2107.020	3594.681	-36.228
1.2 Dead+1.0 Wind 270 deg - No Ice	64.553	-41.978	-0.051	7.511	4053.038	-12.365
0.9 Dead+1.0 Wind 270 deg - No Ice	48.415	-41.978	-0.051	4.518	4062.396	-12.365
1.2 Dead+1.0 Wind 300 deg - No Ice	64.553	-34.522	-20.054	-1973.293	3381.068	2.696
0.9 Dead+1.0 Wind 300 deg - No Ice	48.415	-34.522	-20.054	-1976.286	3390.426	2.696
1.2 Dead+1.0 Wind 330 deg - No Ice	64.553	-19.081	-33.161	-3306.919	1872.290	8.841
0.9 Dead+1.0 Wind 330 deg - No Ice	48.415	-19.081	-33.161	-3309.912	1881.648	8.841
1.2 Dead+1.0 Ice+1.0 Temp	144.731	0.000	0.000	35.942	-104.629	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	144.731	-0.015	-11.588	-1120.569	-103.380	7.274
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	144.731	5.861	-10.236	-976.308	-684.170	11.780
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	144.731	10.511	-6.100	-563.230	-1136.470	10.163
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	144.731	12.233	0.015	37.192	-1309.488	4.211

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	144.731	10.393	6.050	637.087	-1137.386	0.097
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	144.731	5.671	9.876	1031.037	-675.709	-2.431
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	144.731	0.015	11.308	1171.587	-105.879	-7.274
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	144.731	-5.861	10.236	1048.192	474.911	-11.780
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	144.731	-10.754	6.240	645.547	945.282	-10.163
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	144.731	-12.233	-0.015	34.692	1100.229	-4.211
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	144.731	-10.151	-5.910	-554.770	910.056	-0.097
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	144.731	-5.671	-9.876	-959.153	466.450	2.431
Dead+Wind 0 deg - Service	53.794	-0.013	-10.505	-1022.536	-30.018	7.031
Dead+Wind 30 deg - Service	53.794	5.269	-9.183	-887.761	-546.450	11.799
Dead+Wind 60 deg - Service	53.794	9.429	-5.461	-523.318	-951.951	9.534
Dead+Wind 90 deg - Service	53.794	11.047	0.013	11.152	-1107.631	3.254
Dead+Wind 120 deg - Service	53.794	9.506	5.521	551.236	-963.395	-0.710
Dead+Wind 150 deg - Service	53.794	5.021	8.727	883.370	-533.750	-2.327
Dead+Wind 180 deg - Service	53.794	0.013	10.018	1004.851	-32.366	-7.031
Dead+Wind 210 deg - Service	53.794	-5.269	9.183	907.716	484.066	-11.799
Dead+Wind 240 deg - Service	53.794	-9.850	5.704	562.094	922.164	-9.534
Dead+Wind 270 deg - Service	53.794	-11.047	-0.013	8.804	1045.247	-3.254
Dead+Wind 300 deg - Service	53.794	-9.085	-5.277	-512.461	868.413	0.710
Dead+Wind 330 deg - Service	53.794	-5.021	-8.727	-863.415	471.366	2.327

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-53.794	0.000	-0.000	53.794	0.000	0.000%
2	-0.051	-64.553	-39.919	0.051	64.553	39.919	0.000%
3	-0.051	-48.415	-39.919	0.051	48.415	39.919	0.000%
4	20.024	-64.553	-34.896	-20.024	64.553	34.896	0.000%
5	20.024	-48.415	-34.896	-20.024	48.415	34.896	0.000%
6	35.829	-64.553	-20.750	-35.829	64.553	20.750	0.000%
7	35.829	-48.415	-20.750	-35.829	48.415	20.750	0.000%
8	41.978	-64.553	0.051	-41.978	64.553	-0.051	0.000%
9	41.978	-48.415	0.051	-41.978	48.415	-0.051	0.000%
10	36.124	-64.553	20.979	-36.124	64.553	-20.979	0.000%
11	36.124	-48.415	20.979	-36.124	48.415	-20.979	0.000%
12	19.081	-64.553	33.161	-19.081	64.553	-33.161	0.000%
13	19.081	-48.415	33.161	-19.081	48.415	-33.161	0.000%
14	0.051	-64.553	38.069	-0.051	64.553	-38.069	0.000%
15	0.051	-48.415	38.069	-0.051	48.415	-38.069	0.000%
16	-20.024	-64.553	34.896	20.024	64.553	-34.896	0.000%
17	-20.024	-48.415	34.896	20.024	48.415	-34.896	0.000%
18	-37.431	-64.553	21.675	37.431	64.553	-21.675	0.000%
19	-37.431	-48.415	21.675	37.431	48.415	-21.675	0.000%
20	-41.978	-64.553	-0.051	41.978	64.553	0.051	0.000%
21	-41.978	-48.415	-0.051	41.978	48.415	0.051	0.000%
22	-34.522	-64.553	-20.054	34.522	64.553	20.054	0.000%
23	-34.522	-48.415	-20.054	34.522	48.415	20.054	0.000%
24	-19.081	-64.553	-33.161	19.081	64.553	33.161	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
25	-19.081	-48.415	-33.161	19.081	48.415	33.161	0.000%
26	0.000	-144.731	0.000	-0.000	144.731	-0.000	0.000%
27	-0.015	-144.731	-11.588	0.015	144.731	11.588	0.000%
28	5.861	-144.731	-10.236	-5.861	144.731	10.236	0.000%
29	10.511	-144.731	-6.100	-10.511	144.731	6.100	0.000%
30	12.233	-144.731	0.015	-12.233	144.731	-0.015	0.000%
31	10.393	-144.731	6.050	-10.393	144.731	-6.050	0.000%
32	5.671	-144.731	9.876	-5.671	144.731	-9.876	0.000%
33	0.015	-144.731	11.308	-0.015	144.731	-11.308	0.000%
34	-5.861	-144.731	10.236	5.861	144.731	-10.236	0.000%
35	-10.754	-144.731	6.240	10.754	144.731	-6.240	0.000%
36	-12.233	-144.731	-0.015	12.233	144.731	0.015	0.000%
37	-10.151	-144.731	-5.910	10.151	144.731	5.910	0.000%
38	-5.671	-144.731	-9.876	5.671	144.731	9.876	0.000%
39	-0.013	-53.794	-10.505	0.013	53.794	10.505	0.000%
40	5.269	-53.794	-9.183	-5.269	53.794	9.183	0.000%
41	9.429	-53.794	-5.461	-9.429	53.794	5.461	0.000%
42	11.047	-53.794	0.013	-11.047	53.794	-0.013	0.000%
43	9.506	-53.794	5.521	-9.506	53.794	-5.521	0.000%
44	5.021	-53.794	8.727	-5.021	53.794	-8.727	0.000%
45	0.013	-53.794	10.018	-0.013	53.794	-10.018	0.000%
46	-5.269	-53.794	9.183	5.269	53.794	-9.183	0.000%
47	-9.850	-53.794	5.704	9.850	53.794	-5.704	0.000%
48	-11.047	-53.794	-0.013	11.047	53.794	0.013	0.000%
49	-9.085	-53.794	-5.277	9.085	53.794	5.277	0.000%
50	-5.021	-53.794	-8.727	5.021	53.794	8.727	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	4.435	43	0.233	0.046
T2	168 - 160	3.850	43	0.230	0.046
T3	160 - 140	3.465	43	0.221	0.046
T4	140 - 120	2.580	43	0.186	0.040
T5	120 - 100	1.846	43	0.151	0.033
T6	100 - 80	1.263	43	0.116	0.026
T7	80 - 60	0.802	43	0.090	0.018
T8	60 - 40	0.447	43	0.067	0.012
T9	40 - 20	0.201	43	0.042	0.008
T10	20 - 0	0.058	47	0.017	0.004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.000	PD10017	43	4.337	0.233	0.046	589191
170.000	800 10504 w/ Mount Pipe	43	3.947	0.231	0.046	268440
164.000	(2) APL868013-42T0 w/ Mount Pipe	43	3.657	0.226	0.046	78232
154.000	7770.00 w/ Mount Pipe	43	3.186	0.211	0.044	39791
145.000	800 EXTERNAL NOTCH FILTER	43	2.789	0.196	0.042	32684
143.000	APXVTM14-C-120	43	2.704	0.192	0.041	31471
124.000	1142-2C	43	1.980	0.158	0.035	30436
104.000	220-3BN	43	1.369	0.122	0.027	37872
93.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	43	1.089	0.106	0.023	42565
62.000	GPS_A	43	0.478	0.069	0.013	43380
60.000	(2) 3'x8" Knife Plate	43	0.447	0.067	0.012	43241
42.000	GPS_A	43	0.221	0.044	0.008	47434
31.000	GPS_A	47	0.124	0.030	0.006	46780
20.000	(2) 3'x8" Knife Plate	47	0.058	0.017	0.004	47361

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 168	16.535	10	0.864	0.176
T2	168 - 160	14.364	10	0.854	0.176
T3	160 - 140	12.933	10	0.821	0.173
T4	140 - 120	9.649	19	0.694	0.153
T5	120 - 100	6.920	19	0.561	0.126
T6	100 - 80	4.747	19	0.432	0.097
T7	80 - 60	3.025	19	0.336	0.070
T8	60 - 40	1.694	19	0.248	0.046
T9	40 - 20	0.766	19	0.156	0.030
T10	20 - 0	0.220	19	0.062	0.015

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.000	PD10017	10	16.173	0.864	0.176	206509
170.000	800 10504 w/ Mount Pipe	10	14.725	0.859	0.177	91066
164.000	(2) APL868013-42T0 w/ Mount Pipe	10	13.644	0.840	0.175	22568
154.000	7770.00 w/ Mount Pipe	19	11.895	0.787	0.169	10924
145.000	800 EXTERNAL NOTCH FILTER	19	10.422	0.728	0.159	8819
143.000	APXVTM14-C-120	19	10.109	0.715	0.156	8467
124.000	1142-2C	19	7.419	0.588	0.131	8173
104.000	220-3BN	19	5.142	0.456	0.103	10167
93.000	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	19	4.097	0.396	0.088	11424
62.000	GPS_A	19	1.809	0.257	0.048	11614
60.000	(2) 3'x8" Knife Plate	19	1.694	0.248	0.046	11576

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
42.000	GPS_A	19	0.842	0.166	0.032	12758
31.000	GPS_A	19	0.473	0.111	0.023	12582
20.000	(2) 3'x8" Knife Plate	19	0.220	0.062	0.015	12693

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325N	0.625	1	0.549	7.875	0.070 ✔	1.05	Member Block Shear
		Top Girt	A325N	0.625	1	0.137	7.875	0.017 ✔	1.05	Member Block Shear
T2	168	Leg	A325N	0.625	4	1.708	20.340	0.084 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	2.508	7.875	0.319 ✔	1.05	Member Block Shear
T3	160	Leg	A325N	0.625	4	8.856	20.340	0.435 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	3.821	7.875	0.485 ✔	1.05	Member Block Shear
T4	140	Leg	A325N	0.750	4	16.138	30.101	0.536 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.589	7.875	0.583 ✔	1.05	Member Block Shear
T5	120	Leg	A325N	0.750	4	22.688	30.101	0.754 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	4.885	9.914	0.493 ✔	1.05	Member Block Shear
T6	100	Leg	A490N	0.875	4	29.050	51.945	0.559 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	6.054	9.914	0.611 ✔	1.05	Member Block Shear
T7	80	Leg	A325N	0.875	4	35.084	41.556	0.844 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7.169	10.934	0.656 ✔	1.05	Member Block Shear
T8	60	Leg	A325N	1.000	4	41.410	54.517	0.760 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	7.723	13.806	0.559 ✔	1.05	Bolt Shear
T9	40	Leg	A325N	1.000	4	47.281	54.517	0.867 ✔	1.05	Bolt Tension
		Diagonal	A325N	0.625	1	8.994	13.806	0.651 ✔	1.05	Bolt Shear
		Secondary Horizontal	A325N	0.500	1	3.904	8.836	0.442 ✔	1.05	Bolt Shear
T10	20	Diagonal	A325N	0.625	1	9.307	13.806	0.674 ✔	1.05	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	P2x0.154	12.000	4.000	61.0 K=1.00	1.075	-2.469	27.981	0.088 [1] ✔
T2	168 - 160	P2x0.154 (GR)	8.000	4.000	61.0 K=1.00	1.075	-10.855	38.430	0.282 [1] ✔
T3	160 - 140	P3x0.216 (GR)	20.033	5.008	51.7 K=1.00	2.228	-45.645	87.013	0.525 [1] ✔
T4	140 - 120	P3.5x.318 (GR)	20.033	6.678	61.3 K=1.00	3.678	-78.369	122.133	0.642 [1] ✔
T5	120 - 100	P4x.337 (GR)	20.033	6.678	54.3 K=1.00	4.407	-108.113	157.190	0.688 [1] ✔
T6	100 - 80	P5x0.375 (GR)	20.033	6.678	43.6 K=1.00	6.112	-139.601	242.300	0.576 [1] ✔
T7	80 - 60	P6x0.432	20.033	10.017	54.8 K=1.00	8.405	-167.318	227.081	0.737 [1] ✔
T8	60 - 40	P6x0.432	20.033	10.017	54.8 K=1.00	8.405	-196.770	227.081	0.867 [1] ✔
T9	40 - 20	P6x0.432	20.033	5.151	28.2 K=1.00	8.405	-225.139	254.222	0.886 [1] ✔
T10	20 - 0	P8x.5	20.033	10.017	41.8 K=1.00	12.763	-254.414	367.690	0.692 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	5.657	2.543	101.1 K=1.07	0.621	-0.602	15.177	0.040 [1] ✔
T2	168 - 160	L2x1 1/2x3/16	5.657	2.543	101.1 K=1.07	0.621	-2.617	15.177	0.172 [1] ✔
T3	160 - 140	L2x1 1/2x3/16	7.621	3.637	135.6 K=1.00	0.621	-3.881	9.673	0.401 [1] ✔
T4	140 - 120	L2x2x3/16	10.162	4.935	150.3 K=1.00	0.715	-4.571	9.058	0.505 [1] ✔
T5	120 - 100	L2 1/2x2x3/16	11.744	5.701	160.2 K=1.00	0.809	-4.934	9.021	0.547 [1] ✔
T6	100 - 80	L2 1/2x2 1/2x3/16	13.438	6.498	157.5 K=1.00	0.902	-6.025	10.403	0.579 [1] ✔
T7	80 - 60	L3x3x3/16	16.803	8.223	165.6 K=1.00	1.090	-7.220	11.381	0.634 [1] ✔
T8	60 - 40	L3 1/2x3x1/4	18.448	9.047	172.1	1.560	-7.723	15.083	0.512 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3x1/4	20.158	10.049	K=1.00 191.1 K=1.00	1.560	-8.994	12.226	✔ 0.736 [1] ✔
T10	20 - 0	L3 1/2x3 1/2x1/4	21.916	10.690	184.8 K=1.00	1.690	-9.307	14.159	0.657 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.486	8.467	146.4 K=1.00	1.690	-3.904	22.568	0.173 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	4.000	3.510	130.8 K=1.00	0.621	-0.107	10.385	0.010 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	P2x0.154	12.000	4.000	61.0	1.075	1.686	33.848	0.050 [1] ✔
T2	168 - 160	P2x0.154 (GR)	8.000	4.000	61.0	1.075	6.830	33.848	0.202 [1] ✔
T3	160 - 140	P3x0.216 (GR)	20.033	5.008	51.7	2.228	35.426	70.197	0.505 [1] ✔
T4	140 - 120	P3.5x.318 (GR)	20.033	6.678	61.3	3.678	64.551	115.870	0.557 [1] ✔
T5	120 - 100	P4x.337 (GR)	20.033	6.678	54.3	4.407	90.752	138.834	0.654 [1] ✔
T6	100 - 80	P5x0.375 (GR)	20.033	6.678	43.6	6.112	116.201	192.527	0.604 [1] ✔
T7	80 - 60	P6x0.432	20.033	10.017	54.8	8.405	140.337	264.756	0.530 [1] ✔
T8	60 - 40	P6x0.432	20.033	10.017	54.8	8.405	165.640	264.756	0.626 [1] ✔
T9	40 - 20	P6x0.432	20.033	4.865	26.6	8.405	189.303	264.756	0.715 [1] ✔
T10	20 - 0	P8x.5	20.033	10.017	41.8	12.763	212.694	402.026	0.529 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	5.657	2.543	73.4	0.360	0.549	15.675	0.035 [1] ✔
T2	168 - 160	L2x1 1/2x3/16	5.657	2.543	73.4	0.360	2.508	15.675	0.160 [1] ✔
T3	160 - 140	L2x1 1/2x3/16	7.621	3.637	103.3	0.360	3.821	15.675	0.244 [1] ✔
T4	140 - 120	L2x2x3/16	9.197	4.474	89.9	0.431	4.589	18.739	0.245 [1] ✔
T5	120 - 100	L2 1/2x2x3/16	11.744	5.701	117.0	0.501	4.885	21.806	0.224 [1] ✔
T6	100 - 80	L2 1/2x2 1/2x3/16	13.438	6.498	102.5	0.571	6.054	24.840	0.244 [1] ✔
T7	80 - 60	L3x3x3/16	16.803	8.223	107.0	0.712	7.169	30.973	0.231 [1] ✔
T8	60 - 40	L3 1/2x3x1/4	18.448	9.047	120.8	1.029	7.656	44.778	0.171 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3x1/4	20.158	10.049	132.1	1.029	8.076	44.778	0.180 [1]
T10	20 - 0	L3 1/2x3 1/2x1/4	21.916	10.690	119.3	1.127	8.611	49.019	0.176 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L3 1/2x3 1/2x1/4	17.486	8.467	186.4	1.150	3.904	50.039	0.078 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 168	L2x1 1/2x3/16	4.000	3.510	103.8	0.360	0.137	15.675	0.009 [1]

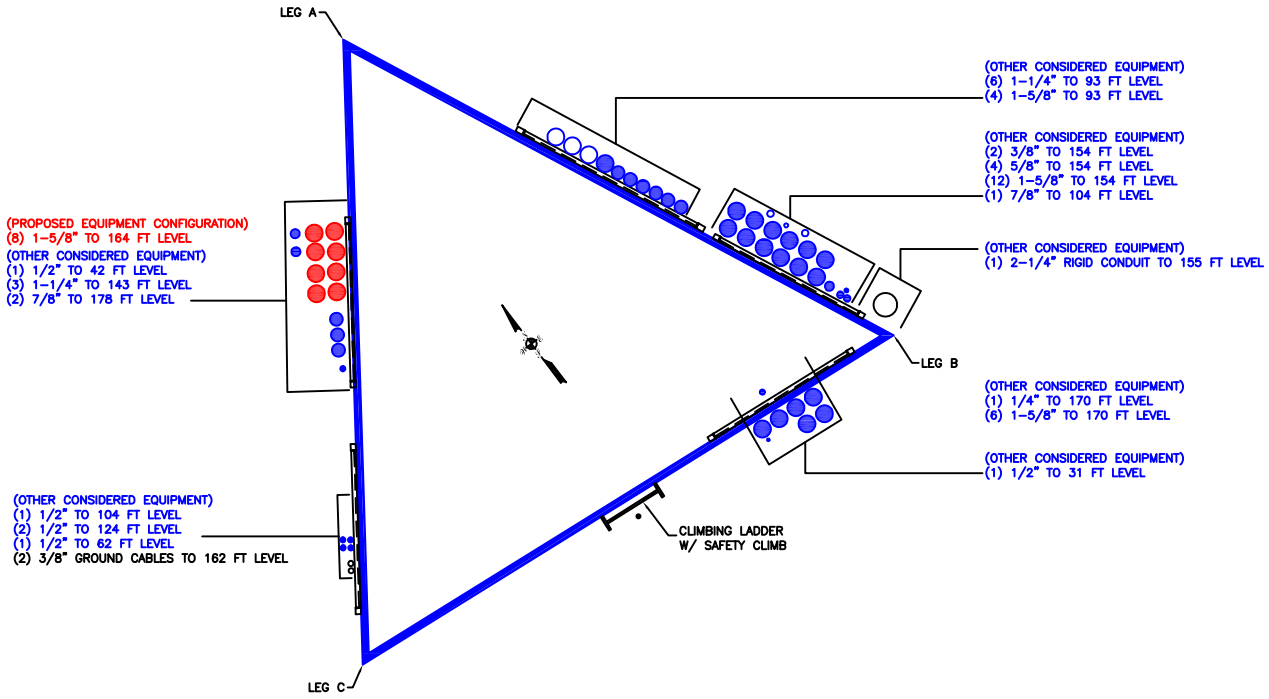
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	180 - 168	Leg	P2x0.154	2	-2.469	29.380	8.4	Pass
T2	168 - 160	Leg	P2x0.154 (GR)	26	-10.855	40.351	26.9	Pass
T3	160 - 140	Leg	P3x0.216 (GR)	41	-45.645	91.364	50.0	Pass
T4	140 - 120	Leg	P3.5x.318 (GR)	68	-78.369	128.240	61.1	Pass
T5	120 - 100	Leg	P4x.337 (GR)	89	-108.113	165.049	65.5 71.8 (b)	Pass
T6	100 - 80	Leg	P5x0.375 (GR)	109	116.201	202.153	57.5	Pass
T7	80 - 60	Leg	P6x0.432	131	-167.318	238.435	70.2 80.4 (b)	Pass
T8	60 - 40	Leg	P6x0.432	146	-196.770	238.435	82.5	Pass
T9	40 - 20	Leg	P6x0.432	160	-225.139	266.933	84.3	Pass
T10	20 - 0	Leg	P8x.5	181	-254.414	386.074	65.9	Pass
T1	180 - 168	Diagonal	L2x1 1/2x3/16	10	-0.602	15.935	3.8 6.6 (b)	Pass
T2	168 - 160	Diagonal	L2x1 1/2x3/16	29	-2.617	15.935	16.4 30.3 (b)	Pass
T3	160 - 140	Diagonal	L2x1 1/2x3/16	43	-3.881	10.157	38.2 46.2 (b)	Pass
T4	140 - 120	Diagonal	L2x2x3/16	70	-4.571	9.511	48.1 55.5 (b)	Pass
T5	120 - 100	Diagonal	L2 1/2x2x3/16	91	-4.934	9.472	52.1	Pass
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	112	-6.025	10.923	55.2 58.2 (b)	Pass
T7	80 - 60	Diagonal	L3x3x3/16	133	-7.220	11.950	60.4 62.4 (b)	Pass
T8	60 - 40	Diagonal	L3 1/2x3x1/4	148	-7.723	15.837	48.8 53.3 (b)	Pass
T9	40 - 20	Diagonal	L3 1/2x3x1/4	163	-8.994	12.837	70.1	Pass
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	184	-9.307	14.867	62.6 64.2 (b)	Pass
T9	40 - 20	Secondary Horizontal	L3 1/2x3 1/2x1/4	169	-3.904	23.697	16.5 42.1 (b)	Pass
T1	180 - 168	Top Girt	L2x1 1/2x3/16	6	-0.107	10.904	1.0 1.7 (b)	Pass
						Summary		
						Leg (T9)	84.3	Pass
						Diagonal (T9)	70.1	Pass
						Secondary Horizontal (T9)	42.1	Pass
						Top Girt (T1)	1.7	Pass
						Bolt Checks	82.6	Pass
						RATING =	**84.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806353

APPENDIX C

ADDITIONAL CALCULATIONS

CCIplate

Project Information

BU #	806353
Site Name	BRG 124 943066, CT
Order #	504546 Rev# 0

Tower Information

Tower Type	Self Support
TIA-222 Rev	H

☑ Apply TIA-222-H Section 15.5

Applied Loads

	Comp.	Uplift
Axial (k)	0.00	218.00
Shear (k)	0.00	24.00

Anchor Rod Data

Quantity:	6	
Diameter (in):	1.5	
Material Grade:	A36	Fy=36 ksi Fu=58 ksi
Grout Considered:	Yes	Not Considered, lar<=1(d)
l_{ar} (in):	0	
Eta Factor, η:	0.55	
Thread Type:	N-Included	
Configuration:	Symmetrical	

Anchor Rod Results

Axial, Pu_t (kips)	36.33	
Shear, Vu (kips)	4.00	
Moment, Mu (kip-in)	-	
Axial Cap., φPn_t (kips)	61.34	
Shear Cap., ϕVn (kips)	38.44	
Moment Cap., ϕMn (kip-in)	-	
Stress Rating	34.5%	**Pass**

Drilled Pier Foundation

BU # :	806353
Site Name:	BRG 124 943066, CT
Order Number:	504546 Rev# 0

TIA-222 Revison:	H
Tower Type:	Self Support

Applied Loads	Comp.	Uplift
Moment (kip-ft)	0	0
Axial Force (kips)	262	218
Shear Force (kips)	27	24

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	13.2	ft
Ext. Above Grade	0.3	ft
Pier Section 1		
From 0.3' above grade to 13.2' below grade		
Pier Diameter	2.5	ft
Rebar Quantity	14	
Rebar Size	8	
Clear Cover to Ties	4	in
Tie Size	4	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.52	7.52
Soil Safety Factor	7.74	8.71
Max Moment (kip-ft)	184.76	164.23
Rating*	*16.4%*	*14.5%*
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	191.24	191.24
End Bearing (kips)	206.28	-
Weight of Concrete (kips)	11.93	8.95
Total Capacity (kips)	397.52	267.34
Axial (kips)	341.08	218.00
Rating*	*81.7%*	*77.7%*
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	7.53	7.16
Critical Moment (kip-ft)	184.76	163.01
Critical Moment Capacity	505.83	360.43
Rating*	*34.8%*	*43.1%*

Soil Interaction Rating*	**81.7%**
Structural Foundation Rating*	**43.1%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐

Soil Profile

Groundwater Depth	N/A	ft	# of Layers	3

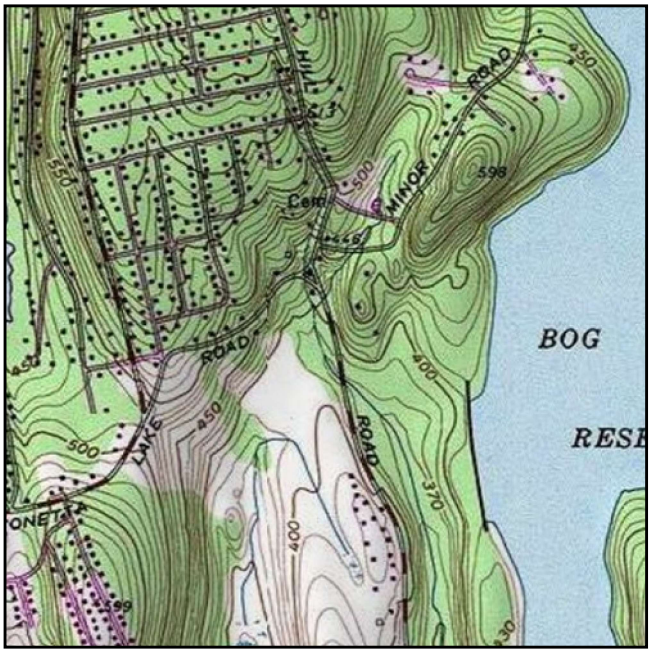
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	6	1	110	150	0	30	0.000	0.000	0.77	0.77			Cohesionless
3	6	13.2	7.2	140	150	8	0	3.600	3.600	4.40	4.40	56.03		Cohesive

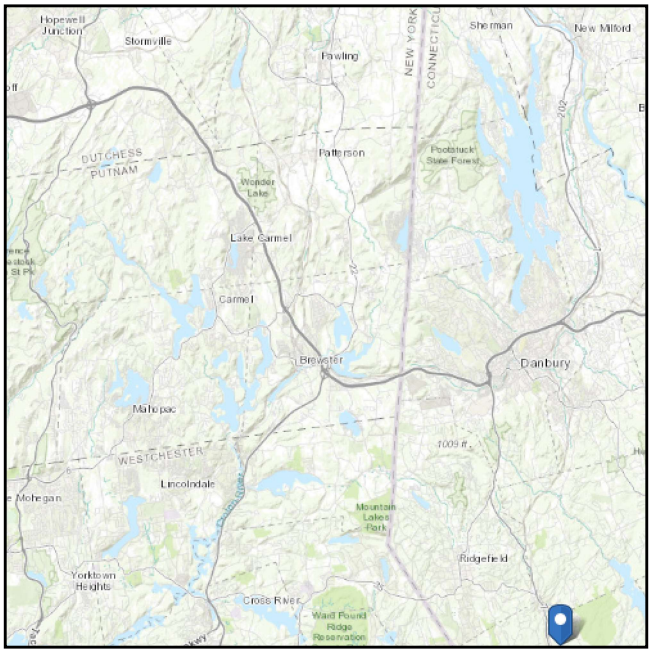
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 426.37 ft (NAVD 88)
Latitude: 41.238428
Longitude: -73.424011





Wind

Results:

Wind Speed:	118 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	91 Vmph
100-year MRI	97 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Wed Oct 02 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

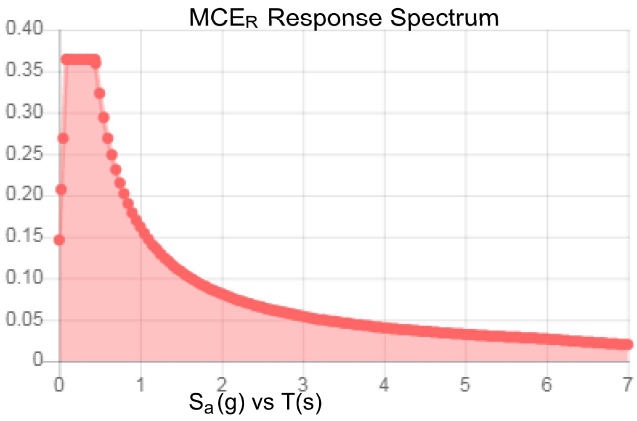
Seismic

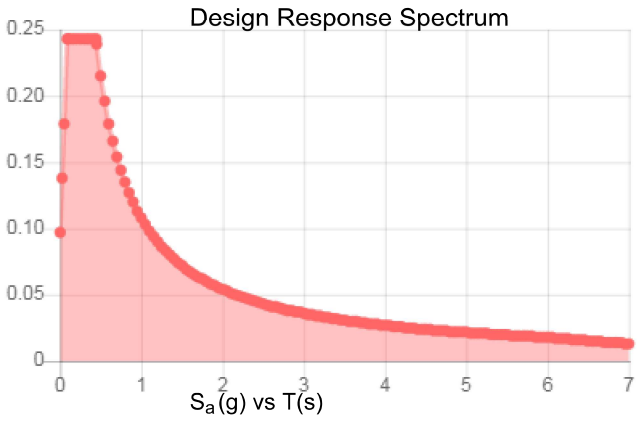
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.227	S_{DS} :	0.243
S_1 :	0.067	S_{D1} :	0.108
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.127
S_{MS} :	0.364	PGA_M :	0.197
S_{M1} :	0.162	F_{PGA} :	1.546
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Oct 02 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Oct 02 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit E

Mount Analysis

PAUL J. FORD & COMPANY

Date: September 25, 2019

Kevin Morrow
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679

Subject:	**Mount Analysis Report**	
Carrier Designation:	***Verizon Wireless* Equipment Change-out**	
	Carrier Site Number:	NG1976
	Carrier Site Name:	WILTON CT
Crown Castle Designation:	**Crown Castle BU Number:**	806353
	Crown Castle Site Name:	BRG 124 943066
	Crown Castle JDE Job Number:	589777
	Crown Castle Purchase Order Number:	1451389
	Crown Castle Order Number:	504546 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	A37519-3879.001.8190
Site Data:	**128 Mather St, Wilton, Fairfield County, CT 06897** **Latitude 41.238428°, Longitude -73.424011°**	
Structure Information:	**Tower Height & Type:**	**180 Foot Self Support**
	Mount Elevation:	**164 Foot**
	Mount Type:	**(3) 16 Foot Sector Frames**

Dear Kevin Morrow,

Paul J Ford and Company is pleased to submit this "Mount Analysis Report" to determine the structural integrity of the Verizon Wireless antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

16' Sector Frames (typical)	**72.7%**	**SUFFICIENT**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

Angela Sage, E.I.
Structural Designer
asage@pauljford.com

D.S.

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

2019.09.26
10:30:03-04'00'

TABLE OF CONTENTS

1) INTRODUCTION

The existing mounts under consideration are (3) 16' Sector Frames mounts estimated based on photos and models of previously analyzed mounts of similar type.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	120 mph
Exposure Category:	B
Topographic Factor at Base:	1.00
Topographic Factor at Mount:	1.00
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
164	166	6	COMMSCOPE	JAHH-65B-R3B	(3) 16' Sector Frames
		6	RFS CELWAVE	APL868013-42T0	
		3	SAMSUNG TELECOMMUNICATIONS	CBRS	
		3	COMMSCOPE	CBC78T-DS-43-2X	
		2	RFS CELWAVE	DB-T1-6Z-8AB-0Z	
		3	SAMSUNG TELECOMMUNICATIONS	20W CBRS	
		3	SAMSUNG TELECOMMUNICATIONS	RFV01U-D1A	
		3	SAMSUNG TELECOMMUNICATIONS	RFV01U-D2A	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Tower Manufacturer Drawings	Doc ID: 217757 Dated: 05/06/1988	-	
Photos	Dated: 09/12/2019	-	CCISites
TIA Inspection	Dated: 04/12/2015	-	CCISites
Order	ID: 504546 Rev. 0 Dated: 09/19/2019	-	CCISites

3.1) Analysis Method

RISA-3D (version 17.0.3), 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.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision C).

3.2) Assumptions

1) *The analysis of the existing tower or the effect of the mount attachment to the tower is not within the current scope of work.*
2) *The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.*
3) *The configuration of antennas, mounts, and other appurtenances are as specified in Table 1.*
4) *All member connections have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report. All U-Bolt connections have been properly tightened. This analysis will be required to be revised if the existing conditions in the field differ from those shown in the above referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.*
5) *Steel grades are as follows, unless noted otherwise:*
   - *a) Channel, Solid Round, Angle, Plate, Unistrut* — *ASTM A36 (GR 36)*
   - *b) Pipe* — *ASTM A53 (GR 35)*
   - *c) HSS (Rectangular)* — *ASTM 500 (GR B-46)*
   - *d) HSS (Round)* — *ASTM 500 (GR B-42)*
   - *e) Threaded Rods* — *ASTM F1554 (GR 36)*
   - *f) Connection Bolts* — *ASTM A325*
   - *g) U-Bolts* — *SAE J429 (GR 2)*
6) *Proposed equipment is to be installed in the locations specified in Appendix A. Any changes to the proposed equipment locations will render this report invalid.*
7) *Mount has been modeled based on the photographs and/or the TIA inspection referenced in Table 2. Member information and dimensions not provided have been assumed based on previous experience with similar mounts. No guarantee can be made as to the accuracy of these assumptions without a complete mount mapping.*

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the mount.

4) ANALYSIS RESULTS

Table 3 - Mount Component Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Face Horizontals	164	72.7	Pass
1, 2	Standoff Members		20.4	Pass
1, 2	Tie Backs		4.1	Pass
1, 2	Bracing Members		10.2	Pass
1, 2	Mount Pipes		42.8	Pass
1, 2	Mount to Tower Connection		6.4	Pass

Mount Rating (max from all components) =	72.7%

Notes:
1) See additional documentation in "Appendix C – Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical.

Table 4 - Tieback Connection Data Table

Tower Connection Node No.	Existing / Proposed	Resultant End Reaction (lb)	Connected Member Type	Connected Member Size	Member Compressive Capacity (lb)[2]	Notes
N59	Existing	1144	Leg	P2STD	1922	1

Notes:
1) Tieback connection point is within 25% of either end of the connected tower member
2) Reduced member compressive capacity according to CED-STD-10294 *Standard for Installation of Mounts and Appurtenances*

4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING MOUNTS BY PAUL J. FORD AND COMPANY

1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.

2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.

3) The mount has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.

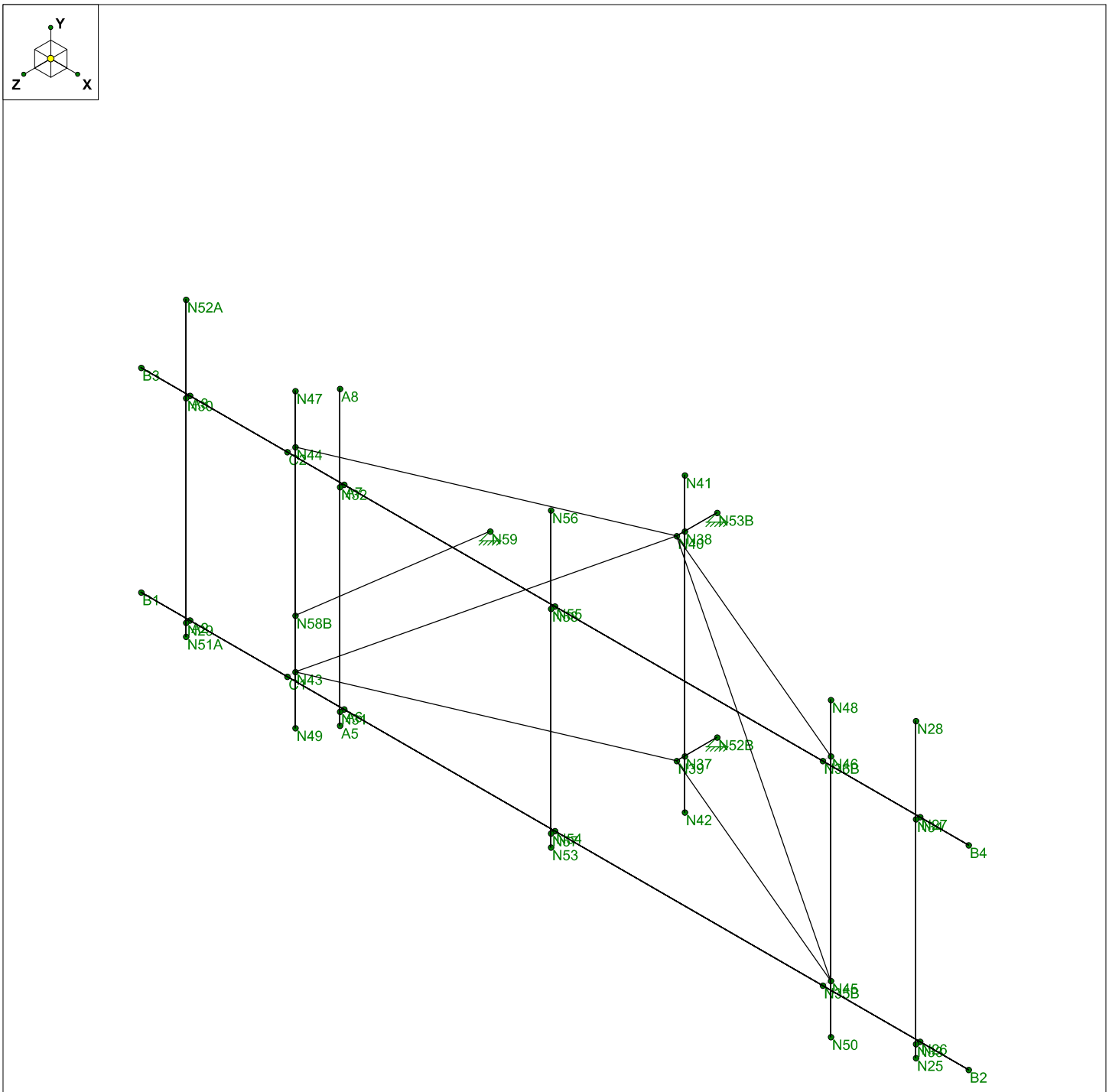
4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

****

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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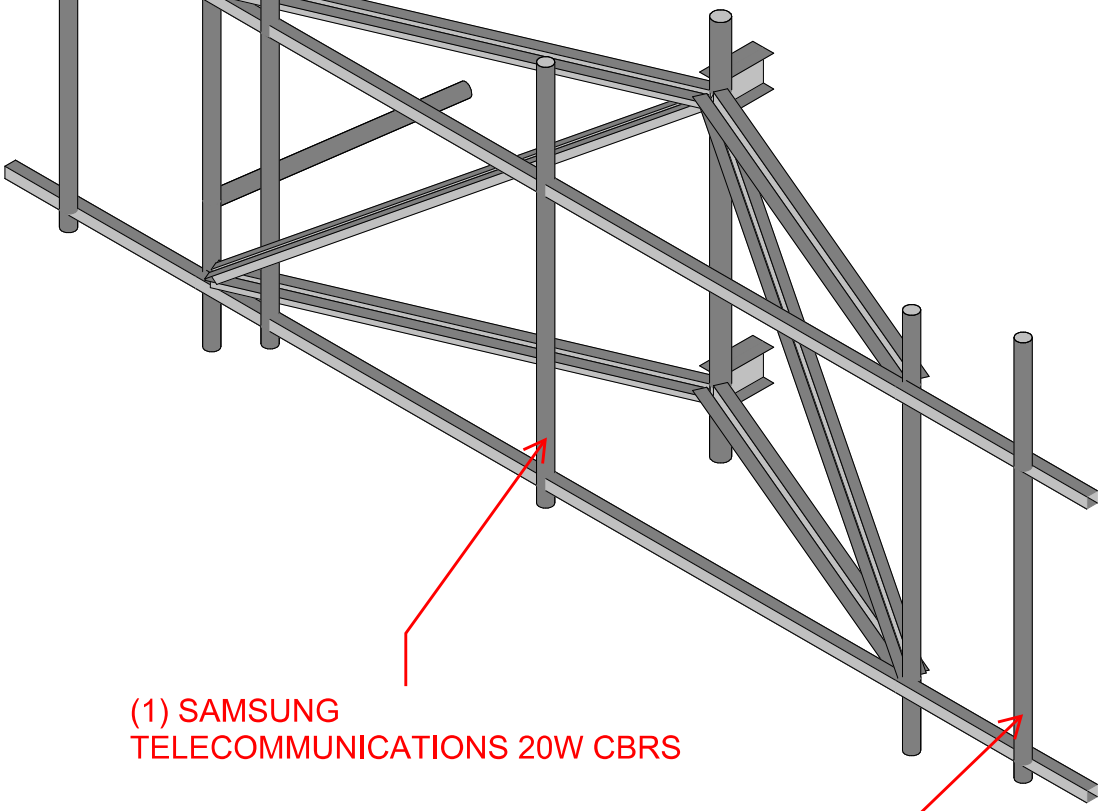
LOADING CONFIGURATION DIFFERS PER SECTOR.
WORST CASE REPORTED.

PROPOSED: (TYP)
(2) COMMSCOPE JAHH-65B-R3B
(1) COMMSCOPE BSAMNT-SBS-2-2
(1) COMMSCOPE CBC78T-DS-43-2X

PROPOSED:
(1) SAMSUNG TELECOMMUNICATIONS CBRS
(1) RFS CELWAVE DB-T1-6Z-8AB-0Z



(1) SAMSUNG
TELECOMMUNICATIONS 20W CBRS

(1) SAMSUNG TELECOMMUNICATIONS RFV01U-D1A
(1) SAMSUNG TELECOMMUNICATIONS RFV01U-D2A

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APPENDIX B

SOFTWARE INPUT CALCULATION

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project # 37519-3879.001.8190
By AMS

Analysis 30 degrees
EPA Method Projected Area
File _Client.r3d

Date: 09/25/19

v1.8, Effective 8/5/19

Mount Loading per TIA-222-H

Structure & Wind Speed

Analysis Scope=	Client	
Structure Type =	Mount	
Mount Type =	1 Sector	
Mount Centerline (z) =	164	ft
C/L Y Coordinate =	0	in
Ultimate Wind Speed =	120	mph
Service Wind Speed =	30	mph
Ice Wind Speed =	50	mph
Ice Thickness =	1.5	in
Const. Duration =		
Non-Op Wind Speed =	#N/A	mph
Op Wind Speed =	30	mph

Topography

Risk Category =	II	
Exposure Category =	B	
Topographic Category =	1	
Structure Base Height (Z_s) =	426.37	ft
Crest Height (H) =		ft

Maintenance Point Loads

			Label	Node #	
L_m =	500 lbs	@	N26	18	(Typically 500 lbs)
L_v =	250 lbs	@	B2	8	(Typically 250 lbs)

*In negative y-direction

Velocity Pressure Coefficients

z_g =	1200	ft	(Table 2-4)
α' =	7.00		(Table 2-4)
K_z =	1.14		(Section 2.6.5.2)
K_{min} = 0.70			
K_{zmin} = 1.14			
K_{max} = 2.01			
K_{zt} =	1.00		(Section 2.6.6.2.1)
K_d =	0.95		(Table 2-2)
K_o =	0.98		(Section 2.6.8)
G_h =	1.00		(Section 2.6.9)
K_{es} =	1.0		(Annex S - Wind Force)
q_z =	39.25	psf	(Section 2.6.11.6)

Ice Loading

I_i =	1.00		(Table 2-3)
K_{es} =	1.0		(Annex S - Ice)
q_{iz} =	6.92	psf	(Section 2.6.11.6)
K_{iz} =	1.17		(Section 2.6.10)
t_{iz} =	1.76	in	(Section 2.6.10)
h =	0.00	in	(Bar Grating Height)
W_i =	8.22	psf	(Grating Ice Weight)

Wind Pressure

Ka Override =		for All Antennas and Members
$(q_z)(G_h)(K_{es})$ =	39.25	psf
$(q_{iz})(G_h)(K_{es})$ =	6.92	psf (Ice)

Antennas

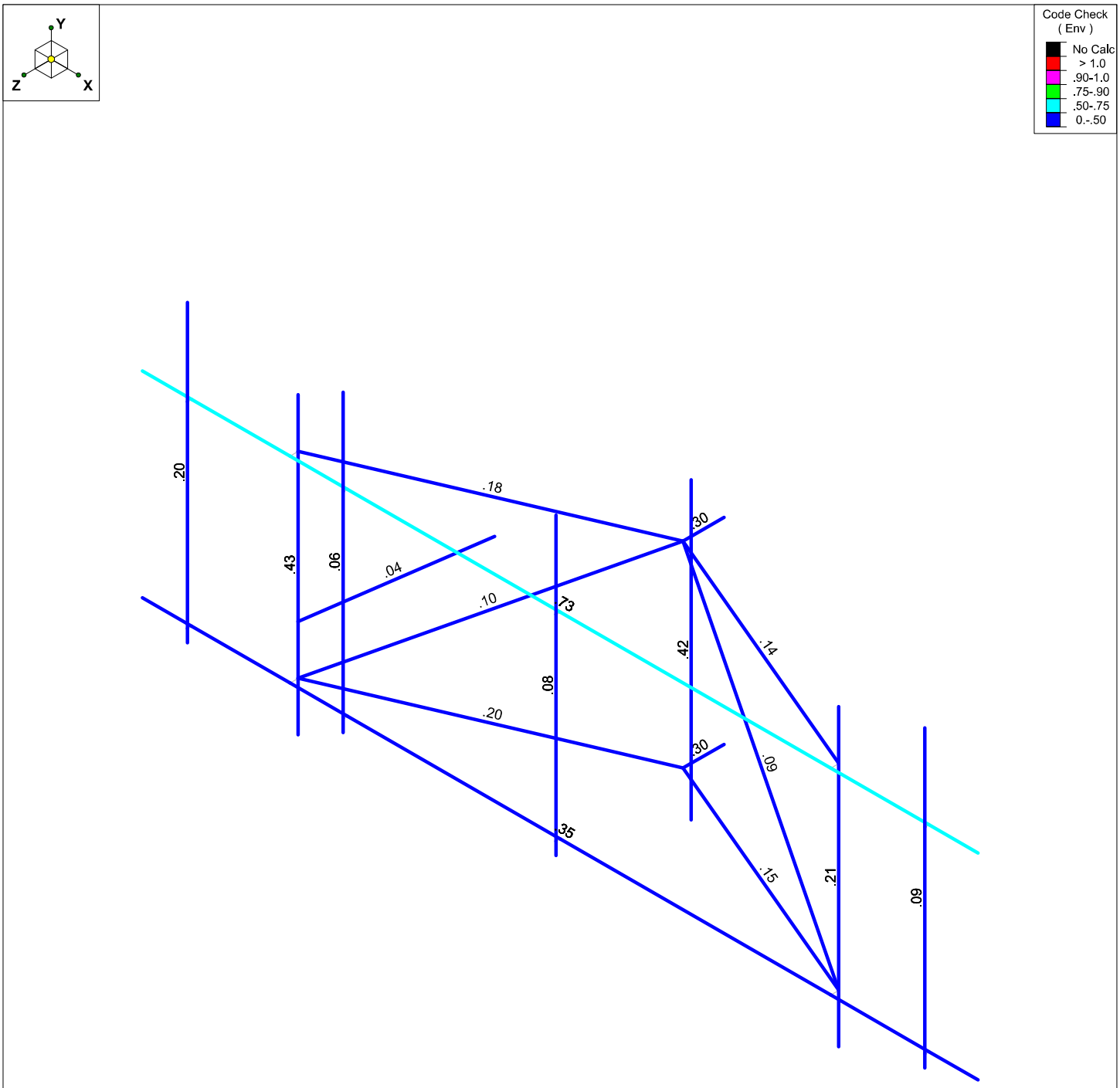
Item	Status	Manufacturer	Antenna	Height (in)	Width (in)	Depth (in)	Flat or Round	Weight (lbs)	Sector / Face	Position	Quantity	Orientation	Use tnxTower C_AA_A (CFD)	Top/Bottom Mounting Point Spacing	Override Spacing (in)	Max Antenna C/L (ft)	Min Antenna C/L (ft)	Antenna C/L (ft)	Antenna Top Mount Location from Mount Pipe Bottom (in)	Antenna Bottom Mount Location from Mount Pipe Bottom (in)	Override Top Antenna Mounting Location (in)	Override Bottom Antenna Mounting Location (in)	Normal Wind Force per Antenna (lbs)	Transverse Wind Force per Antenna (lbs)
1	P	COMMSCOPE	JAHH-65B-R3B_CCI CFD	72	13.8	8.2	Flat	63.3	C	4	1	Normal	Yes	66.00	40	166.083	163.417	166	71.00	31.00			207.645	119.720
2	P	COMMSCOPE	JAHH-65B-R3B_CCI CFD	72	13.8	8.2	Flat	63.3	C	4	1	Normal	Yes	66.00	40	166.083	163.417	166	71.00	31.00			207.645	119.720
3	P	COMMSCOPE	BSAMNT-SBS-2-2	1	1	1	Flat	67.4	C	4	1	Normal	No	1.00		167.708	161.792	166	51.50	50.50			0.294	0.294
4	I	RFS CELWAVE	APL868013-42T0	48	6	8	Flat	6.32	C	1	1	Normal	No	42.00	40	166.083	163.417	166	71.00	31.00			101.271	127.701
5	I	RFS CELWAVE	APL868013-42T0	48	6	8	Flat	6.32	C	2	1	Normal	No	42.00	40	166.083	163.417	166	71.00	31.00			101.271	127.701
6	P	SAMSUNG TELECOMMUNICATIONS	CBRS	16.16	11.39	5.45	Flat	23.14	C	3	1	Normal	No	10.16		167.327	162.173	166	56.08	45.92			54.187	26.374
7	P	COMMSCOPE	CBC78T-DS-43-2X	6.4	6.9	9.6	Flat	20.7	C	4	1	Normal	No	0.40		167.733	161.767	166	51.20	50.80			13.000	18.087
8	P	RFS CELWAVE	DB-T1-6Z-8AB-0Z	24	24	10	Flat	44	C	3	1	Normal	No	18.00		167.000	162.500	166	60.00	42.00			169.570	70.654
9	P	SAMSUNG TELECOMMUNICATIONS	20W CBRS	12.1	8.5	4.1	Flat	18.64	C	2	1	Normal	No	6.10		167.496	162.004	166	54.05	47.95			30.278	14.849
10	P	SAMSUNG TELECOMMUNICATIONS	RFV01U-D1A	15	15	10	Flat	84.4	C	1	1	Normal	No	9.00		167.375	162.125	166	55.50	46.50			66.238	44.159
11	P	SAMSUNG TELECOMMUNICATIONS	RFV01U-D2A	15	15	8.1	Flat	70.3	C	1	1	Normal	No	9.00		167.375	162.125	166	55.50	46.50			66.238	35.769

Dishes

Item	Status	Manufacturer	Microwave Dish	Dia (in)	Dish Type	Weight (lbs)	Sector / Face	Position	Top/Bottom Mounting Point Spacing	Override Spacing (in)	Max Dish C/L (ft)	Min Dish C/L (ft)	Dish C/L (ft)	Dish Top Mount Location from Mount Pipe Bottom	Dish Bottom Mount Location from Mount Pipe Bottom	Override Top Dish Mounting Location (in)	Override Bottom Dish Mounting Location (in)

APPENDIX C

SOFTWARE ANALYSIS OUTPUT



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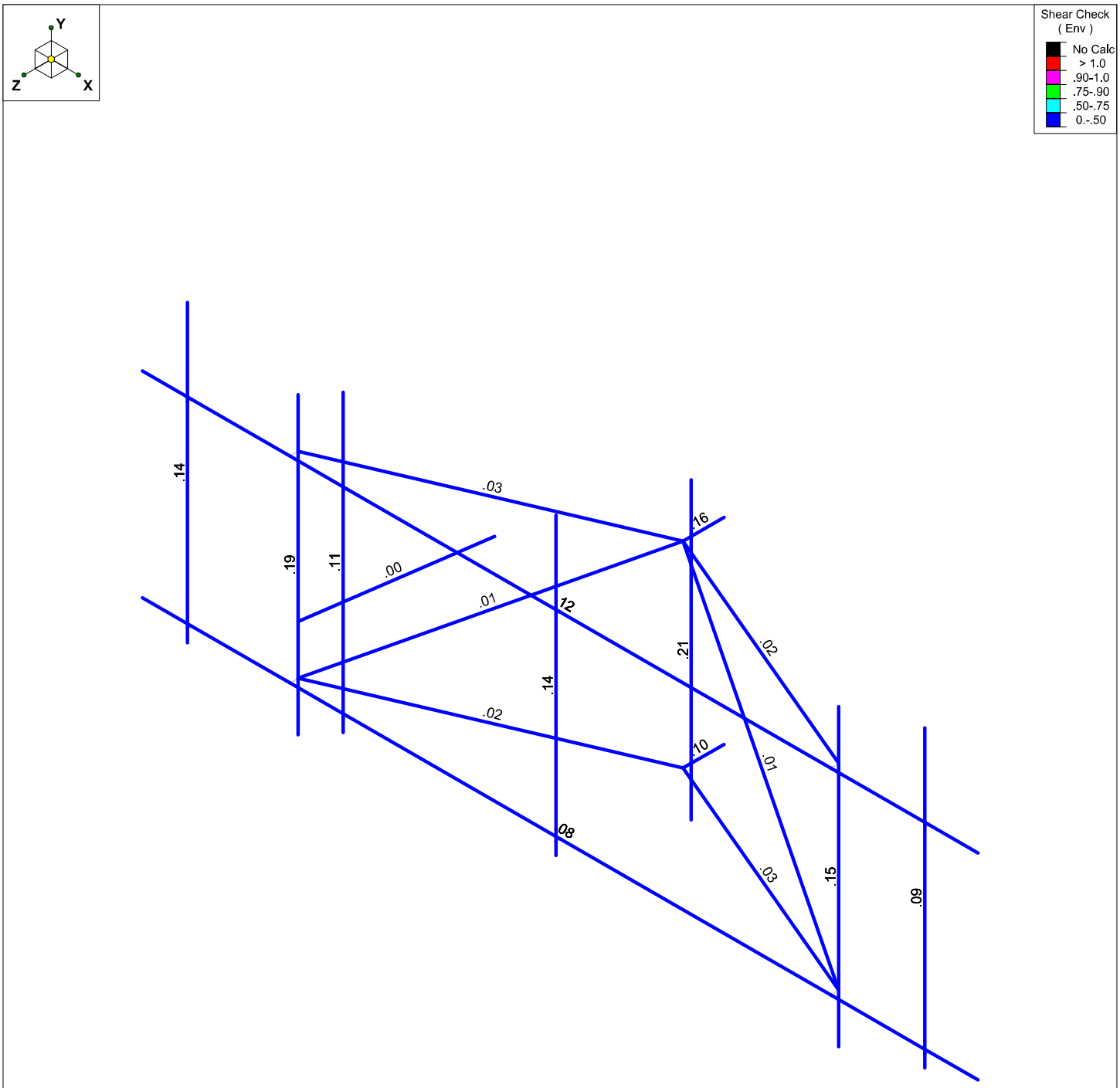

Member Shear Checks Displayed (Enveloped)
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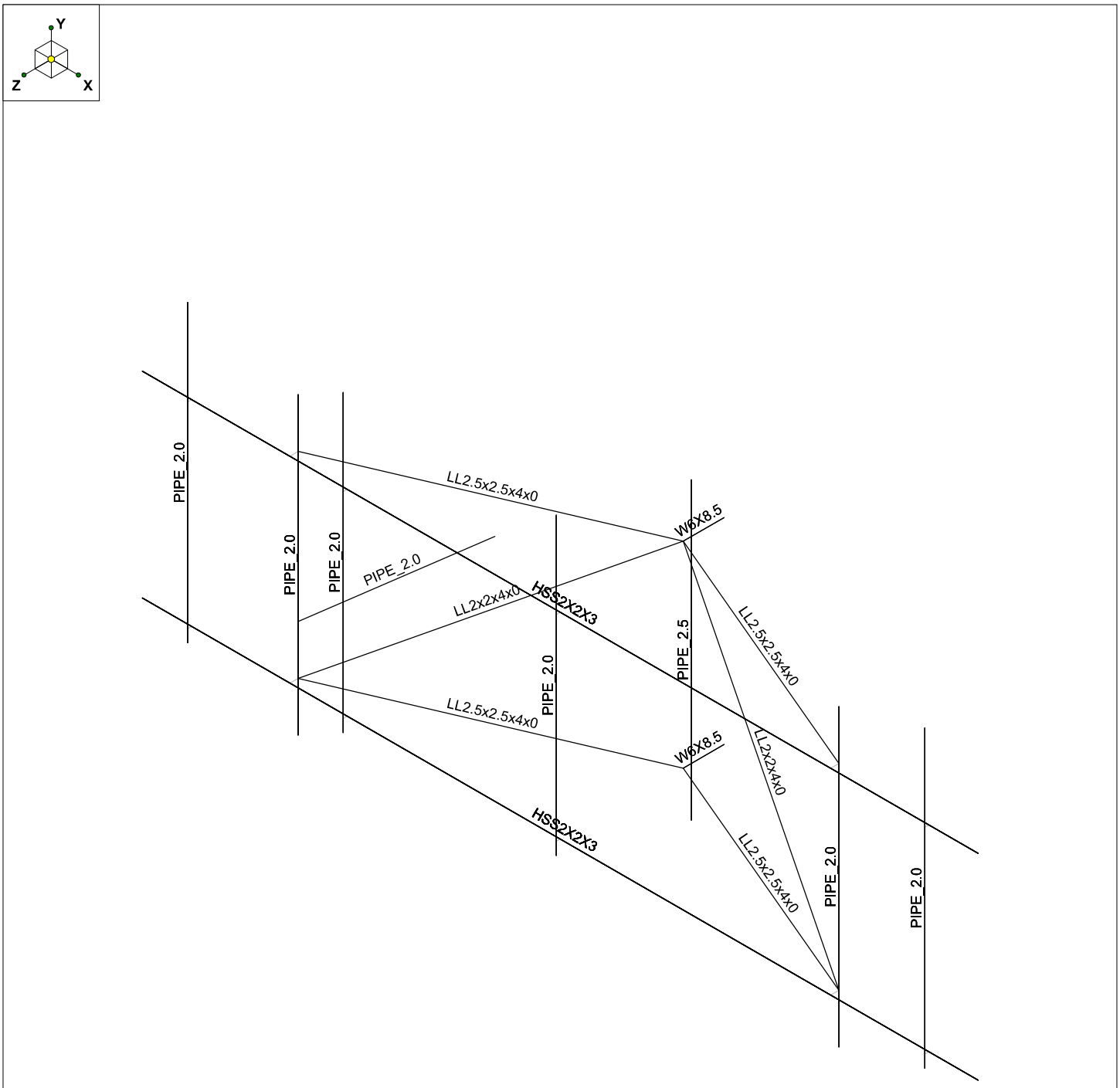

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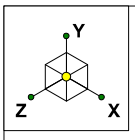

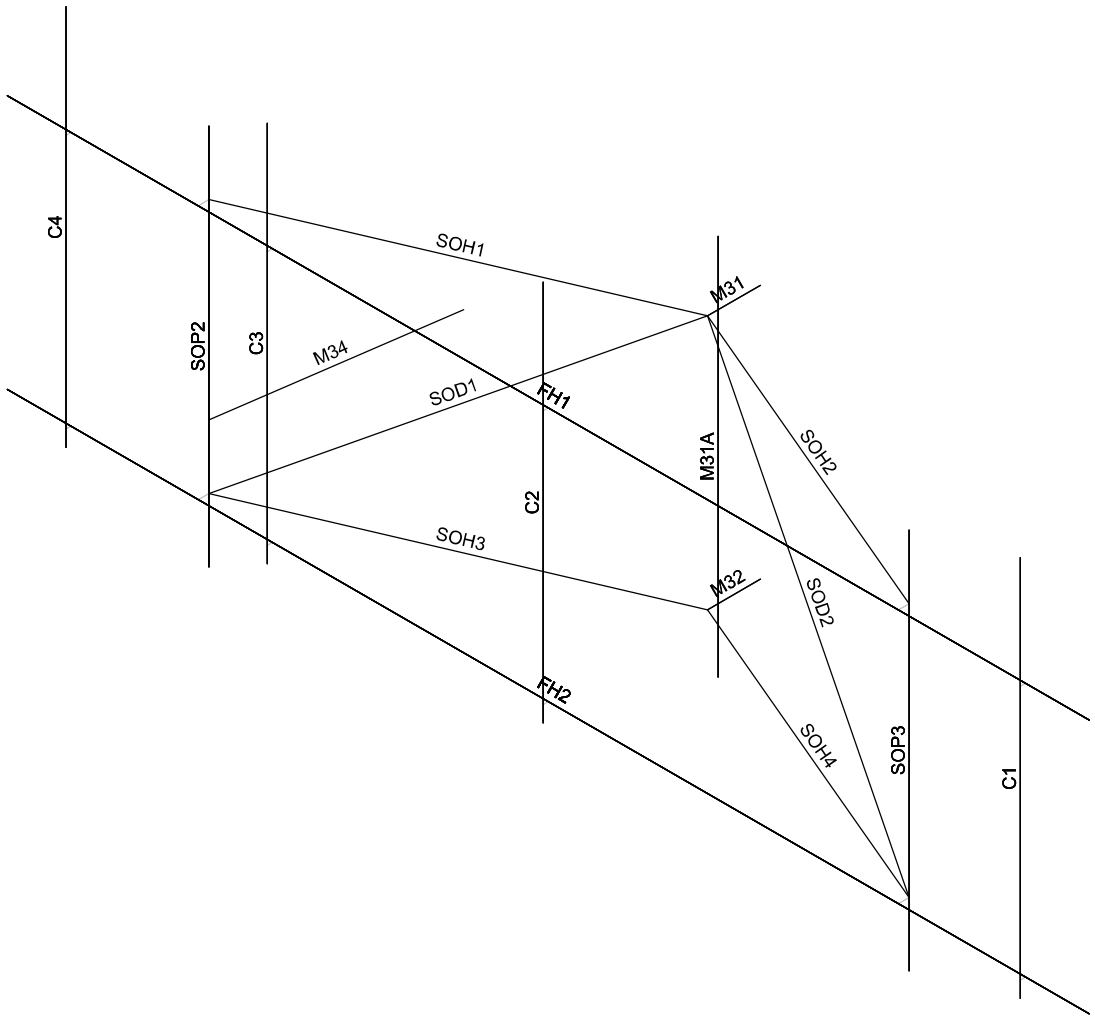

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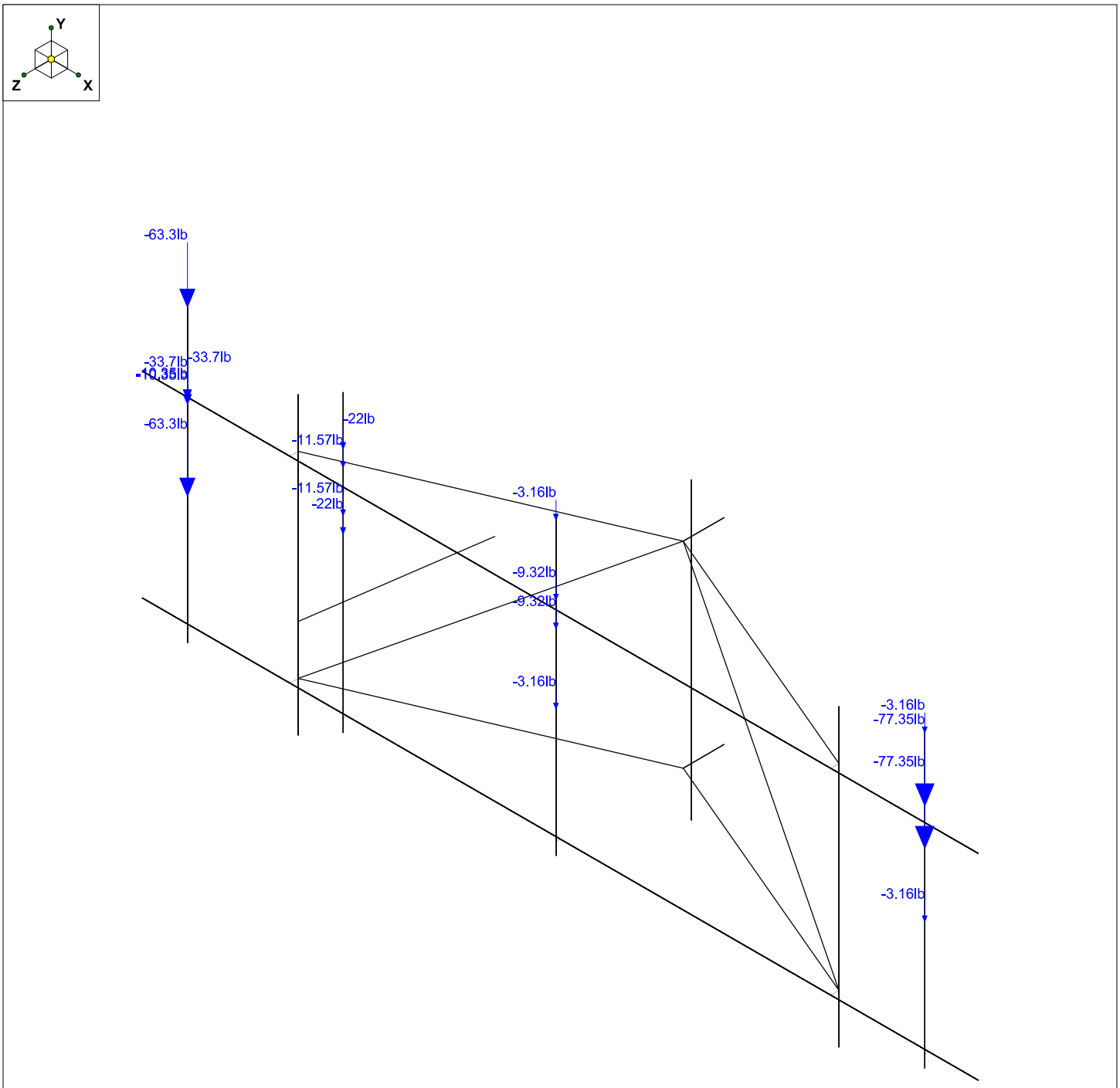

Loads: BLC 1, Dead
Envelope Only Solution

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(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	No
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	No
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	0

(Global) Model Settings, Continued

Seismic Code	None
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	No
Ct X	0
Ct Z	0
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	1
R Z	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A53 Gr. B (35 ksi)	29000	11154	.3	.65	.49	35	1.5	60	1.2
2	A500 Gr. B (46ksi)	29000	11154	.3	.65	.49	46	1.5	58	1.2
3	A36 (36ksi)	29000	11154	.3	.65	.49	36	1.5	58	1.2

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	C3	A5	A8			PIPE_2.0	None	None	A53 Gr. B ...	Typical
2	FH2	B1	B2			HSS2X2X3	None	None	A500 Gr. ...	Typical
3	FH1	B3	B4			HSS2X2X3	None	None	A500 Gr. ...	Typical
4	M12	A3	N30			RIGID	None	None	RIGID	Typical
5	M13	A2	N29			RIGID	None	None	RIGID	Typical
6	M14	A7	N32			RIGID	None	None	RIGID	Typical
7	M15	A6	N31			RIGID	None	None	RIGID	Typical
8	C1	N25	N28			PIPE_2.0	None	None	A53 Gr. B ...	Typical
9	M13A	N27	N34			RIGID	None	None	RIGID	Typical
10	M14A	N26	N33			RIGID	None	None	RIGID	Typical
11	SOP2	N49	N47			PIPE_2.0	None	None	A53 Gr. B ...	Typical
12	SOP3	N50	N48			PIPE_2.0	None	None	A53 Gr. B ...	Typical
13	M24	C2	N44			RIGID	None	None	RIGID	Typical
14	M25	C1	N43			RIGID	None	None	RIGID	Typical
15	M26	N36B	N46			RIGID	None	None	RIGID	Typical
16	M27	N35B	N45			RIGID	None	None	RIGID	Typical
17	SOH1	N40	N44			LL2.5x2.5x4x0	None	None	A36 (36ksi)	Typical
18	SOH3	N39	N43			LL2.5x2.5x4x0	None	None	A36 (36ksi)	Typical
19	SOD1	N40	N43			LL2x2x4x0	None	None	A36 (36ksi)	Typical
20	SOH2	N40	N46			LL2.5x2.5x4x0	None	None	A36 (36ksi)	Typical
21	SOH4	N39	N45			LL2.5x2.5x4x0	None	None	A36 (36ksi)	Typical
22	SOD2	N40	N45			LL2x2x4x0	None	None	A36 (36ksi)	Typical
23	C4	N51A	N52A			PIPE_2.0	None	None	A53 Gr. B ...	Typical
24	C2	N53	N56			PIPE_2.0	None	None	A53 Gr. B ...	Typical
25	M36	N55	N58			RIGID	None	None	RIGID	Typical
26	M37	N54	N57			RIGID	None	None	RIGID	Typical
27	M31	N40	N53B			W6X8.5	None	None	A36 (36ksi)	Typical
28	M32	N39	N52B			W6X8.5	None	None	A36 (36ksi)	Typical
29	M31A	N42	N41			PIPE_2.5	None	None	A53 Gr. B ...	Typical
30	M34	N58B	N59			PIPE_2.0	None	None	A53 Gr. B ...	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	C3						Yes	** NA **			None
2	FH2						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
3	FH1						Yes	** NA **			None
4	M12	OOOXOX					Yes	** NA **		Exclude	None
5	M13	OOOXOX					Yes	** NA **		Exclude	None
6	M14	OOOXOX					Yes	** NA **		Exclude	None
7	M15	OOOXOX					Yes	** NA **		Exclude	None
8	C1						Yes	** NA **			None
9	M13A	OOOXOX					Yes	** NA **		Exclude	None
10	M14A	OOOXOX					Yes	** NA **		Exclude	None
11	SOP2						Yes	** NA **			None
12	SOP3						Yes	** NA **			None
13	M24						Yes	** NA **			None
14	M25						Yes	** NA **			None
15	M26						Yes	** NA **			None
16	M27						Yes	** NA **			None
17	SOH1						Yes	** NA **			None
18	SOH3						Yes	** NA **			None
19	SOD1	BenPIN	BenPIN				Yes	** NA **			None
20	SOH2						Yes	** NA **			None
21	SOH4						Yes	** NA **			None
22	SOD2	BenPIN	BenPIN				Yes	** NA **			None
23	C4						Yes	** NA **			None
24	C2						Yes	** NA **			None
25	M36	OOOXOX					Yes	** NA **		Exclude	None
26	M37	OOOXOX					Yes	** NA **		Exclude	None
27	M31						Yes	** NA **			None
28	M32						Yes	** NA **			None
29	M31A						Yes	** NA **			None
30	M34	BenPIN					Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	C3	PIPE_2.0	72			Lbyy						Lateral
2	FH2	HSS2X2X3	204			Lbyy						Lateral
3	FH1	HSS2X2X3	204			Lbyy						Lateral
4	C1	PIPE_2.0	72			Lbyy						Lateral
5	SOP2	PIPE_2.0	72									Lateral
6	SOP3	PIPE_2.0	72									Lateral
7	SOH1	LL2.5x2.5x4...	71.694									Lateral
8	SOH3	LL2.5x2.5x4...	71.694									Lateral
9	SOD1	LL2x2x4x0	86.279									Lateral
10	SOH2	LL2.5x2.5x4...	71.694									Lateral
11	SOH4	LL2.5x2.5x4...	71.694									Lateral
12	SOD2	LL2x2x4x0	86.279									Lateral
13	C4	PIPE_2.0	72			Lbyy						Lateral
14	C2	PIPE_2.0	72			Lbyy						Lateral
15	M31	W6X8.5	10			Lbyy						Lateral
16	M32	W6X8.5	10			Lbyy						Lateral
17	M31A	PIPE_2.5	72									Lateral
18	M34	PIPE_2.0	42.426									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1.1			18			
2	Wind 0	None					36	36		
3	Wind 30	None					36	36		
4	Wind 60	None					36	36		
5	Wind 90	None					36	36		
6	Wind 120	None					36	36		
7	Wind 150	None					36	36		
8	Ice Load	None					18	18		
9	Ice 0	None					36	36		
10	Ice 30	None					36	36		
11	Ice 60	None					36	36		
12	Ice 90	None					36	36		
13	Ice 120	None					36	36		
14	Ice 150	None					36	36		
15	Lm	None				1				
16	Lv	None				1				

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4 D	Yes	Y		1	1.4																		
2	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	2	1																
3	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	3	1																
4	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	4	1																
5	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	5	1																
6	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	6	1																
7	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	7	1																
8	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	2	-1																
9	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	3	-1																
10	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	4	-1																
11	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	5	-1																
12	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	6	-1																
13	1.2 D + 1.0 Wo @...	Yes	Y		1	1.2	7	-1																
14	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	9	1														
15	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	10	1														
16	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	11	1														
17	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	12	1														
18	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	13	1														
19	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	14	1														
20	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	9	-1														
21	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	10	-1														
22	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	11	-1														
23	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	12	-1														
24	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	13	-1														
25	1.2 D + 1.0 Di + 1...	Yes	Y		1	1.2	8	1	14	-1														
26	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	2	.063														
27	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	3	.063														
28	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	4	.063														
29	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	5	.063														
30	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	6	.063														
31	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	7	.063														
32	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	2	-.063														
33	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	3	-.063														
34	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	4	-.063														
35	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	5	-.063														
36	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	6	-.063														

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
37	1.2 D + 1.5 Lm + ...	Yes	Y		1	1.2	15	1.5	7	-.063														
38	1.2 D + 1.5 Lv	Yes	Y		1	1.2	16	1.5																
39	1.0 D	Yes	Y		1	1																		

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N52B	max	1188.506	36	2215.57	24	2948.133	16	0	39	0	39	0	39
2		min	-1182.73	18	677.512	39	107.783	10	0	1	0	1	0	1
3	N53B	max	1562.656	12	1502.374	18	579.184	3	0	39	0	39	0	39
4		min	-1239.382	30	449.526	12	-3137.172	21	0	1	0	1	0	1
5	N59	max	148.404	6	24.741	18	1133.525	12	0	39	0	39	0	39
6		min	-152.709	12	3.33	12	-1131.456	6	0	1	0	1	0	1
7	Totals:	max	1639.35	12	3681.235	18	2212.998	2						
8		min	-1639.357	6	1136.703	39	-2213.028	8						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	FH1	HSS2X2X3	.727	36.125	9	.118	36.125	y	12	3479.666	49266	2749.65	2749.65	3....	H1-1a
2	SOP2	PIPE_2.0	.428	24	12	.194	24		6	20866.733	32130	1871.625	1871.625	2....	H1-1b
3	M31A	PIPE_2.5	.420	60	22	.207	12		12	37773.818	50715	3596.25	3596.25	1....	H1-1b
4	FH2	HSS2X2X3	.354	48.875	10	.076	36.125	y	6	3479.666	49266	2749.65	2749.65	1....	H1-1a
5	M31	W6X8.5	.296	2.083	22	.164	1.979	y	24	81105.501	81648	4212	15471	1....	H1-1b
6	M32	W6X8.5	.296	2.083	16	.104	10	y	24	81105.501	81648	4212	15471	1....	H1-1b
7	SOP3	PIPE_2.0	.209	12	36	.147	12		12	20866.733	32130	1871.625	1871.625	1....	H1-1b
8	SOH3	LL2.5x2.5x4x0	.204	71.694	12	.024	71.694	z	13	48355.745	77112	4440.96	3010.844	2....	H1-1b
9	C4	PIPE_2.0	.202	51	8	.138	51		7	20866.733	32130	1871.625	1871.625	1....	H1-1b
10	SOH1	LL2.5x2.5x4x0	.178	71.694	7	.033	0	y	12	48355.745	77112	4440.96	3010.844	1....	H1-1b
11	SOH4	LL2.5x2.5x4x0	.152	71.694	32	.027	0	z	7	48355.745	77112	4440.96	3010.844	1....	H1-1b
12	SOH2	LL2.5x2.5x4x0	.145	0	24	.023	71.694	y	6	48355.745	77112	4440.96	3010.844	1....	H1-1b
13	SOD1	LL2x2x4x0	.102	43.139	18	.010	0	y	15	21000.98	61236	2894.4	2067.004	1....	H1-1b
14	C1	PIPE_2.0	.094	51	10	.093	51		10	20866.733	32130	1871.625	1871.625	2....	H1-1b
15	SOD2	LL2x2x4x0	.092	43.139	22	.009	86.279	z	7	21000.98	61236	2894.4	2067.004	1....	H1-1b
16	C2	PIPE_2.0	.078	51	6	.141	51		12	20866.733	32130	1871.625	1871.625	2....	H1-1b
17	C3	PIPE_2.0	.056	51	9	.107	51		10	20866.733	32130	1871.625	1871.625	2....	H1-1b
18	M34	PIPE_2.0	.041	42.426	12	.003	0		23	27658.062	32130	1871.625	1871.625	1....	H1-1b*

PAUL J. FORD & COMPANY
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Phone 614.221.6679 www.pauljford.com

Project # 37519-3879.001.8190
By AMS
Date: 09/25/19
v0.1, Effective 07/10/18

MOUNT TO TOWER CONNECTION CHECKS

REACTIONS

Px=	1.19	Kip
Py=	2.22	Kip
(Axial)Pz=	2.95	Kip
Mx=	0	Kip-in
My=	0	Kip-in
(Torque)Mz=	0	Kip-in

Number of Bolts = 4

BOLT CHECKS

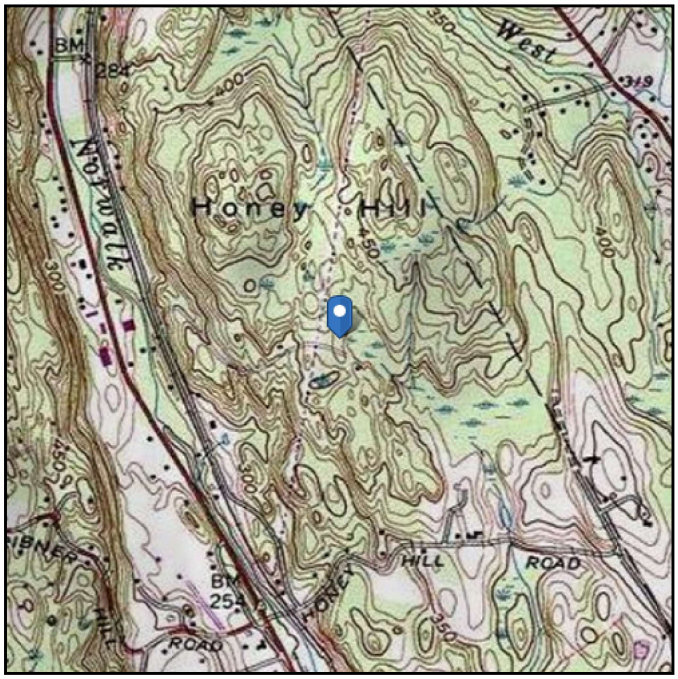
Tension Reaction	0.74	kip
Shear Reaction	0.63	kip
Bolt Type	U-Bolt	
Bolt Diameter	0.5	in
Tensile Strength	16.3	kips
Shear Strength	9.8	kips
Reduced Tensile Strength	-	kips
Tensile Capacity Used	4.5%	**Note: Tension reduction not required if tension or shear capacity < 30%**
Shear Capacity Used	6.4%	

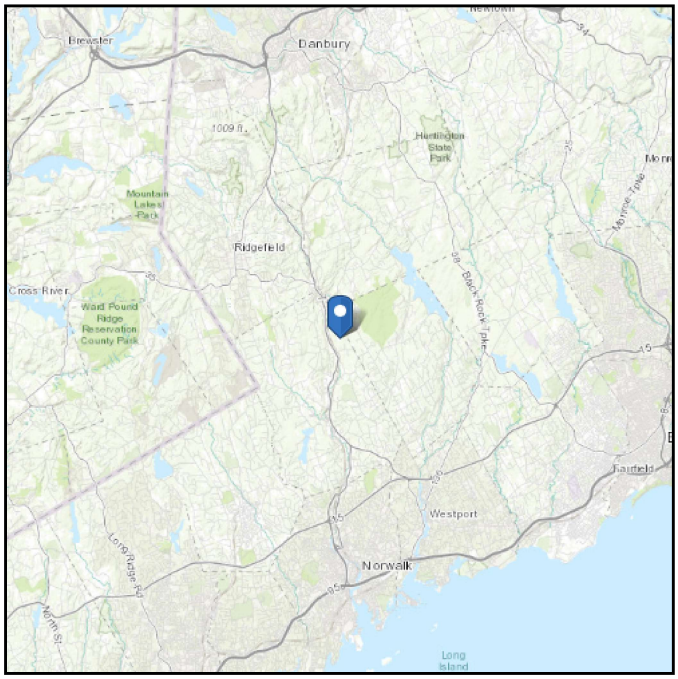
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 426.37 ft (NAVD 88)
Latitude: 41.238428
Longitude: -73.424011





Wind

Results:

Wind Speed:	118 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	91 Vmph
100-year MRI	97 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Oct 08 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

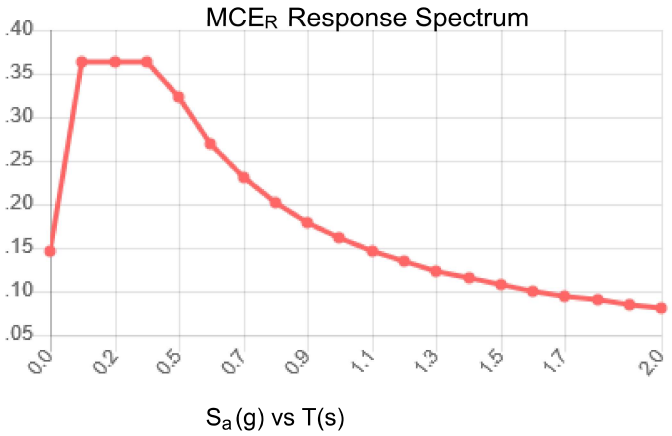
Seismic

Site Soil Class: D - Stiff Soil

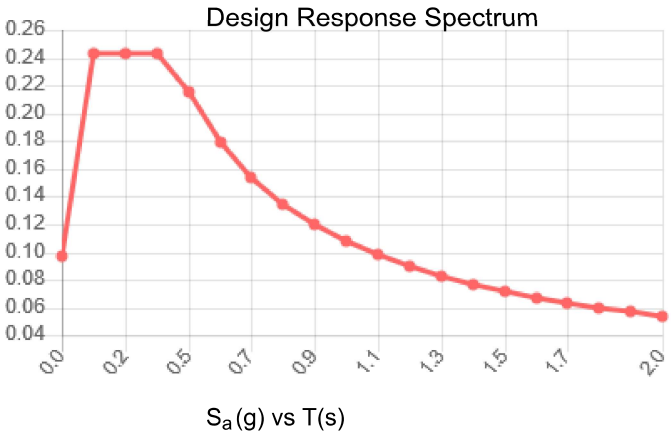
Results:

S_S :	0.227	S_{DS} :	0.243
S_1 :	0.067	S_{D1} :	0.108
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.127
S_{MS} :	0.364	PGA_M :	0.197
S_{M1} :	0.162	F_{PGA} :	1.546
		I_e :	1

Seismic Design Category B



S_a(g) vs T(s)



S_a(g) vs T(s)

Data Accessed: Mon Oct 08 2018

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Oct 08 2018

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit F

Power Density/RF Emissions Report

Site Name: WILTON CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
VZW PCS	1970	4	1480	5919.12	162	0.0811	1.0	8.11%
VZW Cellular CDMA	869	3	265	794.55	162	0.0109	0.579333333	1.88%
VZW Cellular LTE	880	4	355	1418.6	162	0.0194	0.586666667	3.31%
VZW AWS	2145	4	1450	5801.76	162	0.0795	1.0	7.95%
VZW 700	746	4	628	2511.04	162	0.0344	0.497333333	6.92%
VZW CBRS	746	4	11	42.32	162	0.0006	0.497333333	0.12%
Total Percentage of Maximum Permissible Exposure								28.29%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz
mW/cm^2 = milliwatts per square centimeter
ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:
1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.