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

December 21, 2018

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

RE: **Notice of Exempt Modification for Sprint, Crown Castle**
Site# 876334, Sprint Cascade:CT03XC027
150 Mattatuck Heights, Waterbury, CT 06705
Latitude: 41° -32' 16.3"/ Longitude: -72° -59' 6.1"

Dear Ms. Bachman:

Sprint currently maintains seven (7) antennas at the 130-foot level of the existing 133-foot monopole tower at 150 Mattatuck Heights, Waterbury, CT 06705. The tower is owned by Crown Castle. The property is owned by Waterbury Twin LLC & 150 MH LLC. Sprint now intends to remove and replace three (3) existing antennas with three (3) new antennas. Sprint also intends to remove three (3) remote radio heads and add one (1) hybrid cable.

An email from the City of Waterbury Admin support of the Clerk, Margaret Rice, states they no longer are in receipt of the original zoning approval of this tower. The email from M Rice is included with this letter.

.

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 Town Honorable Neil M. O'Leary, Mayor, City of Waterbury, James A. Sequin, AICP, City Planner land owner Waterbury Twin LLC & 150 MH LLC. Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

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

Attachments:

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

cc: Neil M. O'Leary, Mayor
City Hall Building
235 Grand Street
Waterbury, CT 060702

James A. Sequin, AICP
City Hall Building
235 Grand Street
Waterbury, CT 060702

Waterbury Twin LLC & 150
MH LLC.
12 Iselin Terrace
Larchmont, New York 10538

Myl, Kimberly

From: Myl, Kimberly
Sent: Tuesday, May 17, 2016 3:38 PM
To: 'siting.council@ct.gov'
Subject: 150 Mattatuck Heights - Existing Telecommunications Tower Original Zoning Approval

To Whom It May Concern:

Please be advised both the township (email below) and Crown Castle as the tower owner, do not have the original zoning resolution on file. Please use this email as notification to waive this requirement as we will include this and the email from the township within our submission.

Please let me know if you have any questions or need additional information. Thank you in advance.

KIMBERLY MYL
Real Estate Specialist
T: (201) 236-9069 | M: (201) 993-3697

CROWN CASTLE
1200 MacArthur Blvd, Suite 200
Mahwah, NJ 07430

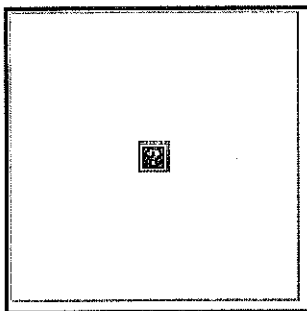
From: Margaret Rice [mailto:mrice@waterburyct.org]
Sent: Tuesday, May 17, 2016 1:03 PM
To: Myl, Kimberly
Subject: RE: 150 Mattatuck Heights - Existing Telecommunications Tower Original Zoning Approval

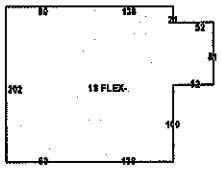
Hi Kimberly,

I checked our records and City Clerk's office and could not find anything. I then contacted the Town Clerk and I was told that there might be something on the Land Records and that you would need to contact the Town Clerk for them to do a Title Search. They're phone number is (203) 574-6806.

Cissie
Administrative Support Specialist III
203)574-6817 Ext.7296

Location: 150 MATTATUCK HEIGHTS **Owner:** WATERBURY TWIN LLC & 150 MH LLC





Property Information:

Map Block Lot:	0424-0141-0001	**Acres:**	7.02
Primary Use:	Industrial - Flex	**Zone:**	IP
Neighborhood:	85000-Industrial Park	**Vol/Page:**	4647
Mailing Address:	WATERBURY TWIN LLC & 150 MH LLC 12 ISELIN TERRACE LARCHMONT NY 10538		

Property Values:

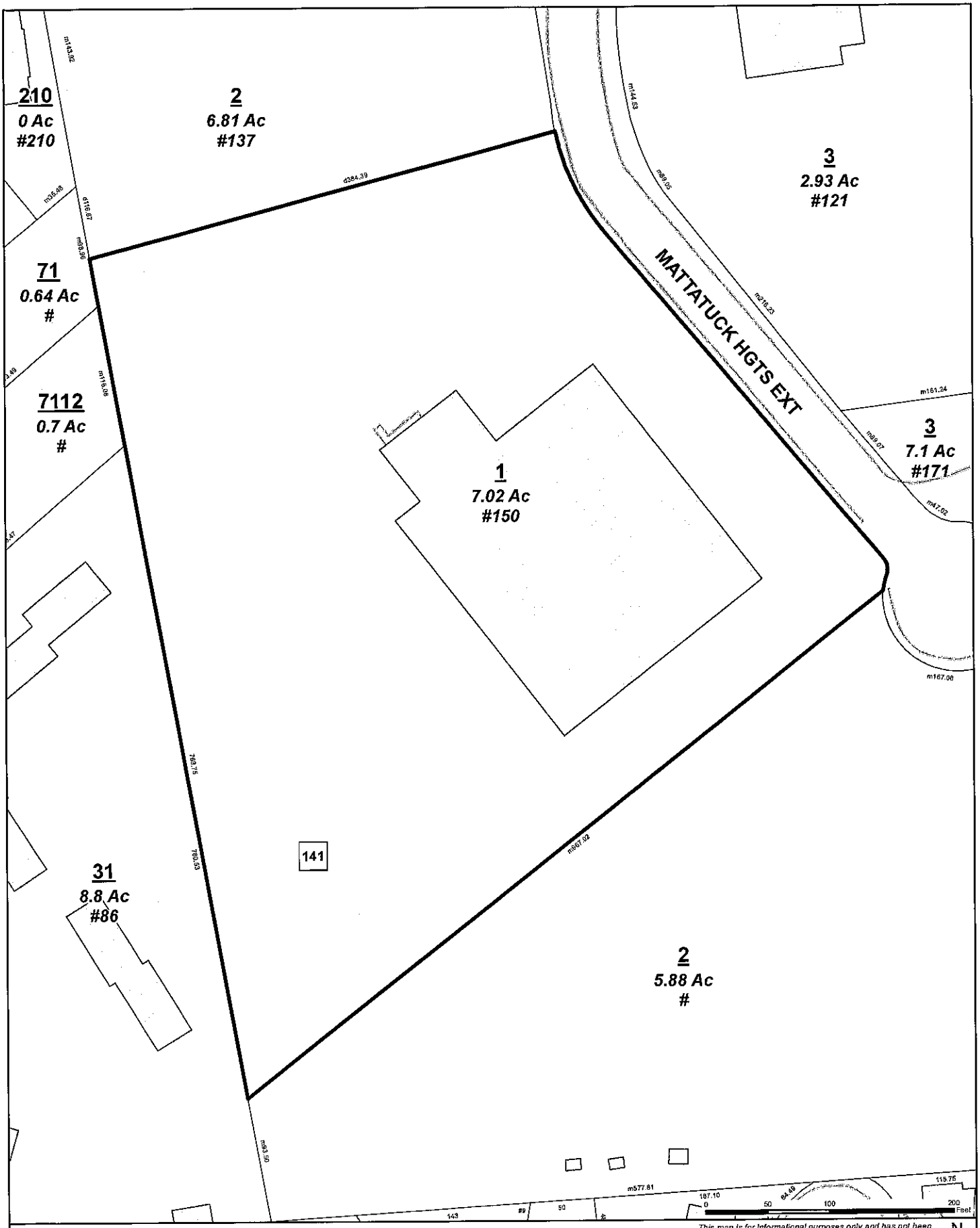
	Appraised Value	Assessed Value (70%)
Building	1619053	1133340
Land	287048	200930
OutBuilding	66320	46420
Total	1972421	1380690

Building Information:

Bldg Style:		**Living Area:**	48248sq.ft
Construction:	Average	**Year Built:**	1988
Exterior Wall:	Brick Solid	**Stories:**	1
Roof Cover:		**Heating:**	Space Heater
Condition:	Average	**Heat Fuel:**	
Rooms:	0	**Bedrooms:**	0
Full Baths:	0	**Half Baths:**	0

Outbuilding Information:

Type	Area (sq.ft)	Year Built	Condition
Tanks Tanks	1sq.ft	1996	Average
Concrete Paving	390sq.ft	1996	Average
Concrete Paving	40sq.ft	1988	Average
Concrete Paving	40sq.ft	1988	Average



City of Waterbury
Public Works Department

MBL: **0424-0141-0001**

ADDRESS: 150 MATTATUCK HEIGHTS

This map is for informational purposes only and has not been prepared for, or suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to verify the usability of the information. The City of Waterbury makes no warranties, express or implied, as to the use of the information obtained herein.

N

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Monday, December 24, 2018 8:47 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 774047453725 Delivered

Your package has been delivered

Tracking # 774047453725

Ship date:
Fri, 12/21/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US

Delivered

Delivery date:
Mon, 12/24/2018 8:44 am

James A. Sequin, AICP-Planner
City of Waterbury
235 Grand Street
WATERBURY, CT 06702
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774047453725
Status:	Delivered: 12/24/2018 08:44 AM Signed for By: K.BARON
Reference:	1766.6680
Signed for by:	K.BARON
Delivery location:	WATERBURY, CT
Delivered to:	Mailroom
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.

Special handling/Services:	Deliver Weekday
Standard transit:	12/24/2018 by 10:30 am

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 7:46 AM CST on 12/24/2018.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

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

Thank you for your business.

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Monday, December 24, 2018 8:47 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 774047425828 Delivered

Your package has been delivered

Tracking # 774047425828

Ship date:
Fri, 12/21/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US

Delivered

Delivery date:
Mon, 12/24/2018 8:44 am

Neil M. O'Leary-Mayor
City of Waterbury
235 Grand Street
WATERBURY, CT 06702
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774047425828
Status:	Delivered: 12/24/2018 08:44 AM Signed for By: K.BARON
Reference:	1766.6680
Signed for by:	K.BARON
Delivery location:	WATERBURY, CT
Delivered to:	Mailroom
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday

Standard transit:	12/24/2018 by 10:30 am

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 7:46 AM CST on 12/24/2018.

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Thank you for your business.

774047580044

Delivered
Saturday 12/22/2018 at 1:00 pm

DELIVERED

Signature not required

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Crown Castle
Jeff Barbadora
12 Gill Street
Suite 5800
WOBURN, MA US 01801
781 970-0053

TO

Waterbury Twin LLC & 150 MH LLC
Waterbury Twin LLC & 150 MH LLC
LARCHMONT, NY US 10538
518 373-3543

Shipment Facts

TRACKING NUMBER
774047580044

SERVICE
FedEx Priority Overnight

WEIGHT
0.5 lbs / 0.23 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Residence

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
0.5 lbs / 0.23 kgs

TERMS
Not Available

SHIPPER REFERENCE
1766.6680

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday, Residential Delivery

STANDARD TRANSIT

12/24/2018 by 10:30 am

SHIP DATE

Fri 12/21/2018

ACTUAL DELIVERY
Sat 12/22/2018 1:00 pm

Travel History

			Local Scan Time
Saturday, 12/22/2018			
1:00 pm	LARCHMONT, NY	Delivered	

		Left at front door. Package delivered to recipient address - release authorized
10:11 am	MOUNT VERNON, NY	On FedEx vehicle for delivery
8:56 am	MOUNT VERNON, NY	At local FedEx facility
5:07 am	NEWARK, NJ	Departed FedEx location
12:46 am	NEWARK, NJ	Arrived at FedEx location
Friday , 12/21/2018		
11:31 pm	EAST BOSTON, MA	Shipment exception Delay beyond our control
8:05 pm	WILMINGTON, MA	Left FedEx origin facility
6:28 pm	WILMINGTON, MA	Picked up
1:46 pm		Shipment information sent to FedEx

Date: **August 12, 2018**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Elizabeth Sweeney
Crown Castle
3 Corporate Dr., St 101
Clifton Park, NY 12065

Subject:	**Mount Structural Analysis**	
Carrier Designation:	***Sprint PCS Co-locate***	
	Carrier Site Number:	CT03XC027
	Carrier Site Name:	CT03XC027S18.3
Crown Castle Designation:	**Crown Castle BU Number:**	876317
	Crown Castle Site Name:	Waterbury
	Crown Castle JDE Job Number:	519255
	Crown Castle PO Number:	1231901
	Crown Castle Application Number:	450715, Rev.3
Engineering Firm Designation:	**Infinigy Report Designation:**	600-002
Site Data:	**150 Mattatuck Heights, Waterbury, CT 06705** **Latitude 41° 32' 16.30" Longitude -72° 59' 6.10"**	
Structure Information:	**Tower Height & Type:**	**133 Foot Monopole**
	Mount Elevation:	**133 ft**
	Mount Type:	**13 ft Platform**

Dear Elizabeth Sweeney,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural integrity of Sprint's antenna proposed mounting system with the proposed appurtenance 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 for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the proposed loading to be:

Platform **Sufficient Capacity**

This analysis has been performed in accordance with the 2015 International Building Code with 2016 Connecticut State Building Code and the Local Jurisdictional wind speed requirement of a 97 mph nominal 3-second gust wind speed as required for use in the ANSI/TIA-222-G Standard per Exception #5 of Section 1609.1. Exposure Category B and Risk Category II were used in this analysis.

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

Mount structural analysis prepared by: Aaron Estabrooks

Respectfully Submitted by:

Joe Johnston, P.E.
VP Structural Engineering / Principal

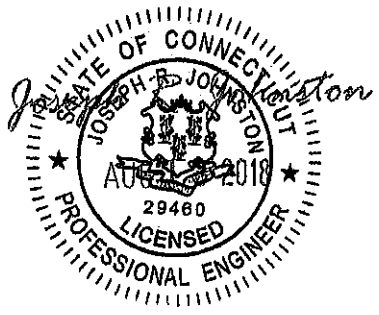


TABLE OF CONTENTS

1) INTRODUCTION

The proposed mount installation will consist of a three (3) 13 ft wide Platform at the 133 ft elevation. The proposed antenna loading was obtained from the Application provided by CCI, Application Number 450715, Revision 3 and the Valmont Design Drawings.

2) ANALYSIS CRITERIA

The structural analysis was performed in accordance with the requirements of TIA 222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75 inch escalated ice thickness, Exposure Category B and Topographic Category 1. In addition, the mounts have been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
133.0	130.0	3	Nokia	AAHC	--	1

Notes:
1) Proposed equipment

Table 2 - Existing Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
133.0	130.0	4	RFS	APXVSPP18-C-A20	Platform	1
	133.0	3	Alcatel-Lucent	800 External Notch Filter		
		3	Alcatel-Lucent	800MHz RRH		
		6	Alcatel-Lucent	1900MHz RRH (65MHz)		
		4	RFS	IBC1900HB-2		
		2	RFS	PD2DE-700/2700		

Notes:
1) Existing Equipment to Remain

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Sprint Application	450715, Rev.3	CCI Sites
Mount Photos	Photos	876317	CCI Sites
Mount Assembly Drawings	Valmont	DWG# DCA039Z	Valmont

3.1) Analysis Method

RISA-3D (Version 16.0.5), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool 3.0.2, a tool internally developed by Infinigy, was used to calculate member loading for various load cases. Selected output from the analysis is included in Appendix B.

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1,2	Face Horizontal	133.0	57.4%	Pass
	Handrail		17.8%	Pass
	Mount Pipe		38.3%	Pass
	Bracing		77.6%	Pass
	Standoff		74.6%	Pass
	Bolts		29.5%	Pass

Structure Rating (max from all components) =	77.6%

Notes:

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

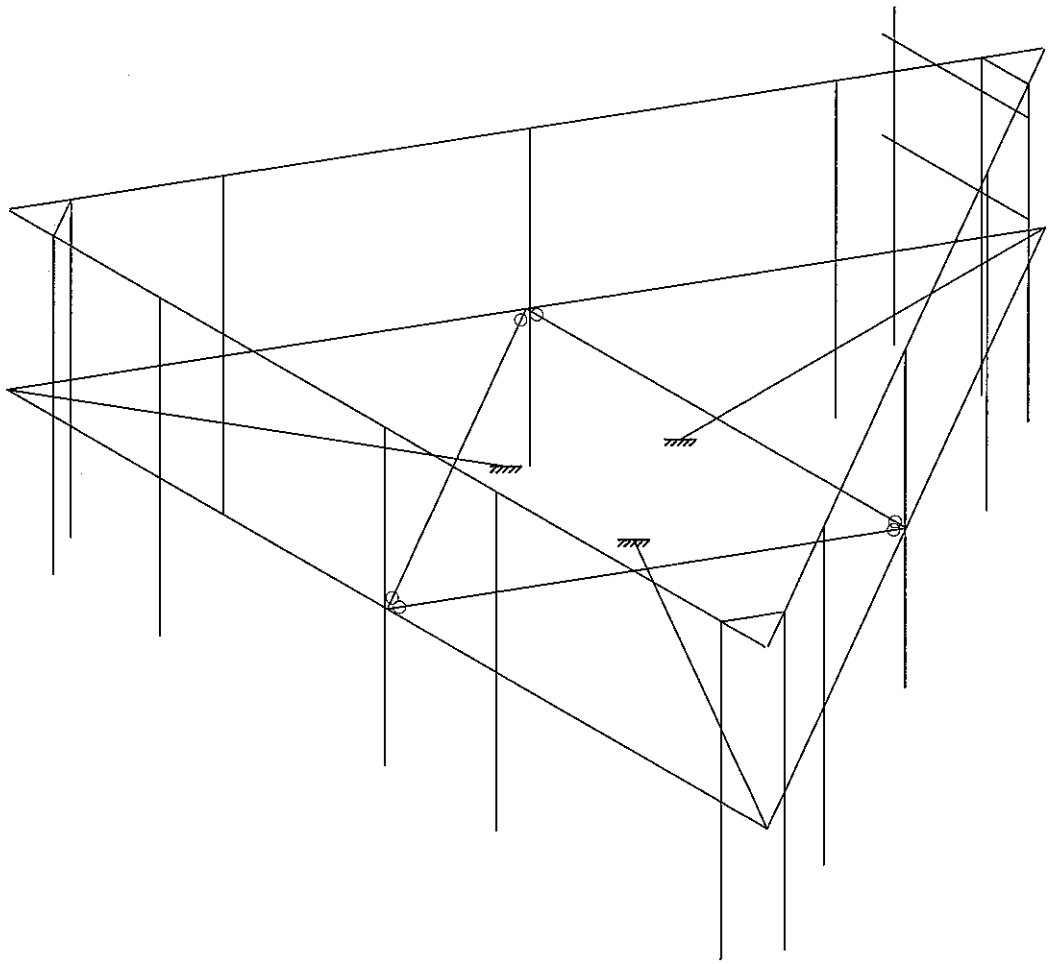
4.1) Recommendations

The mount has Sufficient capacity to carry the proposed loading configuration. Modifications are not required at this time.

APPENDIX A

WIRE FRAME AND RENDERED MODELS

Infinigy Enigneering, PLLC	876317	Final Configuration
ATE		Aug 12, 2018 at 5:52 PM
600-002		Valmont DCA039Z.r3d



Infinigy Enigneering, PLLC	876317	Wireframe
ATE		Aug 12, 2018 at 5:53 PM
600-002		Valmont DCA039Z.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	876317
Client:	Crown
Carrier:	Sprint
Engineer:	ATE
Date:	8/12/2018

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Mount - Platform
Number of Sectors:	4
Structure Shape 1:	Flat

Rooftop Inputs:

Rooftop Wind Speed-Up?: No

Wind Loading Inputs:

Design Wind Velocity:	97	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	133.0	ft
Side Face Angle (θ):	90	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
24.53	1.00	**49.07**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
6.52	1.00	**18.36**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (nominal 3-second gust)
Base Ice Thickness:	0.75	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(90) (lbs)	Fx(0) (lbs)
RFS APXVSPP18-C-A20	130.0	4	1.00	Flat	Flat	24.37	8.02	195.59	128.77	128.77	195.59
Nokia AAHC	130.0	3	1.00	Flat	Flat	24.37	4.21	102.66	50.53	50.53	102.66
Alcatel Lucent 800 External Notch Filter	133.0	3	1.00	Flat	Flat	24.53	0.66	16.19	7.10	7.10	16.19
Alcatel Lucent 800MHz RRH	133.0	3	1.00	Flat	Flat	24.53	2.13	52.36	43.50	43.50	52.36
Alcatel Lucent 1900MHz RRH (65MHz)	133.0	3	1.00	Flat	Flat	24.53	2.32	56.96	58.50	58.50	56.96
RFS IBC1900HB-2	133.0	4	1.00	Flat	Flat	24.53	1.13	27.60	17.48	17.48	27.60
RFS PD2DE-700/2700	133.0	2	1.00	Flat	Flat	24.53	0.11	2.80	2.80	2.80	2.80
Alcatel Lucent 1900MHz RRH (65MHz)	133.0	3	1.00	Flat	Flat	24.53	2.32	56.96	58.50	58.50	56.96

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2		180	Horizontal	Beam	Channel	A36 Gr.36	Typical
2	M3	N5	N6			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
3	M4	N7	N8			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
4	M5	N1	N12			Offset Arm	Beam	Tube	A53 Gr. B	Typical
5	M6	N2	N13		180	Horizontal	Beam	Channel	A36 Gr.36	Typical
6	M9	N18	N19			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
7	M10	N2	N23			Offset Arm	Beam	Tube	A53 Gr. B	Typical
8	M11	N13	N1		180	Horizontal	Beam	Channel	A36 Gr.36	Typical
9	M14	N28	N29			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
10	M15	N13	N33			Offset Arm	Beam	Tube	A53 Gr. B	Typical
11	M16	N34	N35			Offset Horz	Beam	Tube	A36 Gr.36	Typical
12	M17	N35	N36			Offset Horz	Beam	Tube	A36 Gr.36	Typical
13	M18	N36	N34			Offset Horz	Beam	Tube	A36 Gr.36	Typical
14	M19	N40	N42			Handrail	Beam	Pipe	A53 Gr. B	Typical
15	M20	N43	N44			Handrail	Beam	Pipe	A53 Gr. B	Typical
16	M21	N45	N46			Handrail	Beam	Pipe	A53 Gr. B	Typical
17	M22	N47	N48			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
18	M23	N49	N50			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
19	M25	N56	N57			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
20	M26	N58	N59			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
21	M27	N60	N61			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
22	M28	N65	N66			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
23	M29	N67	N68			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
24	M30	N69	N70			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
25	M31	N76	N77			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
26	M32	N79	N80			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
27	M33	N82	N83			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical
28	M34	N77	N29			Bracing	Beam	Single Angle	A36 Gr.36	Typical
29	M35	N80	N8			Bracing	Beam	Single Angle	A36 Gr.36	Typical
30	M36	N83	N19			Bracing	Beam	Single Angle	A36 Gr.36	Typical
31	M37	N85	N74			Cross arm	Beam	Single Angle	A36 Gr.36	Typical
32	M38	N86	N75			Cross arm	Beam	Single Angle	A36 Gr.36	Typical
33	M39	N89	N90			Mount Pipe	Beam	Pipe	A53 Gr. B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	C5x6.7	3	468	.3
3	A36 Gr.36	L3.5x3.5x4	3	234	.1
4	A36 Gr.36	L2x2x4	3	28.5	0
5	A36 Gr.36	L3x3x4	2	60	0
6	A53 Gr. B	HSS4x4x4	3	225	.2
7	A53 Gr. B	PIPE 2.0	19	1425	.4
8	Total HR Steel		33	2440.5	1

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Self Weight	DL		-1			32		3	
2	Wind Load AZI 000	WLZ					32		1	
3	Wind Load AZI 090	WLX					32		1	
4	Ice Weight	OL1					32	30	3	
5	Wind + Ice Load AZI 000	OL2					32		1	
6	Wind + Ice Load AZI 090	OL3					32		1	
7	Service Live 1	LL				3				
8	BLC 1 Transient Area Loads	None						36		
9	BLC 2 Transient Area Loads	None						32		
10	BLC 3 Transient Area Loads	None						27		
11	BLC 4 Transient Area Loads	None						36		
12	BLC 5 Transient Area Loads	None						32		
13	BLC 6 Transient Area Loads	None						27		

Load Combinations

	Description	So..	P...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y		DL	1.4						
2	1.2D + 1.6W AZI 000	Yes	Y		DL	1.2	WLZ	1.6				
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	WLZ	1.386	WLX	.8		
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	WLZ	.8	WLX	1.386		
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			WLX	1.6		
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	WLZ	-.8	WLX	1.386		
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	WLZ	-1.386	WLX	.8		
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	WLZ	-1.6				
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	WLZ	-1.386	WLX	-.8		
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	WLZ	-.8	WLX	-1.386		
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			WLX	-1.6		
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	WLZ	.8	WLX	-1.386		
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	WLZ	1.386	WLX	-.8		
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	WLZ	1.6				
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	WLZ	1.386	WLX	.8		
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	WLZ	.8	WLX	1.386		
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			WLX	1.6		
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	WLZ	-.8	WLX	1.386		
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	WLZ	-1.386	WLX	.8		
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	WLZ	-1.6				
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	WLZ	-1.386	WLX	-.8		
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	WLZ	-.8	WLX	-1.386		
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			WLX	-1.6		
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	WLZ	.8	WLX	-1.386		
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	WLZ	1.386	WLX	-.8		
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1				
27	1.2D + 1.0Di + 1.0Wi AZI 000	Yes	Y		DL	1.2	OL1	1	OL2	1		
28	1.2D + 1.0Di + 1.0Wi AZI 030	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5
29	1.2D + 1.0Di + 1.0Wi AZI 060	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866
30	1.2D + 1.0Di + 1.0Wi AZI 090	Yes	Y		DL	1.2	OL1	1			OL3	1
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y		DL	1.2	OL1	1	OL2	-1		

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y		DL	1.2	OL1	1			OL3	-1
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5
39	1.2D + 1.5L + 1.0WL (30 mph) AZI 000	Yes	Y		DL	1.2	LL	1.5	WLZ	.096		
40	1.2D + 1.5L + 1.0WL (30 mph) AZI 030	Yes	Y		DL	1.2	LL	1.5	WLZ	.083	WLX	.048
41	1.2D + 1.5L + 1.0WL (30 mph) AZI 060	Yes	Y		DL	1.2	LL	1.5	WLZ	.048	WLX	.083
42	1.2D + 1.5L + 1.0WL (30 mph) AZI 090	Yes	Y		DL	1.2	LL	1.5			WLX	.096
43	1.2D + 1.5L + 1.0WL (30 mph) AZI 120	Yes	Y		DL	1.2	LL	1.5	WLZ	-.048	WLX	.083
44	1.2D + 1.5L + 1.0WL (30 mph) AZI 150	Yes	Y		DL	1.2	LL	1.5	WLZ	-.083	WLX	.048
45	1.2D + 1.5L + 1.0WL (30 mph) AZI 180	Yes	Y		DL	1.2	LL	1.5	WLZ	-.096		
46	1.2D + 1.5L + 1.0WL (30 mph) AZI 210	Yes	Y		DL	1.2	LL	1.5	WLZ	-.083	WLX	-.048
47	1.2D + 1.5L + 1.0WL (30 mph) AZI 240	Yes	Y		DL	1.2	LL	1.5	WLZ	-.048	WLX	-.083
48	1.2D + 1.5L + 1.0WL (30 mph) AZI 270	Yes	Y		DL	1.2	LL	1.5			WLX	-.096
49	1.2D + 1.5L + 1.0WL (30 mph) AZI 300	Yes	Y		DL	1.2	LL	1.5	WLZ	.048	WLX	-.083
50	1.2D + 1.5L + 1.0WL (30 mph) AZI 330	Yes	Y		DL	1.2	LL	1.5	WLZ	.083	WLX	-.048

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N12	max	2330.064	17	3542.817	31	3507.553	13	-.822	25	1.864	14	-1.42	24
2		min	-2881.959	11	794.05	24	-3165.452	19	-4.436	32	-1.916	8	-7.67	31
3	N23	max	2673.005	4	2203.1	35	1760.226	13	-.321	15	1.4	6	3.438	35
4		min	-2097.777	22	420.928	16	-1356.615	19	-3.126	34	-1.11	24	.176	16
5	N33	max	1419.431	18	2053.717	27	1375.389	16	3.69	27	1.059	24	.124	23
6		min	-1442.923	12	277.184	20	-2124.897	10	-.254	20	-1.279	6	-1.27	30
7	Totals:	max	5839.976	17	7596.517	37	5543.75	14						
8		min	-5839.976	23	2331.523	18	-5543.75	20						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Memb...	Shape	Code Check	L...	LC	Shear Check	L...	...	LC	phi*...	phi*...	phi*...	phi*...	Eqn
1	M16	L3.5x3.5x4	.776	39	29	.048	39	y	27	451...	550...	2.416	5.229	H2-1
2	M5	HSS4x4x4	.746	75	33	.136	75	z	9	937...	106...	12.3...	12.3...	H1...
3	M18	L3.5x3.5x4	.719	39	34	.054	39	y	27	451...	550...	2.416	5.229	H2-1
4	M17	L3.5x3.5x4	.677	3...	28	.053	3...	y	35	451...	550...	2.416	5.229	H2-1
5	M1	C5x6.7	.574	0	8	.096	0	y	32	625...	638...	1.604	9.585	H1...
6	M11	C5x6.7	.559	1...	4	.108	1...	y	32	625...	638...	1.604	9.585	H1...
7	M6	C5x6.7	.538	0	12	.125	0	y	36	625...	638...	1.604	9.585	H1...
8	M35	L2x2x4	.416	0	31	.084	9...	y	7	296...	305...	.691	1.577	H2-1
9	M10	HSS4x4x4	.401	75	33	.175	75	y	33	937...	106...	12.3...	12.3...	H1...
10	M4	PIPE_2.0	.383	2...	30	.074	2...		7	295...	321...	1.872	1.872	H1...
11	M38	L3x3x4	.364	1...	2	.081	1...	z	2	406...	466...	1.688	3.756	H2-1
12	M31	PIPE_2.0	.333	2...	36	.066	2...		10	295...	321...	1.872	1.872	H1...
13	M15	HSS4x4x4	.331	75	29	.190	75	y	30	937...	106...	12.3...	12.3...	H1...
14	M33	PIPE_2.0	.313	2...	8	.217	2...		8	319...	321...	1.872	1.872	H1...
15	M22	PIPE_2.0	.301	2...	36	.073	2...		13	295...	321...	1.872	1.872	H1...
16	M34	L2x2x4	.291	0	9	.080	0	y	9	296...	305...	.691	1.577	H2-1
17	M14	PIPE_2.0	.284	2...	38	.070	2...		13	295...	321...	1.872	1.872	H1...
18	M39	PIPE_2.0	.284	3...	2	.128	3...		13	312...	321...	1.872	1.872	H1...

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Memb...	Shape	Code Check	L...	LC	Shear Check	L...	...	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
19	M30	PIPE_2.0	.253	2...	13	.066	2...		11	295...	321...	1.872	1.872	..	H1...
20	M28	PIPE_2.0	.234	2...	32	.072	2...		4	295...	321...	1.872	1.872	..	H1...
21	M32	PIPE_2.0	.222	2...	5	.048	2...		13	295...	321...	1.872	1.872	..	H1...
22	M25	PIPE_2.0	.218	2...	3	.068	2...		4	295...	321...	1.872	1.872	..	H1...
23	M3	PIPE_2.0	.211	2...	30	.079	2...		3	295...	321...	1.872	1.872	..	H1...
24	M26	PIPE_2.0	.194	2...	3	.107	2...		5	295...	321...	1.872	1.872	..	H1...
25	M9	PIPE_2.0	.178	2...	30	.135	3...		13	319...	321...	1.872	1.872	..	H1...
26	M19	PIPE_2.0	.173	1...	30	.079	1...		8	589...	321...	1.872	1.872	..	H1...
27	M20	PIPE_2.0	.165	1...	10	.107	7...		11	589...	321...	1.872	1.872	..	H1...
28	M23	PIPE_2.0	.155	2...	11	.038	2...		12	295...	321...	1.872	1.872	..	H1...
29	M29	PIPE_2.0	.148	2...	7	.033	2...		12	295...	321...	1.872	1.872	..	H1...
30	M21	PIPE_2.0	.148	1...	38	.069	1...		3	589...	321...	1.872	1.872	..	H1...
31	M27	PIPE_2.0	.137	60	10	.105	2...		11	295...	321...	1.872	1.872	..	H1...
32	M37	L3x3x4	.134	1...	38	.029	2...	y	30	406...	466...	1.688	3.756	..	H2-1
33	M36	L2x2x4	.098	9...	13	.018	0	y	5	296...	305...	.691	1.577	..	H2-1

APPENDIX D

ADDITIONAL CALCULATIONS

Date:	8/12/2018
Client	Crown
Carrier	Sprint
Engineer:	ATE
Site:	876317
Job #:	600-002

Code:	LRFD	
Axial:	3507.55	lbs
Shear:	3542.82	lbs

Bolt Capacity (5/8" A325 Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	13106.7	9830.0	2	19660
Shear(lb)	8013.3	6010.0	2	12020

Interaction Check	
$T/\phi T_n$	17.8%
$V/\phi Vn$	29.5%
≤1.0	11.9%
	OK

Date: **August 29, 2018**

James Klein
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
770-701-2500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC027
	Carrier Site Name:	CT03XC027S18.3
Crown Castle Designation:	**Crown Castle BU Number:**	876317
	Crown Castle Site Name:	WATERBURY
	Crown Castle JDE Job Number:	519255
	Crown Castle Work Order Number:	1621488
	Crown Castle Application Number:	450715 Rev. 4
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1621488
Site Data:	**150 Mattatuck Heights, WATERBURY, New Haven County, CT** **Latitude *41° 32' 16.3"*, Longitude *-72° 59' 6.1"*** **133 Foot - Monopole Tower**	

Dear James Klein,

Jacobs Engineering Group, Inc. 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**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2016 Connecticut State Building Code. Exposure Category B and Risk Category II were used in this analysis.

Structural analysis prepared by:

Kelvin Klein Lagata
Structural Engineer

Respectfully **submitted by:**

2018-08-29
18:56-04:00

Paul L. Mucci, P.E.
Senior Project Manager

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 133 ft Monopole tower designed by VALMONT in April of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified multiple times in the past to accommodate additional loading.

2) ANALYSIS CRITERIA

Building Code:	2012 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.275 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)
133.0	133.0	6	alcatel lucent	1900MHz RRH (65MHz)	1 3	1-1/2 1-1/4
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER		
		3	alcatel lucent	800MHZ RRH		
		4	rfs celwave	IBC1900HB-2		
		2	rfs celwave	PD2DE-700/2700		
		1	tower mounts	Platform Mount [LP 602-1]		
	130.0	3	nokia	AAHC w/ Mount Pipe		
		4	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		

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)
133.0	135.0	1	andrew	VHLP2-18	3	7983A
		2	andrew	VHLP2-23		
110.0	113.0	1	trimble	BULLET III	1 13	1/2 1-5/8
	110.0	3	alcatel lucent	RRH2X60-PCS		
		3	alcatel lucent	RRH4X45-AWS4 B66		
		6	andrew	SBNHH-1D65B w/ Mount Pipe		
		3	antel	BXA-70063/6CF-2 w/ Mount Pipe		
		3	antel	BXA-80063/4CF w/ Mount Pipe		
		6	commscope	CBC78-DF		
		1	rfs celwave	DB-T1-6Z-8AB-0Z		
		1	tower mounts	Platform Mount [LP 713-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
100.0	100.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	5 6 2 1	7/8 1-1/4 1-1/2 1-5/8
		3	ericsson	AIR 21 B2A/B4P w/ Mount Pipe		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	rfs celwave	ATMAA1412D-1A20		
		1	tower mounts	Platform Mount [LP 303-1]		
90.0	90.0	3	rfs celwave	APXV18-206517S-C	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
50.0	51.0	1	lucent	KS24019-L112A	1	1/2
	50.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Velocitel	1529737	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	1630930	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	1530953	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, Inc.	2381113	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3315244	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions, Inc.	2381112	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3770745	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), 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) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
133 - 128	Pole	TP14.48x13.48x0.1875	Pole	14.9%	Pass
128 - 123	Pole	TP15.479x14.48x0.1875	Pole	26.7%	Pass
123 - 118	Pole	TP16.479x15.479x0.1875	Pole	36.8%	Pass
118 - 113	Pole	TP17.478x16.479x0.1875	Pole	45.4%	Pass
113 - 108	Pole	TP18.478x17.478x0.1875	Pole	57.0%	Pass
108 - 104.75	Pole	TP19.127x18.478x0.1875	Pole	66.7%	Pass
104.75 - 104.5	Pole + Reinf.	TP19.177x19.127x0.425	Reinf. 11 Bolt-Shaft Bearing	41.4%	Pass
104.5 - 99.5	Pole + Reinf.	TP20.177x19.177x0.4063	Reinf. 11 Tension Rupture	46.5%	Pass
99.5 - 98.75	Pole + Reinf.	TP20.327x20.177x0.4063	Reinf. 11 Tension Rupture	48.1%	Pass
98.75 - 98.5	Pole + Reinf.	TP20.377x20.327x0.4063	Reinf. 11 Tension Rupture	48.6%	Pass
98.5 - 95	Pole + Reinf.	TP21.81x20.377x0.4	Reinf. 11 Tension Rupture	55.5%	Pass
95 - 90	Pole + Reinf.	TP21.7x20.701x0.4563	Reinf. 11 Tension Rupture	57.0%	Pass
90 - 89.25	Pole + Reinf.	TP21.85x21.7x0.45	Reinf. 11 Tension Rupture	58.2%	Pass
89.25 - 89	Pole + Reinf.	TP21.9x21.85x0.85	Reinf. 5 Bolt-Shaft Bearing	55.2%	Pass
89 - 88.25	Pole + Reinf.	TP22.05x21.9x0.8375	Reinf. 5 Tension Rupture	48.1%	Pass
88.25 - 88	Pole + Reinf.	TP22.1x22.05x0.6125	Reinf. 5 Tension Rupture	64.1%	Pass
88 - 83	Pole + Reinf.	TP23.099x22.1x0.5875	Reinf. 5 Tension Rupture	72.0%	Pass
83 - 78	Pole + Reinf.	TP24.097x23.099x0.575	Reinf. 5 Tension Rupture	79.2%	Pass
78 - 77	Pole + Reinf.	TP24.297x24.097x0.575	Reinf. 5 Tension Rupture	80.5%	Pass
77 - 76.75	Pole + Reinf.	TP24.347x24.297x0.7625	Reinf. 5 Tension Rupture	61.8%	Pass
76.75 - 71.75	Pole + Reinf.	TP25.346x24.347x0.7375	Reinf. 5 Tension Rupture	67.0%	Pass
71.75 - 66.75	Pole + Reinf.	TP26.345x25.346x0.7125	Reinf. 5 Tension Rupture	71.8%	Pass
66.75 - 62.25	Pole + Reinf.	TP27.244x26.345x0.7	Reinf. 5 Tension Rupture	75.8%	Pass
62.25 - 62	Pole + Reinf.	TP27.294x27.244x0.7	Reinf. 5 Tension Rupture	76.0%	Pass
62 - 59.5	Pole + Reinf.	TP27.793x27.294x0.4	Reinf. 9 Tension Rupture	90.7%	Pass
59.5 - 59.25	Pole + Reinf.	TP27.843x27.793x0.75	Reinf. 4 Bolt-Shaft Bearing	61.9%	Pass
59.25 - 54.25	Pole + Reinf.	TP28.842x27.843x0.725	Reinf. 4 Tension Rupture	63.4%	Pass
54.25 - 50	Pole + Reinf.	TP30.64x28.842x0.7	Reinf. 4 Tension Rupture	65.9%	Pass
50 - 45	Pole + Reinf.	TP30.192x29.191x0.7625	Reinf. 4 Tension Rupture	64.5%	Pass
45 - 40.75	Pole + Reinf.	TP31.043x30.192x0.75	Reinf. 4 Tension Rupture	66.6%	Pass
40.75 - 40.5	Pole + Reinf.	TP31.093x31.043x0.7625	Reinf. 4 Tension Rupture	66.6%	Pass
40.5 - 35.75	Pole + Reinf.	TP32.044x31.093x0.75	Reinf. 4 Tension Rupture	68.8%	Pass
35.75 - 35.5	Pole + Reinf.	TP32.094x32.044x0.6875	Reinf. 4 Tension Rupture	71.8%	Pass
35.5 - 30.5	Pole + Reinf.	TP33.095x32.094x0.675	Reinf. 4 Tension Rupture	74.0%	Pass
30.5 - 29.75	Pole + Reinf.	TP33.245x33.095x0.4	Reinf. 7 Tension Rupture	98.0%	Pass
29.75 - 29.5	Pole + Reinf.	TP33.295x33.245x0.675	Reinf. 1 Tension Rupture	72.7%	Pass
29.5 - 24.5	Pole + Reinf.	TP34.296x33.295x0.6625	Reinf. 1 Tension Rupture	74.7%	Pass
24.5 - 19.5	Pole + Reinf.	TP35.297x34.296x0.65	Reinf. 1 Tension Rupture	76.7%	Pass
19.5 - 14.5	Pole + Reinf.	TP36.297x35.297x0.6375	Reinf. 1 Tension Rupture	78.5%	Pass
14.5 - 12.5	Pole + Reinf.	TP36.698x36.297x0.6375	Reinf. 1 Tension Rupture	79.2%	Pass
12.5 - 12.25	Pole + Reinf.	TP36.748x36.698x0.5625	Reinf. 1 Tension Rupture	91.4%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
12.25 - 10.75	Pole + Reinf.	TP37.048x36.748x0.5625	Reinf. 1 Tension Rupture	91.9%	Pass
10.75 - 10.5	Pole + Reinf.	TP37.098x37.048x0.6375	Reinf. 1 Tension Rupture	84.7%	Pass
10.5 - 5.5	Pole + Reinf.	TP38.099x37.098x0.625	Reinf. 1 Tension Rupture	86.4%	Pass
5.5 - 0.5	Pole + Reinf.	TP39.1x38.099x0.6125	Reinf. 1 Tension Rupture	88.0%	Pass
0.5 - 0	Pole + Reinf.	TP39.2x39.1x0.6125	Reinf. 1 Tension Rupture	88.2%	Pass
				Summary	
			Pole	91.0%	Pass
			Reinforcement	98.0%	Pass
			Overall	98.0%	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	74.2	Pass
1	Base Plate	0	69.5	Pass
1	Base Foundation Structural	0	13.3	Pass
1	Base Foundation Soil Interaction	0	69.2	Pass

Structure Rating (max from all components) =	98.0%

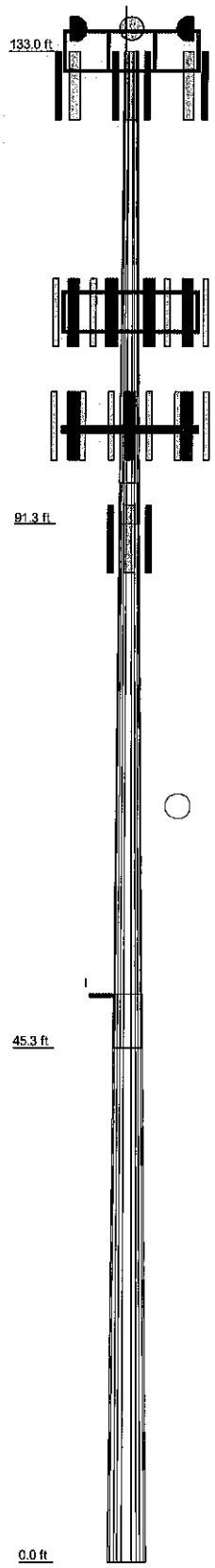
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT



Section	1	2	3
Length (ft)	41.67	49.75	50.00
Number of Sides	12	12	12
Thickness (in)	0.1875	0.2500	0.3125
Socket Length (ft)	3.67	4.75	
Top Dia (in)	13.4800	20.7014	29.1911
Bot Dia (in)	21.8100	30.6400	39.2000
Grade		A572-65	
Weight (K)	1.5	3.5	5.8

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	133	BXA-80063/4CF w/ Mount Pipe	110
(2) APXVSPP18-C-A20 w/ Mount Pipe	133	BXA-80063/4CF w/ Mount Pipe	110
APXVSPP18-C-A20 w/ Mount Pipe	133	BXA-80063/4CF w/ Mount Pipe	110
APXVSPP18-C-A20 w/ Mount Pipe	133	BULLET III	110
AAHC w/ Mount Pipe	133	DB-T1-6Z-8AB-0Z	110
AAHC w/ Mount Pipe	133	10' x 2" Pipe Mount	110
AAHC w/ Mount Pipe	133	10' x 2" Pipe Mount	110
(2) 800MHZ RRH	133	10' x 2" Pipe Mount	110
800MHZ RRH	133	(2) 5' x 2" Mount Pipe	110
(2) IBC1900HB-2	133	(2) 5' x 2" Mount Pipe	110
IBC1900HB-2	133	(2) 5' x 2" Mount Pipe	110
IBC1900HB-2	133	Platform Mount [LP 713-1]	110
(4) 1900MHz RRH (65MHz)	133	(2) SBNHH-1D65B w/ Mount Pipe	110
(2) 1900MHz RRH (65MHz)	133	(2) SBNHH-1D65B w/ Mount Pipe	110
(2) 800 EXTERNAL NOTCH FILTER	133	(2) SBNHH-1D65B w/ Mount Pipe	110
800 EXTERNAL NOTCH FILTER	133	RADIO 4449 B12/B71	100
PD2DE-700/2700	133	RADIO 4449 B12/B71	100
PD2DE-700/2700	133	RADIO 4449 B12/B71	100
8' x 3" Pipe Mount	133	AIR 21 B2A/B4P w/ Mount Pipe	100
8' x 3" Pipe Mount	133	AIR 21 B2A/B4P w/ Mount Pipe	100
8' x 3" Pipe Mount	133	AIR 21 B2A/B4P w/ Mount Pipe	100
(3) 6' x 2" Mount Pipe	133	AIR -32 B2A/B66AA w/ Mount Pipe	100
(3) 6' x 2" Mount Pipe	133	AIR -32 B2A/B66AA w/ Mount Pipe	100
(3) 6' x 2" Mount Pipe	133	AIR -32 B2A/B66AA w/ Mount Pipe	100
Platform Mount [LP 602-1]	133	ATMAA1412D-1A20	100
VHLP2-23	133	ATMAA1412D-1A20	100
VHLP2-23	133	ATMAA1412D-1A20	100
VHLP2-18	133	Platform Mount [LP 303-1]	100
RRH4X45-AWS4 B66	110	APXVAARR24_43-U-NA20 w/ Mount Pipe	100
RRH4X45-AWS4 B66	110	APXVAARR24_43-U-NA20 w/ Mount Pipe	100
RRH4X45-AWS4 B66	110	APXVAARR24_43-U-NA20 w/ Mount Pipe	100
RRH2X60-PCS	110	Pipe Mount [PM 601-3]	90
RRH2X60-PCS	110	APXV18-206517S-C	90
RRH2X60-PCS	110	APXV18-206517S-C	90
(2) CBC78-DF	110	APXV18-206517S-C	90
(2) CBC78-DF	110	Side Arm Mount [SO 701-1]	50
(2) CBC78-DF	110	KS24019-L112A	50
BXA-70063/6CF-2 w/ Mount Pipe	110		
BXA-70063/6CF-2 w/ Mount Pipe	110		
BXA-70063/6CF-2 w/ Mount Pipe	110		

MATERIAL STRENGTH

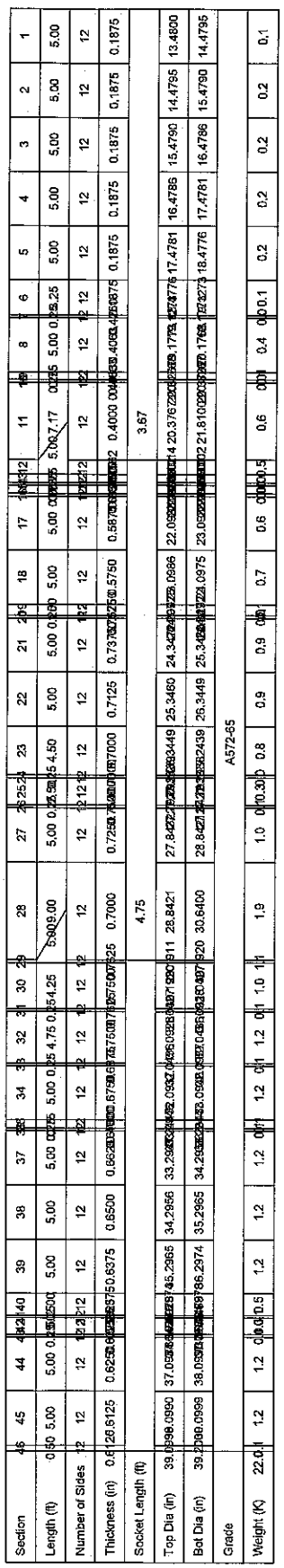
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

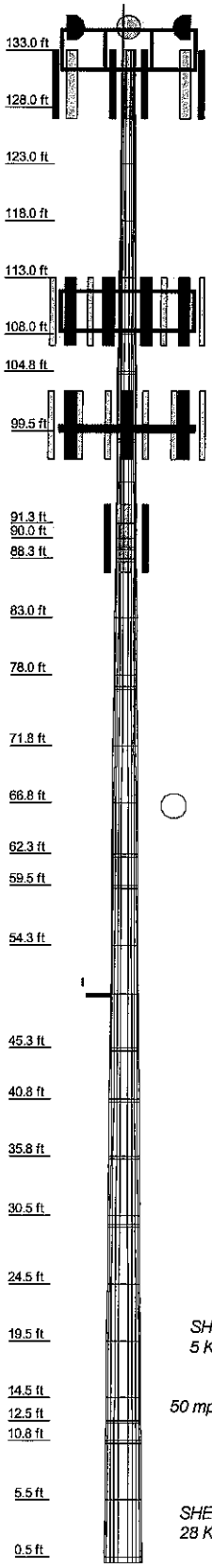
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.27 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 0.00 ft

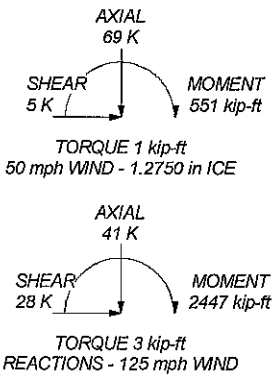
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: ***WATERBURY***		
Project: ***BU#876317 WO#1621488***		
Client: Crown Castle	Drawn by: Kelvin Klein Lagata	App'd:
Code: TIA-222-H	Date: 08/29/18	Scale: NTS
Path:		Dwg No. E-1





ALL REACTIONS ARE FACTORED



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AAHC w/ Mount Pipe	133	DB-T1-6Z-8AB-0Z	110
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RRH4X45-AWS4 B66	110	APXVAARR24_43-U-NA20 w/ Mount Pipe	100
RRH4X45-AWS4 B66	110		
RRH4X45-AWS4 B66	110	APXVAARR24_43-U-NA20 w/ Mount Pipe	100
RRH2X60-PCS	110		
RRH2X60-PCS	110	APXVAARR24_43-U-NA20 w/ Mount Pipe	100
RRH2X60-PCS	110		
(2) CBC78-DF	110	Pipe Mount [PM 601-3]	90
(2) CBC78-DF	110	APXV18-206517S-C	90
(2) CBC78-DF	110	APXV18-206517S-C	90
BXA-70063/6CF-2 w/ Mount Pipe	110	APXV18-206517S-C	90
BXA-70063/6CF-2 w/ Mount Pipe	110	Side Arm Mount [SO 701-1]	50
BXA-70063/6CF-2 w/ Mount Pipe	110	KS24019-L112A	50

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.27 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 0.00 ft

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Phone: 770-701-2500
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Job: ***WATERBURY***		
Project: ***BU#876317 WO#1621488***		
Client: Crown Castle	Drawn by: Kelvin Klein Lagata	App'd:
Code: TIA-222-H	Date: 08/29/18	Scale: NTS
Path:		Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

1) Tower is located in New Haven County, Connecticut.
2) Tower base elevation above sea level: 660.00 ft.
3) Basic wind speed of 125 mph.
4) Risk Category II.
5) Exposure Category B.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height 0.00 ft.
9) Nominal ice thickness of 1.2750 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Temperature drop of 50 °F.
14) Deflections calculated using a wind speed of 60 mph.
15) A non-linear (P-delta) analysis was used.
16) Pressures are calculated at each section.
17) Stress ratio used in pole design is 1.
18) 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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	133.00-128.00	5.00	0.00	12	13.4800	14.4795	0.1875	0.7500	A572-65 (65 ksi)
L2	128.00-123.00	5.00	0.00	12	14.4795	15.4790	0.1875	0.7500	A572-65 (65 ksi)
L3	123.00-118.00	5.00	0.00	12	15.4790	16.4786	0.1875	0.7500	A572-65 (65 ksi)
L4	118.00-113.00	5.00	0.00	12	16.4786	17.4781	0.1875	0.7500	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L5	113.00-108.00	5.00	0.00	12	17.4781	18.4776	0.1875	0.7500	A572-65 (65 ksi)
L6	108.00-104.75	3.25	0.00	12	18.4776	19.1273	0.1875	0.7500	A572-65 (65 ksi)
L7	104.75-104.50	0.25	0.00	12	19.1273	19.1773	0.4250	1.7000	A572-65 (65 ksi)
L8	104.50-99.50	5.00	0.00	12	19.1773	20.1768	0.4063	1.6250	A572-65 (65 ksi)
L9	99.50-98.75	0.75	0.00	12	20.1768	20.3267	0.4063	1.6250	A572-65 (65 ksi)
L10	98.75-98.50	0.25	0.00	12	20.3267	20.3767	0.4063	1.6250	A572-65 (65 ksi)
L11	98.50-91.33	7.17	3.67	12	20.3767	21.8100	0.4000	1.6000	A572-65 (65 ksi)
L12	91.33-90.00	5.00	0.00	12	20.7014	21.7002	0.4562	1.8250	A572-65 (65 ksi)
L13	90.00-89.25	0.75	0.00	12	21.7002	21.8500	0.4500	1.8000	A572-65 (65 ksi)
L14	89.25-89.00	0.25	0.00	12	21.8500	21.9000	0.8500	3.4000	A572-65 (65 ksi)
L15	89.00-88.25	0.75	0.00	12	21.9000	22.0498	0.8375	3.3500	A572-65 (65 ksi)
L16	88.25-88.00	0.25	0.00	12	22.0498	22.0998	0.6125	2.4500	A572-65 (65 ksi)
L17	88.00-83.00	5.00	0.00	12	22.0998	23.0986	0.5875	2.3500	A572-65 (65 ksi)
L18	83.00-78.00	5.00	0.00	12	23.0986	24.0975	0.5750	2.3000	A572-65 (65 ksi)
L19	78.00-77.00	1.00	0.00	12	24.0975	24.2972	0.5750	2.3000	A572-65 (65 ksi)
L20	77.00-76.75	0.25	0.00	12	24.2972	24.3472	0.7625	3.0500	A572-65 (65 ksi)
L21	76.75-71.75	5.00	0.00	12	24.3472	25.3460	0.7375	2.9500	A572-65 (65 ksi)
L22	71.75-66.75	5.00	0.00	12	25.3460	26.3449	0.7125	2.8500	A572-65 (65 ksi)
L23	66.75-62.25	4.50	0.00	12	26.3449	27.2439	0.7000	2.8000	A572-65 (65 ksi)
L24	62.25-62.00	0.25	0.00	12	27.2439	27.2938	0.7000	2.8000	A572-65 (65 ksi)
L25	62.00-59.50	2.50	0.00	12	27.2938	27.7933	0.4000	1.6000	A572-65 (65 ksi)
L26	59.50-59.25	0.25	0.00	12	27.7933	27.8432	0.7500	3.0000	A572-65 (65 ksi)
L27	59.25-54.25	5.00	0.00	12	27.8432	28.8421	0.7250	2.9000	A572-65 (65 ksi)
L28	54.25-45.25	9.00	4.75	12	28.8421	30.6400	0.7000	2.8000	A572-65 (65 ksi)
L29	45.25-45.00	5.00	0.00	12	29.1911	30.1920	0.7625	3.0500	A572-65 (65 ksi)
L30	45.00-40.75	4.25	0.00	12	30.1920	31.0427	0.7500	3.0000	A572-65 (65 ksi)
L31	40.75-40.50	0.25	0.00	12	31.0427	31.0928	0.7625	3.0500	A572-65 (65 ksi)
L32	40.50-35.75	4.75	0.00	12	31.0928	32.0436	0.7500	3.0000	A572-65 (65 ksi)
L33	35.75-35.50	0.25	0.00	12	32.0436	32.0937	0.6875	2.7500	A572-65 (65 ksi)
L34	35.50-30.50	5.00	0.00	12	32.0937	33.0946	0.6750	2.7000	A572-65 (65 ksi)
L35	30.50-29.75	0.75	0.00	12	33.0946	33.2447	0.4000	1.6000	A572-65 (65 ksi)
L36	29.75-29.50	0.25	0.00	12	33.2447	33.2947	0.6750	2.7000	A572-65 (65 ksi)
L37	29.50-24.50	5.00	0.00	12	33.2947	34.2956	0.6625	2.6500	A572-65 (65 ksi)
L38	24.50-19.50	5.00	0.00	12	34.2956	35.2965	0.6500	2.6000	A572-65 (65 ksi)
L39	19.50-14.50	5.00	0.00	12	35.2965	36.2974	0.6375	2.5500	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L40	14.50-12.50	2.00	0.00	12	36.2974	36.6978	0.6375	2.5500	(65 ksi) A572-65 (65 ksi)
L41	12.50-12.25	0.25	0.00	12	36.6978	36.7478	0.5625	2.2500	A572-65 (65 ksi)
L42	12.25-10.75	1.50	0.00	12	36.7478	37.0481	0.5625	2.2500	A572-65 (65 ksi)
L43	10.75-10.50	0.25	0.00	12	37.0481	37.0981	0.6375	2.5500	A572-65 (65 ksi)
L44	10.50-5.50	5.00	0.00	12	37.0981	38.0990	0.6250	2.5000	A572-65 (65 ksi)
L45	5.50-0.50	5.00	0.00	12	38.0990	39.0999	0.6125	2.4500	A572-65 (65 ksi)
L46	0.50-0.00	0.50		12	39.0999	39.2000	0.6125	2.4500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	13.8894	8.0253	180.9936	4.7587	6.9826	25.9205	366.7420	3.9498	3.1101	16.587
	14.9242	8.6288	224.9697	5.1165	7.5004	29.9944	455.8495	4.2468	3.3780	18.016
L2	14.9242	8.6288	224.9697	5.1165	7.5004	29.9944	455.8495	4.2468	3.3780	18.016
	15.9589	9.2323	275.5477	5.4744	8.0181	34.3655	558.3343	4.5438	3.6459	19.445
L3	15.9589	9.2323	275.5477	5.4744	8.0181	34.3655	558.3343	4.5438	3.6459	19.445
	16.9937	9.8357	333.1894	5.8322	8.5359	39.0339	675.1320	4.8408	3.9138	20.873
L4	16.9937	9.8357	333.1894	5.8322	8.5359	39.0339	675.1320	4.8408	3.9138	20.873
	18.0285	10.4392	398.3564	6.1900	9.0536	43.9996	807.1780	5.1379	4.1816	22.302
L5	18.0285	10.4392	398.3564	6.1900	9.0536	43.9996	807.1780	5.1379	4.1816	22.302
	19.0633	11.0426	471.5105	6.5479	9.5714	49.2625	955.4080	5.4349	4.4495	23.731
L6	19.0633	11.0426	471.5105	6.5479	9.5714	49.2625	955.4080	5.4349	4.4495	23.731
	19.7359	11.4349	523.5624	6.7804	9.9079	52.8427	1060.8793	5.6279	4.6236	24.659
L7	19.6521	25.5941	1142.6546	6.6954	9.9079	115.3272	2315.3280	12.5966	3.9871	9.381
	19.7038	25.6625	1151.8393	6.7133	9.9338	115.9513	2333.9386	12.6303	4.0005	9.413
L8	19.7105	24.5548	1104.3288	6.7200	9.9338	111.1686	2237.6695	12.0851	4.0508	9.971
	20.7452	25.8623	1290.2991	7.0779	10.4516	123.4550	2614.4958	12.7287	4.3186	10.63
L9	20.7452	25.8623	1290.2991	7.0779	10.4516	123.4550	2614.4958	12.7287	4.3186	10.63
	20.9005	26.0585	1319.8769	7.1315	10.5292	125.3535	2674.4284	12.8252	4.3588	10.729
L10	20.9005	26.0585	1319.8769	7.1315	10.5292	125.3535	2674.4284	12.8252	4.3588	10.729
	20.9522	26.1238	1329.8356	7.1494	10.5551	125.9896	2694.6075	12.8574	4.3722	10.762
L11	20.9544	25.7300	1310.6064	7.1517	10.5551	124.1678	2655.6438	12.6635	4.3890	10.972
	22.4383	27.5761	1613.4363	7.6648	11.2976	142.8126	3269.2593	13.5721	4.7731	11.933
L12	22.0297	29.7426	1555.9821	7.2477	10.7233	145.1029	3152.8417	14.6384	4.3252	9.48
	22.3048	31.2100	1797.8406	7.6053	11.2407	159.9401	3642.9125	15.3606	4.5929	10.067
L13	22.3070	30.7916	1774.7782	7.6076	11.2407	157.8884	3596.1817	15.1547	4.6097	10.244
	22.4621	31.0087	1812.5838	7.6612	11.3183	160.1460	3672.7862	15.2615	4.6498	10.333
L14	22.3210	57.4771	3235.3488	7.5180	11.3183	285.8506	6555.6939	28.2885	3.5778	4.209
	22.3727	57.6138	3258.4870	7.5359	11.3442	287.2384	6602.5781	28.3558	3.5912	4.225
L15	22.3771	56.8003	3216.2910	7.5404	11.3442	283.5188	6517.0776	27.9554	3.6247	4.328
	22.5322	57.2043	3285.4182	7.5940	11.4218	287.6445	6657.1480	28.1542	3.6648	4.376
L16	22.6116	42.2797	2480.0412	7.6746	11.4218	217.1322	5025.2359	20.8088	4.2678	6.968
	22.6633	42.3782	2497.4151	7.6924	11.4477	218.1592	5060.4400	20.8573	4.2812	6.99
L17	22.6721	40.6958	2403.8508	7.7014	11.4477	209.9860	4870.8534	20.0292	4.3482	7.401
	23.7062	42.5854	2754.4865	8.0590	11.9651	230.2104	5581.3365	20.9592	4.6159	7.857
L18	23.7106	41.7025	2700.3739	8.0635	11.9651	225.6879	5471.6895	20.5247	4.6494	8.086
	24.7447	43.5519	3075.8036	8.4210	12.4825	246.4094	6232.4120	21.4349	4.9171	8.552
L19	24.7447	43.5519	3075.8036	8.4210	12.4825	246.4094	6232.4120	21.4349	4.9171	8.552
	24.9515	43.9217	3154.8377	8.4926	12.5860	250.6630	6392.5566	21.6169	4.9707	8.645
L20	24.8854	57.7837	4085.1703	8.4254	12.5860	324.5812	8277.6625	28.4394	4.4682	5.86
	24.9371	57.9063	4111.2329	8.4433	12.6118	325.9819	8330.4724	28.4997	4.4815	5.877
L21	24.9459	56.0671	3989.0969	8.4523	12.6118	316.2977	8082.9919	27.5945	4.5485	6.168
	25.9800	58.4391	4517.1214	8.8099	13.1293	344.0502	9152.9126	28.7620	4.8162	6.53
L22	25.9888	56.5155	4377.3124	8.8188	13.1293	333.4015	8869.6217	27.8152	4.8832	6.854
	27.0229	58.8071	4931.6791	9.1764	13.6467	361.3836	9992.9189	28.9431	5.1509	7.229
L23	27.0273	57.8036	4852.2503	9.1809	13.6467	355.5632	9831.9746	28.4492	5.1844	7.406
	27.9580	59.8299	5380.6288	9.5027	14.1123	381.2715	10902.612	29.4465	5.4254	7.751

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L24	27.9580	59.8299	5380.6288	9.5027	14.1123	381.2715	10902.6126	29.4465	5.4254	7.751
	28.0097	59.9425	5411.0573	9.5206	14.1382	382.7260	10964.2691	29.5019	5.4387	7.77
L25	28.1155	34.6392	3197.8596	9.6280	14.1382	226.1858	6479.7305	17.0484	6.2427	15.607
	28.6326	35.2825	3379.3455	9.8068	14.3969	234.7272	6847.4701	17.3650	6.3766	15.941
L26	28.5091	65.3095	6096.4895	9.6815	14.3969	423.4584	12353.1406	32.1433	5.4386	7.251
	28.5608	65.4301	6130.3286	9.6994	14.4228	425.0450	12421.7077	32.2027	5.4520	7.269
L27	28.5696	63.3074	5942.4039	9.7083	14.4228	412.0153	12040.9213	31.1580	5.5190	7.612
	29.6037	65.6393	6623.5264	10.0659	14.9402	443.3363	13421.0603	32.3056	5.7867	7.982
L28	29.6126	63.4322	6412.2026	10.0749	14.9402	429.1917	12992.8610	31.2194	5.8537	8.362
	31.4739	67.4848	7721.3858	10.7185	15.8715	486.4931	15645.6209	33.2139	6.3355	9.051
L29	30.9362	69.7993	7200.2463	10.1774	15.1210	476.1759	14589.6512	34.3531	5.7797	7.58
	30.9881	72.2567	7987.8382	10.5358	15.6394	510.7495	16185.5258	35.5626	6.0479	7.932
L30	30.9925	71.1024	7866.9058	10.5402	15.6394	503.0170	15940.4839	34.9944	6.0814	8.109
	31.8732	73.1570	8568.7694	10.8448	16.0801	532.8792	17362.6499	36.0056	6.3095	8.413
L31	31.8688	74.3455	8700.8024	10.8403	16.0801	541.0901	17630.1847	36.5906	6.2760	8.231
	31.9206	74.4684	8744.0140	10.8582	16.1061	542.9021	17717.7429	36.6511	6.2894	8.248
L32	31.9250	73.2778	8611.3076	10.8627	16.1061	534.6626	17448.8439	36.0651	6.3229	8.43
	32.9094	75.5741	9446.4952	11.2031	16.5986	569.1140	19141.1603	37.1953	6.5777	8.77
L33	32.9315	69.4146	8711.2742	11.2255	16.5986	524.8199	17651.4033	34.1638	6.7452	9.811
	32.9833	69.5254	8753.0509	11.2434	16.6245	526.5145	17736.0543	34.2183	6.7586	9.831
L34	32.9877	68.2885	8604.1700	11.2479	16.6245	517.5590	17434.3812	33.6095	6.7921	10.062
	34.0239	70.4639	9452.9418	11.6062	17.1430	551.4176	19154.2229	34.6802	7.0603	10.46
L35	34.1209	42.1106	5745.5068	11.7047	17.1430	335.1521	11641.9545	20.7256	7.7973	19.493
	34.2763	42.3040	5825.0212	11.7584	17.2208	338.2559	11803.0723	20.8207	7.8376	19.594
L36	34.1793	70.7902	9584.8798	11.6600	17.2208	556.5889	19421.5650	34.8408	7.1006	10.519
	34.2311	70.8990	9629.1298	11.6779	17.2467	558.3180	19511.2275	34.8943	7.1140	10.539
L37	34.2355	69.6127	9461.6815	11.6823	17.2467	548.6090	19171.9319	34.2613	7.1475	10.789
	35.2717	71.7479	10359.2807	12.0407	17.7651	583.1242	20990.7112	35.3121	7.4157	11.194
L38	35.2762	70.4203	10175.1592	12.0451	17.7651	572.7600	20617.6311	34.6587	7.4492	11.46
	36.3124	72.5152	11110.5140	12.4035	18.2836	607.6765	22512.9135	35.6898	7.7175	11.873
L39	36.3168	71.1463	10908.6488	12.4079	18.2836	596.6358	22103.8799	35.0160	7.7510	12.158
	37.3530	73.2009	11881.2706	12.7662	18.8021	631.9132	24074.6753	36.0273	8.0192	12.579
L40	37.3530	73.2009	11881.2706	12.7662	18.8021	631.9132	24074.6753	36.0273	8.0192	12.579
	37.7674	74.0227	12285.9564	12.9096	19.0094	646.3080	24894.6785	36.4317	8.1265	12.747
L41	37.7939	65.4500	10908.3307	12.9364	19.0094	573.8374	22103.2355	32.2125	8.3275	14.804
	37.8457	65.5407	10953.7155	12.9543	19.0354	575.4402	22195.1973	32.2571	8.3409	14.828

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L42	37.8457	65.5407	10953.7155	12.9543	19.0354	575.4402	22195.1973	32.2571	8.3409	14.828
	38.1566	66.0845	11228.6674	13.0618	19.1909	585.1035	22752.3245	32.5248	8.4214	14.971
L43	38.1301	74.7418	12647.5064	13.0350	19.1909	659.0364	25627.2770	36.7857	8.2204	12.895
	38.1819	74.8446	12699.7287	13.0529	19.2168	660.8649	25733.0935	36.8362	8.2338	12.916
L44	38.1863	73.4022	12463.5245	13.0574	19.2168	648.5734	25254.4797	36.1263	8.2673	13.228
	39.2225	75.4165	13518.0067	13.4157	19.7353	684.9661	27391.1465	37.1177	8.5355	13.657
L45	39.2269	73.9328	13260.9078	13.4202	19.7353	671.9388	26870.1944	36.3875	8.5690	13.99
	40.2631	75.9068	14351.7218	13.7785	20.2538	708.5956	29080.4794	37.3590	8.8373	14.428
L46	40.2631	75.9068	14351.7218	13.7785	20.2538	708.5956	29080.4794	37.3590	8.8373	14.428
	40.3668	76.1042	14463.9810	13.8143	20.3056	712.3149	29307.9469	37.4562	8.8641	14.472

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
L1 133.00-128.00				1	1	1			
L2 128.00-123.00				1	1	1			
L3 123.00-118.00				1	1	1			
L4 118.00-113.00				1	1	1			
L5 113.00-108.00				1	1	1			
L6 108.00-104.75				1	1	1			
L7 104.75-104.50				1	1	0.915043			
L8 104.50-99.50				1	1	0.931306			
L9 99.50-98.75				1	1	0.92777			
L10 98.75-98.50				1	1	0.926603			
L11 98.50-91.33				1	1	0.924814			
L12 91.33-90.00				1	1	0.938308			
L13 90.00-89.25				1	1	0.948291			
L14 89.25-89.00				1	1	0.869583			
L15 89.00-88.25				1	1	0.877917			
L16 88.25-88.00				1	1	0.902435			
L17 88.00-83.00				1	1	0.916927			
L18 83.00-78.00				1	1	0.915042			
L19 78.00-77.00				1	1	0.910998			
L20 77.00-76.75				1	1	0.899211			
L21 76.75-71.75				1	1	0.904772			

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
L22 71.75-66.75				1	1	0.912783			
L23 66.75-62.25				1	1	0.909275			
L24 62.25-62.00				1	1	0.908238			
L25 62.00-59.50				1	1	0.969022			
L26 59.50-59.25				1	1	0.903393			
L27 59.25-54.25				1	1	0.912764			
L28 54.25-45.25				1	1	0.927321			
L29 45.25-45.00				1	1	0.926734			
L30 45.00-40.75				1	1	0.927032			
L31 40.75-40.50				1	1	0.965174			
L32 40.50-35.75				1	1	0.963713			
L33 35.75-35.50				1	1	0.990665			
L34 35.50-30.50				1	1	0.991763			
L35 30.50-29.75				1	1	1.0674			
L36 29.75-29.50				1	1	1.00176			
L37 29.50-24.50				1	1	1.00395			
L38 24.50-19.50				1	1	1.00721			
L39 19.50-14.50				1	1	1.01154			
L40 14.50-12.50				1	1	1.00575			
L41 12.50-12.25				1	1	0.95332			
L42 12.25-10.75				1	1	0.950047			
L43 10.75-10.50				1	1	0.954509			
L44 10.50-5.50				1	1	0.960625			
L45 5.50-0.50				1	1	0.967688			
L46 0.50-0.00				1	1	0.966502			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
** FACE A**										
Safety Line 5/8	A	No	Surface Ar (CaAa)	133.00 - 0.00	1	1	0.500 0.500	0.8800		0.40
*										
7983A(ELLIPTICAL)	A	No	Surface Ar (CaAa)	133.00 - 0.00	3	3	0.270 0.330	0.5730		0.08
LCF158-50JL(1-5/8)	A	No	Surface Ar (CaAa)	90.00 - 0.00	2	2	-0.100 -0.050	1.9800		0.52
MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	C	No	Surface Ar (CaAa)	100.00 - 0.00	1	1	0.200 0.200	1.6250		1.07

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***										
***										
RNF 2381113										
6.875" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	12.00 - 0.00	1	1	0.500 0.500	6.8750	27.5000	0.00
6.875" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	12.00 - 0.00	1	1	0.000 0.000	6.8750	27.5000	0.00
*										
6.875" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	29.75 - 0.00	1	1	-0.250 -0.250	6.8750	27.5000	0.00
6.875" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	29.75 - 0.00	1	1	-0.250 -0.250	6.8750	27.5000	0.00
6.875" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	29.75 - 7.25	1	1	-0.250 -0.250	6.8750	27.5000	0.00
*										
6.625" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	59.50 - 29.75	1	1	-0.250 -0.250	6.6250	26.5000	0.00
6.625" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	59.50 - 29.75	1	1	-0.250 -0.250	6.6250	26.5000	0.00
6.625" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	59.50 - 29.75	1	1	-0.250 -0.250	6.6250	26.5000	0.00
*										
5.5" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	89.25 - 59.50	1	1	-0.250 -0.250	5.5000	13.5000	0.00
5.5" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	89.25 - 59.50	1	1	-0.250 -0.250	5.5000	13.5000	0.00
5.5" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	89.25 - 59.50	1	1	-0.250 -0.250	5.5000	13.5000	0.00
*										
3.625" x 1.25" Flat Plate (G)	A	No	Surface Af (CaAa)	100.00 - 89.25	1	1	-0.250 -0.250	3.6250	14.5000	0.00
3.625" x 1.25" Flat Plate (G)	B	No	Surface Af (CaAa)	100.00 - 89.25	1	1	-0.250 -0.250	3.6250	14.5000	0.00
3.625" x 1.25" Flat Plate (G)	C	No	Surface Af (CaAa)	100.00 - 89.25	1	1	-0.250 -0.250	3.6250	14.5000	0.00
RNF 3315244										
4" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	35.75 - 10.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	40.75 - 10.75	1	1	-0.250 -0.250	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	35.75 - 10.75	1	1	0.000 0.000	4.0000	10.0000	0.00
*										
4" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	62.25 - 32.25	1	1	0.250 0.250	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	62.25 - 32.25	1	1	0.250 0.250	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	62.25 - 32.25	1	1	0.250 0.250	4.0000	10.0000	0.00
*										
4" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	78.75 - 58.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	78.75 - 58.75	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	78.75 - 58.75	1	1	0.000 0.000	4.0000	10.0000	0.00
*										
4" x 1" Flat Plate (G)	A	No	Surface Af (CaAa)	106.50 - 86.50	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	B	No	Surface Af (CaAa)	106.50 - 86.50	1	1	0.000 0.000	4.0000	10.0000	0.00
4" x 1" Flat Plate (G)	C	No	Surface Af (CaAa)	106.50 - 86.50	1	1	0.000 0.000	4.0000	10.0000	0.00
***										
***										
*										

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 plf
HB114-1-0813U4-M5J(1 1/4")	A	No	No	Inside Pole	133.00 - 0.00	3	No Ice	0.00	1.20
							1/2" Ice	0.00	1.20
							1" Ice	0.00	1.20
							2" Ice	0.00	1.20
LCF158-50JL(1-5/8)	A	No	No	Inside Pole	90.00 - 0.00	4	No Ice	0.00	0.52
							1/2" Ice	0.00	0.52
							1" Ice	0.00	0.52
							2" Ice	0.00	0.52
** FACE B**									
MLC6C-06C-008R-008R(1-1/2")	B	No	No	Inside Pole	133.00 - 0.00	1	No Ice	0.00	1.52
							1/2" Ice	0.00	1.52
							1" Ice	0.00	1.52
							2" Ice	0.00	1.52
LDF4-50A(1/2")	B	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
LDF7-50A(1-5/8)	B	No	No	Inside Pole	110.00 - 0.00	13	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
LDF4-50A(1/2")	B	No	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
** FACE C**									
MLC HYBRID 6X12 6AWGX6(1-1/2)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice	0.00	0.59
							1/2" Ice	0.00	0.59
							1" Ice	0.00	0.59
							2" Ice	0.00	0.59
LDF5-50A(7/8)	C	No	No	Inside Pole	100.00 - 0.00	5	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
							2" Ice	0.00	0.33
LDF6-50A(1-1/4)	C	No	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
MLC HYBRID 6X12 6AWGX6(1-1/2)	C	No	No	Inside Pole	100.00 - 0.00	1	No Ice	0.00	0.59
							1/2" Ice	0.00	0.59
							1" Ice	0.00	0.59
							2" Ice	0.00	0.59
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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
L1	133.00-128.00	A	0.000	0.000	1.300	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L2	128.00-123.00	A	0.000	0.000	1.300	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L3	123.00-118.00	A	0.000	0.000	1.300	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L4	118.00-113.00	A	0.000	0.000	1.300	0.000	0.02

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
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
L5	113.00-108.00	A	0.000	0.000	1.300	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.03
		C	0.000	0.000	0.000	0.000	0.00
L6	108.00-104.75	A	0.000	0.000	2.011	0.000	0.01
		B	0.000	0.000	1.167	0.000	0.04
		C	0.000	0.000	1.167	0.000	0.00
L7	104.75-104.50	A	0.000	0.000	0.232	0.000	0.00
		B	0.000	0.000	0.167	0.000	0.00
		C	0.000	0.000	0.167	0.000	0.00
L8	104.50-99.50	A	0.000	0.000	4.935	0.000	0.02
		B	0.000	0.000	3.635	0.000	0.06
		C	0.000	0.000	3.717	0.000	0.00
L9	99.50-98.75	A	0.000	0.000	1.148	0.000	0.00
		B	0.000	0.000	0.953	0.000	0.01
		C	0.000	0.000	1.075	0.000	0.01
L10	98.75-98.50	A	0.000	0.000	0.383	0.000	0.00
		B	0.000	0.000	0.318	0.000	0.00
		C	0.000	0.000	0.358	0.000	0.00
L11	98.50-91.33	A	0.000	0.000	10.975	0.000	0.03
		B	0.000	0.000	9.112	0.000	0.09
		C	0.000	0.000	10.277	0.000	0.05
L12	91.33-90.00	A	0.000	0.000	2.036	0.000	0.01
		B	0.000	0.000	1.690	0.000	0.02
		C	0.000	0.000	1.906	0.000	0.01
L13	90.00-89.25	A	0.000	0.000	1.445	0.000	0.01
		B	0.000	0.000	0.953	0.000	0.01
		C	0.000	0.000	1.075	0.000	0.01
L14	89.25-89.00	A	0.000	0.000	0.560	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.436	0.000	0.00
L15	89.00-88.25	A	0.000	0.000	1.679	0.000	0.01
		B	0.000	0.000	1.188	0.000	0.01
		C	0.000	0.000	1.309	0.000	0.01
L16	88.25-88.00	A	0.000	0.000	0.560	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.436	0.000	0.00
L17	88.00-83.00	A	0.000	0.000	8.863	0.000	0.04
		B	0.000	0.000	5.583	0.000	0.06
		C	0.000	0.000	6.396	0.000	0.04
L18	83.00-78.00	A	0.000	0.000	8.363	0.000	0.04
		B	0.000	0.000	5.083	0.000	0.06
		C	0.000	0.000	5.896	0.000	0.04
L19	78.00-77.00	A	0.000	0.000	2.239	0.000	0.01
		B	0.000	0.000	1.583	0.000	0.01
		C	0.000	0.000	1.746	0.000	0.01
L20	77.00-76.75	A	0.000	0.000	0.560	0.000	0.00
		B	0.000	0.000	0.396	0.000	0.00
		C	0.000	0.000	0.436	0.000	0.00
L21	76.75-71.75	A	0.000	0.000	11.196	0.000	0.04
		B	0.000	0.000	7.917	0.000	0.06
		C	0.000	0.000	8.729	0.000	0.04
L22	71.75-66.75	A	0.000	0.000	11.196	0.000	0.04
		B	0.000	0.000	7.917	0.000	0.06
		C	0.000	0.000	8.729	0.000	0.04
L23	66.75-62.25	A	0.000	0.000	10.077	0.000	0.03
		B	0.000	0.000	7.125	0.000	0.06
		C	0.000	0.000	7.856	0.000	0.03
L24	62.25-62.00	A	0.000	0.000	0.726	0.000	0.00
		B	0.000	0.000	0.563	0.000	0.00
		C	0.000	0.000	0.603	0.000	0.00
L25	62.00-59.50	A	0.000	0.000	7.265	0.000	0.02
		B	0.000	0.000	5.625	0.000	0.03
		C	0.000	0.000	6.031	0.000	0.02
L26	59.50-59.25	A	0.000	0.000	0.773	0.000	0.00
		B	0.000	0.000	0.609	0.000	0.00
		C	0.000	0.000	0.650	0.000	0.00
L27	59.25-54.25	A	0.000	0.000	12.467	0.000	0.04

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
		B	0.000	0.000	9.188	0.000	0.06
		C	0.000	0.000	10.000	0.000	0.04
L28	54.25-45.25	A	0.000	0.000	21.841	0.000	0.07
		B	0.000	0.000	15.938	0.000	0.11
		C	0.000	0.000	17.400	0.000	0.07
L29	45.25-45.00	A	0.000	0.000	0.607	0.000	0.00
		B	0.000	0.000	0.443	0.000	0.00
		C	0.000	0.000	0.483	0.000	0.00
L30	45.00-40.75	A	0.000	0.000	10.314	0.000	0.03
		B	0.000	0.000	7.526	0.000	0.05
		C	0.000	0.000	8.217	0.000	0.03
L31	40.75-40.50	A	0.000	0.000	0.607	0.000	0.00
		B	0.000	0.000	0.609	0.000	0.00
		C	0.000	0.000	0.483	0.000	0.00
L32	40.50-35.75	A	0.000	0.000	11.527	0.000	0.04
		B	0.000	0.000	11.578	0.000	0.06
		C	0.000	0.000	9.183	0.000	0.04
L33	35.75-35.50	A	0.000	0.000	0.773	0.000	0.00
		B	0.000	0.000	0.609	0.000	0.00
		C	0.000	0.000	0.650	0.000	0.00
L34	35.50-30.50	A	0.000	0.000	14.300	0.000	0.04
		B	0.000	0.000	11.021	0.000	0.06
		C	0.000	0.000	11.833	0.000	0.04
L35	30.50-29.75	A	0.000	0.000	1.820	0.000	0.01
		B	0.000	0.000	1.328	0.000	0.01
		C	0.000	0.000	1.450	0.000	0.01
L36	29.75-29.50	A	0.000	0.000	0.617	0.000	0.00
		B	0.000	0.000	0.453	0.000	0.00
		C	0.000	0.000	0.494	0.000	0.00
L37	29.50-24.50	A	0.000	0.000	12.342	0.000	0.04
		B	0.000	0.000	9.063	0.000	0.06
		C	0.000	0.000	9.875	0.000	0.04
L38	24.50-19.50	A	0.000	0.000	12.342	0.000	0.04
		B	0.000	0.000	9.063	0.000	0.06
		C	0.000	0.000	9.875	0.000	0.04
L39	19.50-14.50	A	0.000	0.000	12.342	0.000	0.04
		B	0.000	0.000	9.063	0.000	0.06
		C	0.000	0.000	9.875	0.000	0.04
L40	14.50-12.50	A	0.000	0.000	4.937	0.000	0.01
		B	0.000	0.000	3.625	0.000	0.02
		C	0.000	0.000	3.950	0.000	0.01
L41	12.50-12.25	A	0.000	0.000	0.617	0.000	0.00
		B	0.000	0.000	0.453	0.000	0.00
		C	0.000	0.000	0.494	0.000	0.00
L42	12.25-10.75	A	0.000	0.000	3.703	0.000	0.01
		B	0.000	0.000	3.908	0.000	0.02
		C	0.000	0.000	4.152	0.000	0.01
L43	10.75-10.50	A	0.000	0.000	0.450	0.000	0.00
		B	0.000	0.000	0.524	0.000	0.00
		C	0.000	0.000	0.565	0.000	0.00
L44	10.50-5.50	A	0.000	0.000	9.009	0.000	0.04
		B	0.000	0.000	10.485	0.000	0.06
		C	0.000	0.000	9.293	0.000	0.04
L45	5.50-0.50	A	0.000	0.000	9.009	0.000	0.04
		B	0.000	0.000	10.485	0.000	0.06
		C	0.000	0.000	5.569	0.000	0.04
L46	0.50-0.00	A	0.000	0.000	0.901	0.000	0.00
		B	0.000	0.000	1.049	0.000	0.01
		C	0.000	0.000	0.557	0.000	0.00

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
L1	133.00-128.00	A	1.463	0.000	0.000	4.806	0.000	0.07

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
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L2	128.00-123.00	A	1.457	0.000	0.000	4.793	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L3	123.00-118.00	A	1.451	0.000	0.000	4.780	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L4	118.00-113.00	A	1.445	0.000	0.000	4.766	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00
L5	113.00-108.00	A	1.439	0.000	0.000	4.752	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.03
		C		0.000	0.000	0.000	0.000	0.00
L6	108.00-104.75	A	1.433	0.000	0.000	4.749	0.000	0.06
		B		0.000	0.000	1.668	0.000	0.06
		C		0.000	0.000	1.668	0.000	0.02
L7	104.75-104.50	A	1.431	0.000	0.000	0.475	0.000	0.01
		B		0.000	0.000	0.238	0.000	0.01
		C		0.000	0.000	0.238	0.000	0.00
L8	104.50-99.50	A	1.427	0.000	0.000	9.877	0.000	0.11
		B		0.000	0.000	5.151	0.000	0.11
		C		0.000	0.000	5.375	0.000	0.05
L9	99.50-98.75	A	1.423	0.000	0.000	2.006	0.000	0.02
		B		0.000	0.000	1.299	0.000	0.02
		C		0.000	0.000	1.634	0.000	0.02
L10	98.75-98.50	A	1.423	0.000	0.000	0.669	0.000	0.01
		B		0.000	0.000	0.433	0.000	0.01
		C		0.000	0.000	0.545	0.000	0.01
L11	98.50-91.33	A	1.417	0.000	0.000	19.144	0.000	0.23
		B		0.000	0.000	12.400	0.000	0.23
		C		0.000	0.000	15.597	0.000	0.23
L12	91.33-90.00	A	1.411	0.000	0.000	3.552	0.000	0.04
		B		0.000	0.000	2.301	0.000	0.04
		C		0.000	0.000	2.894	0.000	0.04
L13	90.00-89.25	A	1.409	0.000	0.000	2.633	0.000	0.03
		B		0.000	0.000	1.295	0.000	0.02
		C		0.000	0.000	1.628	0.000	0.02
L14	89.25-89.00	A	1.408	0.000	0.000	0.983	0.000	0.01
		B		0.000	0.000	0.537	0.000	0.01
		C		0.000	0.000	0.648	0.000	0.01
L15	89.00-88.25	A	1.407	0.000	0.000	2.947	0.000	0.03
		B		0.000	0.000	1.610	0.000	0.02
		C		0.000	0.000	1.943	0.000	0.02
L16	88.25-88.00	A	1.407	0.000	0.000	0.982	0.000	0.01
		B		0.000	0.000	0.536	0.000	0.01
		C		0.000	0.000	0.647	0.000	0.01
L17	88.00-83.00	A	1.402	0.000	0.000	16.304	0.000	0.19
		B		0.000	0.000	7.406	0.000	0.13
		C		0.000	0.000	9.621	0.000	0.13
L18	83.00-78.00	A	1.394	0.000	0.000	15.554	0.000	0.18
		B		0.000	0.000	6.686	0.000	0.12
		C		0.000	0.000	8.893	0.000	0.12
L19	78.00-77.00	A	1.389	0.000	0.000	3.909	0.000	0.04
		B		0.000	0.000	2.139	0.000	0.03
		C		0.000	0.000	2.579	0.000	0.03
L20	77.00-76.75	A	1.388	0.000	0.000	0.977	0.000	0.01
		B		0.000	0.000	0.535	0.000	0.01
		C		0.000	0.000	0.645	0.000	0.01
L21	76.75-71.75	A	1.383	0.000	0.000	19.511	0.000	0.21
		B		0.000	0.000	10.682	0.000	0.15
		C		0.000	0.000	12.877	0.000	0.15
L22	71.75-66.75	A	1.373	0.000	0.000	19.458	0.000	0.21
		B		0.000	0.000	10.663	0.000	0.15
		C		0.000	0.000	12.848	0.000	0.15
L23	66.75-62.25	A	1.363	0.000	0.000	17.464	0.000	0.19
		B		0.000	0.000	9.579	0.000	0.14
		C		0.000	0.000	11.537	0.000	0.14
L24	62.25-62.00	A	1.358	0.000	0.000	1.203	0.000	0.01

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
		B		0.000	0.000	0.766	0.000	0.01
		C		0.000	0.000	0.875	0.000	0.01
L25	62.00-59.50	A	1.355	0.000	0.000	12.024	0.000	0.12
		B		0.000	0.000	7.658	0.000	0.10
		C		0.000	0.000	8.742	0.000	0.10
L26	59.50-59.25	A	1.352	0.000	0.000	1.248	0.000	0.01
		B		0.000	0.000	0.812	0.000	0.01
		C		0.000	0.000	0.920	0.000	0.01
L27	59.25-54.25	A	1.346	0.000	0.000	20.714	0.000	0.24
		B		0.000	0.000	12.014	0.000	0.19
		C		0.000	0.000	14.173	0.000	0.19
L28	54.25-45.25	A	1.328	0.000	0.000	36.269	0.000	0.42
		B		0.000	0.000	20.719	0.000	0.33
		C		0.000	0.000	24.573	0.000	0.33
L29	45.25-45.00	A	1.316	0.000	0.000	1.007	0.000	0.01
		B		0.000	0.000	0.576	0.000	0.01
		C		0.000	0.000	0.683	0.000	0.01
L30	45.00-40.75	A	1.309	0.000	0.000	17.036	0.000	0.20
		B		0.000	0.000	9.751	0.000	0.15
		C		0.000	0.000	11.554	0.000	0.15
L31	40.75-40.50	A	1.302	0.000	0.000	1.000	0.000	0.01
		B		0.000	0.000	0.805	0.000	0.01
		C		0.000	0.000	0.679	0.000	0.01
L32	40.50-35.75	A	1.293	0.000	0.000	18.960	0.000	0.22
		B		0.000	0.000	15.265	0.000	0.21
		C		0.000	0.000	12.870	0.000	0.17
L33	35.75-35.50	A	1.285	0.000	0.000	1.226	0.000	0.01
		B		0.000	0.000	0.802	0.000	0.01
		C		0.000	0.000	0.907	0.000	0.01
L34	35.50-30.50	A	1.275	0.000	0.000	22.851	0.000	0.25
		B		0.000	0.000	14.399	0.000	0.20
		C		0.000	0.000	16.487	0.000	0.20
L35	30.50-29.75	A	1.263	0.000	0.000	2.969	0.000	0.03
		B		0.000	0.000	1.707	0.000	0.03
		C		0.000	0.000	2.019	0.000	0.03
L36	29.75-29.50	A	1.261	0.000	0.000	0.999	0.000	0.01
		B		0.000	0.000	0.579	0.000	0.01
		C		0.000	0.000	0.674	0.000	0.01
L37	29.50-24.50	A	1.250	0.000	0.000	19.925	0.000	0.22
		B		0.000	0.000	11.562	0.000	0.18
		C		0.000	0.000	13.452	0.000	0.17
L38	24.50-19.50	A	1.224	0.000	0.000	19.785	0.000	0.22
		B		0.000	0.000	11.511	0.000	0.17
		C		0.000	0.000	13.386	0.000	0.17
L39	19.50-14.50	A	1.193	0.000	0.000	19.614	0.000	0.21
		B		0.000	0.000	11.449	0.000	0.17
		C		0.000	0.000	13.304	0.000	0.17
L40	14.50-12.50	A	1.166	0.000	0.000	7.786	0.000	0.08
		B		0.000	0.000	4.558	0.000	0.07
		C		0.000	0.000	5.293	0.000	0.06
L41	12.50-12.25	A	1.156	0.000	0.000	0.970	0.000	0.01
		B		0.000	0.000	0.569	0.000	0.01
		C		0.000	0.000	0.660	0.000	0.01
L42	12.25-10.75	A	1.147	0.000	0.000	5.809	0.000	0.06
		B		0.000	0.000	4.770	0.000	0.07
		C		0.000	0.000	5.318	0.000	0.07
L43	10.75-10.50	A	1.138	0.000	0.000	0.742	0.000	0.01
		B		0.000	0.000	0.616	0.000	0.01
		C		0.000	0.000	0.707	0.000	0.01
L44	10.50-5.50	A	1.106	0.000	0.000	14.697	0.000	0.17
		B		0.000	0.000	12.263	0.000	0.20
		C		0.000	0.000	11.713	0.000	0.17
L45	5.50-0.50	A	1.003	0.000	0.000	14.231	0.000	0.15
		B		0.000	0.000	12.098	0.000	0.18
		C		0.000	0.000	7.182	0.000	0.11
L46	0.50-0.00	A	0.782	0.000	0.000	1.324	0.000	0.01
		B		0.000	0.000	1.175	0.000	0.02
		C		0.000	0.000	0.683	0.000	0.01

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	133.00-128.00	-0.3633	-1.2828	-0.5487	-2.1352
L2	128.00-123.00	-0.3668	-1.2945	-0.5671	-2.2052
L3	123.00-118.00	-0.3699	-1.3050	-0.5843	-2.2703
L4	118.00-113.00	-0.3727	-1.3145	-0.6002	-2.3307
L5	113.00-108.00	-0.3753	-1.3230	-0.6151	-2.3869
L6	108.00-104.75	-0.2358	-0.8311	-0.4390	-1.7028
L7	104.75-104.50	-0.1630	-0.5746	-0.3540	-1.3727
L8	104.50-99.50	-0.1737	-0.5196	-0.3744	-1.2735
L9	99.50-98.75	-0.2258	-0.1465	-0.4698	-0.5222
L10	98.75-98.50	-0.2265	-0.1470	-0.4714	-0.5241
L11	98.50-91.33	-0.2318	-0.1509	-0.4832	-0.5380
L12	91.33-90.00	-0.2351	-0.1534	-0.4910	-0.5473
L13	90.00-89.25	-0.8533	-0.3875	-1.2861	-0.8067
L14	89.25-89.00	-0.7501	-0.3407	-1.1586	-0.7268
L15	89.00-88.25	-0.7523	-0.3418	-1.1624	-0.7292
L16	88.25-88.00	-0.7539	-0.3425	-1.1654	-0.7312
L17	88.00-83.00	-0.9393	-0.4271	-1.4144	-0.8879
L18	83.00-78.00	-1.0120	-0.4609	-1.5188	-0.9544
L19	78.00-77.00	-0.8003	-0.3648	-1.2444	-0.7823
L20	77.00-76.75	-0.8036	-0.3663	-1.2496	-0.7857
L21	76.75-71.75	-0.8146	-0.3716	-1.2684	-0.7978
L22	71.75-66.75	-0.8353	-0.3815	-1.3037	-0.8204
L23	66.75-62.25	-0.8546	-0.3907	-1.3365	-0.8414
L24	62.25-62.00	-0.6911	-0.3161	-1.1061	-0.6964
L25	62.00-59.50	-0.6952	-0.3181	-1.1133	-0.7010
L26	59.50-59.25	-0.6636	-0.3037	-1.0828	-0.6819
L27	59.25-54.25	-0.8090	-0.3705	-1.3020	-0.8199
L28	54.25-45.25	-0.8535	-0.3914	-1.3729	-0.8645
L29	45.25-45.00	-0.8614	-0.3952	-1.3872	-0.8739
L30	45.00-40.75	-0.8695	-0.3990	-1.3978	-0.8795
L31	40.75-40.50	-0.7347	-1.5469	-1.2365	-1.9779
L32	40.50-35.75	-0.7425	-1.5637	-1.2494	-2.0000
L33	35.75-35.50	-1.4739	-0.9107	-1.9321	-1.3221
L34	35.50-30.50	-1.5916	-0.9836	-2.0776	-1.4215
L35	30.50-29.75	-1.8392	-1.1368	-2.3791	-1.6273
L36	29.75-29.50	-1.8195	-1.1247	-2.4144	-1.6551
L37	29.50-24.50	-1.8377	-1.1361	-2.4372	-1.6701
L38	24.50-19.50	-1.8719	-1.1576	-2.4786	-1.6971
L39	19.50-14.50	-1.9054	-1.1787	-2.5164	-1.7209
L40	14.50-12.50	-1.9286	-1.1933	-2.5399	-1.7351
L41	12.50-12.25	-1.9355	-1.1976	-2.5463	-1.7387
L42	12.25-10.75	-0.9918	2.1906	-1.6827	1.3216
L43	10.75-10.50	-0.0509	4.0559	-0.8313	3.0236
L44	10.50-5.50	-0.8391	3.6915	-1.5758	2.6405
L45	5.50-0.50	-2.5360	2.9015	-3.1275	1.8594
L46	0.50-0.00	-2.5579	2.9236	-3.0745	2.0267

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	Safety Line 5/8	128.00 - 133.00	1.0000	1.0000
L1	4	7983A(ELLIPTICAL)	128.00 - 133.00	1.0000	1.0000
L2	2	Safety Line 5/8	123.00 - 128.00	1.0000	1.0000
L2	4	7983A(ELLIPTICAL)	123.00 - 128.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L3	2	Safety Line 5/8	118.00 - 123.00	1.0000	1.0000
L3	4	7983A(ELLIPTICAL)	118.00 - 123.00	1.0000	1.0000
L4	2	Safety Line 5/8	113.00 - 118.00	1.0000	1.0000
L4	4	7983A(ELLIPTICAL)	113.00 - 118.00	1.0000	1.0000
L5	2	Safety Line 5/8	108.00 - 113.00	1.0000	1.0000
L5	4	7983A(ELLIPTICAL)	108.00 - 113.00	1.0000	1.0000
L6	2	Safety Line 5/8	104.75 - 108.00	1.0000	1.0000
L6	4	7983A(ELLIPTICAL)	104.75 - 108.00	1.0000	1.0000
L6	54	4" x 1" Flat Plate (G)	104.75 - 106.50	1.0000	1.0000
L6	55	4" x 1" Flat Plate (G)	104.75 - 106.50	1.0000	1.0000
L6	56	4" x 1" Flat Plate (G)	104.75 - 106.50	1.0000	1.0000
L7	2	Safety Line 5/8	104.50 - 104.75	1.0000	1.0000
L7	4	7983A(ELLIPTICAL)	104.50 - 104.75	1.0000	1.0000
L7	54	4" x 1" Flat Plate (G)	104.50 - 104.75	1.0000	1.0000
L7	55	4" x 1" Flat Plate (G)	104.50 - 104.75	1.0000	1.0000
L7	56	4" x 1" Flat Plate (G)	104.50 - 104.75	1.0000	1.0000
L8	2	Safety Line 5/8	99.50 - 104.50	1.0000	1.0000
L8	4	7983A(ELLIPTICAL)	99.50 - 104.50	1.0000	1.0000
L8	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	99.50 - 100.00	1.0000	1.0000
L8	38	3.625" x 1.25" Flat Plate (G)	99.50 - 100.00	1.0000	1.0000
L8	39	3.625" x 1.25" Flat Plate (G)	99.50 - 100.00	1.0000	1.0000
L8	40	3.625" x 1.25" Flat Plate (G)	99.50 - 100.00	1.0000	1.0000
L8	54	4" x 1" Flat Plate (G)	99.50 - 104.50	1.0000	1.0000
L8	55	4" x 1" Flat Plate (G)	99.50 - 104.50	1.0000	1.0000
L8	56	4" x 1" Flat Plate (G)	99.50 - 104.50	1.0000	1.0000
L9	2	Safety Line 5/8	98.75 - 99.50	1.0000	1.0000
L9	4	7983A(ELLIPTICAL)	98.75 - 99.50	1.0000	1.0000
L9	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	98.75 - 99.50	1.0000	1.0000
L9	38	3.625" x 1.25" Flat Plate (G)	98.75 - 99.50	1.0000	1.0000
L9	39	3.625" x 1.25" Flat Plate (G)	98.75 - 99.50	1.0000	1.0000
L9	40	3.625" x 1.25" Flat Plate (G)	98.75 - 99.50	1.0000	1.0000
L9	54	4" x 1" Flat Plate (G)	98.75 - 99.50	1.0000	1.0000
L9	55	4" x 1" Flat Plate (G)	98.75 - 99.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L9	56	4" x 1" Flat Plate (G)	98.75 - 99.50	1.0000	1.0000
L10	2	Safety Line 5/8	98.50 - 98.75	1.0000	1.0000
L10	4	7983A(ELLIPTICAL)	98.50 - 98.75	1.0000	1.0000
L10	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	98.50 - 98.75	1.0000	1.0000
L10	38	3.625" x 1.25" Flat Plate (G)	98.50 - 98.75	1.0000	1.0000
L10	39	3.625" x 1.25" Flat Plate (G)	98.50 - 98.75	1.0000	1.0000
L10	40	3.625" x 1.25" Flat Plate (G)	98.50 - 98.75	1.0000	1.0000
L10	54	4" x 1" Flat Plate (G)	98.50 - 98.75	1.0000	1.0000
L10	55	4" x 1" Flat Plate (G)	98.50 - 98.75	1.0000	1.0000
L10	56	4" x 1" Flat Plate (G)	98.50 - 98.75	1.0000	1.0000
L11	2	Safety Line 5/8	91.33 - 98.50	1.0000	1.0000
L11	4	7983A(ELLIPTICAL)	91.33 - 98.50	1.0000	1.0000
L11	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	91.33 - 98.50	1.0000	1.0000
L11	38	3.625" x 1.25" Flat Plate (G)	91.33 - 98.50	1.0000	1.0000
L11	39	3.625" x 1.25" Flat Plate (G)	91.33 - 98.50	1.0000	1.0000
L11	40	3.625" x 1.25" Flat Plate (G)	91.33 - 98.50	1.0000	1.0000
L11	54	4" x 1" Flat Plate (G)	91.33 - 98.50	1.0000	1.0000
L11	55	4" x 1" Flat Plate (G)	91.33 - 98.50	1.0000	1.0000
L11	56	4" x 1" Flat Plate (G)	91.33 - 98.50	1.0000	1.0000
L13	2	Safety Line 5/8	89.25 - 90.00	1.0000	1.0000
L13	4	7983A(ELLIPTICAL)	89.25 - 90.00	1.0000	1.0000
L13	6	LCF158-50JL(1-5/8)	89.25 - 90.00	1.0000	1.0000
L13	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	89.25 - 90.00	1.0000	1.0000
L13	38	3.625" x 1.25" Flat Plate (G)	89.25 - 90.00	1.0000	1.0000
L13	39	3.625" x 1.25" Flat Plate (G)	89.25 - 90.00	1.0000	1.0000
L13	40	3.625" x 1.25" Flat Plate (G)	89.25 - 90.00	1.0000	1.0000
L13	54	4" x 1" Flat Plate (G)	89.25 - 90.00	1.0000	1.0000
L13	55	4" x 1" Flat Plate (G)	89.25 - 90.00	1.0000	1.0000
L13	56	4" x 1" Flat Plate (G)	89.25 - 90.00	1.0000	1.0000
L14	2	Safety Line 5/8	89.00 - 89.25	1.0000	1.0000
L14	4	7983A(ELLIPTICAL)	89.00 - 89.25	1.0000	1.0000
L14	6	LCF158-50JL(1-5/8)	89.00 - 89.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L14	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	89.00 - 89.25	1.0000	1.0000
L14	34	5.5" x 1.25" Flat Plate (G)	89.00 - 89.25	1.0000	1.0000
L14	35	5.5" x 1.25" Flat Plate (G)	89.00 - 89.25	1.0000	1.0000
L14	36	5.5" x 1.25" Flat Plate (G)	89.00 - 89.25	1.0000	1.0000
L14	54	4" x 1" Flat Plate (G)	89.00 - 89.25	1.0000	1.0000
L14	55	4" x 1" Flat Plate (G)	89.00 - 89.25	1.0000	1.0000
L14	56	4" x 1" Flat Plate (G)	89.00 - 89.25	1.0000	1.0000
L15	2	Safety Line 5/8	88.25 - 89.00	1.0000	1.0000
L15	4	7983A(ELLIPTICAL)	88.25 - 89.00	1.0000	1.0000
L15	6	LCF158-50JL(1-5/8)	88.25 - 89.00	1.0000	1.0000
L15	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	88.25 - 89.00	1.0000	1.0000
L15	34	5.5" x 1.25" Flat Plate (G)	88.25 - 89.00	1.0000	1.0000
L15	35	5.5" x 1.25" Flat Plate (G)	88.25 - 89.00	1.0000	1.0000
L15	36	5.5" x 1.25" Flat Plate (G)	88.25 - 89.00	1.0000	1.0000
L15	54	4" x 1" Flat Plate (G)	88.25 - 89.00	1.0000	1.0000
L15	55	4" x 1" Flat Plate (G)	88.25 - 89.00	1.0000	1.0000
L15	56	4" x 1" Flat Plate (G)	88.25 - 89.00	1.0000	1.0000
L16	2	Safety Line 5/8	88.00 - 88.25	1.0000	1.0000
L16	4	7983A(ELLIPTICAL)	88.00 - 88.25	1.0000	1.0000
L16	6	LCF158-50JL(1-5/8)	88.00 - 88.25	1.0000	1.0000
L16	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	88.00 - 88.25	1.0000	1.0000
L16	34	5.5" x 1.25" Flat Plate (G)	88.00 - 88.25	1.0000	1.0000
L16	35	5.5" x 1.25" Flat Plate (G)	88.00 - 88.25	1.0000	1.0000
L16	36	5.5" x 1.25" Flat Plate (G)	88.00 - 88.25	1.0000	1.0000
L16	54	4" x 1" Flat Plate (G)	88.00 - 88.25	1.0000	1.0000
L16	55	4" x 1" Flat Plate (G)	88.00 - 88.25	1.0000	1.0000
L16	56	4" x 1" Flat Plate (G)	88.00 - 88.25	1.0000	1.0000
L17	2	Safety Line 5/8	83.00 - 88.00	1.0000	1.0000
L17	4	7983A(ELLIPTICAL)	83.00 - 88.00	1.0000	1.0000
L17	6	LCF158-50JL(1-5/8)	83.00 - 88.00	1.0000	1.0000
L17	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	83.00 - 88.00	1.0000	1.0000
L17	34	5.5" x 1.25" Flat Plate (G)	83.00 - 88.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L17	35	5.5" x 1.25" Flat Plate (G)	83.00 - 88.00	1.0000	1.0000
L17	36	5.5" x 1.25" Flat Plate (G)	83.00 - 88.00	1.0000	1.0000
L17	54	4" x 1" Flat Plate (G)	86.50 - 88.00	1.0000	1.0000
L17	55	4" x 1" Flat Plate (G)	86.50 - 88.00	1.0000	1.0000
L17	56	4" x 1" Flat Plate (G)	86.50 - 88.00	1.0000	1.0000
L18	2	Safety Line 5/8	78.00 - 83.00	1.0000	1.0000
L18	4	7983A(ELLIPTICAL)	78.00 - 83.00	1.0000	1.0000
L18	6	LCF158-50JL(1-5/8)	78.00 - 83.00	1.0000	1.0000
L18	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	78.00 - 83.00	1.0000	1.0000
L18	34	5.5" x 1.25" Flat Plate (G)	78.00 - 83.00	1.0000	1.0000
L18	35	5.5" x 1.25" Flat Plate (G)	78.00 - 83.00	1.0000	1.0000
L18	36	5.5" x 1.25" Flat Plate (G)	78.00 - 83.00	1.0000	1.0000
L18	50	4" x 1" Flat Plate (G)	78.00 - 78.75	1.0000	1.0000
L18	51	4" x 1" Flat Plate (G)	78.00 - 78.75	1.0000	1.0000
L18	52	4" x 1" Flat Plate (G)	78.00 - 78.75	1.0000	1.0000
L19	2	Safety Line 5/8	77.00 - 78.00	1.0000	1.0000
L19	4	7983A(ELLIPTICAL)	77.00 - 78.00	1.0000	1.0000
L19	6	LCF158-50JL(1-5/8)	77.00 - 78.00	1.0000	1.0000
L19	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	77.00 - 78.00	1.0000	1.0000
L19	34	5.5" x 1.25" Flat Plate (G)	77.00 - 78.00	1.0000	1.0000
L19	35	5.5" x 1.25" Flat Plate (G)	77.00 - 78.00	1.0000	1.0000
L19	36	5.5" x 1.25" Flat Plate (G)	77.00 - 78.00	1.0000	1.0000
L19	50	4" x 1" Flat Plate (G)	77.00 - 78.00	1.0000	1.0000
L19	51	4" x 1" Flat Plate (G)	77.00 - 78.00	1.0000	1.0000
L19	52	4" x 1" Flat Plate (G)	77.00 - 78.00	1.0000	1.0000
L20	2	Safety Line 5/8	76.75 - 77.00	1.0000	1.0000
L20	4	7983A(ELLIPTICAL)	76.75 - 77.00	1.0000	1.0000
L20	6	LCF158-50JL(1-5/8)	76.75 - 77.00	1.0000	1.0000
L20	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	76.75 - 77.00	1.0000	1.0000
L20	34	5.5" x 1.25" Flat Plate (G)	76.75 - 77.00	1.0000	1.0000
L20	35	5.5" x 1.25" Flat Plate (G)	76.75 - 77.00	1.0000	1.0000
L20	36	5.5" x 1.25" Flat Plate (G)	76.75 - 77.00	1.0000	1.0000
L20	50	4" x 1" Flat Plate (G)	76.75 - 77.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L20	51	4" x 1" Flat Plate (G)	76.75 - 77.00	1.0000	1.0000
L20	52	4" x 1" Flat Plate (G)	76.75 - 77.00	1.0000	1.0000
L21	2	Safety Line 5/8	71.75 - 76.75	1.0000	1.0000
L21	4	7983A(ELLIPTICAL)	71.75 - 76.75	1.0000	1.0000
L21	6	LCF158-50JL(1-5/8)	71.75 - 76.75	1.0000	1.0000
L21	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	71.75 - 76.75	1.0000	1.0000
L21	34	5.5" x 1.25" Flat Plate (G)	71.75 - 76.75	1.0000	1.0000
L21	35	5.5" x 1.25" Flat Plate (G)	71.75 - 76.75	1.0000	1.0000
L21	36	5.5" x 1.25" Flat Plate (G)	71.75 - 76.75	1.0000	1.0000
L21	50	4" x 1" Flat Plate (G)	71.75 - 76.75	1.0000	1.0000
L21	51	4" x 1" Flat Plate (G)	71.75 - 76.75	1.0000	1.0000
L21	52	4" x 1" Flat Plate (G)	71.75 - 76.75	1.0000	1.0000
L22	2	Safety Line 5/8	66.75 - 71.75	1.0000	1.0000
L22	4	7983A(ELLIPTICAL)	66.75 - 71.75	1.0000	1.0000
L22	6	LCF158-50JL(1-5/8)	66.75 - 71.75	1.0000	1.0000
L22	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	66.75 - 71.75	1.0000	1.0000
L22	34	5.5" x 1.25" Flat Plate (G)	66.75 - 71.75	1.0000	1.0000
L22	35	5.5" x 1.25" Flat Plate (G)	66.75 - 71.75	1.0000	1.0000
L22	36	5.5" x 1.25" Flat Plate (G)	66.75 - 71.75	1.0000	1.0000
L22	50	4" x 1" Flat Plate (G)	66.75 - 71.75	1.0000	1.0000
L22	51	4" x 1" Flat Plate (G)	66.75 - 71.75	1.0000	1.0000
L22	52	4" x 1" Flat Plate (G)	66.75 - 71.75	1.0000	1.0000
L23	2	Safety Line 5/8	62.25 - 66.75	1.0000	1.0000
L23	4	7983A(ELLIPTICAL)	62.25 - 66.75	1.0000	1.0000
L23	6	LCF158-50JL(1-5/8)	62.25 - 66.75	1.0000	1.0000
L23	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	62.25 - 66.75	1.0000	1.0000
L23	34	5.5" x 1.25" Flat Plate (G)	62.25 - 66.75	1.0000	1.0000
L23	35	5.5" x 1.25" Flat Plate (G)	62.25 - 66.75	1.0000	1.0000
L23	36	5.5" x 1.25" Flat Plate (G)	62.25 - 66.75	1.0000	1.0000
L23	50	4" x 1" Flat Plate (G)	62.25 - 66.75	1.0000	1.0000
L23	51	4" x 1" Flat Plate (G)	62.25 - 66.75	1.0000	1.0000
L23	52	4" x 1" Flat Plate (G)	62.25 - 66.75	1.0000	1.0000
L24	2	Safety Line 5/8	62.00 - 62.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L24	4	7983A(ELLIPTICAL)	62.00 - 62.25	1.0000	1.0000
L24	6	LCF158-50JL(1-5/8)	62.00 - 62.25	1.0000	1.0000
L24	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	62.00 - 62.25	1.0000	1.0000
L24	34	5.5" x 1.25" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	35	5.5" x 1.25" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	36	5.5" x 1.25" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	46	4" x 1" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	47	4" x 1" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	48	4" x 1" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	50	4" x 1" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	51	4" x 1" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L24	52	4" x 1" Flat Plate (G)	62.00 - 62.25	1.0000	1.0000
L25	2	Safety Line 5/8	59.50 - 62.00	1.0000	1.0000
L25	4	7983A(ELLIPTICAL)	59.50 - 62.00	1.0000	1.0000
L25	6	LCF158-50JL(1-5/8)	59.50 - 62.00	1.0000	1.0000
L25	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	59.50 - 62.00	1.0000	1.0000
L25	34	5.5" x 1.25" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	35	5.5" x 1.25" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	36	5.5" x 1.25" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	46	4" x 1" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	47	4" x 1" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	48	4" x 1" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	50	4" x 1" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	51	4" x 1" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L25	52	4" x 1" Flat Plate (G)	59.50 - 62.00	1.0000	1.0000
L26	2	Safety Line 5/8	59.25 - 59.50	1.0000	1.0000
L26	4	7983A(ELLIPTICAL)	59.25 - 59.50	1.0000	1.0000
L26	6	LCF158-50JL(1-5/8)	59.25 - 59.50	1.0000	1.0000
L26	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	59.25 - 59.50	1.0000	1.0000
L26	30	6.625" x 1.25" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	31	6.625" x 1.25" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	32	6.625" x 1.25" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	46	4" x 1" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L26	47	4" x 1" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	48	4" x 1" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	50	4" x 1" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	51	4" x 1" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L26	52	4" x 1" Flat Plate (G)	59.25 - 59.50	1.0000	1.0000
L27	2	Safety Line 5/8	54.25 - 59.25	1.0000	1.0000
L27	4	7983A(ELLIPTICAL)	54.25 - 59.25	1.0000	1.0000
L27	6	LCF158-50JL(1-5/8)	54.25 - 59.25	1.0000	1.0000
L27	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	54.25 - 59.25	1.0000	1.0000
L27	30	6.625" x 1.25" Flat Plate (G)	54.25 - 59.25	1.0000	1.0000
L27	31	6.625" x 1.25" Flat Plate (G)	54.25 - 59.25	1.0000	1.0000
L27	32	6.625" x 1.25" Flat Plate (G)	54.25 - 59.25	1.0000	1.0000
L27	46	4" x 1" Flat Plate (G)	54.25 - 59.25	1.0000	1.0000
L27	47	4" x 1" Flat Plate (G)	54.25 - 59.25	1.0000	1.0000
L27	48	4" x 1" Flat Plate (G)	54.25 - 59.25	1.0000	1.0000
L27	50	4" x 1" Flat Plate (G)	58.75 - 59.25	1.0000	1.0000
L27	51	4" x 1" Flat Plate (G)	58.75 - 59.25	1.0000	1.0000
L27	52	4" x 1" Flat Plate (G)	58.75 - 59.25	1.0000	1.0000
L28	2	Safety Line 5/8	45.25 - 54.25	1.0000	1.0000
L28	4	7983A(ELLIPTICAL)	45.25 - 54.25	1.0000	1.0000
L28	6	LCF158-50JL(1-5/8)	45.25 - 54.25	1.0000	1.0000
L28	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	45.25 - 54.25	1.0000	1.0000
L28	30	6.625" x 1.25" Flat Plate (G)	45.25 - 54.25	1.0000	1.0000
L28	31	6.625" x 1.25" Flat Plate (G)	45.25 - 54.25	1.0000	1.0000
L28	32	6.625" x 1.25" Flat Plate (G)	45.25 - 54.25	1.0000	1.0000
L28	46	4" x 1" Flat Plate (G)	45.25 - 54.25	1.0000	1.0000
L28	47	4" x 1" Flat Plate (G)	45.25 - 54.25	1.0000	1.0000
L28	48	4" x 1" Flat Plate (G)	45.25 - 54.25	1.0000	1.0000
L30	2	Safety Line 5/8	40.75 - 45.00	1.0000	1.0000
L30	4	7983A(ELLIPTICAL)	40.75 - 45.00	1.0000	1.0000
L30	6	LCF158-50JL(1-5/8)	40.75 - 45.00	1.0000	1.0000
L30	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	40.75 - 45.00	1.0000	1.0000
L30	30	6.625" x 1.25" Flat Plate (G)	40.75 - 45.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L30	31	6.625" x 1.25" Flat Plate (G)	40.75 - 45.00	1.0000	1.0000
L30	32	6.625" x 1.25" Flat Plate (G)	40.75 - 45.00	1.0000	1.0000
L30	46	4" x 1" Flat Plate (G)	40.75 - 45.00	1.0000	1.0000
L30	47	4" x 1" Flat Plate (G)	40.75 - 45.00	1.0000	1.0000
L30	48	4" x 1" Flat Plate (G)	40.75 - 45.00	1.0000	1.0000
L31	2	Safety Line 5/8	40.50 - 40.75	1.0000	1.0000
L31	4	7983A(ELLIPTICAL)	40.50 - 40.75	1.0000	1.0000
L31	6	LCF158-50JL(1-5/8)	40.50 - 40.75	1.0000	1.0000
L31	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	40.50 - 40.75	1.0000	1.0000
L31	30	6.625" x 1.25" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L31	31	6.625" x 1.25" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L31	32	6.625" x 1.25" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L31	43	4" x 1" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L31	46	4" x 1" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L31	47	4" x 1" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L31	48	4" x 1" Flat Plate (G)	40.50 - 40.75	1.0000	1.0000
L32	2	Safety Line 5/8	35.75 - 40.50	1.0000	1.0000
L32	4	7983A(ELLIPTICAL)	35.75 - 40.50	1.0000	1.0000
L32	6	LCF158-50JL(1-5/8)	35.75 - 40.50	1.0000	1.0000
L32	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	35.75 - 40.50	1.0000	1.0000
L32	30	6.625" x 1.25" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L32	31	6.625" x 1.25" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L32	32	6.625" x 1.25" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L32	43	4" x 1" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L32	46	4" x 1" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L32	47	4" x 1" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L32	48	4" x 1" Flat Plate (G)	35.75 - 40.50	1.0000	1.0000
L33	2	Safety Line 5/8	35.50 - 35.75	1.0000	1.0000
L33	4	7983A(ELLIPTICAL)	35.50 - 35.75	1.0000	1.0000
L33	6	LCF158-50JL(1-5/8)	35.50 - 35.75	1.0000	1.0000
L33	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	35.50 - 35.75	1.0000	1.0000
L33	30	6.625" x 1.25" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	31	6.625" x 1.25" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L33	32	6.625" x 1.25" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	42	4" x 1" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	43	4" x 1" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	44	4" x 1" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	46	4" x 1" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	47	4" x 1" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L33	48	4" x 1" Flat Plate (G)	35.50 - 35.75	1.0000	1.0000
L34	2	Safety Line 5/8	30.50 - 35.50	1.0000	1.0000
L34	4	7983A(ELLIPTICAL)	30.50 - 35.50	1.0000	1.0000
L34	6	LCF158-50JL(1-5/8)	30.50 - 35.50	1.0000	1.0000
L34	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	30.50 - 35.50	1.0000	1.0000
L34	30	6.625" x 1.25" Flat Plate (G)	30.50 - 35.50	1.0000	1.0000
L34	31	6.625" x 1.25" Flat Plate (G)	30.50 - 35.50	1.0000	1.0000
L34	32	6.625" x 1.25" Flat Plate (G)	30.50 - 35.50	1.0000	1.0000
L34	42	4" x 1" Flat Plate (G)	30.50 - 35.50	1.0000	1.0000
L34	43	4" x 1" Flat Plate (G)	30.50 - 35.50	1.0000	1.0000
L34	44	4" x 1" Flat Plate (G)	30.50 - 35.50	1.0000	1.0000
L34	46	4" x 1" Flat Plate (G)	32.25 - 35.50	1.0000	1.0000
L34	47	4" x 1" Flat Plate (G)	32.25 - 35.50	1.0000	1.0000
L34	48	4" x 1" Flat Plate (G)	32.25 - 35.50	1.0000	1.0000
L35	2	Safety Line 5/8	29.75 - 30.50	1.0000	1.0000
L35	4	7983A(ELLIPTICAL)	29.75 - 30.50	1.0000	1.0000
L35	6	LCF158-50JL(1-5/8)	29.75 - 30.50	1.0000	1.0000
L35	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	29.75 - 30.50	1.0000	1.0000
L35	30	6.625" x 1.25" Flat Plate (G)	29.75 - 30.50	1.0000	1.0000
L35	31	6.625" x 1.25" Flat Plate (G)	29.75 - 30.50	1.0000	1.0000
L35	32	6.625" x 1.25" Flat Plate (G)	29.75 - 30.50	1.0000	1.0000
L35	42	4" x 1" Flat Plate (G)	29.75 - 30.50	1.0000	1.0000
L35	43	4" x 1" Flat Plate (G)	29.75 - 30.50	1.0000	1.0000
L35	44	4" x 1" Flat Plate (G)	29.75 - 30.50	1.0000	1.0000
L36	2	Safety Line 5/8	29.50 - 29.75	1.0000	1.0000
L36	4	7983A(ELLIPTICAL)	29.50 - 29.75	1.0000	1.0000
L36	6	LCF158-50JL(1-5/8)	29.50 - 29.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L36	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	29.50 - 29.75	1.0000	1.0000
L36	26	6.875" x 1.25" Flat Plate (G)	29.50 - 29.75	1.0000	1.0000
L36	27	6.875" x 1.25" Flat Plate (G)	29.50 - 29.75	1.0000	1.0000
L36	28	6.875" x 1.25" Flat Plate (G)	29.50 - 29.75	1.0000	1.0000
L36	42	4" x 1" Flat Plate (G)	29.50 - 29.75	1.0000	1.0000
L36	43	4" x 1" Flat Plate (G)	29.50 - 29.75	1.0000	1.0000
L36	44	4" x 1" Flat Plate (G)	29.50 - 29.75	1.0000	1.0000
L37	2	Safety Line 5/8	24.50 - 29.50	1.0000	1.0000
L37	4	7983A(ELLIPTICAL)	24.50 - 29.50	1.0000	1.0000
L37	6	LCF158-50JL(1-5/8)	24.50 - 29.50	1.0000	1.0000
L37	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	24.50 - 29.50	1.0000	1.0000
L37	26	6.875" x 1.25" Flat Plate (G)	24.50 - 29.50	1.0000	1.0000
L37	27	6.875" x 1.25" Flat Plate (G)	24.50 - 29.50	1.0000	1.0000
L37	28	6.875" x 1.25" Flat Plate (G)	24.50 - 29.50	1.0000	1.0000
L37	42	4" x 1" Flat Plate (G)	24.50 - 29.50	1.0000	1.0000
L37	43	4" x 1" Flat Plate (G)	24.50 - 29.50	1.0000	1.0000
L37	44	4" x 1" Flat Plate (G)	24.50 - 29.50	1.0000	1.0000
L38	2	Safety Line 5/8	19.50 - 24.50	1.0000	1.0000
L38	4	7983A(ELLIPTICAL)	19.50 - 24.50	1.0000	1.0000
L38	6	LCF158-50JL(1-5/8)	19.50 - 24.50	1.0000	1.0000
L38	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	19.50 - 24.50	1.0000	1.0000
L38	26	6.875" x 1.25" Flat Plate (G)	19.50 - 24.50	1.0000	1.0000
L38	27	6.875" x 1.25" Flat Plate (G)	19.50 - 24.50	1.0000	1.0000
L38	28	6.875" x 1.25" Flat Plate (G)	19.50 - 24.50	1.0000	1.0000
L38	42	4" x 1" Flat Plate (G)	19.50 - 24.50	1.0000	1.0000
L38	43	4" x 1" Flat Plate (G)	19.50 - 24.50	1.0000	1.0000
L38	44	4" x 1" Flat Plate (G)	19.50 - 24.50	1.0000	1.0000
L39	2	Safety Line 5/8	14.50 - 19.50	1.0000	1.0000
L39	4	7983A(ELLIPTICAL)	14.50 - 19.50	1.0000	1.0000
L39	6	LCF158-50JL(1-5/8)	14.50 - 19.50	1.0000	1.0000
L39	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	14.50 - 19.50	1.0000	1.0000
L39	26	6.875" x 1.25" Flat Plate (G)	14.50 - 19.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L39	27	6.875" x 1.25" Flat Plate (G)	14.50 - 19.50	1.0000	1.0000
L39	28	6.875" x 1.25" Flat Plate (G)	14.50 - 19.50	1.0000	1.0000
L39	42	4" x 1" Flat Plate (G)	14.50 - 19.50	1.0000	1.0000
L39	43	4" x 1" Flat Plate (G)	14.50 - 19.50	1.0000	1.0000
L39	44	4" x 1" Flat Plate (G)	14.50 - 19.50	1.0000	1.0000
L40	2	Safety Line 5/8	12.50 - 14.50	1.0000	1.0000
L40	4	7983A(ELLIPTICAL)	12.50 - 14.50	1.0000	1.0000
L40	6	LCF158-50JL(1-5/8)	12.50 - 14.50	1.0000	1.0000
L40	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	12.50 - 14.50	1.0000	1.0000
L40	26	6.875" x 1.25" Flat Plate (G)	12.50 - 14.50	1.0000	1.0000
L40	27	6.875" x 1.25" Flat Plate (G)	12.50 - 14.50	1.0000	1.0000
L40	28	6.875" x 1.25" Flat Plate (G)	12.50 - 14.50	1.0000	1.0000
L40	42	4" x 1" Flat Plate (G)	12.50 - 14.50	1.0000	1.0000
L40	43	4" x 1" Flat Plate (G)	12.50 - 14.50	1.0000	1.0000
L40	44	4" x 1" Flat Plate (G)	12.50 - 14.50	1.0000	1.0000
L41	2	Safety Line 5/8	12.25 - 12.50	1.0000	1.0000
L41	4	7983A(ELLIPTICAL)	12.25 - 12.50	1.0000	1.0000
L41	6	LCF158-50JL(1-5/8)	12.25 - 12.50	1.0000	1.0000
L41	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	12.25 - 12.50	1.0000	1.0000
L41	26	6.875" x 1.25" Flat Plate (G)	12.25 - 12.50	1.0000	1.0000
L41	27	6.875" x 1.25" Flat Plate (G)	12.25 - 12.50	1.0000	1.0000
L41	28	6.875" x 1.25" Flat Plate (G)	12.25 - 12.50	1.0000	1.0000
L41	42	4" x 1" Flat Plate (G)	12.25 - 12.50	1.0000	1.0000
L41	43	4" x 1" Flat Plate (G)	12.25 - 12.50	1.0000	1.0000
L41	44	4" x 1" Flat Plate (G)	12.25 - 12.50	1.0000	1.0000
L42	2	Safety Line 5/8	10.75 - 12.25	1.0000	1.0000
L42	4	7983A(ELLIPTICAL)	10.75 - 12.25	1.0000	1.0000
L42	6	LCF158-50JL(1-5/8)	10.75 - 12.25	1.0000	1.0000
L42	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	10.75 - 12.25	1.0000	1.0000
L42	23	6.875" x 1.25" Flat Plate (G)	10.75 - 12.00	1.0000	1.0000
L42	24	6.875" x 1.25" Flat Plate (G)	10.75 - 12.00	1.0000	1.0000
L42	26	6.875" x 1.25" Flat Plate (G)	10.75 - 12.25	1.0000	1.0000
L42	27	6.875" x 1.25" Flat Plate (G)	10.75 - 12.25	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L42	28	6.875" x 1.25" Flat Plate (G)	10.75 - 12.25	1.0000	1.0000
L42	42	4" x 1" Flat Plate (G)	10.75 - 12.25	1.0000	1.0000
L42	43	4" x 1" Flat Plate (G)	10.75 - 12.25	1.0000	1.0000
L42	44	4" x 1" Flat Plate (G)	10.75 - 12.25	1.0000	1.0000
L43	2	Safety Line 5/8	10.50 - 10.75	1.0000	1.0000
L43	4	7983A(ELLIPTICAL)	10.50 - 10.75	1.0000	1.0000
L43	6	LCF158-50JL(1-5/8)	10.50 - 10.75	1.0000	1.0000
L43	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	10.50 - 10.75	1.0000	1.0000
L43	23	6.875" x 1.25" Flat Plate (G)	10.50 - 10.75	1.0000	1.0000
L43	24	6.875" x 1.25" Flat Plate (G)	10.50 - 10.75	1.0000	1.0000
L43	26	6.875" x 1.25" Flat Plate (G)	10.50 - 10.75	1.0000	1.0000
L43	27	6.875" x 1.25" Flat Plate (G)	10.50 - 10.75	1.0000	1.0000
L43	28	6.875" x 1.25" Flat Plate (G)	10.50 - 10.75	1.0000	1.0000
L44	2	Safety Line 5/8	5.50 - 10.50	1.0000	1.0000
L44	4	7983A(ELLIPTICAL)	5.50 - 10.50	1.0000	1.0000
L44	6	LCF158-50JL(1-5/8)	5.50 - 10.50	1.0000	1.0000
L44	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	5.50 - 10.50	1.0000	1.0000
L44	23	6.875" x 1.25" Flat Plate (G)	5.50 - 10.50	1.0000	1.0000
L44	24	6.875" x 1.25" Flat Plate (G)	5.50 - 10.50	1.0000	1.0000
L44	26	6.875" x 1.25" Flat Plate (G)	5.50 - 10.50	1.0000	1.0000
L44	27	6.875" x 1.25" Flat Plate (G)	5.50 - 10.50	1.0000	1.0000
L44	28	6.875" x 1.25" Flat Plate (G)	7.25 - 10.50	1.0000	1.0000
L45	2	Safety Line 5/8	0.50 - 5.50	1.0000	1.0000
L45	4	7983A(ELLIPTICAL)	0.50 - 5.50	1.0000	1.0000
L45	6	LCF158-50JL(1-5/8)	0.50 - 5.50	1.0000	1.0000
L45	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	0.50 - 5.50	1.0000	1.0000
L45	23	6.875" x 1.25" Flat Plate (G)	0.50 - 5.50	1.0000	1.0000
L45	24	6.875" x 1.25" Flat Plate (G)	0.50 - 5.50	1.0000	1.0000
L45	26	6.875" x 1.25" Flat Plate (G)	0.50 - 5.50	1.0000	1.0000
L45	27	6.875" x 1.25" Flat Plate (G)	0.50 - 5.50	1.0000	1.0000
L46	2	Safety Line 5/8	0.00 - 0.50	1.0000	1.0000
L46	4	7983A(ELLIPTICAL)	0.00 - 0.50	1.0000	1.0000
L46	6	LCF158-50JL(1-5/8)	0.00 - 0.50	1.0000	1.0000
L46	19	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	0.00 - 0.50	1.0000	1.0000
L46	23	6.875" x 1.25" Flat Plate (G)	0.00 - 0.50	1.0000	1.0000
L46	24	6.875" x 1.25" Flat Plate (G)	0.00 - 0.50	1.0000	1.0000
L46	26	6.875" x 1.25" Flat Plate (G)	0.00 - 0.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L46	27	6.875" x 1.25" Flat Plate (G)	0.00 - 0.50	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8x4'	C	From Leg	0.00 0.00 2.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.25 0.66 0.97 1.49	0.25 0.66 0.97 1.49	0.03 0.03 0.04 0.06
*** L133 *** (2) APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.26 8.82 9.35 10.42	6.95 8.13 9.02 10.84	0.08 0.15 0.23 0.41
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.26 8.82 9.35 10.42	6.95 8.13 9.02 10.84	0.08 0.15 0.23 0.41
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.26 8.82 9.35 10.42	6.95 8.13 9.02 10.84	0.08 0.15 0.23 0.41
AAHC w/ Mount Pipe	A	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.38 4.69 5.01 5.68	2.66 3.04 3.43 4.29	0.11 0.16 0.20 0.31
AAHC w/ Mount Pipe	B	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.38 4.69 5.01 5.68	2.66 3.04 3.43 4.29	0.11 0.16 0.20 0.31
AAHC w/ Mount Pipe	C	From Leg	4.00 0.00 -3.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.38 4.69 5.01 5.68	2.66 3.04 3.43 4.29	0.11 0.16 0.20 0.31
(2) 800MHZ RRH	A	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
800MHZ RRH	B	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
(2) IBC1900HB-2	A	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.13 1.27 1.42 1.75	0.71 0.84 0.97 1.25	0.04 0.05 0.06 0.09
IBC1900HB-2	B	From Leg	4.00 0.00 0.00	0.0000	133.00	No Ice 1/2" Ice	1.13 1.27 1.42	0.71 0.84 0.97	0.04 0.05 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	1.75	1.25	0.09
						2" Ice			
IBC1900HB-2	C	From Leg	4.00	0.0000	133.00	No Ice	1.13	0.71	0.04
			0.00			1/2"	1.27	0.84	0.05
			0.00			Ice	1.42	0.97	0.06
						1" Ice	1.75	1.25	0.09
						2" Ice			
(4) 1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	133.00	No Ice	2.31	2.38	0.06
			0.00			1/2"	2.52	2.58	0.08
			0.00			Ice	2.73	2.79	0.11
						1" Ice	3.17	3.24	0.18
						2" Ice			
(2) 1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	133.00	No Ice	2.31	2.38	0.06
			0.00			1/2"	2.52	2.58	0.08
			0.00			Ice	2.73	2.79	0.11
						1" Ice	3.17	3.24	0.18
						2" Ice			
(2) 800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	133.00	No Ice	0.66	0.32	0.01
			0.00			1/2"	0.76	0.40	0.02
			0.00			Ice	0.87	0.48	0.02
						1" Ice	1.11	0.67	0.04
						2" Ice			
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	133.00	No Ice	0.66	0.32	0.01
			0.00			1/2"	0.76	0.40	0.02
			0.00			Ice	0.87	0.48	0.02
						1" Ice	1.11	0.67	0.04
						2" Ice			
PD2DE-700/2700	B	From Leg	4.00	0.0000	133.00	No Ice	0.11	0.11	0.00
			0.00			1/2"	0.18	0.18	0.00
			0.00			Ice	0.25	0.25	0.00
						1" Ice	0.41	0.41	0.01
						2" Ice			
PD2DE-700/2700	C	From Leg	4.00	0.0000	133.00	No Ice	0.11	0.11	0.00
			0.00			1/2"	0.18	0.18	0.00
			0.00			Ice	0.25	0.25	0.00
						1" Ice	0.41	0.41	0.01
						2" Ice			
8' x 3" Pipe Mount	A	From Leg	4.00	0.0000	133.00	No Ice	2.40	2.40	0.04
			0.00			1/2"	3.19	3.19	0.05
			0.00			Ice	3.67	3.67	0.08
						1" Ice	4.68	4.68	0.14
						2" Ice			
8' x 3" Pipe Mount	B	From Leg	4.00	0.0000	133.00	No Ice	2.40	2.40	0.04
			0.00			1/2"	3.19	3.19	0.05
			0.00			Ice	3.67	3.67	0.08
						1" Ice	4.68	4.68	0.14
						2" Ice			
8' x 3" Pipe Mount	C	From Leg	4.00	0.0000	133.00	No Ice	2.40	2.40	0.04
			0.00			1/2"	3.19	3.19	0.05
			0.00			Ice	3.67	3.67	0.08
						1" Ice	4.68	4.68	0.14
						2" Ice			
(3) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	133.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
(3) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	133.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice			
(3) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	133.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
							1" Ice	3.06	3.06	0.09
							2" Ice			
Platform Mount [LP 602-1]	C	None			0.0000	133.00	No Ice	32.03	32.03	1.34
							1/2" Ice	38.71	38.71	1.80
							1" Ice	45.39	45.39	2.26
							2" Ice	58.75	58.75	3.17
*** L110 ***										
(2) SBNHH-1D65B w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	110.00	No Ice	8.62	7.30	0.07
			0.00				1/2" Ice	9.28	8.58	0.14
			0.00				1" Ice	9.91	9.72	0.22
							2" Ice	11.11	11.66	0.41
(2) SBNHH-1D65B w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	110.00	No Ice	8.62	7.30	0.07
			0.00				1/2" Ice	9.28	8.58	0.14
			0.00				1" Ice	9.91	9.72	0.22
							2" Ice	11.11	11.66	0.41
(2) SBNHH-1D65B w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	110.00	No Ice	8.62	7.30	0.07
			0.00				1/2" Ice	9.28	8.58	0.14
			0.00				1" Ice	9.91	9.72	0.22
							2" Ice	11.11	11.66	0.41
RRH4X45-AWS4 B66	A	From Face	4.00	0.00	0.0000	110.00	No Ice	2.66	1.59	0.06
			0.00				1/2" Ice	2.88	1.77	0.08
			0.00				1" Ice	3.10	1.96	0.11
							2" Ice	3.58	2.36	0.17
RRH4X45-AWS4 B66	B	From Face	4.00	0.00	0.0000	110.00	No Ice	2.66	1.59	0.06
			0.00				1/2" Ice	2.88	1.77	0.08
			0.00				1" Ice	3.10	1.96	0.11
							2" Ice	3.58	2.36	0.17
RRH4X45-AWS4 B66	C	From Face	4.00	0.00	0.0000	110.00	No Ice	2.66	1.59	0.06
			0.00				1/2" Ice	2.88	1.77	0.08
			0.00				1" Ice	3.10	1.96	0.11
							2" Ice	3.58	2.36	0.17
RRH2X60-PCS	A	From Face	4.00	0.00	0.0000	110.00	No Ice	2.20	1.72	0.06
			0.00				1/2" Ice	2.39	1.90	0.08
			0.00				1" Ice	2.59	2.09	0.10
							2" Ice	3.01	2.48	0.16
RRH2X60-PCS	B	From Face	4.00	0.00	0.0000	110.00	No Ice	2.20	1.72	0.06
			0.00				1/2" Ice	2.39	1.90	0.08
			0.00				1" Ice	2.59	2.09	0.10
							2" Ice	3.01	2.48	0.16
RRH2X60-PCS	C	From Face	4.00	0.00	0.0000	110.00	No Ice	2.20	1.72	0.06
			0.00				1/2" Ice	2.39	1.90	0.08
			0.00				1" Ice	2.59	2.09	0.10
							2" Ice	3.01	2.48	0.16
(2) CBC78-DF	A	From Face	4.00	0.00	0.0000	110.00	No Ice	0.39	0.17	0.01
			0.00				1/2" Ice	0.47	0.23	0.01
			0.00				1" Ice	0.56	0.30	0.01
							2" Ice	0.75	0.46	0.03
(2) CBC78-DF	B	From Face	4.00	0.00	0.0000	110.00	No Ice	0.39	0.17	0.01
			0.00				1/2" Ice	0.47	0.23	0.01
			0.00				1" Ice	0.56	0.30	0.01
							2" Ice	0.75	0.46	0.03
(2) CBC78-DF	C	From Face	4.00	0.00	0.0000	110.00	No Ice	0.39	0.17	0.01
			0.00				1/2" Ice	0.47	0.23	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	0.56	0.30	0.01
							1" Ice	0.75	0.46	0.03
							2" Ice			
BXA-70063/6CF-2 w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	110.00	No Ice	7.81	5.40	0.04
			0.00				1/2" Ice	8.36	6.55	0.10
			0.00				1" Ice	8.87	7.41	0.17
							2" Ice	9.93	9.18	0.33
BXA-70063/6CF-2 w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	110.00	No Ice	7.81	5.40	0.04
			0.00				1/2" Ice	8.36	6.55	0.10
			0.00				1" Ice	8.87	7.41	0.17
							2" Ice	9.93	9.18	0.33
BXA-70063/6CF-2 w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	110.00	No Ice	7.81	5.40	0.04
			0.00				1/2" Ice	8.36	6.55	0.10
			0.00				1" Ice	8.87	7.41	0.17
							2" Ice	9.93	9.18	0.33
BXA-80063/4CF w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	110.00	No Ice	4.95	3.42	0.03
			0.00				1/2" Ice	5.32	4.02	0.07
			0.00				1" Ice	5.71	4.64	0.12
							2" Ice	6.51	5.92	0.23
BXA-80063/4CF w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	110.00	No Ice	4.95	3.42	0.03
			0.00				1/2" Ice	5.32	4.02	0.07
			0.00				1" Ice	5.71	4.64	0.12
							2" Ice	6.51	5.92	0.23
BXA-80063/4CF w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	110.00	No Ice	4.95	3.42	0.03
			0.00				1/2" Ice	5.32	4.02	0.07
			0.00				1" Ice	5.71	4.64	0.12
							2" Ice	6.51	5.92	0.23
BULLET III	A	From Face	4.00	0.00	0.0000	110.00	No Ice	0.07	0.07	0.00
			0.00				1/2" Ice	0.10	0.10	0.00
			3.00				1" Ice	0.14	0.14	0.00
							2" Ice	0.25	0.25	0.01
DB-T1-6Z-8AB-0Z	B	From Face	4.00	0.00	0.0000	110.00	No Ice	4.80	2.00	0.04
			0.00				1/2" Ice	5.07	2.19	0.08
			0.00				1" Ice	5.35	2.39	0.12
							2" Ice	5.93	2.81	0.21
10' x 2" Pipe Mount	A	From Face	4.00	0.00	0.0000	110.00	No Ice	2.00	2.00	0.02
			0.00				1/2" Ice	3.02	3.02	0.04
			0.00				1" Ice	4.07	4.07	0.06
							2" Ice	5.70	5.70	0.12
10' x 2" Pipe Mount	B	From Face	4.00	0.00	0.0000	110.00	No Ice	2.00	2.00	0.02
			0.00				1/2" Ice	3.02	3.02	0.04
			0.00				1" Ice	4.07	4.07	0.06
							2" Ice	5.70	5.70	0.12
10' x 2" Pipe Mount	C	From Face	4.00	0.00	0.0000	110.00	No Ice	2.00	2.00	0.02
			0.00				1/2" Ice	3.02	3.02	0.04
			0.00				1" Ice	4.07	4.07	0.06
							2" Ice	5.70	5.70	0.12
(2) 5' x 2" Mount Pipe	A	From Face	4.00	0.00	0.0000	110.00	No Ice	1.19	1.19	0.02
			0.00				1/2" Ice	1.50	1.50	0.03
			0.00				1" Ice	1.81	1.81	0.04
							2" Ice	2.46	2.46	0.08
(2) 5' x 2" Mount Pipe	B	From Face	4.00	0.00	0.0000	110.00	No Ice	1.19	1.19	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2"	1.50	1.50	0.03
			0.00			Ice	1.81	1.81	0.04
						1" Ice	2.46	2.46	0.08
						2" Ice			
(2) 5' x 2" Mount Pipe	C	From Face	4.00	0.0000	110.00	No Ice	1.19	1.19	0.02
			0.00			1/2"	1.50	1.50	0.03
			0.00			Ice	1.81	1.81	0.04
						1" Ice	2.46	2.46	0.08
						2" Ice			
Platform Mount [LP 713-1]	C	None		0.0000	110.00	No Ice	31.27	31.27	1.51
						1/2"	39.68	39.68	1.93
						Ice	48.09	48.09	2.35
						1" Ice	64.91	64.91	3.19
						2" Ice			
*** L100 ***									
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Face	4.00	0.0000	100.00	No Ice	20.48	11.02	0.16
			0.00			1/2"	21.23	12.55	0.30
			0.00			Ice	21.99	14.10	0.44
						1" Ice	23.44	16.45	0.78
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Face	4.00	0.0000	100.00	No Ice	20.48	11.02	0.16
			0.00			1/2"	21.23	12.55	0.30
			0.00			Ice	21.99	14.10	0.44
						1" Ice	23.44	16.45	0.78
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Face	4.00	0.0000	100.00	No Ice	20.48	11.02	0.16
			0.00			1/2"	21.23	12.55	0.30
			0.00			Ice	21.99	14.10	0.44
						1" Ice	23.44	16.45	0.78
						2" Ice			
RADIO 4449 B12/B71	A	From Face	4.00	0.0000	100.00	No Ice	1.65	1.30	0.08
			0.00			1/2"	1.81	1.44	0.09
			0.00			Ice	1.98	1.60	0.11
						1" Ice	2.34	1.92	0.16
						2" Ice			
RADIO 4449 B12/B71	B	From Face	4.00	0.0000	100.00	No Ice	1.65	1.30	0.08
			0.00			1/2"	1.81	1.44	0.09
			0.00			Ice	1.98	1.60	0.11
						1" Ice	2.34	1.92	0.16
						2" Ice			
RADIO 4449 B12/B71	C	From Face	4.00	0.0000	100.00	No Ice	1.65	1.30	0.08
			0.00			1/2"	1.81	1.44	0.09
			0.00			Ice	1.98	1.60	0.11
						1" Ice	2.34	1.92	0.16
						2" Ice			
AIR 21 B2A/B4P w/ Mount Pipe	A	From Face	4.00	0.0000	100.00	No Ice	6.16	5.55	0.10
			0.00			1/2"	6.60	6.30	0.16
			0.00			Ice	7.03	7.00	0.22
						1" Ice	7.92	8.44	0.37
						2" Ice			
AIR 21 B2A/B4P w/ Mount Pipe	B	From Face	4.00	0.0000	100.00	No Ice	6.16	5.55	0.10
			0.00			1/2"	6.60	6.30	0.16
			0.00			Ice	7.03	7.00	0.22
						1" Ice	7.92	8.44	0.37
						2" Ice			
AIR 21 B2A/B4P w/ Mount Pipe	C	From Face	4.00	0.0000	100.00	No Ice	6.16	5.55	0.10
			0.00			1/2"	6.60	6.30	0.16
			0.00			Ice	7.03	7.00	0.22
						1" Ice	7.92	8.44	0.37
						2" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Face	4.00	0.0000	100.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice	8.57	9.06	0.44
						2" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
ATMAA1412D-1A20	A	From Face	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.13 1.26 1.55	0.41 0.50 0.59 0.81	0.01 0.02 0.03 0.06
ATMAA1412D-1A20	B	From Face	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.13 1.26 1.55	0.41 0.50 0.59 0.81	0.01 0.02 0.03 0.06
ATMAA1412D-1A20	C	From Face	4.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.13 1.26 1.55	0.41 0.50 0.59 0.81	0.01 0.02 0.03 0.06
Platform Mount [LP 303-1]	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1.25 1.48 1.71 2.18
*** L90 ***									
APXV18-206517S-C	A	From Leg	1.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.17 5.62 6.08 7.02	3.04 3.47 3.91 4.81	0.03 0.05 0.09 0.17
APXV18-206517S-C	B	From Leg	1.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.17 5.62 6.08 7.02	3.04 3.47 3.91 4.81	0.03 0.05 0.09 0.17
APXV18-206517S-C	C	From Leg	1.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.17 5.62 6.08 7.02	3.04 3.47 3.91 4.81	0.03 0.05 0.09 0.17
Pipe Mount [PM 601-3]	C	None		0.0000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.39 5.48 6.57 8.75	4.39 5.48 6.57 8.75	0.20 0.24 0.28 0.36
Level 50									
KS24019-L112A	C	From Leg	3.00 0.00 1.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.20 0.26 0.41	0.14 0.20 0.26 0.41	0.01 0.01 0.01 0.02
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.85 1.14 1.43 2.01	1.67 2.34 3.01 4.35	0.07 0.08 0.09 0.12
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
* 133' *											
VHLP2-23	A	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	0.0000		133.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.03 0.05 0.07 0.11
VHLP2-23	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	-30.0000		133.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.03 0.05 0.07 0.11
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	-60.0000		133.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice	3.72 4.01 4.30 4.88	0.03 0.05 0.07 0.11
*** *											

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

Comb. No.	Description
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	133 - 128	Pole	Max Tension	26	0.00	0.00	-0.00
			Max. Compression	26	-8.56	-1.88	5.22
			Max. Mx	8	-3.31	-24.18	1.80
			Max. My	2	-3.28	-0.84	26.51
			Max. Vy	20	-5.49	22.77	1.88
			Max. Vx	2	-5.65	-0.84	26.51
			Max. Torque	20			-2.98
L2	128 - 123	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.97	-1.89	5.34
			Max. Mx	8	-3.52	-52.08	1.80
			Max. My	2	-3.49	-0.90	55.39
			Max. Vy	20	-5.75	50.86	1.98
			Max. Vx	2	-5.91	-0.90	55.39
			Max. Torque	20			-2.98
L3	123 - 118	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.40	-1.89	5.44
			Max. Mx	8	-3.75	-81.30	1.80
			Max. My	2	-3.72	-0.96	85.59
			Max. Vy	20	-6.02	80.27	2.07
			Max. Vx	2	-6.18	-0.96	85.59
			Max. Torque	20			-2.98
L4	118 - 113	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.86	-1.88	5.53
			Max. Mx	8	-4.00	-111.88	1.79
			Max. My	2	-3.97	-1.01	117.14
			Max. Vy	20	-6.30	111.04	2.15
			Max. Vx	2	-6.45	-1.01	117.14
			Max. Torque	20			-2.97
L5	113 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.30	-2.55	6.04
			Max. Mx	8	-7.12	-154.35	1.96
			Max. My	2	-7.10	-1.31	160.42
			Max. Vy	20	-11.72	153.32	2.25
			Max. Vx	2	-11.84	-1.31	160.42
			Max. Torque	20			-3.14
L6	108 - 104.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.70	-2.54	6.11
			Max. Mx	8	-7.38	-192.58	2.08
			Max. My	2	-7.36	-1.47	199.14
			Max. Vy	20	-11.90	191.68	2.18
			Max. Vx	14	12.06	-1.57	-194.66
			Max. Torque	20			-3.14
L7	104.75 - 104.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.75	-2.54	6.12
			Max. Mx	8	-7.42	-195.55	2.08
			Max. My	2	-7.40	-1.49	202.14
			Max. Vy	20	-11.91	194.66	2.17
			Max. Vx	14	12.08	-1.57	-197.68
			Max. Torque	20			-3.13
L8	104.5 - 99.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.35	-2.53	6.20
			Max. Mx	8	-11.02	-257.72	2.27
			Max. My	2	-11.00	-1.73	265.07
			Max. Vy	20	-15.93	257.03	2.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	16.12	-1.52	-260.93
			Max. Torque	20			-3.13
L9	99.5 - 98.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.53	-2.53	6.22
			Max. Mx	8	-11.12	-269.66	2.29
			Max. My	2	-11.10	-1.77	277.12
			Max. Vy	20	-16.01	269.00	2.04
			Max. Vx	14	16.19	-1.51	-273.04
			Max. Torque	20			-3.13
L10	98.75 - 98.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.59	-2.53	6.22
			Max. Mx	8	-11.16	-273.66	2.30
			Max. My	2	-11.14	-1.78	281.14
			Max. Vy	20	-16.04	273.01	2.03
			Max. Vx	14	16.21	-1.51	-277.09
			Max. Torque	20			-3.13
L11	98.5 - 91.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.43	-2.52	6.27
			Max. Mx	8	-11.62	-330.30	2.43
			Max. My	2	-11.62	-1.96	338.06
			Max. Vy	20	-16.42	329.79	1.95
			Max. Vx	14	16.52	-1.48	-334.33
			Max. Torque	20			-3.13
L12	91.33 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.24	-2.50	6.34
			Max. Mx	8	-12.74	-413.72	2.61
			Max. My	2	-12.74	-2.21	421.32
			Max. Vy	20	-17.03	413.41	1.83
			Max. Vx	14	17.02	-1.43	-418.17
			Max. Torque	20			-3.13
L13	90 - 89.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.18	-2.49	6.35
			Max. Mx	8	-13.17	-426.90	2.63
			Max. My	2	-13.17	-2.25	434.42
			Max. Vy	20	-17.64	426.62	1.81
			Max. Vx	14	17.63	-1.42	-431.36
			Max. Torque	20			-3.13
L14	89.25 - 89	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.26	-2.49	6.35
			Max. Mx	8	-13.23	-431.30	2.64
			Max. My	2	-13.24	-2.26	438.80
			Max. Vy	20	-17.66	431.03	1.80
			Max. Vx	14	17.66	-1.42	-435.78
			Max. Torque	20			-3.13
L15	89 - 88.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.53	-2.48	6.37
			Max. Mx	8	-13.41	-444.54	2.67
			Max. My	2	-13.41	-2.30	451.97
			Max. Vy	20	-17.74	444.31	1.78
			Max. Vx	14	17.73	-1.41	-449.04
			Max. Torque	20			-3.13
L16	88.25 - 88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.61	-2.48	6.37
			Max. Mx	8	-13.46	-448.97	2.68
			Max. My	2	-13.47	-2.31	456.37
			Max. Vy	20	-17.76	448.74	1.78
			Max. Vx	14	17.76	-1.40	-453.48
			Max. Torque	20			-3.13
L17	88 - 83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.06	-2.42	6.45
			Max. Mx	8	-14.45	-538.64	2.86
			Max. My	2	-14.45	-2.55	545.56
			Max. Vy	20	-18.20	538.63	1.65
			Max. Vx	14	18.21	-1.35	-543.37
			Max. Torque	20			-3.13
L18	83 - 78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.52	-2.35	6.53
			Max. Mx	20	-15.46	630.70	1.53
			Max. My	2	-15.47	-2.79	636.92

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-18.64	630.70	1.53
			Max. Vx	14	18.64	-1.29	-635.45
			Max. Torque	20			-3.13
L19	78 - 77	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.84	-2.33	6.55
			Max. Mx	20	-15.67	649.38	1.50
			Max. My	2	-15.68	-2.84	655.45
			Max. Vy	20	-18.73	649.38	1.50
			Max. Vx	14	18.74	-1.27	-654.14
			Max. Torque	20			-3.13
L20	77 - 76.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.93	-2.33	6.55
			Max. Mx	20	-15.74	654.06	1.49
			Max. My	2	-15.75	-2.85	660.10
			Max. Vy	20	-18.75	654.06	1.49
			Max. Vx	14	18.76	-1.27	-658.82
			Max. Torque	20			-3.13
L21	76.75 - 71.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.76	-2.25	6.62
			Max. Mx	20	-17.00	748.99	1.36
			Max. My	2	-17.01	-3.09	754.31
			Max. Vy	20	-19.23	748.99	1.36
			Max. Vx	14	19.27	-1.21	-753.85
			Max. Torque	20			-3.13
L22	71.75 - 66.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.61	-2.18	6.69
			Max. Mx	20	-18.29	846.31	1.23
			Max. My	14	-18.29	-1.15	-851.39
			Max. Vy	20	-19.71	846.31	1.23
			Max. Vx	14	19.76	-1.15	-851.39
			Max. Torque	20			-3.12
L23	66.75 - 62.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.29	-2.10	6.75
			Max. Mx	20	-19.47	935.92	1.11
			Max. My	14	-19.47	-1.09	-941.29
			Max. Vy	20	-20.14	935.92	1.11
			Max. Vx	14	20.21	-1.09	-941.29
			Max. Torque	20			-3.12
L24	62.25 - 62	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.40	-2.10	6.75
			Max. Mx	20	-19.55	940.96	1.10
			Max. My	14	-19.54	-1.09	-946.34
			Max. Vy	20	-20.15	940.96	1.10
			Max. Vx	14	20.23	-1.09	-946.34
			Max. Torque	20			-3.12
L25	62 - 59.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.19	-2.06	6.78
			Max. Mx	20	-20.02	991.61	1.03
			Max. My	14	-20.01	-1.05	-997.18
			Max. Vy	20	-20.39	991.61	1.03
			Max. Vx	14	20.46	-1.05	-997.18
			Max. Torque	20			-3.12
L26	59.5 - 59.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.30	-2.05	6.79
			Max. Mx	20	-20.10	996.71	1.03
			Max. My	14	-20.10	-1.05	-1002.29
			Max. Vy	20	-20.40	996.71	1.03
			Max. Vx	14	20.48	-1.05	-1002.29
			Max. Torque	20			-3.12
L27	59.25 - 54.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.40	-1.96	6.84
			Max. Mx	20	-21.51	1100.41	0.89
			Max. My	14	-21.51	-0.99	-1106.31
			Max. Vy	20	-21.08	1100.41	0.89
			Max. Vx	14	21.14	-0.99	-1106.31

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	20			-3.12
L28	54.25 - 45.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.19	-1.88	6.89
			Max. Mx	20	-22.74	1191.14	0.77
			Max. My	14	-22.74	-0.93	-1197.25
			Max. Vy	20	-21.63	1191.14	0.77
			Max. Vx	14	21.68	-0.93	-1197.25
			Max. Torque	20			-3.12
L29	45.25 - 45	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.99	-1.47	6.76
			Max. Mx	20	-25.55	1301.56	0.57
			Max. My	14	-25.55	-0.72	-1307.83
			Max. Vy	20	-22.41	1301.56	0.57
			Max. Vx	14	22.46	-0.72	-1307.83
			Max. Torque	20			-3.03
L30	45 - 40.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.89	-1.39	6.80
			Max. Mx	20	-26.90	1397.93	0.50
			Max. My	14	-26.90	-0.71	-1404.36
			Max. Vy	20	-22.95	1397.93	0.50
			Max. Vx	14	22.98	-0.71	-1404.36
			Max. Torque	20			-3.03
L31	40.75 - 40.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.01	-1.38	6.81
			Max. Mx	20	-26.99	1403.67	0.50
			Max. My	14	-26.99	-0.71	-1410.10
			Max. Vy	20	-22.97	1403.67	0.50
			Max. Vx	14	23.01	-0.71	-1410.10
			Max. Torque	20			-3.03
L32	40.5 - 35.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.27	-1.32	6.90
			Max. Mx	20	-28.60	1514.15	0.41
			Max. My	14	-28.59	-0.69	-1520.74
			Max. Vy	20	-23.56	1514.15	0.41
			Max. Vx	14	23.59	-0.69	-1520.74
			Max. Torque	20			-3.03
L33	35.75 - 35.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.39	-1.32	6.90
			Max. Mx	20	-28.69	1520.04	0.41
			Max. My	14	-28.69	-0.69	-1526.64
			Max. Vy	20	-23.58	1520.04	0.41
			Max. Vx	14	23.62	-0.69	-1526.64
			Max. Torque	20			-3.03
L34	35.5 - 30.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.74	-1.20	6.97
			Max. Mx	20	-30.33	1639.40	0.32
			Max. My	14	-30.33	-0.68	-1646.13
			Max. Vy	20	-24.18	1639.40	0.32
			Max. Vx	14	24.20	-0.68	-1646.13
			Max. Torque	20			-3.03
L35	30.5 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.01	-1.19	6.97
			Max. Mx	20	-30.52	1657.55	0.31
			Max. My	14	-30.51	-0.68	-1664.29
			Max. Vy	20	-24.25	1657.55	0.31
			Max. Vx	14	24.25	-0.68	-1664.29
			Max. Torque	20			-3.03
L36	29.75 - 29.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.13	-1.18	6.97
			Max. Mx	20	-30.61	1663.62	0.30
			Max. My	14	-30.61	-0.68	-1670.36
			Max. Vy	20	-24.26	1663.62	0.30
			Max. Vx	14	24.27	-0.68	-1670.36
			Max. Torque	20			-3.03
L37	29.5 - 24.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.45	-1.06	7.01
			Max. Mx	20	-32.31	1786.30	0.22
			Max. My	14	-32.31	-0.66	-1792.68

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-24.82	1786.30	0.22
			Max. Vx	14	24.68	-0.66	-1792.68
			Max. Torque	20			-3.03
L38	24.5 - 19.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.79	-0.95	7.05
			Max. Mx	20	-34.04	1911.70	0.13
			Max. My	14	-34.04	-0.64	-1917.03
			Max. Vy	20	-25.37	1911.70	0.13
			Max. Vx	14	25.09	-0.64	-1917.03
			Max. Torque	20			-3.03
L39	19.5 - 14.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.13	-0.83	7.09
			Max. Mx	20	-35.79	2039.83	0.03
			Max. My	14	-35.80	-0.63	-2043.41
			Max. Vy	20	-25.91	2039.83	0.03
			Max. Vx	14	25.49	-0.63	-2043.41
			Max. Torque	20			-3.03
L40	14.5 - 12.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.07	-0.78	7.11
			Max. Mx	20	-36.50	2091.84	-0.00
			Max. My	14	-36.51	-0.62	-2094.53
			Max. Vy	20	-26.13	2091.84	-0.00
			Max. Vx	14	25.66	-0.62	-2094.53
			Max. Torque	20			-3.03
L41	12.5 - 12.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.18	-0.78	7.11
			Max. Mx	20	-36.59	2098.37	-0.01
			Max. My	14	-36.59	-0.62	-2100.95
			Max. Vy	20	-26.14	2098.37	-0.01
			Max. Vx	14	25.67	-0.62	-2100.95
			Max. Torque	20			-3.03
L42	12.25 - 10.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.84	-0.79	7.08
			Max. Mx	20	-37.04	2137.73	-0.04
			Max. My	14	-37.04	-0.61	-2139.57
			Max. Vy	20	-26.35	2137.73	-0.04
			Max. Vx	14	25.86	-0.61	-2139.57
			Max. Torque	20			-3.03
L43	10.75 - 10.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.96	-0.79	7.08
			Max. Mx	20	-37.14	2144.31	-0.04
			Max. My	14	-37.15	-0.61	-2146.03
			Max. Vy	20	-26.36	2144.31	-0.04
			Max. Vx	14	25.86	-0.61	-2146.03
			Max. Torque	20			-3.03
L44	10.5 - 5.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.25	-0.83	6.98
			Max. Mx	20	-38.86	2277.64	-0.13
			Max. My	14	-38.87	-0.60	-2276.75
			Max. Vy	20	-26.98	2277.64	-0.13
			Max. Vx	14	26.45	-0.60	-2276.75
			Max. Torque	20			-3.03
L45	5.5 - 0.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.46	-0.84	6.97
			Max. Mx	20	-40.62	2413.92	-0.23
			Max. My	14	-40.62	-0.58	-2410.33
			Max. Vy	20	-27.56	2413.92	-0.23
			Max. Vx	14	27.02	-0.58	-2410.33
			Max. Torque	20			-3.03
L46	0.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.66	-0.84	6.97
			Max. Mx	20	-40.80	2427.71	-0.24
			Max. My	14	-40.80	-0.57	-2423.84
			Max. Vy	20	-27.60	2427.71	-0.24
			Max. Vx	14	27.07	-0.57	-2423.84
			Max. Torque	20			-3.03

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	68.66	-0.00	0.00
	Max. H_x	20	40.81	27.60	-0.02
	Max. H_z	2	40.81	-0.03	26.82
	Max. M_x	2	2405.84	-0.03	26.82
	Max. M_z	8	2423.64	-27.56	0.02
	Max. Torsion	8	2.98	-27.56	0.02
	Min. Vert	19	30.61	22.97	-13.42
	Min. H_x	8	40.81	-27.56	0.02
	Min. H_z	14	40.81	0.00	-27.06
	Min. M_x	14	-2423.84	0.00	-27.06
	Min. M_z	20	-2427.71	27.60	-0.02
	Min. Torsion	20	-3.03	27.60	-0.02

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	34.01	0.00	-0.00	-1.85	-0.54	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	40.81	0.03	-26.82	-2405.84	-5.61	0.90
0.9 Dead+1.0 Wind 0 deg - No Ice	30.61	0.03	-26.82	-2378.10	-5.36	0.87
1.2 Dead+1.0 Wind 30 deg - No Ice	40.81	13.86	-24.15	-2124.35	-1214.71	-0.81
0.9 Dead+1.0 Wind 30 deg - No Ice	30.61	13.86	-24.15	-2099.95	-1200.95	-0.81
1.2 Dead+1.0 Wind 60 deg - No Ice	40.81	23.09	-13.50	-1224.15	-2076.13	-2.50
0.9 Dead+1.0 Wind 60 deg - No Ice	30.61	23.09	-13.50	-1209.73	-2052.61	-2.46
1.2 Dead+1.0 Wind 90 deg - No Ice	40.81	27.56	-0.02	-4.80	-2423.64	-2.98
0.9 Dead+1.0 Wind 90 deg - No Ice	30.61	27.56	-0.02	-4.15	-2396.33	-2.91
1.2 Dead+1.0 Wind 120 deg - No Ice	40.81	23.66	13.80	1216.18	-2075.26	-2.77
0.9 Dead+1.0 Wind 120 deg - No Ice	30.61	23.66	13.80	1203.10	-2051.87	-2.69
1.2 Dead+1.0 Wind 150 deg - No Ice	40.81	13.23	23.09	2097.03	-1198.66	-2.17
0.9 Dead+1.0 Wind 150 deg - No Ice	30.61	13.23	23.09	2073.96	-1185.00	-2.11
1.2 Dead+1.0 Wind 180 deg - No Ice	40.81	-0.00	27.06	2423.84	-0.57	-0.98
0.9 Dead+1.0 Wind 180 deg - No Ice	30.61	-0.00	27.06	2397.13	-0.38	-0.95
1.2 Dead+1.0 Wind 210 deg - No Ice	40.81	-13.90	24.14	2118.20	1218.53	0.64
0.9 Dead+1.0 Wind 210 deg - No Ice	30.61	-13.90	24.14	2095.06	1205.08	0.63
1.2 Dead+1.0 Wind 240 deg - No Ice	40.81	-22.97	13.42	1212.76	2066.34	2.07
0.9 Dead+1.0 Wind 240 deg - No Ice	30.61	-22.97	13.42	1199.65	2043.26	2.03
1.2 Dead+1.0 Wind 270 deg - No Ice	40.81	-27.60	0.02	0.24	2427.71	3.03
0.9 Dead+1.0 Wind 270 deg - No Ice	30.61	-27.60	0.02	0.82	2400.70	2.96
1.2 Dead+1.0 Wind 300 deg - No Ice	40.81	-23.87	-13.91	-1229.80	2092.97	2.73

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.0 Wind 300 deg - No Ice	30.61	-23.87	-13.91	-1215.38	2069.72	2.66
1.2 Dead+1.0 Wind 330 deg - No Ice	40.81	-13.27	-23.08	-2100.06	1202.51	1.88
0.9 Dead+1.0 Wind 330 deg - No Ice	30.61	-13.27	-23.08	-2075.78	1189.15	1.82
1.2 Dead+1.0 Ice+1.0 Temp	68.66	0.00	-0.00	-6.97	-0.84	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	68.66	0.00	-5.24	-550.60	-1.69	0.22
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.66	2.61	-4.54	-478.37	-271.07	-0.20
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.66	4.51	-2.63	-280.87	-467.71	-0.61
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.66	5.22	-0.00	-7.38	-540.82	-0.75
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.66	4.51	2.63	266.21	-467.38	-0.71
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.66	2.61	4.54	463.94	-270.50	-0.54
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.66	0.00	5.24	536.50	-1.03	-0.23
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.66	-2.62	4.54	463.94	270.45	0.17
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.66	-4.52	2.64	267.04	467.19	0.53
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.66	-5.22	0.00	-6.72	540.26	0.76
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.66	-4.52	-2.63	-280.58	466.86	0.70
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.66	-2.61	-4.54	-477.71	269.88	0.49
Dead+Wind 0 deg - Service	34.01	0.01	-5.53	-494.48	-1.57	0.18
Dead+Wind 30 deg - Service	34.01	2.86	-4.98	-436.82	-249.38	-0.17
Dead+Wind 60 deg - Service	34.01	4.76	-2.78	-252.31	-425.90	-0.51
Dead+Wind 90 deg - Service	34.01	5.68	-0.00	-2.42	-497.13	-0.62
Dead+Wind 120 deg - Service	34.01	4.88	2.85	247.81	-425.73	-0.57
Dead+Wind 150 deg - Service	34.01	2.73	4.76	428.34	-246.08	-0.45
Dead+Wind 180 deg - Service	34.01	-0.00	5.58	495.32	-0.54	-0.20
Dead+Wind 210 deg - Service	34.01	-2.87	4.98	432.70	249.33	0.13
Dead+Wind 240 deg - Service	34.01	-4.74	2.77	247.11	423.06	0.43
Dead+Wind 270 deg - Service	34.01	-5.69	0.00	-1.39	497.14	0.63
Dead+Wind 300 deg - Service	34.01	-4.92	-2.87	-253.47	428.53	0.56
Dead+Wind 330 deg - Service	34.01	-2.74	-4.76	-431.82	246.03	0.39

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-34.01	0.00	-0.00	34.01	0.00	0.000%
2	0.03	-40.81	-26.82	-0.03	40.81	26.82	0.000%
3	0.03	-30.61	-26.82	-0.03	30.61	26.82	0.000%
4	13.86	-40.81	-24.15	-13.86	40.81	24.15	0.000%
5	13.86	-30.61	-24.15	-13.86	30.61	24.15	0.000%
6	23.09	-40.81	-13.50	-23.09	40.81	13.50	0.000%
7	23.09	-30.61	-13.50	-23.09	30.61	13.50	0.000%
8	27.56	-40.81	-0.02	-27.56	40.81	0.02	0.000%
9	27.56	-30.61	-0.02	-27.56	30.61	0.02	0.000%
10	23.66	-40.81	13.80	-23.66	40.81	-13.80	0.000%
11	23.66	-30.61	13.80	-23.66	30.61	-13.80	0.000%
12	13.23	-40.81	23.09	-13.23	40.81	-23.09	0.000%
13	13.23	-30.61	23.09	-13.23	30.61	-23.09	0.000%
14	-0.00	-40.81	27.06	0.00	40.81	-27.06	0.000%
15	-0.00	-30.61	27.06	0.00	30.61	-27.06	0.000%
16	-13.90	-40.81	24.14	13.90	40.81	-24.14	0.000%
17	-13.90	-30.61	24.14	13.90	30.61	-24.14	0.000%
18	-22.97	-40.81	13.42	22.97	40.81	-13.42	0.000%
19	-22.97	-30.61	13.42	22.97	30.61	-13.42	0.000%
20	-27.60	-40.81	0.02	27.60	40.81	-0.02	0.000%
21	-27.60	-30.61	0.02	27.60	30.61	-0.02	0.000%
22	-23.87	-40.81	-13.91	23.87	40.81	13.91	0.000%
23	-23.87	-30.61	-13.91	23.87	30.61	13.91	0.000%
24	-13.27	-40.81	-23.08	13.27	40.81	23.08	0.000%
25	-13.27	-30.61	-23.08	13.27	30.61	23.08	0.000%
26	0.00	-68.66	0.00	-0.00	68.66	0.00	0.000%
27	0.00	-68.66	-5.24	-0.00	68.66	5.24	0.000%
28	2.61	-68.66	-4.54	-2.61	68.66	4.54	0.000%
29	4.51	-68.66	-2.63	-4.51	68.66	2.63	0.000%
30	5.22	-68.66	-0.00	-5.22	68.66	0.00	0.000%
31	4.51	-68.66	2.63	-4.51	68.66	-2.63	0.000%
32	2.61	-68.66	4.54	-2.61	68.66	-4.54	0.000%
33	0.00	-68.66	5.24	-0.00	68.66	-5.24	0.000%
34	-2.62	-68.66	4.54	2.62	68.66	-4.54	0.000%
35	-4.52	-68.66	2.64	4.52	68.66	-2.64	0.000%
36	-5.22	-68.66	0.00	5.22	68.66	-0.00	0.000%
37	-4.52	-68.66	-2.63	4.52	68.66	2.63	0.000%
38	-2.61	-68.66	-4.54	2.61	68.66	4.54	0.000%
39	0.01	-34.01	-5.53	-0.01	34.01	5.53	0.000%
40	2.86	-34.01	-4.98	-2.86	34.01	4.98	0.000%
41	4.76	-34.01	-2.78	-4.76	34.01	2.78	0.000%
42	5.68	-34.01	-0.00	-5.68	34.01	0.00	0.000%
43	4.88	-34.01	2.85	-4.88	34.01	-2.85	0.000%
44	2.73	-34.01	4.76	-2.73	34.01	-4.76	0.000%
45	-0.00	-34.01	5.58	0.00	34.01	-5.58	0.000%
46	-2.87	-34.01	4.98	2.87	34.01	-4.98	0.000%
47	-4.74	-34.01	2.77	4.74	34.01	-2.77	0.000%
48	-5.69	-34.01	0.00	5.69	34.01	-0.00	0.000%
49	-4.92	-34.01	-2.87	4.92	34.01	2.87	0.000%
50	-2.74	-34.01	-4.76	2.74	34.01	4.76	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000717
2	Yes	5	0.00000001	0.00088181
3	Yes	5	0.00000001	0.00039427
4	Yes	6	0.00000001	0.00092106
5	Yes	6	0.00000001	0.00028877
6	Yes	6	0.00000001	0.00099591
7	Yes	6	0.00000001	0.00031655
8	Yes	6	0.00000001	0.00012680
9	Yes	6	0.00000001	0.00004174
10	Yes	6	0.00000001	0.00086027
11	Yes	6	0.00000001	0.00027057
12	Yes	6	0.00000001	0.00098239
13	Yes	6	0.00000001	0.00031268
14	Yes	5	0.00000001	0.00082845
15	Yes	5	0.00000001	0.00037036
16	Yes	6	0.00000001	0.00094486
17	Yes	6	0.00000001	0.00029847
18	Yes	6	0.00000001	0.00087846
19	Yes	6	0.00000001	0.00027682
20	Yes	6	0.00000001	0.00012291
21	Yes	6	0.00000001	0.00004046
22	Yes	7	0.00000001	0.00005152
23	Yes	6	0.00000001	0.00031780
24	Yes	6	0.00000001	0.00089133
25	Yes	6	0.00000001	0.00027969
26	Yes	5	0.00000001	0.00029769
27	Yes	6	0.00000001	0.00083873
28	Yes	7	0.00000001	0.00012173
29	Yes	7	0.00000001	0.00012309
30	Yes	6	0.00000001	0.00081966
31	Yes	6	0.00000001	0.00093398
32	Yes	6	0.00000001	0.00094842
33	Yes	6	0.00000001	0.00077803
34	Yes	6	0.00000001	0.00092547
35	Yes	6	0.00000001	0.00091957
36	Yes	6	0.00000001	0.00080268
37	Yes	6	0.00000001	0.00099842
38	Yes	6	0.00000001	0.00098222
39	Yes	4	0.00000001	0.00093331
40	Yes	5	0.00000001	0.00019695
41	Yes	5	0.00000001	0.00025348
42	Yes	5	0.00000001	0.00010950
43	Yes	5	0.00000001	0.00017285
44	Yes	5	0.00000001	0.00024081
45	Yes	4	0.00000001	0.00094073
46	Yes	5	0.00000001	0.00020692
47	Yes	5	0.00000001	0.00017305
48	Yes	5	0.00000001	0.00010931
49	Yes	5	0.00000001	0.00025743
50	Yes	5	0.00000001	0.00018083

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	133 - 128 (1)	TP14.4795x13.48x0.1875	5.00	0.00	0.0	8.6288	-3.28	636.03	0.005
L2	128 - 123 (2)	TP15.479x14.4795x0.1875	5.00	0.00	0.0	9.2323	-3.49	680.51	0.005
L3	123 - 118 (3)	TP16.4786x15.479x0.1875	5.00	0.00	0.0	9.8357	-3.72	712.49	0.005
L4	118 - 113 (4)	TP17.4781x16.4786x0.1875	5.00	0.00	0.0	10.439 2	-3.97	741.57	0.005
L5	113 - 108 (5)	TP18.4776x17.4781x0.1875	5.00	0.00	0.0	11.042 6	-7.10	768.95	0.009
L6	108 - 104.75 (6)	TP19.1273x18.4776x0.1875	3.25	0.00	0.0	11.434 9	-7.36	785.84	0.009
L7	104.75 - 104.5 (7)	TP19.1773x19.1273x0.425	0.25	0.00	0.0	25.662 5	-7.40	1891.58	0.004
L8	104.5 - 99.5 (8)	TP20.1768x19.1773x0.4063	5.00	0.00	0.0	25.862 3	-11.00	1906.31	0.006
L9	99.5 - 98.75 (9)	TP20.3267x20.1768x0.4063	0.75	0.00	0.0	26.058 5	-11.10	1920.77	0.006
L10	98.75 - 98.5 (10)	TP20.3767x20.3267x0.4063	0.25	0.00	0.0	26.123 8	-11.14	1925.59	0.006
L11	98.5 - 91.33 (11)	TP21.81x20.3767x0.4	7.17	0.00	0.0	26.631 1	-11.62	1962.98	0.006
L12	91.33 - 90 (12)	TP21.7002x20.7014x0.4563	5.00	0.00	0.0	31.210 0	-12.71	2300.49	0.006
L13	90 - 89.25 (13)	TP21.85x21.7002x0.45	0.75	0.00	0.0	31.008 7	-13.14	2285.65	0.006
L14	89.25 - 89 (14)	TP21.9x21.85x0.85	0.25	0.00	0.0	57.613 8	-13.21	4246.71	0.003
L15	89 - 88.25 (15)	TP22.0498x21.9x0.8375	0.75	0.00	0.0	57.204 3	-13.39	4216.53	0.003
L16	88.25 - 88 (16)	TP22.0998x22.0498x0.6125	0.25	0.00	0.0	42.378 2	-13.44	3123.70	0.004
L17	88 - 83 (17)	TP23.0986x22.0998x0.5875	5.00	0.00	0.0	42.585 4	-14.43	3138.97	0.005
L18	83 - 78 (18)	TP24.0975x23.0986x0.575	5.00	0.00	0.0	43.551 9	-15.45	3210.21	0.005
L19	78 - 77 (19)	TP24.2972x24.0975x0.575	1.00	0.00	0.0	43.921 7	-15.66	3237.47	0.005
L20	77 - 76.75 (20)	TP24.3472x24.2972x0.7625	0.25	0.00	0.0	57.906 3	-15.73	4268.27	0.004
L21	76.75 - 71.75 (21)	TP25.346x24.3472x0.7375	5.00	0.00	0.0	58.439 1	-16.99	4307.55	0.004
L22	71.75 - 66.75 (22)	TP26.3449x25.346x0.7125	5.00	0.00	0.0	58.807 1	-18.28	4334.68	0.004
L23	66.75 - 62.25 (23)	TP27.2439x26.3449x0.7	4.50	0.00	0.0	59.829 9	-19.46	4410.06	0.004
L24	62.25 - 62 (24)	TP27.2938x27.2439x0.7	0.25	0.00	0.0	59.942 5	-19.53	4418.36	0.004
L25	62 - 59.5 (25)	TP27.7933x27.2938x0.4	2.50	0.00	0.0	35.282 5	-20.01	2600.67	0.008
L26	59.5 - 59.25 (26)	TP27.8432x27.7933x0.75	0.25	0.00	0.0	65.430 1	-20.09	4822.85	0.004
L27	59.25 - 54.25 (27)	TP28.8421x27.8432x0.725	5.00	0.00	0.0	65.639 3	-21.50	4838.27	0.004
L28	54.25 - 45.25 (28)	TP30.64x28.8421x0.7	9.00	0.00	0.0	65.345 9	-22.73	4816.65	0.005
L29	45.25 - 45 (29)	TP30.192x29.1911x0.7625	5.00	0.00	0.0	72.256 7	-25.54	5326.04	0.005
L30	45 - 40.75 (30)	TP31.0427x30.192x0.75	4.25	0.00	0.0	73.157 0	-26.89	5392.40	0.005
L31	40.75 - 40.5 (31)	TP31.0928x31.0427x0.7625	0.25	0.00	0.0	74.468 4	-26.98	5489.07	0.005

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L32	40.5 - 35.75 (32)	TP32.0436x31.0928x0.75	4.75	0.00	0.0	75.5741	-28.59	5570.57	0.005
L33	35.75 - 35.5 (33)	TP32.0937x32.0436x0.6875	0.25	0.00	0.0	69.5254	-28.68	5124.72	0.006
L34	35.5 - 30.5 (34)	TP33.0946x32.0937x0.675	5.00	0.00	0.0	70.4639	-30.32	5193.90	0.006
L35	30.5 - 29.75 (35)	TP33.2447x33.0946x0.4	0.75	0.00	0.0	42.3040	-30.51	3118.23	0.010
L36	29.75 - 29.5 (36)	TP33.2947x33.2447x0.675	0.25	0.00	0.0	70.8990	-30.60	5225.97	0.006
L37	29.5 - 24.5 (37)	TP34.2956x33.2947x0.6625	5.00	0.00	0.0	71.7479	-32.30	5288.54	0.006
L38	24.5 - 19.5 (38)	TP35.2965x34.2956x0.65	5.00	0.00	0.0	72.5152	-34.03	5345.09	0.006
L39	19.5 - 14.5 (39)	TP36.2974x35.2965x0.6375	5.00	0.00	0.0	73.2009	-35.79	5395.64	0.007
L40	14.5 - 12.5 (40)	TP36.6978x36.2974x0.6375	2.00	0.00	0.0	74.0227	-36.50	5456.22	0.007
L41	12.5 - 12.25 (41)	TP36.7478x36.6978x0.5625	0.25	0.00	0.0	65.5406	-36.58	4831.00	0.008
L42	12.25 - 10.75 (42)	TP37.0481x36.7478x0.5625	1.50	0.00	0.0	66.0845	-37.03	4871.09	0.008
L43	10.75 - 10.5 (43)	TP37.0981x37.0481x0.6375	0.25	0.00	0.0	74.8446	-37.14	5516.79	0.007
L44	10.5 - 5.5 (44)	TP38.099x37.0981x0.625	5.00	0.00	0.0	75.4165	-38.86	5558.95	0.007
L45	5.5 - 0.5 (45)	TP39.0999x38.099x0.6125	5.00	0.00	0.0	75.9068	-40.62	5595.09	0.007
L46	0.5 - 0 (46)	TP39.2x39.0999x0.6125	0.50	0.00	0.0	76.1042	-40.80	5609.64	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	133 - 128 (1)	TP14.4795x13.48x0.1875	26.52	184.24	0.144	0.00	184.24	0.000
L2	128 - 123 (2)	TP15.479x14.4795x0.1875	55.40	211.09	0.262	0.00	211.09	0.000
L3	123 - 118 (3)	TP16.4786x15.479x0.1875	85.59	235.63	0.363	0.00	235.63	0.000
L4	118 - 113 (4)	TP17.4781x16.4786x0.1875	117.14	260.46	0.450	0.00	260.46	0.000
L5	113 - 108 (5)	TP18.4776x17.4781x0.1875	160.42	285.86	0.561	0.00	285.86	0.000
L6	108 - 104.75 (6)	TP19.1273x18.4776x0.1875	199.15	302.63	0.658	0.00	302.63	0.000
L7	104.75 - 104.5 (7)	TP19.1773x19.1273x0.425	202.15	712.23	0.284	0.00	712.23	0.000
L8	104.5 - 99.5 (8)	TP20.1768x19.1773x0.4063	265.07	758.32	0.350	0.00	758.32	0.000
L9	99.5 - 98.75 (9)	TP20.3267x20.1768x0.4063	277.12	769.98	0.360	0.00	769.98	0.000
L10	98.75 - 98.5 (10)	TP20.3767x20.3267x0.4063	281.15	773.89	0.363	0.00	773.89	0.000
L11	98.5 - 91.33 (11)	TP21.81x20.3767x0.4	338.06	817.61	0.413	0.00	817.61	0.000
L12	91.33 - 90 (12)	TP21.7002x20.7014x0.4563	421.64	982.43	0.429	0.00	982.43	0.000
L13	90 - 89.25 (13)	TP21.85x21.7002x0.45	434.90	983.70	0.442	0.00	983.70	0.000
L14	89.25 - 89 (14)	TP21.9x21.85x0.85	439.33	1764.36	0.249	0.00	1764.36	0.000
L15	89 - 88.25 (15)	TP22.0498x21.9x0.8375	452.65	1766.86	0.256	0.00	1766.86	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L16	88.25 - 88 (16)	TP22.0998x22.0498x0.6125	457.11	1340.04	0.341	0.00	1340.04	0.000
L17	88 - 83 (17)	TP23.0986x22.0998x0.5875	547.33	1414.07	0.387	0.00	1414.07	0.000
L18	83 - 78 (18)	TP24.0975x23.0986x0.575	639.72	1513.57	0.423	0.00	1513.57	0.000
L19	78 - 77 (19)	TP24.2972x24.0975x0.575	658.47	1539.70	0.428	0.00	1539.70	0.000
L20	77 - 76.75 (20)	TP24.3472x24.2972x0.7625	663.16	2002.34	0.331	0.00	2002.34	0.000
L21	76.75 - 71.75 (21)	TP25.346x24.3472x0.7375	758.42	2113.32	0.359	0.00	2113.32	0.000
L22	71.75 - 66.75 (22)	TP26.3449x25.346x0.7125	856.06	2219.80	0.386	0.00	2219.80	0.000
L23	66.75 - 62.25 (23)	TP27.2439x26.3449x0.7	945.97	2341.96	0.404	0.00	2341.96	0.000
L24	62.25 - 62 (24)	TP27.2938x27.2439x0.7	951.02	2350.89	0.405	0.00	2350.89	0.000
L25	62 - 59.5 (25)	TP27.7933x27.2938x0.4	1001.83	1441.81	0.695	0.00	1441.81	0.000
L26	59.5 - 59.25 (26)	TP27.8432x27.7933x0.75	1006.95	2610.84	0.386	0.00	2610.84	0.000
L27	59.25 - 54.25 (27)	TP28.8421x27.8432x0.725	1111.01	2723.19	0.408	0.00	2723.19	0.000
L28	54.25 - 45.25 (28)	TP30.64x28.8421x0.7	1202.11	2799.78	0.429	0.00	2799.78	0.000
L29	45.25 - 45 (29)	TP30.192x29.1911x0.7625	1312.63	3137.28	0.418	0.00	3137.28	0.000
L30	45 - 40.75 (30)	TP31.0427x30.192x0.75	1409.49	3273.21	0.431	0.00	3273.21	0.000
L31	40.75 - 40.5 (31)	TP31.0928x31.0427x0.7625	1415.26	3334.78	0.424	0.00	3334.78	0.000
L32	40.5 - 35.75 (32)	TP32.0436x31.0928x0.75	1526.40	3495.78	0.437	0.00	3495.78	0.000
L33	35.75 - 35.5 (33)	TP32.0937x32.0436x0.6875	1532.33	3234.12	0.474	0.00	3234.12	0.000
L34	35.5 - 30.5 (34)	TP33.0946x32.0937x0.675	1652.50	3387.08	0.488	0.00	3387.08	0.000
L35	30.5 - 29.75 (35)	TP33.2447x33.0946x0.4	1670.78	2077.73	0.804	0.00	2077.73	0.000
L36	29.75 - 29.5 (36)	TP33.2947x33.2447x0.675	1676.88	3429.47	0.489	0.00	3429.47	0.000
L37	29.5 - 24.5 (37)	TP34.2956x33.2947x0.6625	1800.45	3581.84	0.503	0.00	3581.84	0.000
L38	24.5 - 19.5 (38)	TP35.2965x34.2956x0.65	1926.81	3732.65	0.516	0.00	3732.65	0.000
L39	19.5 - 14.5 (39)	TP36.2974x35.2965x0.6375	2055.94	3881.53	0.530	0.00	3881.53	0.000
L40	14.5 - 12.5 (40)	TP36.6978x36.2974x0.6375	2108.38	3969.95	0.531	0.00	3969.95	0.000
L41	12.5 - 12.25 (41)	TP36.7478x36.6978x0.5625	2114.97	3534.64	0.598	0.00	3534.64	0.000
L42	12.25 - 10.75 (42)	TP37.0481x36.7478x0.5625	2154.65	3594.00	0.600	0.00	3594.00	0.000
L43	10.75 - 10.5 (43)	TP37.0981x37.0481x0.6375	2161.29	4059.37	0.532	0.00	4059.37	0.000
L44	10.5 - 5.5 (44)	TP38.099x37.0981x0.625	2295.74	4207.41	0.546	0.00	4207.41	0.000
L45	5.5 - 0.5 (45)	TP39.0999x38.099x0.6125	2433.21	4352.55	0.559	0.00	4352.55	0.000
L46	0.5 - 0 (46)	TP39.2x39.0999x0.6125	2447.12	4375.39	0.559	0.00	4375.39	0.000

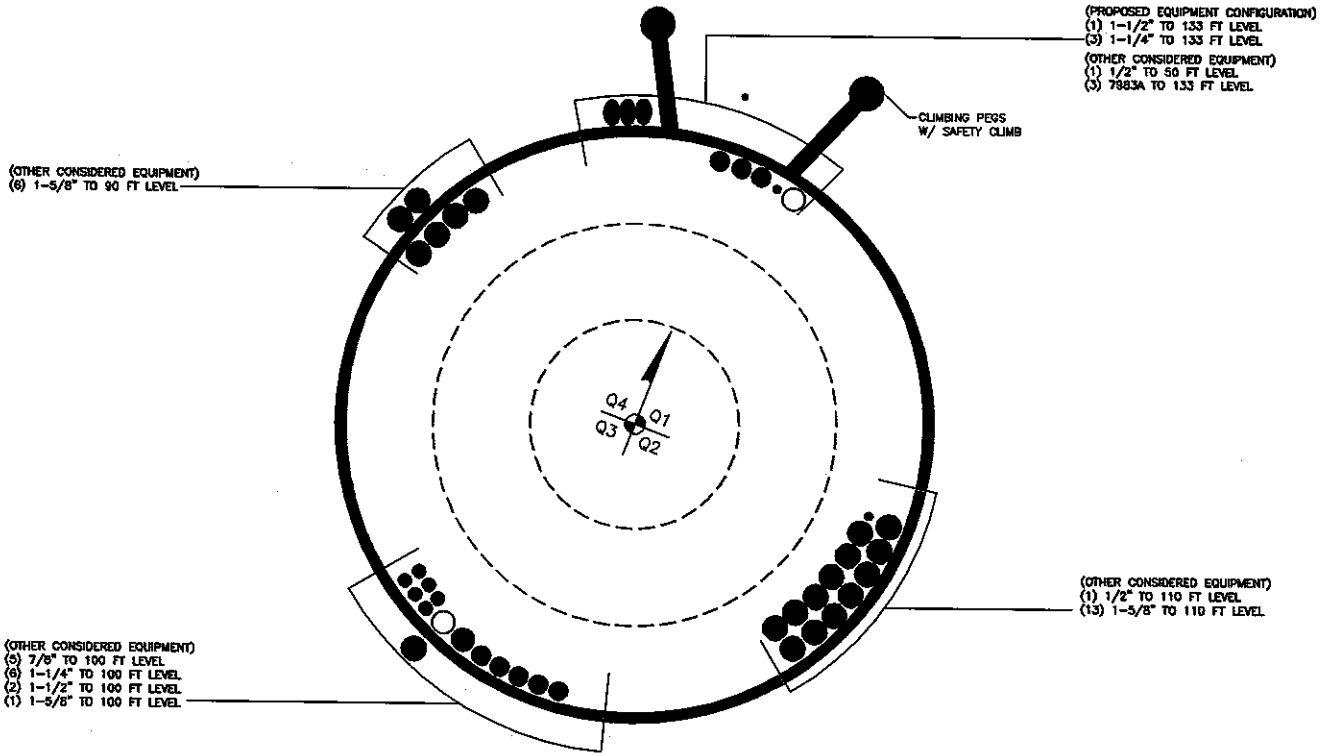
Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	133 - 128 (1)	TP14.4795x13.48x0.1875	5.65	151.44	0.037	0.79	185.42	0.004
L2	128 - 123 (2)	TP15.479x14.4795x0.1875	5.91	162.03	0.036	0.79	212.63	0.004
L3	123 - 118 (3)	TP16.4786x15.479x0.1875	6.18	172.62	0.036	0.79	241.70	0.003
L4	118 - 113 (4)	TP17.4781x16.4786x0.1875	6.45	183.21	0.035	0.79	272.64	0.003
L5	113 - 108 (5)	TP18.4776x17.4781x0.1875	11.84	193.80	0.061	1.06	305.43	0.003
L6	108 - 104.75 (6)	TP19.1273x18.4776x0.1875	12.01	200.68	0.060	1.06	327.75	0.003
L7	104.75 - 104.5 (7)	TP19.1773x19.1273x0.425	12.02	450.38	0.027	1.06	709.61	0.001
L8	104.5 - 99.5 (8)	TP20.1768x19.1773x0.4063	16.04	453.88	0.035	1.06	757.23	0.001
L9	99.5 - 98.75 (9)	TP20.3267x20.1768x0.4063	16.10	457.33	0.035	1.06	769.00	0.001
L10	98.75 - 98.5 (10)	TP20.3767x20.3267x0.4063	16.12	458.47	0.035	1.06	772.95	0.001
L11	98.5 - 91.33 (11)	TP21.81x20.3767x0.4	16.41	467.38	0.035	1.06	817.47	0.001
L12	91.33 - 90 (12)	TP21.7002x20.7014x0.4563	17.10	547.74	0.031	0.73	980.05	0.001
L13	90 - 89.25 (13)	TP21.85x21.7002x0.45	17.71	544.20	0.033	0.73	981.78	0.001
L14	89.25 - 89 (14)	TP21.9x21.85x0.85	17.74	1011.12	0.018	0.73	1724.07	0.000
L15	89 - 88.25 (15)	TP22.0498x21.9x0.8375	17.81	1003.94	0.018	0.73	1728.24	0.000
L16	88.25 - 88 (16)	TP22.0998x22.0498x0.6125	17.83	743.74	0.024	0.73	1326.72	0.001
L17	88 - 83 (17)	TP23.0986x22.0998x0.5875	18.27	747.37	0.024	0.73	1403.67	0.001
L18	83 - 78 (18)	TP24.0975x23.0986x0.575	18.71	764.34	0.024	0.73	1505.12	0.000
L19	78 - 77 (19)	TP24.2972x24.0975x0.575	18.80	770.83	0.024	0.73	1531.44	0.000
L20	77 - 76.75 (20)	TP24.3472x24.2972x0.7625	18.82	1016.26	0.019	0.73	1974.18	0.000
L21	76.75 - 71.75 (21)	TP25.346x24.3472x0.7375	19.30	1025.61	0.019	0.73	2089.00	0.000
L22	71.75 - 66.75 (22)	TP26.3449x25.346x0.7125	19.78	1032.07	0.019	0.73	2199.43	0.000
L23	66.75 - 62.25 (23)	TP27.2439x26.3449x0.7	20.20	1050.01	0.019	0.73	2324.06	0.000
L24	62.25 - 62 (24)	TP27.2938x27.2439x0.7	20.23	1051.99	0.019	0.73	2333.04	0.000
L25	62 - 59.5 (25)	TP27.7933x27.2938x0.4	20.45	619.21	0.033	0.73	1448.78	0.001
L26	59.5 - 59.25 (26)	TP27.8432x27.7933x0.75	20.48	1148.30	0.018	0.73	2587.21	0.000
L27	59.25 - 54.25 (27)	TP28.8421x27.8432x0.725	21.17	1151.97	0.018	0.73	2704.08	0.000
L28	54.25 - 45.25 (28)	TP30.64x28.8421x0.7	21.73	1146.82	0.019	0.73	2785.03	0.000
L29	45.25 - 45 (29)	TP30.192x29.1911x0.7625	22.53	1268.11	0.018	0.82	3114.84	0.000
L30	45 - 40.75 (30)	TP31.0427x30.192x0.75	23.08	1283.90	0.018	0.82	3253.83	0.000
L31	40.75 - 40.5 (31)	TP31.0928x31.0427x0.7625	23.10	1306.92	0.018	0.82	3313.68	0.000
L32	40.5 - 35.75 (32)	TP32.0436x31.0928x0.75	23.72	1326.33	0.018	0.82	3478.04	0.000
L33	35.75 - 35.5 (33)	TP32.0937x32.0436x0.6875	23.74	1220.17	0.019	0.81	3224.86	0.000
L34	35.5 - 30.5 (34)	TP33.0946x32.0937x0.675	24.35	1236.64	0.020	0.81	3381.23	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L35	30.5 - 29.75 (35)	TP33.2447x33.0946x0.4	24.42	742.43	0.033	0.81	2093.05	0.000
L36	29.75 - 29.5 (36)	TP33.2947x33.2447x0.675	24.44	1244.28	0.020	0.81	3424.01	0.000
L37	29.5 - 24.5 (37)	TP34.2956x33.2947x0.6625	25.01	1259.18	0.020	0.81	3579.92	0.000
L38	24.5 - 19.5 (38)	TP35.2965x34.2956x0.65	25.57	1272.64	0.020	0.81	3734.35	0.000
L39	19.5 - 14.5 (39)	TP36.2974x35.2965x0.6375	26.12	1284.68	0.020	0.81	3886.92	0.000
L40	14.5 - 12.5 (40)	TP36.6978x36.2974x0.6375	26.35	1299.10	0.020	0.81	3976.29	0.000
L41	12.5 - 12.25 (41)	TP36.7478x36.6978x0.5625	26.36	1150.24	0.023	0.81	3548.23	0.000
L42	12.25 - 10.75 (42)	TP37.0481x36.7478x0.5625	26.58	1159.78	0.023	0.81	3608.30	0.000
L43	10.75 - 10.5 (43)	TP37.0981x37.0481x0.6375	26.59	1313.52	0.020	0.81	4066.68	0.000
L44	10.5 - 5.5 (44)	TP38.099x37.0981x0.625	27.22	1323.56	0.021	0.81	4218.57	0.000
L45	5.5 - 0.5 (45)	TP39.0999x38.099x0.6125	27.80	1332.16	0.021	0.81	4367.59	0.000
L46	0.5 - 0 (46)	TP39.2x39.0999x0.6125	27.85	1335.63	0.021	0.81	4390.71	0.000

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876317 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

2/12/2015	UPDATED PER WORK ORDER 1105372	MH
11/03/16	UPDATED PER WORK ORDER 1204275	AMM
04/05/16	UPDATED PER WORK ORDER 1231179	AHK
05/06/16	UPDATED PER WORK ORDER 1257982	AHZ
08/12/16	UPDATED PER WORK ORDER 1326400	AMJ
04/01/17	UPDATED PER WORK ORDER 1361533	JB
10/06/17	UPDATED PER WORK ORDER 1437493	SM
10/27/16	UPDATED PER WORK ORDER 1403362	JL
02/06/18	UPDATED PER WORK ORDER 1531447	DM

DRAWN BY: GSV
CHECKED BY: KAH
DRAWING DATE: 30/11/07

SITE NUMBER:
SITE NAME:

SITE NAME

WATERBURY

BUSINESS UNIT NUMBER

876317

SITE ADDRESS

150 MATTATUCK HEIGHTS
WATERBURY, CT 06705
NEW HAVEN COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING

SCALE 1" = 1'-0" | 1

PLOT DATE: 9/27/2016 FILE NAME: 876317_BASELEVEL.DWG

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 876317

Work Order: 1621488

CROWN CASTLE

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	133	41.67	3.67	12	13.48	21.81	0.1875	Auto	A572-65
2	95	49.75	4.75	12	20.70	30.64	0.25	Auto	A572-65
3	50	50	0	12	29.19	39.2	0.3125	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	29.75	plate	Reinf. Bar #1	2		x								x		
2	0	10.75	plate	Reinf. Bar #1A	2					x		x					
3	10.75	29.75	plate	Reinf. Bar #1B	1						x						
4	29.75	59.5	plate	Reinf. Bar #2	3		x				x				x		
5	59.5	89.25	plate	Reinf. Bar #3	3		x				x				x		
6	89.25	98.75	plate	Reinf. Bar #4	3		x				x				x		
7	12.5	35.75	plate	SR1	2							x				x	
8	12.5	40.75	plate	SR2	1		x										
9	35.75	62.25	plate	SR3	3				x				x				x
10	62.25	77	plate	SR4	3			x				x				x	
11	88.25	104.75	plate	SR5	3			x				x				x	
12																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	6.875	1.25	8.59375	0.625	n/a	36.000	15.000	6.991	1.2200	A572-65
2	6.875	1.25	8.59375	0.625	n/a	42.000	15.000	6.991	1.2200	A572-65
3	6.875	1.25	8.59375	0.625	42.000	36.000	15.000	6.991	1.2200	A572-65
4	6.625	1.25	8.28125	0.625	3.000	30.000	18.000	6.678	1.2200	A572-65
5	5.5	1.25	6.875	0.625	3.000	18.000	18.000	5.272	1.2200	A572-55
6	3.625	1.25	4.53125	0.625	3.000	15.000	24.000	2.928	1.2200	A572-55
7	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
8	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
9	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
10	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100
11	4	1	4	0.5	21.000	21.000	20.000	2.750	1.1875	A514-GR100

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	133 - 128	5		12	13.480	14.480	0.1875	A572-65	1.000
2	128 - 123	5		12	14.480	15.479	0.1875	A572-65	1.000
3	123 - 118	5		12	15.479	16.479	0.1875	A572-65	1.000
4	118 - 113	5		12	16.479	17.478	0.1875	A572-65	1.000
5	113 - 108	5		12	17.478	18.478	0.1875	A572-65	1.000
6	108 - 104.75	3.25		12	18.478	19.127	0.1875	A572-65	1.000
7	104.75 - 104.5	0.25		12	19.127	19.177	0.425	A572-65	0.915
8	104.5 - 99.5	5		12	19.177	20.177	0.40625	A572-65	0.931
9	99.5 - 98.75	0.75		12	20.177	20.327	0.40625	A572-65	0.928
10	98.75 - 98.5	0.25		12	20.327	20.377	0.40625	A572-65	0.927
11	98.5 - 95	7.17	3.67	12	20.377	21.810	0.4	A572-65	0.925
12	95 - 90	5		12	20.701	21.700	0.45625	A572-65	0.938
13	90 - 89.25	0.75		12	21.700	21.850	0.45	A572-65	0.948
14	89.25 - 89	0.25		12	21.850	21.900	0.85	A572-65	0.870
15	89 - 88.25	0.75		12	21.900	22.050	0.8375	A572-65	0.878
16	88.25 - 88	0.25		12	22.050	22.100	0.6125	A572-65	0.902
17	88 - 83	5		12	22.100	23.099	0.5875	A572-65	0.917
18	83 - 78	5		12	23.099	24.097	0.575	A572-65	0.915
19	78 - 77	1		12	24.097	24.297	0.575	A572-65	0.911
20	77 - 76.75	0.25		12	24.297	24.347	0.7625	A572-65	0.899
21	76.75 - 71.75	5		12	24.347	25.346	0.7375	A572-65	0.905
22	71.75 - 66.75	5		12	25.346	26.345	0.7125	A572-65	0.913
23	66.75 - 62.25	4.5		12	26.345	27.244	0.7	A572-65	0.909
24	62.25 - 62	0.25		12	27.244	27.294	0.7	A572-65	0.908
25	62 - 59.5	2.5		12	27.294	27.793	0.4	A572-65	0.969
26	59.5 - 59.25	0.25		12	27.793	27.843	0.75	A572-65	0.903
27	59.25 - 54.25	5		12	27.843	28.842	0.725	A572-65	0.913
28	54.25 - 50	9	4.75	12	28.842	30.640	0.7	A572-65	0.927
29	50 - 45	5		12	29.191	30.192	0.7625	A572-65	0.927
30	45 - 40.75	4.25		12	30.192	31.043	0.75	A572-65	0.927
31	40.75 - 40.5	0.25		12	31.043	31.093	0.7625	A572-65	0.965
32	40.5 - 35.75	4.75		12	31.093	32.044	0.75	A572-65	0.964
33	35.75 - 35.5	0.25		12	32.044	32.094	0.6875	A572-65	0.991
34	35.5 - 30.5	5		12	32.094	33.095	0.675	A572-65	0.992
35	30.5 - 29.75	0.75		12	33.095	33.245	0.4	A572-65	1.067
36	29.75 - 29.5	0.25		12	33.245	33.295	0.675	A572-65	1.002
37	29.5 - 24.5	5		12	33.295	34.296	0.6625	A572-65	1.004
38	24.5 - 19.5	5		12	34.296	35.297	0.65	A572-65	1.007
39	19.5 - 14.5	5		12	35.297	36.297	0.6375	A572-65	1.012
40	14.5 - 12.5	2		12	36.297	36.698	0.6375	A572-65	1.006
41	12.5 - 12.25	0.25		12	36.698	36.748	0.5625	A572-65	0.953
42	12.25 - 10.75	1.5		12	36.748	37.048	0.5625	A572-65	0.950
43	10.75 - 10.5	0.25		12	37.048	37.098	0.6375	A572-65	0.955
44	10.5 - 5.5	5		12	37.098	38.099	0.625	A572-65	0.961
45	5.5 - 0.5	5		12	38.099	39.100	0.6125	A572-65	0.968
46	0.5 - 0	0.5		12	39.100	39.200	0.6125	A572-65	0.967

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	133 - 128	3.28	26.52	5.65
2	128 - 123	3.49	55.40	5.91
3	123 - 118	3.72	85.59	6.18
4	118 - 113	3.97	117.14	6.45
5	113 - 108	7.10	160.42	11.84
6	108 - 104.75	7.36	199.15	12.01
7	104.75 - 104.5	7.40	202.15	12.02
8	104.5 - 99.5	11.00	265.07	16.04
9	99.5 - 98.75	11.10	277.12	16.10
10	98.75 - 98.5	11.14	281.15	16.12
11	98.5 - 95	11.62	338.06	16.41
12	95 - 90	12.71	421.64	17.10
13	90 - 89.25	13.14	434.90	17.71
14	89.25 - 89	13.21	439.33	17.74
15	89 - 88.25	13.39	452.65	17.81
16	88.25 - 88	13.44	457.11	17.83
17	88 - 83	14.43	547.33	18.27
18	83 - 78	15.45	639.72	18.71
19	78 - 77	15.66	658.47	18.80
20	77 - 76.75	15.73	663.17	18.82
21	76.75 - 71.75	16.99	758.42	19.30
22	71.75 - 66.75	18.28	856.06	19.78
23	66.75 - 62.25	19.46	945.97	20.20
24	62.25 - 62	19.53	951.02	20.23
25	62 - 59.5	20.01	1001.83	20.45
26	59.5 - 59.25	20.09	1006.95	20.48
27	59.25 - 54.25	21.50	1111.01	21.17
28	54.25 - 50	22.73	1202.11	21.73
29	50 - 45	25.54	1312.62	22.53
30	45 - 40.75	26.89	1409.49	23.08
31	40.75 - 40.5	26.98	1415.26	23.10
32	40.5 - 35.75	28.59	1526.40	23.72
33	35.75 - 35.5	28.68	1532.33	23.74
34	35.5 - 30.5	30.32	1652.50	24.35
35	30.5 - 29.75	30.51	1670.78	24.42
36	29.75 - 29.5	30.60	1676.88	24.44
37	29.5 - 24.5	32.30	1800.45	25.01
38	24.5 - 19.5	34.03	1926.80	25.57
39	19.5 - 14.5	35.79	2055.94	26.12
40	14.5 - 12.5	36.50	2108.38	26.35
41	12.5 - 12.25	36.58	2114.97	26.36
42	12.25 - 10.75	37.03	2154.65	26.58
43	10.75 - 10.5	37.14	2161.29	26.59
44	10.5 - 5.5	38.86	2295.74	27.22
45	5.5 - 0.5	40.62	2433.21	27.80
46	0.5 - 0	40.80	2447.12	27.85

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
133 - 128	Pole	TP14.48x13.48x0.1875	Pole	14.9%	Pass
128 - 123	Pole	TP15.479x14.48x0.1875	Pole	26.7%	Pass
123 - 118	Pole	TP16.479x15.479x0.1875	Pole	36.8%	Pass
118 - 113	Pole	TP17.478x16.479x0.1875	Pole	45.4%	Pass
113 - 108	Pole	TP18.478x17.478x0.1875	Pole	57.0%	Pass
108 - 104.75	Pole	TP19.127x18.478x0.1875	Pole	66.7%	Pass
104.75 - 104.5	Pole + Reinf.	TP19.177x19.127x0.425	Reinf. 11 Bolt-Shaft Bearing	41.4%	Pass
104.5 - 99.5	Pole + Reinf.	TP20.177x19.177x0.4063	Reinf. 11 Tension Rupture	46.5%	Pass
99.5 - 98.75	Pole + Reinf.	TP20.327x20.177x0.4063	Reinf. 11 Tension Rupture	48.1%	Pass
98.75 - 98.5	Pole + Reinf.	TP20.377x20.327x0.4063	Reinf. 11 Tension Rupture	48.6%	Pass
98.5 - 95	Pole + Reinf.	TP21.81x20.377x0.4	Reinf. 11 Tension Rupture	55.5%	Pass
95 - 90	Pole + Reinf.	TP21.7x20.701x0.4563	Reinf. 11 Tension Rupture	57.0%	Pass
90 - 89.25	Pole + Reinf.	TP21.85x21.7x0.45	Reinf. 11 Tension Rupture	58.2%	Pass
89.25 - 89	Pole + Reinf.	TP21.9x21.85x0.85	Reinf. 5 Bolt-Shaft Bearing	55.2%	Pass
89 - 88.25	Pole + Reinf.	TP22.05x21.9x0.8375	Reinf. 5 Tension Rupture	48.1%	Pass
88.25 - 88	Pole + Reinf.	TP22.1x22.05x0.6125	Reinf. 5 Tension Rupture	64.1%	Pass
88 - 83	Pole + Reinf.	TP23.099x22.1x0.5875	Reinf. 5 Tension Rupture	72.0%	Pass
83 - 78	Pole + Reinf.	TP24.097x23.099x0.575	Reinf. 5 Tension Rupture	79.2%	Pass
78 - 77	Pole + Reinf.	TP24.297x24.097x0.575	Reinf. 5 Tension Rupture	80.5%	Pass
77 - 76.75	Pole + Reinf.	TP24.347x24.297x0.7625	Reinf. 5 Tension Rupture	61.8%	Pass
76.75 - 71.75	Pole + Reinf.	TP25.346x24.347x0.7375	Reinf. 5 Tension Rupture	67.0%	Pass
71.75 - 66.75	Pole + Reinf.	TP26.345x25.346x0.7125	Reinf. 5 Tension Rupture	71.8%	Pass
66.75 - 62.25	Pole + Reinf.	TP27.244x26.345x0.7	Reinf. 5 Tension Rupture	75.8%	Pass
62.25 - 62	Pole + Reinf.	TP27.294x27.244x0.7	Reinf. 5 Tension Rupture	76.0%	Pass
62 - 59.5	Pole + Reinf.	TP27.793x27.294x0.4	Reinf. 9 Tension Rupture	90.7%	Pass
59.5 - 59.25	Pole + Reinf.	TP27.843x27.793x0.75	Reinf. 4 Bolt-Shaft Bearing	61.9%	Pass
59.25 - 54.25	Pole + Reinf.	TP28.842x27.843x0.725	Reinf. 4 Tension Rupture	63.4%	Pass
54.25 - 50	Pole + Reinf.	TP30.64x28.842x0.7	Reinf. 4 Tension Rupture	65.9%	Pass
50 - 45	Pole + Reinf.	TP30.192x29.191x0.7625	Reinf. 4 Tension Rupture	64.5%	Pass
45 - 40.75	Pole + Reinf.	TP31.043x30.192x0.75	Reinf. 4 Tension Rupture	66.6%	Pass
40.75 - 40.5	Pole + Reinf.	TP31.093x31.043x0.7625	Reinf. 4 Tension Rupture	66.6%	Pass
40.5 - 35.75	Pole + Reinf.	TP32.044x31.093x0.75	Reinf. 4 Tension Rupture	68.8%	Pass
35.75 - 35.5	Pole + Reinf.	TP32.094x32.044x0.6875	Reinf. 4 Tension Rupture	71.8%	Pass
35.5 - 30.5	Pole + Reinf.	TP33.095x32.094x0.675	Reinf. 4 Tension Rupture	74.0%	Pass
30.5 - 29.75	Pole + Reinf.	TP33.245x33.095x0.4	Reinf. 7 Tension Rupture	98.0%	Pass
29.75 - 29.5	Pole + Reinf.	TP33.295x33.245x0.675	Reinf. 1 Tension Rupture	72.7%	Pass
29.5 - 24.5	Pole + Reinf.	TP34.296x33.295x0.6625	Reinf. 1 Tension Rupture	74.7%	Pass
24.5 - 19.5	Pole + Reinf.	TP35.297x34.296x0.65	Reinf. 1 Tension Rupture	76.7%	Pass
19.5 - 14.5	Pole + Reinf.	TP36.297x35.297x0.6375	Reinf. 1 Tension Rupture	78.5%	Pass
14.5 - 12.5	Pole + Reinf.	TP36.698x36.297x0.6375	Reinf. 1 Tension Rupture	79.2%	Pass
12.5 - 12.25	Pole + Reinf.	TP36.748x36.698x0.5625	Reinf. 1 Tension Rupture	91.4%	Pass
12.25 - 10.75	Pole + Reinf.	TP37.048x36.748x0.5625	Reinf. 1 Tension Rupture	91.9%	Pass
10.75 - 10.5	Pole + Reinf.	TP37.098x37.048x0.6375	Reinf. 1 Tension Rupture	84.7%	Pass
10.5 - 5.5	Pole + Reinf.	TP38.099x37.098x0.625	Reinf. 1 Tension Rupture	86.4%	Pass
5.5 - 0.5	Pole + Reinf.	TP39.1x38.099x0.6125	Reinf. 1 Tension Rupture	88.0%	Pass
0.5 - 0	Pole + Reinf.	TP39.2x39.1x0.6125	Reinf. 1 Tension Rupture	88.2%	Pass
				Summary	
			Pole	91.0%	Pass
			Reinforcement	98.0%	Pass
			Overall	98.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
133 - 128	225	n/a	225	8.62	n/a	8.62	14.9%											
128 - 123	276	n/a	276	9.22	n/a	9.22	26.7%											
123 - 118	334	n/a	334	9.82	n/a	9.82	36.8%											
118 - 113	399	n/a	399	10.42	n/a	10.42	45.4%											
113 - 108	472	n/a	472	11.03	n/a	11.03	57.0%											
108 - 104.75	524	n/a	524	11.42	n/a	11.42	66.7%											
104.75 - 104.5	528	619	1148	11.45	12.00	23.45	30.0%											41.4%
104.5 - 99.5	616	681	1298	12.05	12.00	24.05	37.5%											46.5%
99.5 - 98.75	630	691	1321	12.14	12.00	24.14	38.9%											48.1%
98.75 - 98.5	635	694	1329	12.17	12.00	24.17	39.4%											48.6%
98.5 - 95	703	740	1443	12.59	12.00	24.59	45.7%											55.5%
95 - 90	1015	781	1797	17.24	12.00	29.24	42.7%											57.0%
90 - 89.25	1037	792	1829	17.36	12.00	29.36	43.7%											58.2%
89.25 - 89	1044	2204	3248	17.40	32.63	50.03	25.0%					55.2%						33.2%
89 - 88.25	1066	2232	3298	17.52	32.63	50.15	25.6%					48.1%						33.9%
88.25 - 88	1073	1433	2506	17.56	20.63	38.19	34.1%					64.1%						
88 - 83	1227	1556	2783	18.37	20.63	38.99	38.9%					72.0%						
83 - 78	1395	1684	3079	19.17	20.63	39.79	43.5%					79.2%						
78 - 77	1431	1710	3141	19.33	20.63	39.96	44.4%					80.5%						
77 - 76.75	1440	2689	4128	19.37	32.63	52.00	34.1%					61.8%					43.6%	
76.75 - 71.75	1626	2901	4527	20.17	32.63	52.80	37.6%					67.0%					47.3%	
71.75 - 66.75	1828	3121	4949	20.98	32.63	53.60	40.9%					71.8%					50.7%	
66.75 - 62.25	2024	3326	5349	21.70	32.63	54.32	43.9%					75.8%					53.5%	
62.25 - 62	2035	3337	5372	21.74	32.63	54.36	44.0%					76.0%				53.6%		
62 - 59.5	2150	1252	3402	22.14	12.00	34.14	75.0%									90.7%		
59.5 - 59.25	2162	3932	6094	22.18	36.84	59.02	42.3%				61.9%					51.0%		
59.25 - 54.25	2405	4203	6608	22.98	36.84	59.83	45.2%				63.4%					53.7%		
54.25 - 50	2626	4441	7067	23.67	36.84	60.51	47.8%				65.9%					55.9%		
50 - 45	3431	4585	8016	30.02	36.84	66.87	42.9%				64.5%					54.7%		
45 - 40.75	3732	4834	8566	30.88	36.84	67.72	44.8%				66.6%					56.4%		
40.75 - 40.5	3757	5090	8847	30.93	40.84	71.77	44.9%				66.6%				48.0%	53.9%		
40.5 - 35.75	4116	5391	9507	31.88	40.84	72.73	46.9%				68.8%				49.7%	55.7%		
35.75 - 35.5	4132	4593	8726	31.93	36.84	68.78	51.1%				71.8%			59.0%	56.9%			
35.5 - 30.5	4535	4870	9406	32.94	36.84	69.78	53.4%				74.0%			60.8%	58.7%			
30.5 - 29.75	4610	1281	5891	33.09	12.00	45.09	91.0%							98.0%	93.0%			
29.75 - 29.5	4619	5072	9691	33.14	37.78	70.92	53.0%	72.7%		70.4%				60.3%	58.3%			
29.5 - 24.5	5052	5367	10419	34.15	37.78	71.93	55.2%	74.7%		72.4%				62.0%	59.9%			
24.5 - 19.5	5511	5671	11182	35.15	37.78	72.93	57.4%	76.7%		74.3%				63.7%	61.5%			
19.5 - 14.5	5998	5983	11981	36.16	37.78	73.94	59.5%	78.5%		76.1%				65.2%	63.1%			
14.5 - 12.5	6200	6110	12310	36.56	37.78	74.34	60.3%	79.2%		76.8%				65.8%	63.7%			
12.5 - 12.25	6221	4705	10926	36.61	25.78	62.39	67.0%	91.4%		91.4%								
12.25 - 10.75	6376	4779	11155	36.91	25.78	62.69	67.7%	91.9%		91.9%								
10.75 - 10.5	6437	6287	12724	36.95	34.38	71.34	63.9%	84.7%	75.4%									
10.5 - 5.5	6975	6617	13592	37.97	34.38	72.34	66.1%	86.4%	77.0%									
5.5 - 0.5	7543	6955	14498	38.97	34.38	73.35	68.2%	88.0%	78.5%									
0.5 - 0	7602	6989	14591	39.07	34.38	73.45	68.4%	88.2%	78.7%									

Note: Section capacity checked in 5 degree increments.

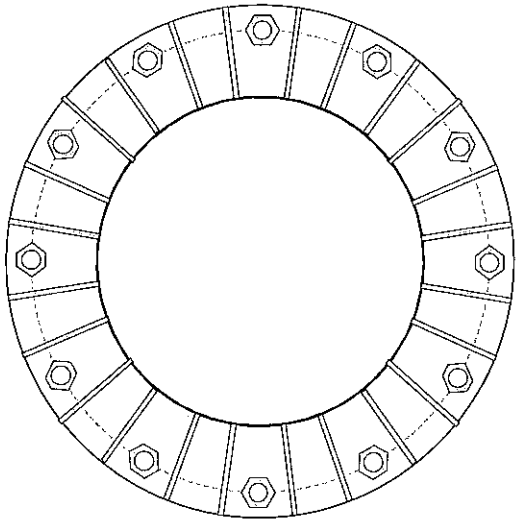
Monopole Base Plate Connection

CROWN CASTLE

Site Info	
BU #	876317
Site Name	WATERBURY
Order #	450715 Rev. 4

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.5

Applied Loads	
Moment (kip-ft)	2447.12
Axial Force (kips)	40.80
Shear Force (kips)	27.85



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 55.16" BC

Base Plate Data

61.16" OD x 2.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

(24) 21.5"H x 11"W x 0.625"T, Notch: 0.75"
plate: Fy= 50 ksi ; weld: Fy= 80 ksi
horiz. weld: 0.25" groove, 45° dbl bevel, 0.5" fillet
vert. weld: 0.3125" fillet

Pole Data

39.2" x 0.3125" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu = 180.74	ϕPn = 243.75	Stress Rating
Vu = 2.32	ϕVn = 73.13	74.2%
Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary		
Max Stress (ksi):	15.74	(Roark's Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	29.1%	Pass

Stiffener Summary		
Horizontal Weld:	69.5%	Pass
Vertical Weld:	32.3%	Pass
Plate Flexure+Shear:	16.0%	Pass
Plate Tension+Shear:	32.3%	Pass
Plate Compression:	53.0%	Pass
Pole Summary		
Punching Shear:	13.1%	Pass

Pier and Pad Foundation

BU # :	876317
Site Name:	WATERBURY
App. Number:	450715 Rev. 4

TIA-222 Revision:	H
Tower Type:	Monopole

Block Foundation?:	☑

Superstructure Analysis Reactions		
Compression, P_{comp}:	41	kips
Base Shear, Vu_comp:	28	kips
Moment, M_u:	2447	ft-kips
Tower Height, **H**:	133	ft
BP Dist. Above Fdn, bp_{dist}:	0	in
Bolt Circle / Bearing Plate Width, **BC**:	55.16	in

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	283.43	28.00	**9.9%**	**Pass**
Bearing Pressure (ksf)	22.50	3.46	**15.4%**	**Pass**
*Overturning (kip*ft)*	3810.77	2636.00	**69.2%**	**Pass**
*Pad Flexure (kip*ft)*	9014.86	1202.93	**13.3%**	**Pass**
Pad Shear - 1-way (kips)	1732.56	75.50	**4.4%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.001	**0.5%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	9014.86	0.00	**0.0%**	**Pass**

Soil Rating:	**69.2%**
Structural Rating:	**13.3%**

Pad Properties		
Depth, **D**:	6.75	ft
Pad Width, **W**:	20	ft
Pad Thickness, **T**:	6.75	ft
Pad Rebar Size, **Sp**:	10	
Pad Rebar Quantity, **mp**:	21	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	130	pcf
Ultimate Gross Bearing, Qult:	30.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	37	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.5	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	11.5	ft

<--Toggle between Gross and Net

Version 3.0.2

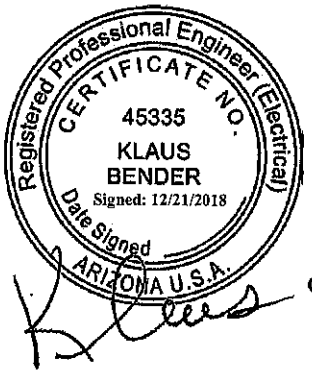
RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of Sprint

Crown Castle BU: 876317
Site: WATERBURY
Sprint Cascade: CT03XC027
150 Mattatuck Heights
WATERBURY, CT
12/20/2018

Report Status:

Sprint Is Compliant



Klaus Bender
Registered Professional Engineer (Electrical)
Expires December 31, 2021

Prepared By:

Sitesafe, LLC

8618 Westwood Center Drive,
Suite 315

Vienna, VA 22182

Voice 703-276-1100
Fax 703-276-1169

Engineering Statement in Re:
Electromagnetic Energy Analysis
Sprint
WATERBURY, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Sitesafe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle on behalf of Sprint (See attached Site Summary and Carrier documents), and that Sprint's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "WATERBURY" ("the site"); and

That Sprint proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by Sprint and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of Sprint's operating frequency as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed Sprint operation is no more than 0.095% of the maximum in any accessible area on the ground and

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 3.826% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the proposed operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that Sprint's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

Sprint
WATERBURY
Site Summary

Carrier	Area Maximum Percentage MPE
Clearwire	0.036 %
Clearwire	0.022 %
Metro PCS (inactive)	0 %
Sprint	0.176 %
Sprint	0.231 %
Sprint (Proposed)	0.095 %
T-Mobile	0.722 %
T-Mobile	0.722 %
T-Mobile	0.344 %
T-Mobile	0.306 %
Verizon Wireless	0.228 %
Verizon Wireless	0.441 %
Verizon Wireless	0.178 %
Verizon Wireless	0.325 %
Composite Site MPE:	3.826 %

Clearwire
WATERBURY
Carrier Summary

Frequency:	21825	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.35886	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.03589	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	VHLP2-23	135	0	4522	0.358858	0.035886	0.358858	0.035886
ANDREW	VHLP2-23	135	90	4522	0.358858	0.035886	0.358858	0.035886

Clearwire
WATERBURY
Carrier Summary

Frequency:	17815	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.21531	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.02153	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	VHLP2-18	135	180	3129	0.215315	0.021531	0.215315	0.021531

Metro PCS (inactive)
WATERBURY
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXV18-206517LS	90	30	0	0	0	0	0
RFS	APXV18-206517LS	90	150	0	0	0	0	0
RFS	APXV18-206517LS	90	270	0	0	0	0	0

Sprint
WATERBURY
Carrier Summary

Frequency:	862	MHz
Maximum Permissible Exposure (MPE):	574.67	µW/cm^2
Maximum power density at ground level:	1.01224	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.17614	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	130	70	1084	0.465588	0.081019	0.476214	0.082868
RFS	APXVSPP18-C-A20	130	0	1084	0.464138	0.080767	0.476214	0.082868
RFS	APXVSPP18-C-A20	130	90	1084	0.464138	0.080767	0.476214	0.082868
RFS	APXVSPP18-C-A20	130	180	1084	0.464138	0.080767	0.476214	0.082868

Sprint
WATERBURY
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.30757	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.23076	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	130	70	1902	0.447833	0.044783	1.025259	0.102526
RFS	APXVSPP18-C-A20	130	0	1902	0.445316	0.044532	1.025259	0.102526
RFS	APXVSPP18-C-A20	130	90	1902	0.445316	0.044532	1.025259	0.102526
RFS	APXVSPP18-C-A20	130	180	1902	0.445316	0.044532	1.025259	0.102526

Sprint (Proposed)
WATERBURY
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.95376	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.09538	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Nokia	AAHC	130	0	1600	0.624253	0.062425	0.7925	0.07925
Nokia	AAHC	130	90	1600	0.624253	0.062425	0.7925	0.07925
Nokia	AAHC	130	180	1600	0.624253	0.062425	0.7925	0.07925

T-Mobile
WATERBURY
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	7.22319	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.72232	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 32 B2A B66AA	100	50	2313	4.987889	0.498789	5.01	0.501
Ericsson	AIR 32 B2A B66AA	100	150	2313	4.987889	0.498789	5.01	0.501
Ericsson	AIR 32 B2A B66AA	100	300	2313	5.019501	0.50195	5.019501	0.50195

T-Mobile
WATERBURY
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	7.22056	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.72206	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	100	50	1854	1.395196	0.13952	2.501604	0.25016
RFS	APXVAARR24_43-U-NA20	100	50	1854	1.395196	0.13952	2.501604	0.25016
RFS	APXVAARR24_43-U-NA20	100	150	1854	1.415794	0.141579	2.501604	0.25016
RFS	APXVAARR24_43-U-NA20	100	150	1854	1.415794	0.141579	2.501604	0.25016
RFS	APXVAARR24_43-U-NA20	100	300	1854	1.395196	0.13952	2.501603	0.25016
RFS	APXVAARR24_43-U-NA20	100	300	1854	1.395196	0.13952	2.501603	0.25016
Ericsson	AIR 21 B2A B4P	100	50	2061	1.035437	0.103544	1.191835	0.119184
Ericsson	AIR 21 B2A B4P	100	150	2061	1.035437	0.103544	1.191835	0.119184
Ericsson	AIR 21 B2A B4P	100	300	2061	1.035742	0.103574	1.191835	0.119184

T-Mobile
WATERBURY
Carrier Summary

Frequency:	600	MHz
Maximum Permissible Exposure (MPE):	400	µW/cm^2
Maximum power density at ground level:	1.37676	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.34419	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	100	50	1251	0.891566	0.222892	0.917674	0.229419
RFS	APXVAARR24_43-U-NA20	100	150	1251	0.891566	0.222892	0.917674	0.229418
RFS	APXVAARR24_43-U-NA20	100	300	1251	0.889935	0.222484	0.917674	0.229419

T-Mobile
WATERBURY
Carrier Summary

Frequency:	700	MHz
Maximum Permissible Exposure (MPE):	466.67	µW/cm^2
Maximum power density at ground level:	1.42826	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.30606	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	100	50	1307	0.872453	0.186954	0.920106	0.197166
RFS	APXVAARR24_43-U-NA20	100	150	1307	0.872453	0.186954	0.920106	0.197166
RFS	APXVAARR24_43-U-NA20	100	300	1307	0.872763	0.187021	0.920106	0.197166

Verizon Wireless
WATERBURY
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.28113	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.22811	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	110	30	1933	1.403257	0.140326	2.17803	0.217803
ANDREW	SBNHH-1D65B	110	150	1933	1.402049	0.140205	2.17803	0.217803
ANDREW	SBNHH-1D65B	110	270	1933	1.402049	0.140205	2.17803	0.217803

Verizon Wireless
WATERBURY
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	4.40725	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.44073	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	110	30	2292	3.363479	0.336348	4.356681	0.435668
ANDREW	SBNHH-1D65B	110	150	2292	3.316126	0.331613	4.356681	0.435668
ANDREW	SBNHH-1D65B	110	270	2292	3.363479	0.336348	4.356681	0.435668

Verizon Wireless
WATERBURY
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	0.891	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.17796	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-70063-6CF	110	30	1005	0.707183	0.141248	0.845784	0.168932
Antel	BXA-70063-6CF	110	150	1005	0.708404	0.141492	0.845784	0.168932
Antel	BXA-70063-6CF	110	270	1005	0.708404	0.141492	0.845784	0.168932

Verizon Wireless
WATERBURY
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.84314	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.32526	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-80063-4CF	110	30	1197	1.392272	0.245695	1.818944	0.32099
Antel	BXA-80063-4CF	110	150	1197	1.394048	0.246008	1.818944	0.32099
Antel	BXA-80063-4CF	110	270	1197	1.392272	0.245695	1.818944	0.32099

Sprint®

TM

PR

SI

SI

CR

SI

SI

SITE INFORMATION

SITE MANAGER:

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CROWN PROJECT MANAGER:
SCOTT WIATROSKI: (201) 235-9228
SCOTT.WIATROSKI@CROWNCASTLE.COM

CROWN CONSTRUCTION MANAGER:
MAHENDRA PERSAUD: (917) 670-9360
MAHENDRA.PERSAUD@CROWNCASTLE.COM

SITE ADDRESS:

150 MATTATUCK HEIGHTS
WATERBURY, CT 06705

GEOGRAPHIC COORDINATES:

LATITUDE: 41°-32'-16.30" N, (41.537861°)
LONGITUDE: 72°-59'-06.10" W, (-72.985028°)

COUNTY:

NEW HAVEN COUNTY

POWER COMPANY:

CONNECTICUT LIGHT & POWER CO
(800) 286-2000

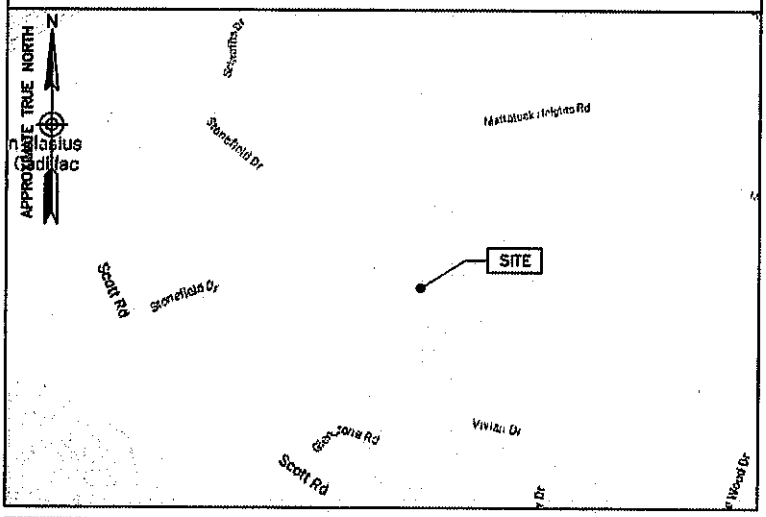
TELCO PROVIDER:

LIGHTOWER
(845) 458-7720

SPRINT CONSTRUCTION MANAGER:

NAME: MARC MASON
E-MAIL: MARC.MASON@SPRINT.COM

AREA MAP



LOCATION MAP

PRO

- REMOVE (3) 2.5 GHz
- REMOVE (3) 2.5 GHz
- INSTALL (3) 2.5 GHz
- REMOVE (1) 1-1/4"ø
- INSTALL (1) 1-1/2"ø
- INSTALL (1) mMIMO A
- INSTALL (1) TOP HAT
- INSTALL (2) AMOB UN

AP

- ALL WORK SHALL BE PE ACCORDANCE WITH THE GOVERNING AUTHORITIES. TO PERMIT WORK NOT C

1. BUILDING CODE: 2016 C
2. ANSI/TIA (TELECOMMUNIC STRUCTURAL STANDARDS SUPPORTING STRUCTURES
3. LIGHTNING PROTECTION C
4. ELECTRICAL CODE: NATION
5. ALL STEEL WORK TO BE THE AISC "SPECIFICATION STRUCTURAL STEEL FOR
6. ANSI T1.311, FOR TELECO ENVIRONMENTAL PROTECTI

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CON
CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

THE WORK:
SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF. ALSO SEE SPRINT METHOD OF PROCEDURE (MOP) AND SPRINT STANDARDS AT THE TIME OF CONSTRUCTION START.

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE ALONG WITH SPRINT CONSTRUCTION MANAGER APPROVAL.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

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

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:
CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS. CONTRACTOR IS RESPONSIBLE TO USE LATEST MOP's.

A. BASE BAND UNIT IN EXISTING UNIT
B. INSTALLATION OF BATTERIES
C. INSTALLATION OF FIBER CABLE
D. INSTALLATION OF RRU'S
E. CABLING
F. TS-0200 REV 5 – ANTENNA LINE ACCEPTANCE STANDARDS
G. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
H. COMMISSIONING MOPS

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

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

CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

CONTRACTOR RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE. CONTRACTOR MAY BE REQUIRED TO PICK UP MATERIAL AT LOCATION PRESCRIBED BY SPRINT.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

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

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

SECTION 01 400 – SUBMITTALS & TESTS

ALTERNATES:
AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINTS CONSTRUCTION MANAGER FOR APPROVAL. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED.

TESTS AND INSPECTIONS:

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

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

1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 5 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR THE PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT
1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS OF ALIGNMENT TOOL (AAT)
2. SWEEP AND FIBER TESTS
3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND IN EQUIPMENT
4. ALL AVAILABLE JURISDICTIONAL INFORMATION
5. PDF SCAN OF REDLINES PRODUCED IN FIELD
6. A PDF SCAN OF REDLINE MARK-UPS SUITABLE FOR USE I DRAWING PRODUCTION
7. LIEN WAIVERS
8. FINAL PAYMENT APPLICATION
9. REQUIRED FINAL CONSTRUCTION PHOTOS
10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE
11. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COM DOCUMENT REPOSITORY OF RECORD).
12. CLOSEOUT PHOTOGRAPHS:

D. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWIN PHOTOGRAPHS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PRO

(i) BACK MAIN HYBRID CABLE ROUTE (MINIMUM TWO PHOTOS)

(ii) OF EACH ANTENNA AND RRU

(iii) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMEI

(iv) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RI (DOOR OPEN)

(v) MMBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS

(vi) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED

(vii) BREAK OUT CYLINDERS

(viii) ASR SIGNAGE FOR SPRINT OWNED TOWERS

(ix) RADIATION EXPOSURE WARNING SIGNS

(x) PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY R NEW ANTENNA AT HORIZON.

E. LOAD PHOTOS TO SITERRA PROJECT LIBRARY IS. IN IS CREATE DEPLOYMENT, AND SECTION; PERMANENT CONSTRUCTION. LABEL CASCADE AND VIEW BEING DEPICTED. CAMERAS USED TO TAKE P GPS ENABLED SUCH THAT THE GPS COORDINATES ARE INCLUDEI MEDIA-FILE INFORMATION.

COMMISSIONING:
PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

INTEGRATION:
PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE

SECTION 11 700 – ANTENNA ASSEMBLY, REMOT CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CA AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:
THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICAB REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RR SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER- ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOW CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL C JUMPER SHALL BE SO AS TO ALLOW FOR THE PROPER BEND RADIUS SPRINT SPECIFICATIONS.

CONTINUE FROM SP-1

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER LATEST VERSION OF TS 0200.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI)

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBTS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MANUFACTURERS OF EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

MANUFACTURERS OF EQUIPMENT:
ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO PROVIDE PRODUCTS BY THE FOLLOWING.
   1. ALLIED TUBE AND CONDUIT
   2. B-LINE SYSTEM
   3. UNISTRUT DIVERSIFIED PRODUCTS
   4. THOMAS & BETTS
B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES A
   1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TY
   2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DE SERVICE.
   3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
   4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
   5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OI
   6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-T
   7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTUR
   8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER TH STRUCTURES.
   9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET

SUPPORTING DEVICES:

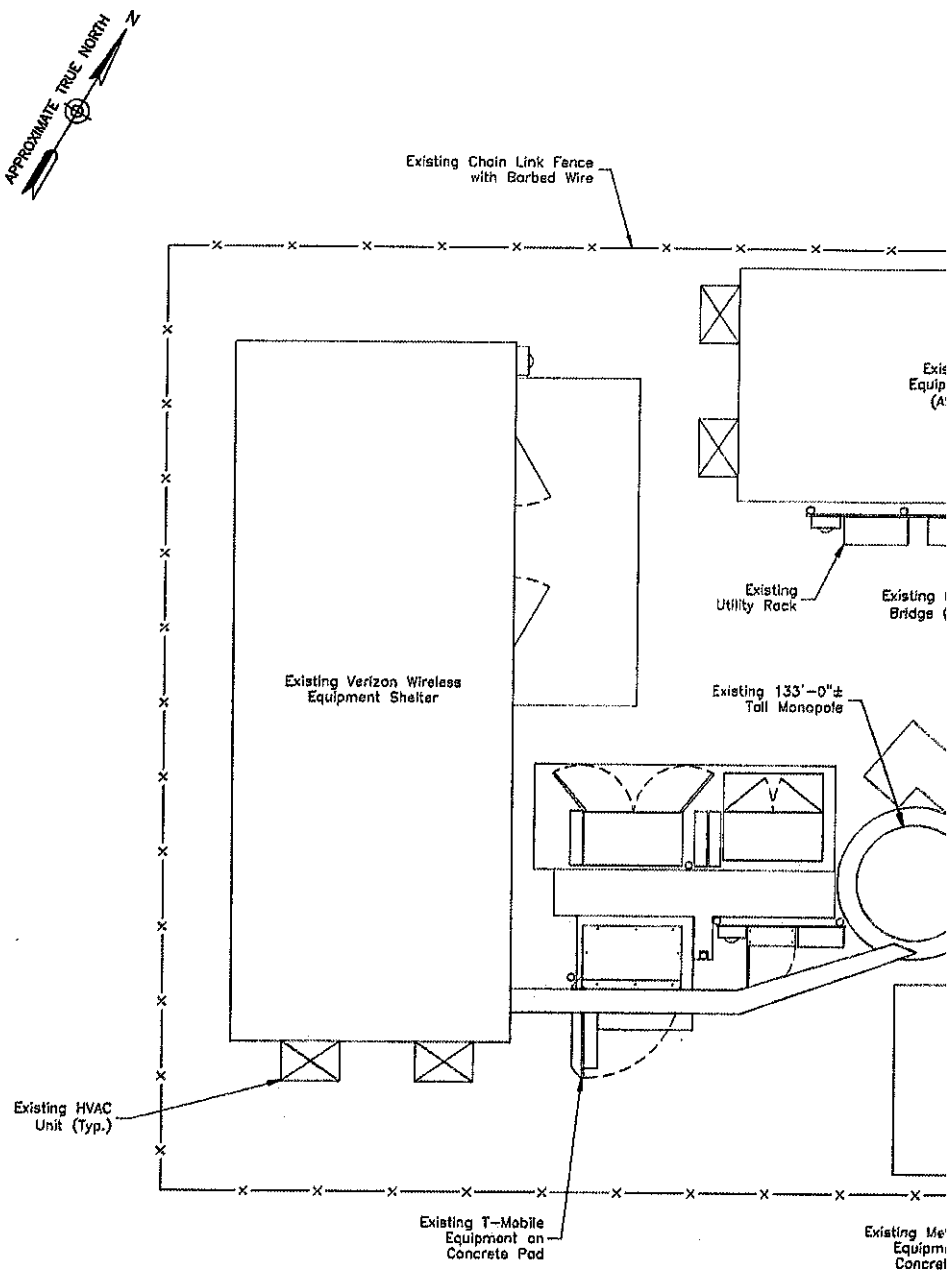
A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONEN ACCORDANCE WITH NEC.
B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH
C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECT HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH
D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT TEST LOAD.
E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHM

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN TI OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SY
B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUI AS SUCH AT THE BRANCH CIRCUIT PLANELOAD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPM

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR E AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUN FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INT PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LAB THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT B BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.
B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLO BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH S MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELE EQUAL.
C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WI SWEEP RADIUS ELBOWS.
D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINI AND CEILING. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFAC WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC CONNECTIONS SHALL NOT BE ACCEPTABLE.



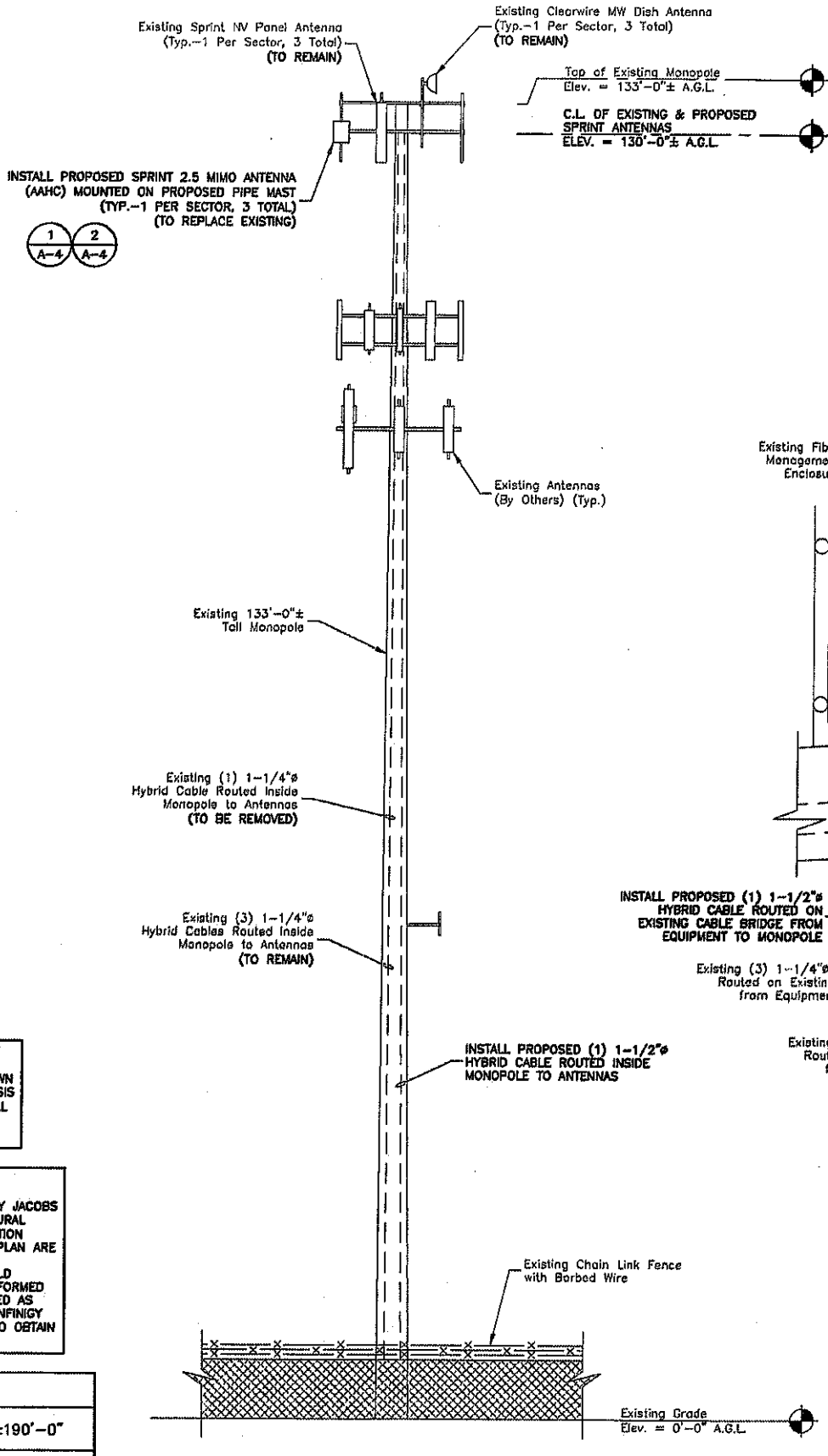
COMPOUND PLAN

SCALE: 1/8"=1' FOR 11"x17"
1/4"=1' FOR 22"x34"

0' 2' 4' 8'

NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON EXISTING PLANS PROVIDED BY CROWN CASTLE.



ELEVATION 1
SCALE: 1/16"=1' FOR 11"x17"
1/8"=1' FOR 22"x34"

0' 4' 8' 16'

NOTE:

PROPOSED MIMO ANTENNAS MUST BE LOCATED AS SHOWN AND IN ACCORDANCE WITH THE ANTENNA MOUNT ANALYSIS BY INFINIGY ENGINEERING, PLLC (DATED: 08/12/18). ALL APPROPRIATE HARDWARE MUST BE UTILIZED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

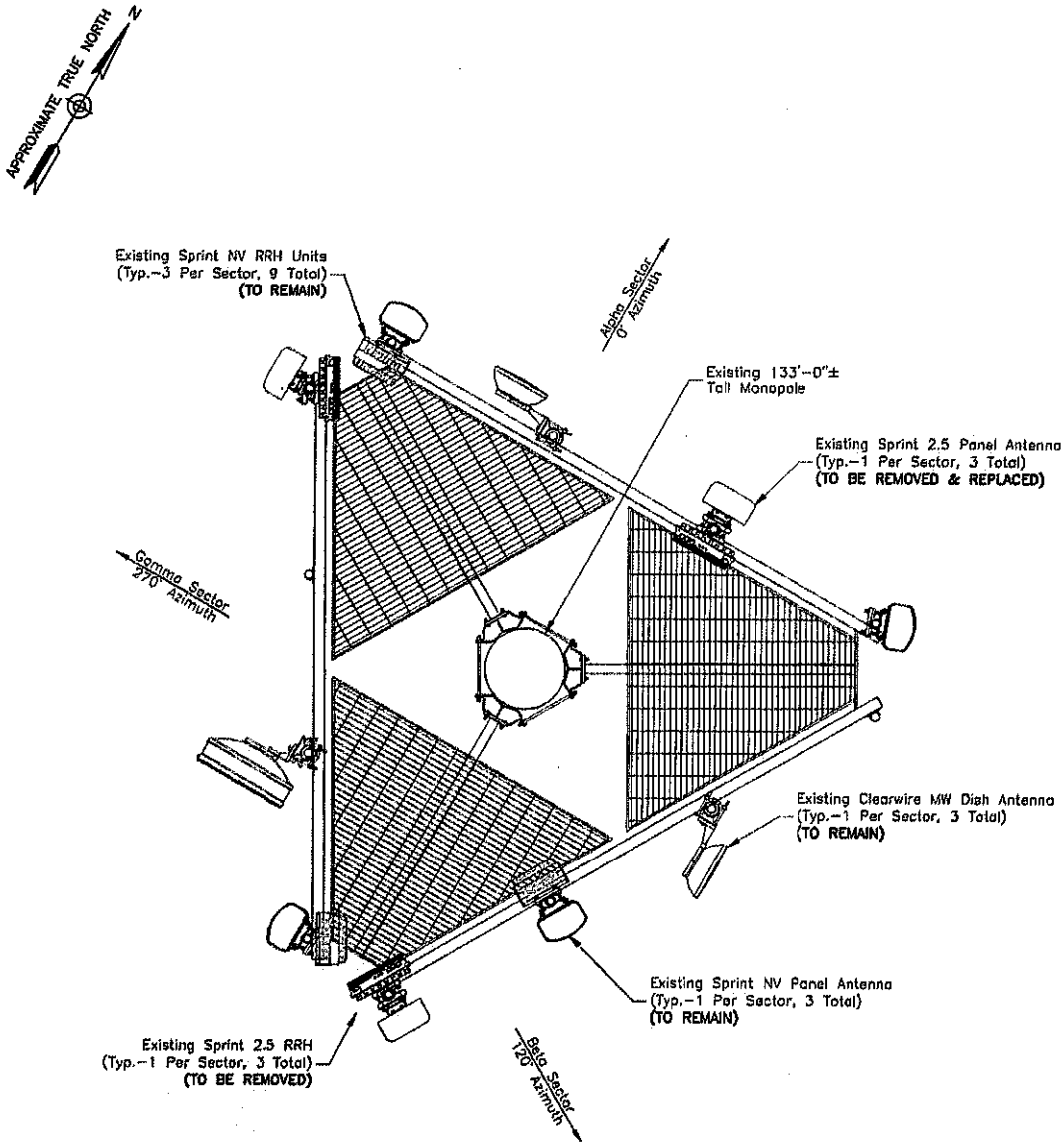
NOTE:

ANALYSIS OF THE STRUCTURE HAS BEEN PERFORMED BY JACOBS ENGINEERING GROUP, INC. (DATED: 08/29/18). STRUCTURAL ANALYSIS SUBJECT TO AMENDMENT AFTER ALL MODIFICATION WORK IS COMPLETED. THE ANTENNAS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND THE HEIGHT, LOCATION, AND MOUNTING SHOWN IN THE STRUCTURAL ANALYSES SHOULD SUPERSEDE THESE DRAWINGS. NO WORK IS TO BE PERFORMED PRIOR TO ANY AND ALL MODIFICATIONS BEING COMPLETED AS APPLICABLE. MOUNT ANALYSIS REPORT COMPLETED BY INFINIGY ENGINEERING, PLLC (DATED: 08/12/18). CONTRACTOR TO OBTAIN COPIES OF BOTH REPORTS PRIOR TO START OF WORK.

CABLE LENGTHS	
FIBER – JUNCTION BOX TO ANTENNA	±190'-0"
JUNCTION BOX TO BTS	±18'-0"

NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON EXISTING PLANS PROVIDED BY CROWN CASTLE.



EXISTING ANTENNA LAYOUT 1

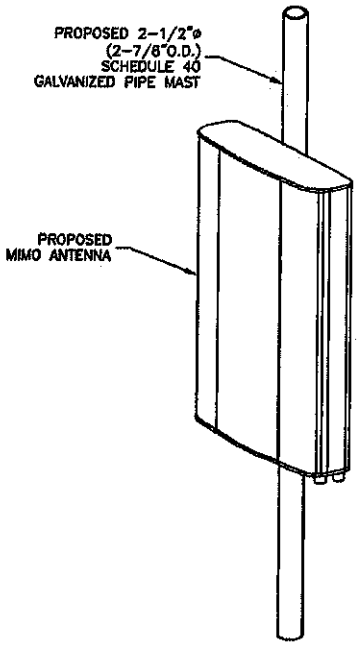
SCALE: N.T.S.

NOTE:

PROPOSED MIMO ANTENNAS MUST BE LOCATED AS SHOWN AND IN ACCORDANCE WITH THE ANTENNA MOUNT ANALYSIS BY INFINIGY ENGINEERING, PLLC (DATED: 08/12/18). ALL APPROPRIATE HARDWARE MUST BE UTILIZED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

NOTE:

EXISTING INFORMATION SHOWN HEREON IS BASED ON EXISTING PLANS PROVIDED BY CROWN CASTLE.



ANTENNA SPECIFICATIONS	
MANUFACTURER	NOKIA
MODEL NUMBER	AAHC
DIMENSIONS (HxWxD)	25.6" x 19.7" x 9.64"
WEIGHT	103.7 LBS

CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND IDENTIFYING ANY EXISTING CONFLICTS (INCLUDING BUT NOT LIMITED TO EXISTING COAXIAL CABLES, SAFETY CLIMBS, ETC) AND DETERMINING TEMPORARY BRACING OR RELOCATION REQUIRED FOR INSTALLATION OF THE PROPOSED EQUIPMENT. CONTRACTOR TO CONTACT ENGINEER AND SPRINT CM IMMEDIATELY IN CASE OF ANY CONFLICTS. THE CONTRACTOR SHALL RESTORE ALL RELOCATED ITEMS TO PREVIOUS CONDITIONS.

NOTES:

1. INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATIONS.
2. WEIGHT DOES NOT INCLUDE MOUNTING BRACKETS.

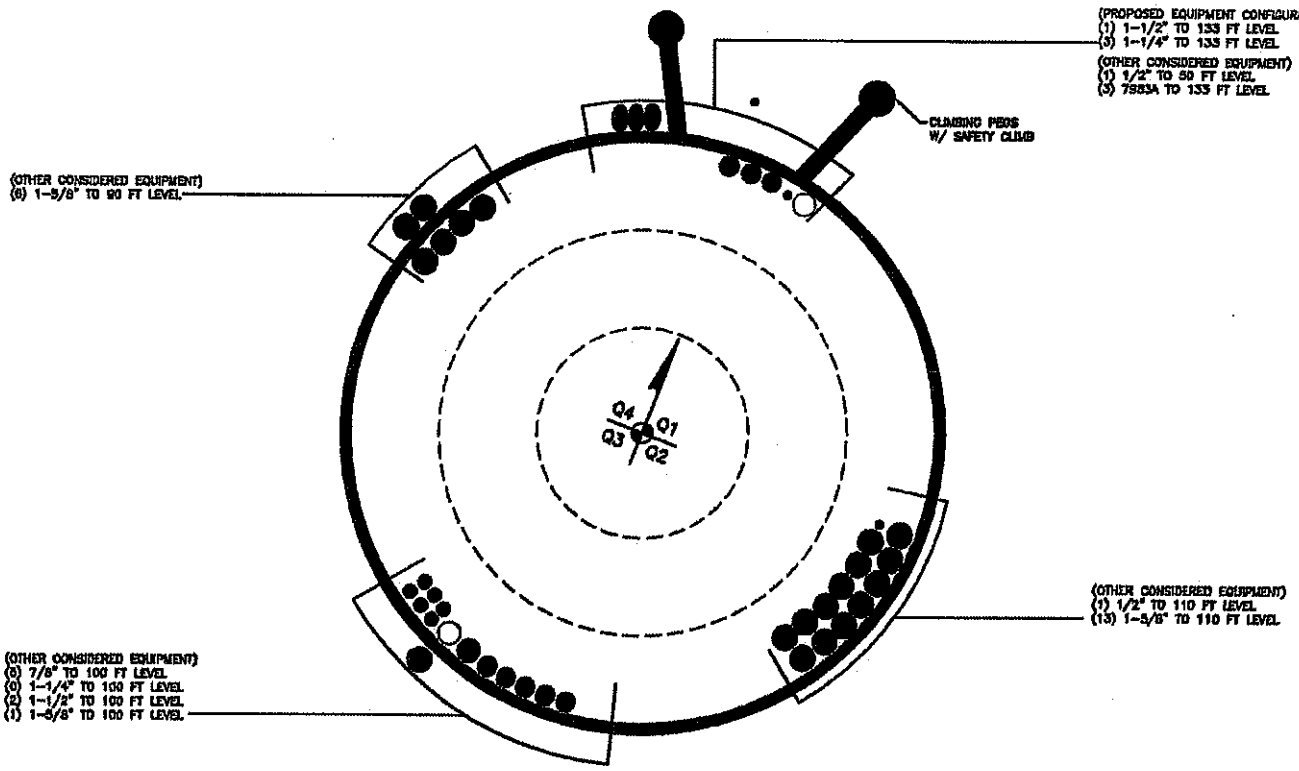
MIMO ANTENNA DETAIL 1

SCALE: N.T.S.

ANTENNA SECTOR EQU			
SECTOR	ANTENNA MODEL	TECHNOLOGY	AZIMUT
ALPHA	(E) NV PANEL ANTENNA	800/1900 MHz	0°
	(P) MIMO ANTENNA	2.5 GHz	0°
BETA	(E) NV PANEL ANTENNA	800/1900 MHz	120°
	(P) MIMO ANTENNA	2.5 GHz	120°
GAMMA	(E) NV PANEL ANTENNA	800/1900 MHz	270°
	(P) MIMO ANTENNA	2.5 GHz	270°

ANTENNA SCHE

SCALE: N.T.S.



BASE LEVEL DETAIL

SCALE: N.T.S.

1

NOTES:

1. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE, STENCIL TAG COLORED TAPE, OR COLORED HEAT SHRINK TUBING.
2. COLORED TAPE MAY BE OBTAINED FROM GRAYBAR ELECTRIC. UV STABILIZED TAPE OR HEAT SHRINK ARE PREFERRED.
3. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE, AND THERE SHALL BE A 1" SPACE BETWEEN EACH RING.
4. THE CABLE COLOR CODE SHALL BE APPLIED IN ACCORDANCE TO TABLE 19-1

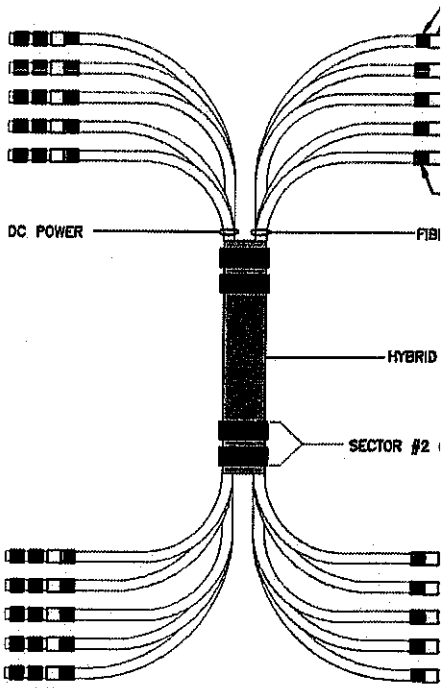
4.A. TABLE 19-1 ONLY SHOWS 3 SECTORS, BUT ADDITIONAL SECTORS ARE EASILY SUPPORTED BY ADDING THE APPROPRIATE NUMBER OF COLORED RINGS TO THE CABLE COLOR CODE.

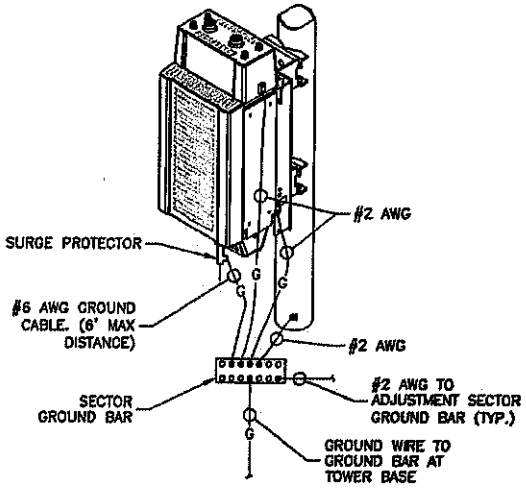
5. AFTER THE CABLE COLOR CODE IS APPLIED, THE FREQUENCY COLOR CODE, TABLE 19-2, MUST BE APPLIED FOR THE SPECIFIC FREQUENCY BAND IN USE ON A GIVEN LINE.

5.A. 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.

5.B. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.

6. WRAP 2" COLORED TAPE A MINIMUM OF 3 TIMES AROUND THE COAX, AND KEEP THE TAPE IN THE SAME AREA AS MUCH AS POSSIBLE. THIS WILL ALLOW REMOVAL OF TAPE THAT FADES OR DISCOLORS DUE TO WEATHER.
7. EXAMPLES OF THE CABLE AND FREQUENCY COLOR CODES ARE SHOWN IN FIGURE 19-1 AND FIGURE 19-2

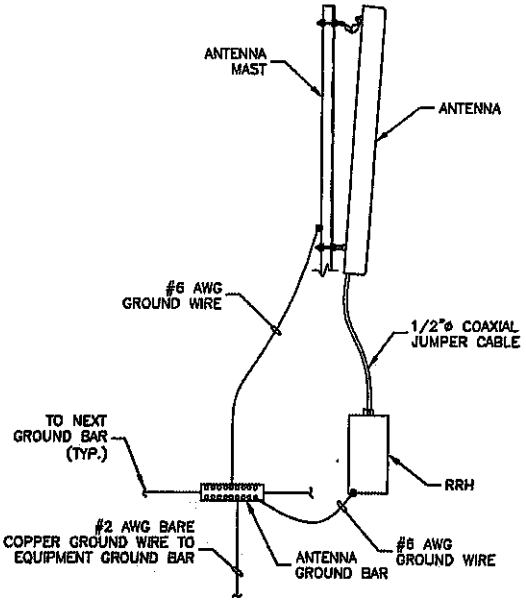




RRH POLE MOUNT GROUNDING DETAIL

SCALE: N.T.S.

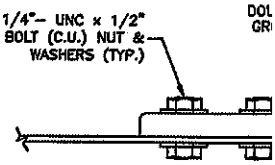
1



TYPICAL ANTENNA GROUNDING DETAIL

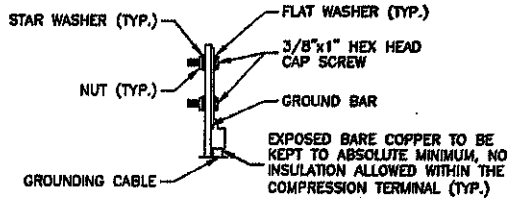
SCALE: N.T.S.

2

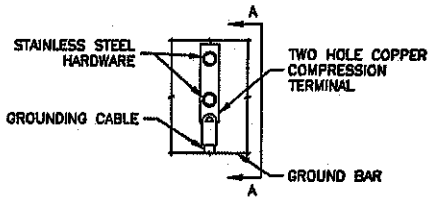


CONNECTION TO E

SCALE: N.T.S.



SECTION 'A–A'



ELEVATION

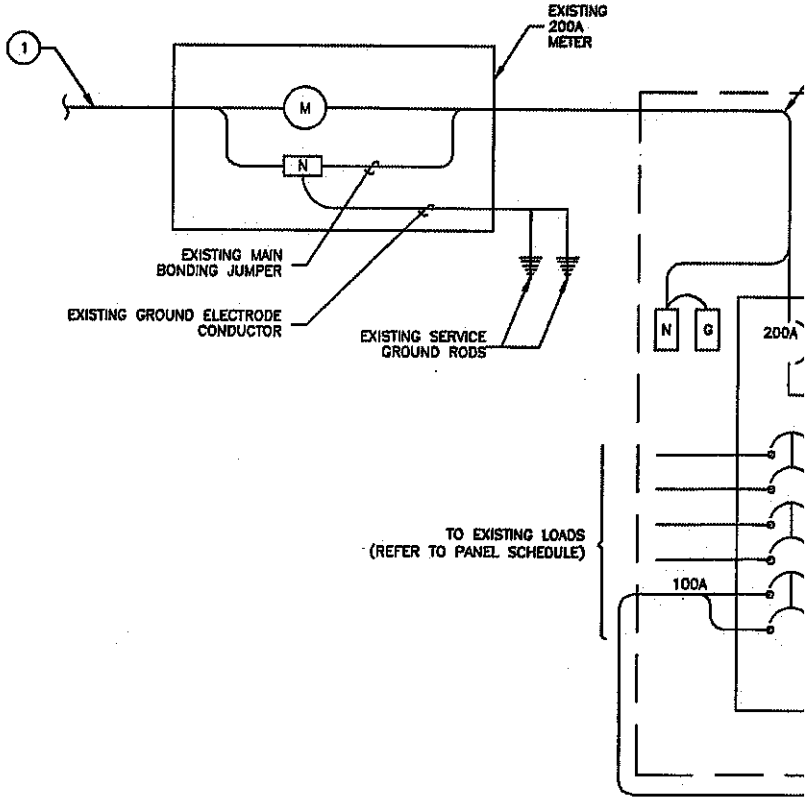
NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL

SCALE: N.T.S.

5



ELECTRICAL INSTALLATION NOTES:

PART 1 GENERAL:

1. WORK INCLUDED

A. SECONDARY ELECTRICAL SERVICE INCLUDING UNDERGROUND CONDUIT BANK FROM POWER COMPANY TRANSFORMER AND SECONDARY SERVICE ENTRANCE SERVICE;

B. OUTDOOR SECONDARY DISTRIBUTION SYSTEM INCLUDING EXISTING EQUIPMENT TO BE RELOCATED AS SHOWN ON THE DRAWINGS AND PROPOSED RACEWAYS, CABLES, WIRING, JUNCTION BOXES, PULL BOXES AND OTHER COMPONENTS REQUIRED FOR COMPLETE INSTALLATION OF ELECTRICAL DISTRIBUTION SYSTEM.

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING ELECTRICAL SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, AND LATEST EDITION ALL APPLICABLE NATIONAL AND LOCAL CODES.

4. THE POWER COMPANY SERVING THIS PROJECT IS ORLANDO UTILITIES COMMISSION. SERVICE WILL BE OBTAINED 200 AMPERES AT 240/120 VOLTS, SINGLE PHASE, 3 WIRE. COORDINATE WITH POWER COMPANY TRENCHING REQUIREMENTS, INSTALLATION OF THE SECONDARY POWER CONDUITS AND CABLES, AND METERING.

5. THE DRAWINGS, WHICH CONSTITUTE AN INTEGRAL PART OF THIS CONTRACT, SHALL SERVE AS THE WORKING DRAWINGS. THEY INDICATE THE GENERAL LAYOUT OF THE EXISTING FACILITIES AND THE COMPLETE NEW ELECTRICAL SYSTEM OR SYSTEMS, ARRANGEMENT OF FEEDERS, CIRCUITS, OUTLETS, SWITCHES, CONTROLS, PANELBOARDS, SERVICE EQUIPMENT, AND OTHER WORK.

6. DISCONNECT POWER AND CONTROL AND MAKE SAFE FOR RELOCATION OR DEMOLITION FROM EQUIPMENT INDICATED FOR RELOCATION OR DEMOLITION. PROVIDE RELOCATION OR DEMOLITION IN ACCORDANCE WITH CONTRACT DRAWINGS. REMOVE ALL DEBRIS, DEMOLISHED WIRING, CONDUIT AND EQUIPMENT, UNLESS THESE SCHEDULED TO BE RETURN TO OWNER.

7. INSTALLATION OF ELECTRICAL EQUIPMENT, ACCESSORIES AND COMPONENTS SHALL BE IN ACCORDANCE WITH SEISMIC REQUIREMENTS IDENTIFIED IN THE LATEST EDITION OF THE APPLICABLE BUILDING CODES.

8. SUBMIT SHOP DRAWING FOR EQUIPMENT SPECIFIED IN THE PROJECT: SWITCHING DEVICES, WIRING DEVICES AND COVER PLATES, WIRING AND CABLES, CONDUITS, BOXES AND FITTINGS, SAFETY SWITCHES. THE SHOP DRAWINGS SHALL INCLUDE CATALOG NUMBERS, CUTS, DIAGRAMS, DETAILED DIMENSIONED SHOP DRAWINGS OF EQUIPMENT, BROCHURES OF LIGHTING FIXTURES, WIRING DIAGRAMS AS REQUIRED, DRAWINGS, SAMPLES AS REQUESTED, AND SUCH OTHER PERTINENT DESCRIPTIVE RATINGS AND DATA AS MAY BE REQUIRED BY THE ENGINEER.

9. THE ELECTRICAL CONTRACTOR BEFORE STARTING WORK SHALL CONFER WITH ALL OTHER TRADES INTERESTED IN THE LOCATION OF PIPES, PITS, TRENCHES OR ANY OTHER APPARATUS TO BE INSTALLED BY THEM AND SHALL SELECT HIS LOCATION SO AS NOT TO INTERFERE WITH THE WORK AND RIGHTS OF THE OTHER TRADES. ALL DIFFERENCES OR CONFLICTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR ADJUSTMENT BEFORE COMMENCING WORK, AND ANY SUCH WORK OR MATERIALS PLACED IN POSITION IN VIOLATION OF THIS CLAUSE SHALL BE READJUSTED AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.

10. THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, AFTER CONSTRUCTION IS COMPLETED, A TEMPORARY POWER AND LIGHTING SYSTEM AS REQUIRED FOR CONSTRUCTION PURPOSES. THE SYSTEM SHALL CONSIST OF A POWER SERVICE, DISTRIBUTION SYSTEM, PANELBOARDS, GROUNDING, GROUND FAULT PROTECTIVE DEVICES, BRANCH CIRCUITS AND RECEPTACLE OUTLETS AS REQUIRED.

11. ELECTRICAL ENCLOSURE SHALL BE NEMA 3R FOR OUTDOOR LOCATION AND NEMA 4 FOR WET LOCATION WITH OPEN WATER.

12. THE ELECTRICAL SYSTEM OR SYSTEMS, TOGETHER WITH THE COMPONENT UNITS AS INCLUDED IN THIS SECTION OF THE SPECIFICATIONS, SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE THEREOF AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP.

PART 2 PRODUCT:

1. ALL EQUIPMENT AND MATERIALS EXCEPT RELOCATED FINISHED BY THE ELECTRICAL CONTRACTOR SHALL BE NEW AND FIRST GRADE, AND AS APPROVED BY THE UNDERWRITERS' LABORATORIES, INC., AND/OR BY OTHER STANDARDS MENTIONED IN THESE SPECIFICATIONS. MATERIALS TO BE FURNISHED UNDER THIS SPECIFICATION SHALL BE THE STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT AND SHALL BE OF THE LATEST STANDARD DESIGN. EQUIPMENT AND MATERIALS SHALL BE OF THE TYPE AND QUALITY LISTED BELOW.

2. PVC CONDUIT SHALL BE RIGID POLYVINYL CHLORIDE SCHEDULE 40. RIGID PVC CONDUIT AND FITTINGS TRADE SIZE SHALL BE AS SHOWN ON THE DRAWINGS. CONDUITS SHALL BE INSTALLED DIRECT BURIAL AND COMPLY WITH NEMA TC-8 AND ASTM F512. ACCEPTABLE MANUFACTURER: CARLON CORP, CERTAINED CORP., CONUX PIPE SYSTEMS, INC., OR EQUAL. CONNECTORS, COUPLINGS, FITTINGS AND ANCILLARY MATERIALS SHALL BE SUPPLIED BY THE CONDUIT MANUFACTURER.

3. GALVANIZED RIGID METAL CONDUIT (GRS), COUPLINGS, FACTORY ELBOWS AND FITTINGS SHALL BE HEAVY WALL STEEL TUBING WITH A HOT-DIPPED GALVANIZED FINISH INSIDE AND OUT AFTER THREADING AND SHALL COMPLY WITH ANSI C 80.1 AND UL/6. ACCEPTABLE MANUFACTURER: ALLIEN TUBE & CONDUIT CORP.; LTV STEEL TUBULAR PRODUCTS CORP. TRIANGLE PWC. CORP. OR EQUAL.

4. PULL AND JUNCTION BOXES FOR DRY LOCATION SHALL BE ZINC-GALVANIZED, EXTRA DEPTH, PRESSED STEEL WITH KNOCKOUTS AND OF SIZE AND TYPE SUITABLE FOR THE INTENDED APPLICATION. NEMA 3R TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE SHEET TYPE 316 STAINLESS STEEL. BOXES SHALL BE CONTINUOUSLY WELDED SEAAND MOUNTING FEET. WELDS SHALL BE GROUND SMOOTH BOXES SHALL BE FLANGED AND SHALL NOT HAVE HOLES AND KNOCKOUTS. ACCEPTABLE MANUFACTURERS: HOFFMAN STAHLIN – DIVISION OF ROBROY IND. ENGLISH ELECTRIC, OR EQUAL

5. WIRES AND CABLES SHALL BE OF ANNEALED, 98 PERCENT CONDUCTIVITY, SOFT DRAWN COPPER. ALL CONDUCTORS SHALL BE STRANDED, EXCEPT THAT CONTROL WIRING MAY BE SOLID. POWER WIRE SMALLER THAN NO. 12 AWG SHALL NOT BE USED. CONTROL AND SIGNAL WIRE SHALL BE NO.14 AWG NEC TYPE THHN/THWN, STRANDED. WIRE SHALL BE NEC TYPE THHN/THWN AS MANUFACTURED BY THE OKONITE CO.; CAROL CABLE CO. INC.; PIRELLI CABLE CORP. OR EQUAL.

6. RECEPTACLES INSTALLED OUTDOOR SHALL BE WEATHERPROOF WITH GFI PROTECTION. RECEPTACLES SHALL BE MADE BY THE FOLLOWING MANUFACTURER: HARVEY HUBBELL, INC.; PASS & SEYMOUR, INC. OR EQUAL. RECEPTACLES PLATES SHALL BE THE SAME MANUFACTURER AND SUITABLE FOR NEMA ENVIRONMENT.

7. DISCONNECT SWITCHES SHALL BE HEAVY_DUTY, QUICK_MAKE, QUICK_BREAK, VISIBLE BLADES, 600 VOLT, 3 POLE WITH FULL COVER INTERLOCK, INTERLOCK DEFEAT AND FLANGE MOUNTED OPERATING HANDLE. FUSED DISCONNECT SHALL BE EQUIPPED WITH FUSE SIZE AND TYPE AS SHOWN ON THE DRAWING. SWITCHES ALL CURRENT CARRYING PARTS SHALL BE COPPER. SWITCHES SHALL BE AS MANUFACTURED BY THE SQUARE D CO.; GENERAL ELECTRIC; CUTLER-HAMMER, OR EQUAL

8. MOLDED CASE CIRCUIT BREAKER: 600 VOLT, 2 POLE FULLY RATED, INSULATED CASE, WITH INTEGRAL FULLY ADJUSTABLE SOLID STATE TRIP DEVICE. TRIP DEVICE SHALL BE TEMPERATURE INSENSITIVE AND HAVE THE FOLLOWING CHARACTERISTICS AND FUNCTIONS: INDEPENDENTLY ADJUSTABLE LONG TIME PICK_UP AND DELAY; INDEPENDENTLY ADJUSTABLE SHORT TIME PICK_UP AND DELAY WITH I2T IN AND OUT SWITCH, ADJUSTABLE INSTANTANEOUS; INDEPENDENTLY ADJUSTABLE GROUND FAULT PICK_UP AND DELAY; TRIP MODE TARGETS FOR OVER LOAD, SHORT CIRCUIT AND GROUND FAULT; LONG TIME PICK_UP LIGHT. CIRCUIT BREAKER SHALL BE SHALL HAVE A SHORT CIRCUIT RATING OF 42,000 RMS SYMMETRICAL AT RATED VOLTAGE. CIRCUIT BREAKER SHALL BE AS MANUFACTURED BY SQUARE D CO.; GENERAL ELECTRIC CO.; CUTLER- HAMMER, OR EQUAL.

PART 3 INSTALLATION:

12. ALL WIRE SHALL BE COLOR CODED OR CODED USING ELECTR
COLORED INSULATION IS NOT AVAILABLE. WHERE TAPE IS US
SYSTEM, IT SHALL BE APPLIED IN ALL JUNCTION BOXES, ND
LOCATIONS AS WELL AS AT EACH TERMINATION.
EACH END OF EVERY POWER, POWER PHASE CONDUCTOR, GR
AND CABLE SHALL BE LABELED WITH COLOR-CODED INSUL
BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTE
IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA,
INSTALLATION REQUIREMENTS.

13. GALVANIZED RIGID STEEL CONDUIT (RGS) SHALL BE USED FOR
GRADE.

14. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 O
SHALL BE USED
UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIG
IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFI

15. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX)
OUTDOORS, WHERE
VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.

16. IN DAMP, WET OR WET/CORROSIVE AREAS INSTALL SURFACE M

17. FIELD MOUNTED DISCONNECTS, PUSHBUTTON CONTROL STATION
STARTERS AND CIRCUIT BREAKERS, AUTOMATIC TRANSFER SWIT
PANELS, WIREWAYS, CONTACTORS, TERMINAL BOXES, JUNCTION
MOUNTED ON GALVANIZED OR STAINLESS STEEL STANDS UNLES
ALLOWED BY ENGINEER.

18. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WI
LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTA
CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY R
NUMBERS (I.E., PANELBOARDS AND CIRCUIT ID'S).

19. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS
BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABE

20. SUPPLEMENTAL GROUNDING CONDUCTOR LOCATED OUTDOORS,
SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, U

21. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE
WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL
BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF A

22. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR
ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

23. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INST

24. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABEL
ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.

25. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTH
CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER

26. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON TH
DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE
SAFEGUARD AGAINST LIFE AND PROPERTY.

28. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTIN
EDGES.