July 20,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **772718972573**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	H.BRADRICK	**Delivery location:**	1043 BUCKLEY HWY UNION, CT 06076
Service type:	FedEx Express Saver	**Delivery date:**	Jul 19, 2018 11:19
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772718972573	**Ship date:**	Jul 16, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Joe Pajak, Building Official
Town of Union
1043 Buckley Highway
UNION, CT 06076 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT33XC572 CSC

Thank you for choosing FedEx.

July 20,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772718994442.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	H.BRADRICK	**Delivery location:**	1043 BUCKLEY HWY UNION, CT 06076
Service type:	FedEx Express Saver	**Delivery date:**	Jul 19, 2018 11:19
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772718994442	**Ship date:**	Jul 16, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
David Eaton, First Selectman
Town of Union
1043 Buckley Highway
UNION, CT 06076 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT33XC572 CSC

Thank you for choosing FedEx.

July 20,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **772719027951**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	L.VITALI	**Delivery location:**	22 OAKWOOD DRIVE KENNEBUNKPORT, ME 04046
Service type:	FedEx Express Saver	**Delivery date:**	Jul 19, 2018 12:13
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

Shipping Information:

Tracking number:	772719027951	**Ship date:**	Jul 16, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
Nancy Aumen
Navigator Properties, LLC
22 Oakwood Drive
KENNEBUNKPORT, ME 04046 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT33XC572 CSC

Thank you for choosing FedEx.

4 Davis Road West, Suite 5 – Old Lyme, CT 06371

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

Re: Notice of Exempt Modification Application
1050 Buckley Highway, Union, CT 06076

June 20, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. Sprint currently maintains 6 panel antennae at the130.3' level of the Tower. Sprint proposes to replace those panel antennas (2 per sector). Sprint also proposes relocating 3 existing remote radio units and and adding 9 additional remote radio units, installing them at the 130.3' level on the tower. Sprint further proposes to add 4 hybrid cables while removing any existing cabling and strengthening the existing mounting apparatus. Any ground based modifications will be added to existing equipment cabinets.

There are no existing zoning or permitting documents, however there are Tower Share applications for both Nextel and Sprint on this tower. Any documents enclosed reflect the reality of the current installations on the Tower.

If you have any questions, please feel free to contact me.

Thank you,

By: *Paul F. Sagristano*

Paul F. Sagristano
Cherundolo Consulting
917.841.0247
psagristano@lrivassoc.com

4 Davis Road West, Suite 5 – Old Lyme, CT 06371

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

Re: Notice of Exempt Modification Application
1050 Buckley Highway, Union, CT 06076

Latitude : N41.99917
Longitude: W72.15237

July 12, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. . Sprint currently maintains 6 panel antennae at the 130.3' level of the Tower. Sprint proposes to replace those panel antennas (2 per sector) with 6 new antennas (2 per sector). Sprint also proposes to relocate 3 existing remote radio units and add 9 additional Remote Radio units also at the 130.3' level on the tower. Sprint further proposes to add 4 hybrid cable (while removing all other Sprint related cabling) and adding Antenna-RRH jumper cables. Lastly Sprint proposes strengthening the existing antenna mounts. Any ground based modifications will be added to existing equipment cabinets. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The Sprint installation does not show original zoning or building permits, however there are early Sprint and Nextel requests for Tower Sharing at this site on the Siting Council Database

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).
In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to and to David Eaton, first selectman of Union as well as Joe Pajak, Building Official of the Town of Union, and to Nancy Auman of Navigator Properties, LLC the Tower owner.
.
Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The Union Facility is located at 1050 Buckley Highway in the Town of Union and is owned by Navigator Properties, LLC, the Site coordinates are: N41.99917, W72.15237

The existing facility consists of a 170' Lattice tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 6 antennas mounted at a centerline of 130.3'

Statutory Considerations

The planned modifications to the facility fall within the activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2)

1. The height of the overall structure will be unaffected.

2. The proposed changes will not require an extension of the property boundaries.

3. The proposed additions will not increase the noise level at the existing facility by

six decibels or more, or to levels that exceed state and/or local criteria

4. The changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the Federal Communications 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 changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully submitted,

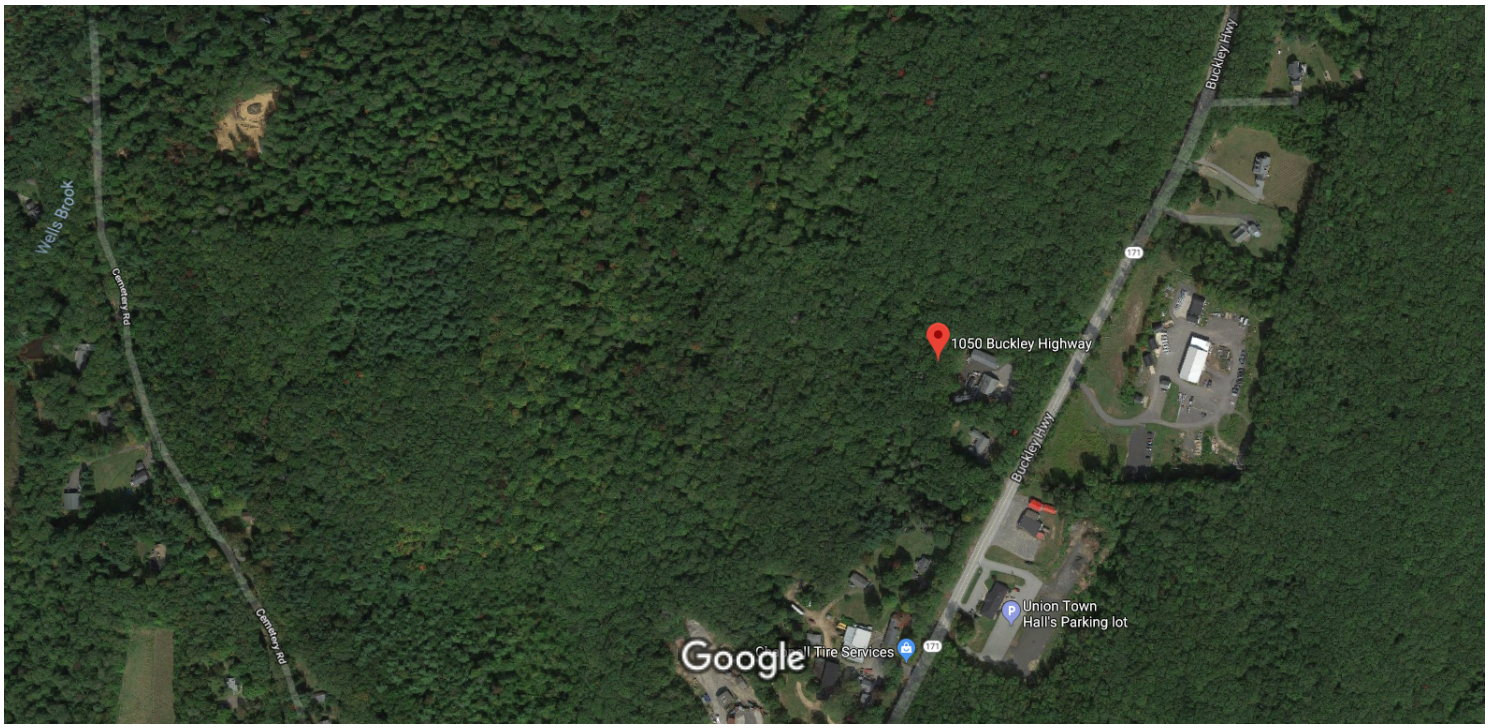
Paul F. Sagristano

Paul F. Sagristano
Charles Cherundolo Consulting
917-841-0247
psagristano@lrivassoc.com

PFS/mtf

Additional Recipients:
David Eaton, First Selectman, Town of Union
Joe Pajak, Building Official, Town of Union
Navigator Properties, LLC Via Fed Ex

Google Maps 1050 Buckley Hwy



Imagery ©2018 Google, Map data ©2018 Google 200 ft

1050 BUCKLEY HIGHWAY

Location	1050 BUCKLEY HIGHWAY	**Mblu**	13/ 18/ 20C/ /
Acct#	131820C	**Owner**	NEW ENGLAND SITE MANAGEMENT, LLC
Assessment	$593,910	**Appraisal**	$848,430
PID	183821	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$848,430	$0	$848,430
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$593,910	$0	$593,910

Owner of Record

Owner	NEW ENGLAND SITE MANAGEMENT, LLC	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	1515 NORTH STONE ST WEST SUFFIELD, CT 06093	**Book & Page**	41/381
		Sale Date	11/01/1997
		Instrument	29

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
NEW ENGLAND SITE MANAGEMENT, LLC	$0		41/381	29	11/01/1997

Building Information

Building 1 : Section 1

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

Building Attributes

Field	Description
Style	Outbuildings
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	

Building Photo

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

Building Layout

Building Layout

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4340
Description	Cell Tower
Zone	
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0
Frontage	
Depth	
Assessed Value	$0
Appraised Value	$0

Outbuildings

Outbuildings	Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CELL	CELL TENANT			5.00 UNITS	$846,450	1
FN4	FENCE-8' CHAIN			200.00 L.F.	$1,980	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2012	$705,880	$0	$705,880
2011	$705,880	$0	$705,880
2010	$705,880	$0	$705,880

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2012	$494,120	$0	$494,120
2011	$494,120	$0	$494,120
2010	$494,120	$0	$494,120

ASSIGNMENT AND ASSUMPTION AGREEMENT

THIS ASSIGNMENT AND ASSUMPTION AGREEMENT (the "Agreement") is executed as of the 4th day of April 2016, by and among New England Site Management, LLC ("Seller"), Wayne Kemp and Kathy Kemp ("Owners") and Navigator Properties LLC ("Buyer").

RECITALS:

A. Buyer and Seller are parties to an Asset Purchase Agreement, dated as of December 10, 2015, by and between Buyer and Seller (the "Purchase Agreement"), pursuant to which Buyer will purchase certain assets of the Seller.

B. Pursuant to the Purchase Agreement, Seller and Owners have agreed to assign to Buyer, and Buyer has agreed to assume, certain obligations of Seller and Owners.

IN CONSIDERATION OF these premises, and other good and valuable consideration, the receipt and sufficiency of which hereby are acknowledged, the parties hereby agree as follows:

1. Assignment and Assumption of Assumed Obligations. Seller and Owners hereby transfer and assign to Buyer all of Seller's and Owners' right, title and interest in and to, and Buyer hereby assumes and agrees to perform all obligations of Seller and Owners arising under the Ground Lease, the Management Agreements and the Union Tenant Leases with respect to periods on and after the date hereof, other than those arising out of or attributable to wrongful acts or omissions of the Seller or Owners prior to the date hereof (the "Assumed Obligations").

2. Exclusive Assignment. Except as expressly set forth herein or in any other instrument or agreement executed on behalf of the Buyer, the Buyer does not assume any other liability, duty, responsibility or obligation of the Seller or the Owners of any kind.

3. Survival of Purchase Agreement. Seller, Owners and Buyer acknowledge that the Purchase Agreement contains, or may contain, certain representations with respect to the Assumed Obligations and with respect to the parties' indemnification obligations to each other, all of which survive the execution and delivery of this Agreement. In the event of any conflict between the terms of this Agreement and the Purchase Agreement, the terms of the Purchase Agreement shall control.

4. Miscellaneous. Capitalized terms used in this Agreement without definition have the respective meanings ascribed to them in the Purchase Agreement. The provisions of this Agreement shall inure to the benefit of and shall be binding upon the respective successors and assigns of Seller, Owners and Buyer. This Agreement may be executed in several counterparts, each of which together shall constitute one and the same instrument. This Agreement shall be

governed by and construed and enforced in accordance with the laws of the State of Connecticut, determined without reference to conflicts of law principles.

IN WITNESS WHEREOF, Seller and Buyer have caused this Assignment and Assumption Agreement to be executed by their duly authorized representatives, and Owners have executed this Assignment and Assumption Agreement, as of the day and year first above written.

NEW ENGLAND SITE MANAGEMENT, LLC

By: _____

Name: Wayne Kemp

Title: Member

_____

Wayne Kemp, Individually

_____

Kathy Kemp, Individually

NAVIGATOR PROPERTIES LLC

By: _____

Louis Vitali, Manager

(W5361290.4)

governed by and construed and enforced in accordance with the laws of the State of Connecticut, determined without reference to conflicts of law principles.

IN WITNESS WHEREOF, Seller and Buyer have caused this Assignment and Assumption Agreement to be executed by their duly authorized representatives, and Owners have executed this Assignment and Assumption Agreement, as of the day and year first above written.

NEW ENGLAND SITE MANAGEMENT, LLC

By: _____

Name: _____

Title: _____

_____
Wayne Kemp, Individually

_____
Kathy Kemp, Individually

NAVIGATOR PROPERTIES LLC

By: _____
Louis Vitali, Manager

{W5361290.4}

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT33XC572

New England Site Management_Buckley Highway
1050 Buckley Highway (CT Route 171)
Union, CT 06076

May 14, 2018

EBI Project Number: 6218003681

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.43 %

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

EBI Consulting
environmental | engineering | due diligence

May 14, 2018

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

Emissions Analysis for Site: **CT33XC572 – New England Site Management_Buckley Highway**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **1050 Buckley Highway (CT Route 171), Union, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **1050 Buckley Highway (CT Route 171), Union, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

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

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

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

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

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

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

9) The antenna mounting height centerlines of the proposed antennas are **130.3 feet** above ground level (AGL) for **Sector A**, **130.3 feet** above ground level (AGL) for **Sector B** and **130.3 feet** above ground level (AGL) for Sector C.

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

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**130.3 feet**	Height (AGL):	**130.3 feet**	Height (AGL):	**130.3 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	6,248.42	ERP (W):	6,248.42	ERP (W):	6,248.42
Antenna A1 MPE%	**1.65 %**	Antenna B1 MPE%	**1.65 %**	Antenna C1 MPE%	**1.65 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**130.3 feet**	Height (AGL):	**130.3 feet**	Height (AGL):	**130.3 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.45 %**	Antenna B2 MPE%	**1.45 %**	Antenna C2 MPE%	**1.45 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.10 %**
AT&T	2.65 %
Verizon Wireless	3.45 %
Nextel	0.24 %
PageNet	0.29 %
T-Mobile	1.70 %
Site Total MPE %:	**11.43 %**

SPRINT Sector A Total:	3.10 %
SPRINT Sector B Total:	3.10 %
SPRINT Sector C Total:	3.10 %
Site Total:	11.43 %

SPRINT _ Frequency Band / Technology (All Sectors)	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density ($\mu W/cm^2$)**	**Frequency (MHz)**	**Allowable MPE ($\mu W/cm^2$)**	**Calculated % MPE**
Sprint 850 MHz CDMA	1	376.73	130.3	0.88	850 MHz	567	0.15%
Sprint 850 MHz LTE	2	376.73	130.3	1.75	850 MHz	567	0.30%
Sprint 1900 MHz (PCS) CDMA	5	511.82	130.3	5.95	1900 MHz (PCS)	1000	0.60%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	130.3	5.95	1900 MHz (PCS)	1000	0.60%
Sprint 2500 MHz (BRS) LTE	8	778.09	130.3	14.48	2500 MHz (BRS)	1000	1.45%
						Total:	**3.10%**

Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	3.10 %
Sector B:	3.10 %
Sector C:	3.10 %
SPRINT Maximum Total (per sector):	3.10 %
Site Total:	11.43 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.43 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

RAMAKER & ASSOCIATES, INC.

April 23, 2018

Tom Jupin
Charles Cherundolo Consulting, Inc
1280 Rt. 46 West
Parsippany, NJ 07054

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

SUBJECT: **MOUNT ASSESSMENT**

CARRIER: **SPRINT**

SITE: **CT33XC572**
1050 BUCKLEY HIGHWAY (CT RTE 171)
UNION, TOLLAND COUNTY, CONNECTICUT 06076
RAMAKER & ASSOCIATES PROJECT NUMBER: 22977

RESULTS: **MOUNT:** **PASS WITH MODIFICATIONS**

Dear Tom Jupin:

Ramaker & Associates, Inc. (RAMAKER) respectfully submits this mount assessment for the above mentioned site. The purpose of this report is to determine the structural integrity of the mounting structure with the proposed loading configurations. Engineering recommendations regarding the analysis results are provided in the following pages.

RAMAKER developed a finite element model of the mount(s) using RISA analysis software. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the mount loading occur.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

Tucker Schwab
Structural Designer

James R. Skowronski, P.E.
Supervising Engineer

ANALYSIS CRITERIA

Adopted Building Code	2106 CT State Building Code
Referenced Standard	TIA-222-G
Risk Category	II
Ultimate Design Wind Speed, V_{ult}	125 mph (3 sec. gust)
Nominal Design Wind Speed, V_{asd}	97 mph (3 sec. gust)
Design Wind Speed w/ Ice	50 mph (3 sec. gust)
Ice Thickness	1 inch
Exposure Category	B
Topographic Feature	None

SUPPORTING DOCUMENTATION

- Construction drawings by RAMAKER, project number 22977
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

MOUNT LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antennas and equipment configurations as shown in the following chart(s):

Antenna Mount – Alpha, Beta, & Gamma Sectors				
Elevation	**Position**	**Appurtenance**	**Mount Type**	**Status**
130.3	1	**(1) Decibel DB980**	Sector Frame	**Remove**
		(1) ALU 800MHz 2x50W RRH		**Proposed**
		(1) ALU 1900MHz 4x45 RRH		**Relocated**
	2	**(1) Commscope NNVV-65B-R4**		**Proposed**
	3	**(1) ALU 800MHz 2x50W RRH**		**Proposed**
		(1) ALU TD-RRH8x20-25		
	4	**(1) Decibel DB980**		**Remove**
		(1) RFS APXVTM14-ALU-I20		**Proposed**

MOUNT RESULTS

By engineering calculation and inspection, the ***modified*** antenna and equipment mounting structure(s) are capable of supporting the proposed loading configurations without causing an overstress condition in the antenna and equipment mounting structure(s), ***provided the proposed structural modifications are completed prior to antenna and equipment installation. See attached modification details for required modifications.***

LIMITATIONS

The recommendations contained within this report were developed using the supporting documentation as previously described. All recommendations pertain only to the proposed antenna installation activities as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

- Missing, corroding, and/or deteriorating members
- Improper manufacturing and/or construction
- Improper maintenance
- Member grades less than assumed grades show below:

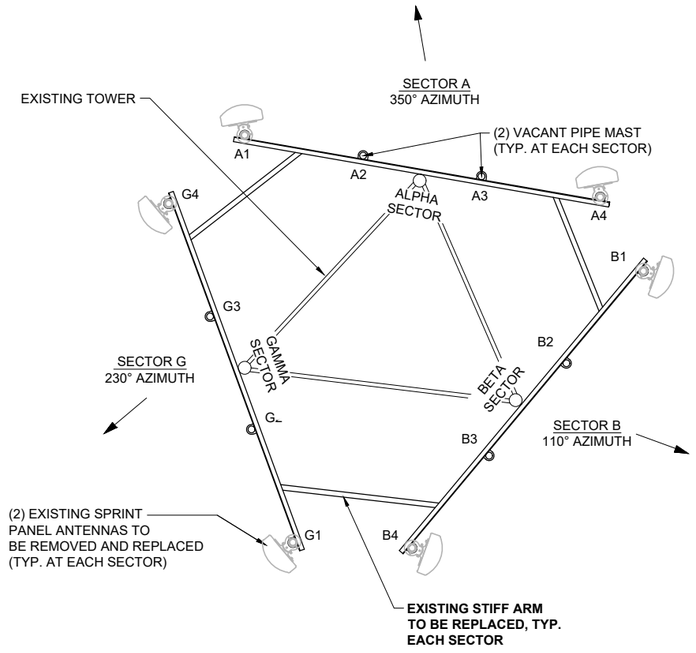
Assumed Steel Member Grades	
Angles/Plates	ASTM A36, 36 ksi
Pipes	ASTM A53 Gr. B, 35 ksi

RAMAKER is not responsible for verifying that the loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication and erection deficiencies, this report should be disregarded and RAMAKER should be contacted immediately. RAMAKER is not liable for any representation, recommendation, or conclusion not expressly stated herein.

This analysis pertains only to the mounting structure, and no analyses or conclusions were made regarding the supporting structure. Analysis and certification of the supporting structure is performed and submitted separately.

ATTACHMENTS

- Modification Details
- Analysis Figures
- Analysis Calculations

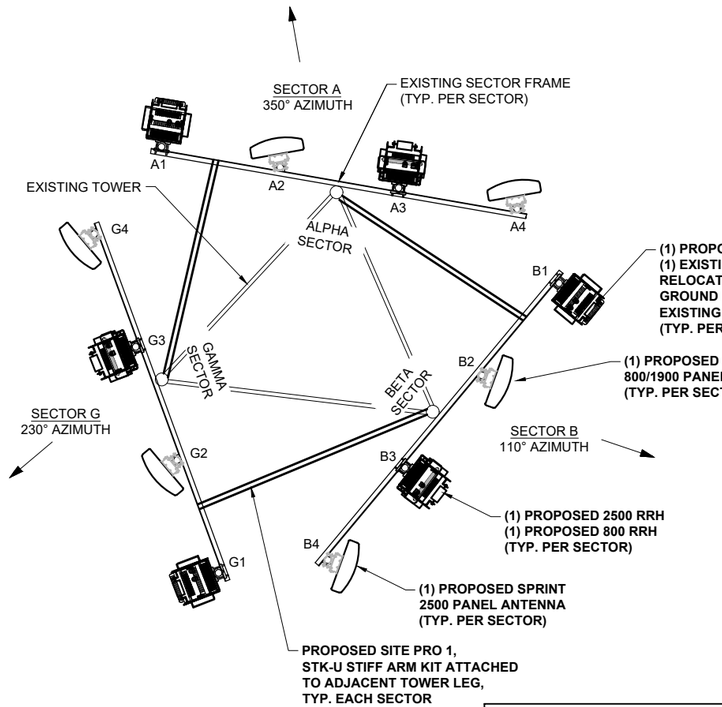


EXISTING ANTENNA PLAN

SCALE: NTS

1

NOTE:
FINAL ANTENNA & RRH MOUNTING DESIGN AND DETAILS PENDING STRUCTURAL ANALYSIS.

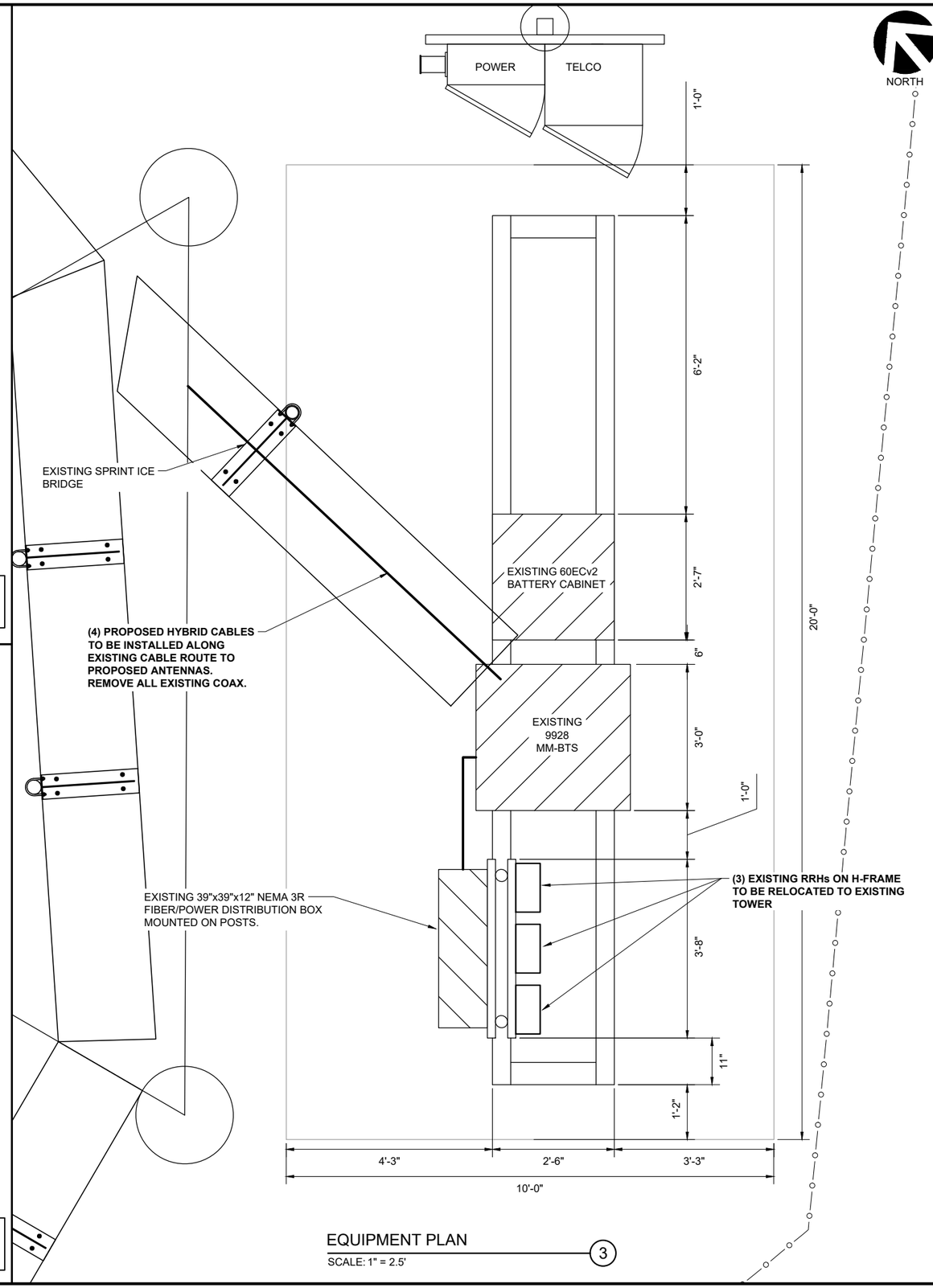


PROPOSED ANTENNA PLAN

SCALE: NTS

2

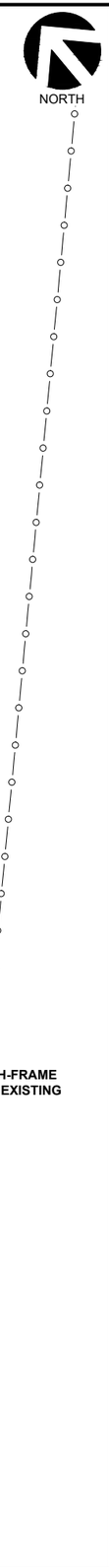
NOTE:
FINAL ANTENNA & RRH MOUNTING DESIGN AND DETAILS PENDING STRUCTURAL ANALYSIS.



EQUIPMENT PLAN

SCALE: 1" = 2.5'

3



Sprint

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Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:

MARK	DATE	DESCRIPTION

ISSUE PHASE: PRELIMINARY
DATE ISSUED: 03/27/2018

PROJECT TITLE:

CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:

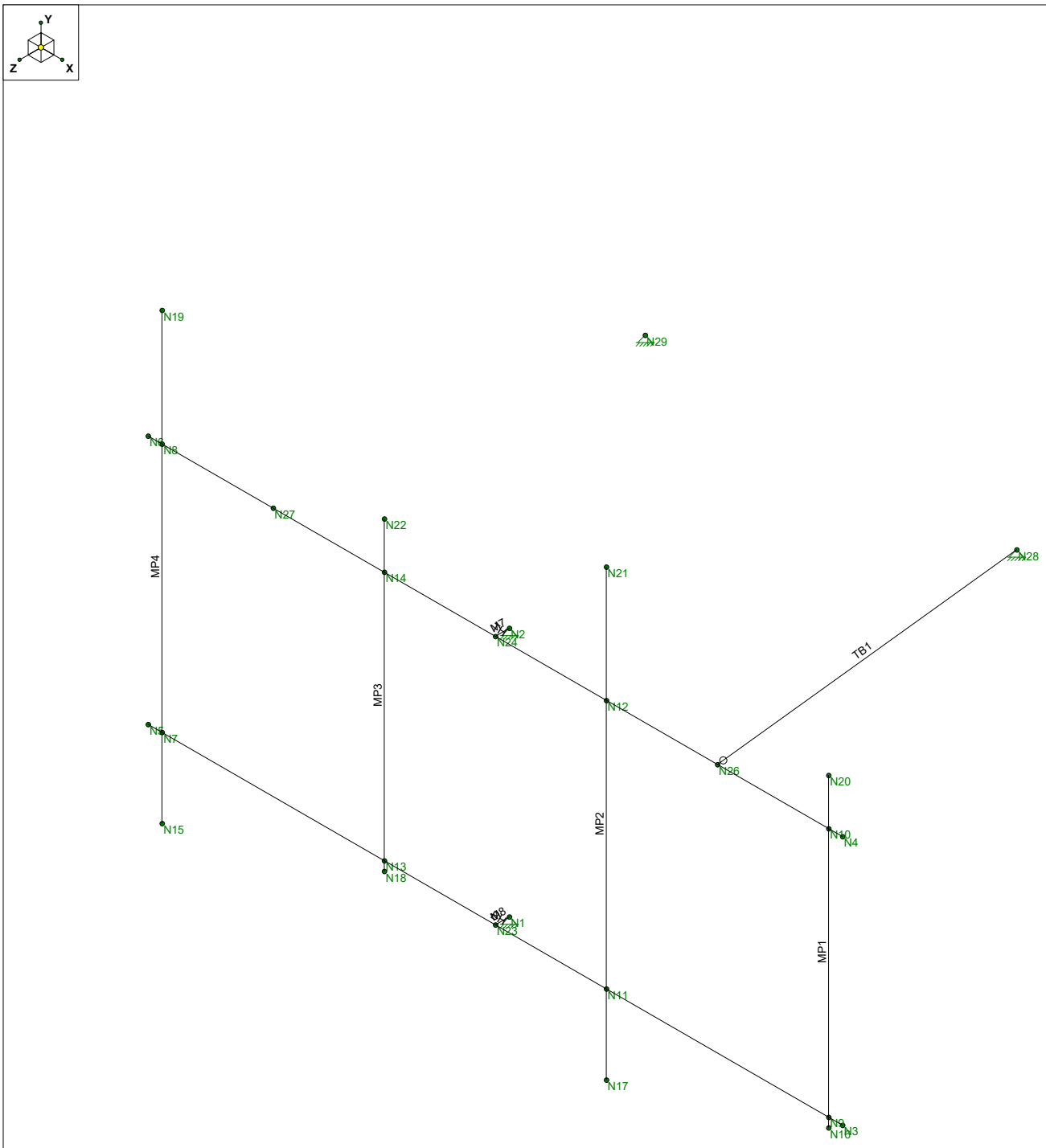
PROPOSED ANTENNA LAYOUT & EQUIPMENT LAYOUT

0 1.25' 2.5' 5'

11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

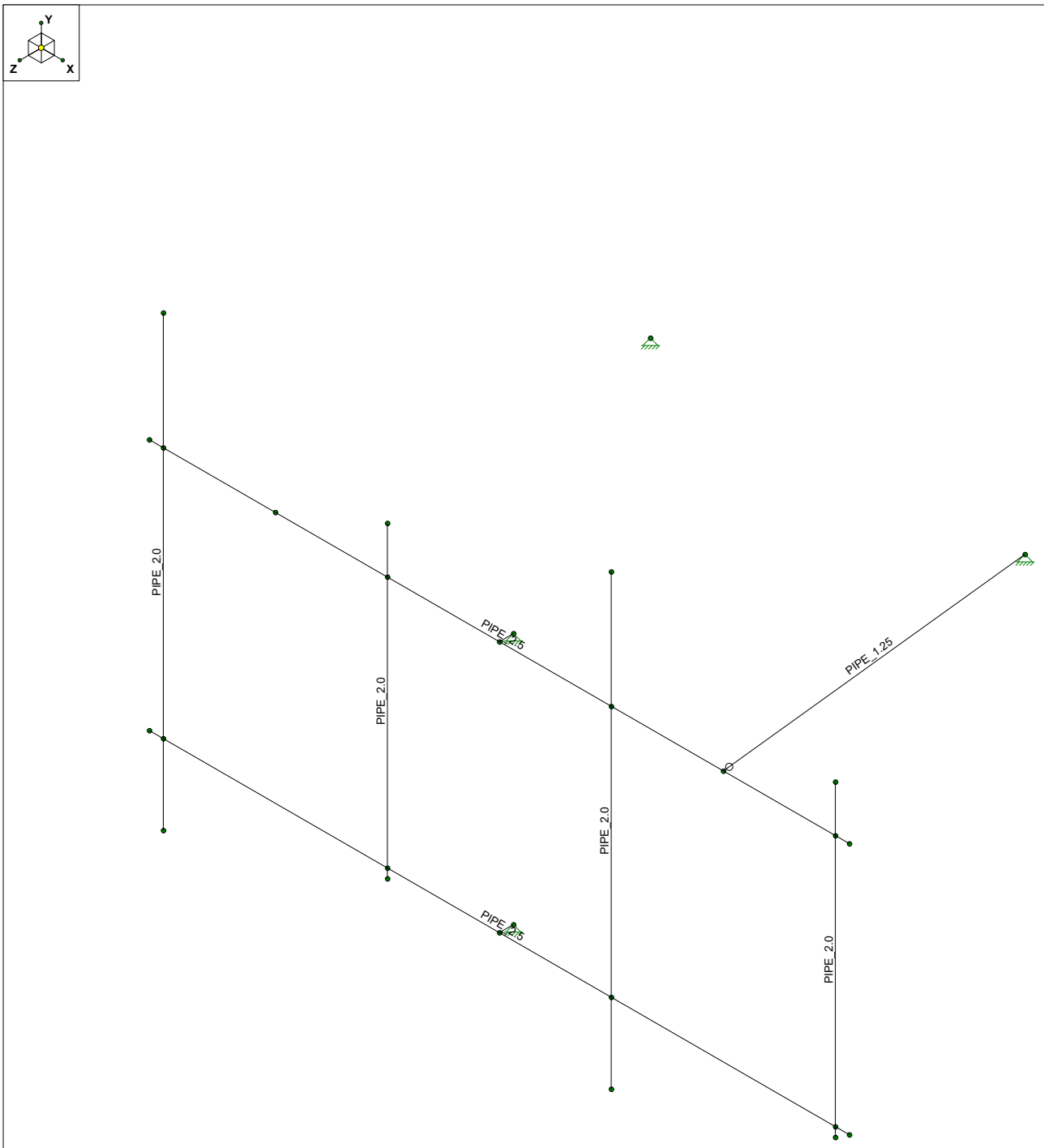
PROJECT NUMBER: 22977

SHEET NUMBER: A-1



Envelope Only Solution

Ramaker & Associates	CT33XC572	SK - 1
TJS		Apr 17, 2018 at 8:56 AM
22977		22977 Rev1 Mount.r3d



Envelope Only Solution

Ramaker & Associates	CT33XC572	SK - 2
TJS		Apr 17, 2018 at 8:57 AM
22977		22977 Rev1 Mount.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..Density[k/f...		Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe_2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Pipe_2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	Pipe_1.25	PIPE_1.25	Beam	Pipe	A53 Gr.B	Typical	.625	.184	.184	.368

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	BH	N5	N3			Pipe_2.5	Beam	Pipe	A53 Gr.B	Typical
2	TH	N6	N4			Pipe_2.5	Beam	Pipe	A53 Gr.B	Typical
3	MP4	N15	N19			Pipe_2.0	Beam	Pipe	A53 Gr.B	Typical
4	MP3	N18	N22			Pipe_2.0	Beam	Pipe	A53 Gr.B	Typical
5	MP2	N17	N21			Pipe_2.0	Beam	Pipe	A53 Gr.B	Typical
6	MP1	N16	N20			Pipe_2.0	Beam	Pipe	A53 Gr.B	Typical
7	M7	N24	N2			RIGID	None	None	RIGID	Typical
8	M8	N23	N1			RIGID	None	None	RIGID	Typical
9	TB1	N26	N28			Pipe_1.25	Beam	Pipe	A53 Gr.B	Typical
10	TB2	N27	N29			Pipe_1.25	Beam	Pipe	A53 Gr.B	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead Load	None		-1			12			
2	Antenna Wind 0	None					24			
3	Antenna Wind 30	None					24			
4	Antenna Wind 45	None					24			
5	Antenna Wind 60	None					24			
6	Antenna Wind 90	None					24			
7	Antenna Wind 120	None					24			
8	Antenna Wind 135	None					24			
9	Antenna Wind 150	None					24			
10	Antenna Wind 180	None					24			
11	Antenna Wind 210	None					24			
12	Antenna Wind 225	None					24			
13	Antenna Wind 240	None					24			
14	Antenna Wind 270	None					24			
15	Antenna Wind 300	None					24			
16	Antenna Wind 315	None					24			
17	Antenna Wind 330	None					24			
18	Antenna Ice Dead Load	None					12			
19	Antenna Wind w/Ice 0	None					24			
20	Antenna Wind w/Ice 30	None					24			
21	Antenna Wind w/Ice 45	None					24			
22	Antenna Wind w/Ice 60	None					24			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
23	Antenna Wind w/Ice 90	None					24			
24	Antenna Wind w/Ice 1...	None					24			
25	Antenna Wind w/Ice 1...	None					24			
26	Antenna Wind w/Ice 1...	None					24			
27	Antenna Wind w/Ice 1...	None					24			
28	Antenna Wind w/Ice 2...	None					24			
29	Antenna Wind w/Ice 2...	None					24			
30	'Antenna Wind w/Ice ...	None					24			
31	Antenna Wind w/Ice 2...	None					24			
32	Antenna Wind w/Ice 3...	None					24			
33	Antenna Wind w/Ice 3...	None					24			
34	Antenna Wind w/Ice 3...	None					24			
35	Member Wind 0	None						16		
36	Member Wind 30	None						16		
37	Member Wind 45	None						16		
38	Member Wind 60	None						16		
39	Member Wind 90	None						16		
40	Member Wind 120	None						16		
41	Member Wind 135	None						16		
42	Member Wind 150	None						16		
43	Member Wind 180	None						16		
44	Member Wind 210	None						16		
45	Member Wind 225	None						16		
46	Member Wind 240	None						16		
47	Member Wind 270	None						16		
48	Member Wind 300	None						16		
49	Member Wind 315	None						16		
50	Member Wind 330	None						16		
51	Member Ice Dead Load	None						8		
52	Member Wind w/Ice 0	None						16		
53	Member Wind w/Ice 30	None						16		
54	Member Wind w/Ice 45	None						16		
55	Member Wind w/Ice 60	None						16		
56	Member Wind w/Ice 90	None						16		
57	Member Wind w/Ice 1...	None						16		
58	Member Wind w/Ice 1...	None						16		
59	Member Wind w/Ice 1...	None						16		
60	Member Wind w/Ice 1...	None						16		
61	Member Wind w/Ice 2...	None						16		
62	Member Wind w/Ice 2...	None						16		
63	Member Wind w/Ice 2...	None						16		
64	Member Wind w/Ice 2...	None						16		
65	Member Wind w/Ice 3...	None						16		
66	Member Wind w/Ice 3...	None						16		
67	Member Wind w/Ice 3...	None						16		
68	LV-1	None					1			
69	LV-2	None					1			
70	LV-3	None					1			
71	LV-4	None					1			
72	LV-5	None					1			
73	LV-6	None					1			
74	LV-7	None								
75	LV-8	None								
76	LV-9	None								
77	LV-10	None								
78	LV-11	None								
79	LV-12	None								

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
80	LV-13	None								
81	LV-14	None								
82	LV-15	None								
83	LM-1	None					1			
84	LM-2	None					1			
85	LM-3	None					1			
86	LM-4	None					1			
87	LM-5	None								
88	LM-6	None								
89	LM-7	None								
90	LM-8	None								
91	LM-9	None								
92	LM-10	None								
93	LM-11	None								
94	LM-12	None								
95	LM-13	None								
96	LM-14	None								
97	LM-15	None								

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
1	1.4D	Yes	Y		1	1.4																		
2	0.9D + 1.6 (0-Wind)	Yes	Y		1	.9	2	1.6	35	1.6														
3	0.9D + 1.6 (30-Wind)	Yes	Y		1	.9	3	1.6	36	1.6														
4	0.9D + 1.6 (45-Wind)	Yes	Y		1	.9	4	1.6	37	1.6														
5	0.9D + 1.6 (60-Wind)	Yes	Y		1	.9	5	1.6	38	1.6														
6	0.9D + 1.6 (90-Wind)	Yes	Y		1	.9	6	1.6	39	1.6														
7	0.9D + 1.6 (120-Wind)	Yes	Y		1	.9	7	1.6	40	1.6														
8	0.9D + 1.6 (135-Wind)	Yes	Y		1	.9	8	1.6	41	1.6														
9	0.9D + 1.6 (150-Wind)	Yes	Y		1	.9	9	1.6	42	1.6														
10	0.9D + 1.6 (180-Wind)	Yes	Y		1	.9	10	1.6	43	1.6														
11	0.9D + 1.6 (210-Wind)	Yes	Y		1	.9	11	1.6	44	1.6														
12	0.9D + 1.6 (225-Wind)	Yes	Y		1	.9	12	1.6	45	1.6														
13	0.9D + 1.6 (240-Wind)	Yes	Y		1	.9	13	1.6	46	1.6														
14	0.9D + 1.6 (270-Wind)	Yes	Y		1	.9	14	1.6	47	1.6														
15	0.9D + 1.6 (300-Wind)	Yes	Y		1	.9	15	1.6	48	1.6														
16	0.9D + 1.6 (315-Wind)	Yes	Y		1	.9	16	1.6	49	1.6														
17	0.9D + 1.6 (330-Wind)	Yes	Y		1	.9	17	1.6	50	1.6														
18	1.2D + 1.6 (0-Wind)	Yes	Y		1	1.2	2	1.6	35	1.6														
19	1.2D + 1.6 (30-Wind)	Yes	Y		1	1.2	3	1.6	36	1.6														
20	1.2D + 1.6 (45-Wind)	Yes	Y		1	1.2	4	1.6	37	1.6														
21	1.2D + 1.6 (60-Wind)	Yes	Y		1	1.2	5	1.6	38	1.6														
22	1.2D + 1.6 (90-Wind)	Yes	Y		1	1.2	6	1.6	39	1.6														
23	1.2D + 1.6 (120-Wind)	Yes	Y		1	1.2	7	1.6	40	1.6														
24	1.2D + 1.6 (135-Wind)	Yes	Y		1	1.2	8	1.6	41	1.6														
25	1.2D + 1.6 (150-Wind)	Yes	Y		1	1.2	9	1.6	42	1.6														
26	1.2D + 1.6 (180-Wind)	Yes	Y		1	1.2	10	1.6	43	1.6														
27	1.2D + 1.6 (210-Wind)	Yes	Y		1	1.2	11	1.6	44	1.6														
28	1.2D + 1.6 (225-Wind)	Yes	Y		1	1.2	12	1.6	45	1.6														
29	1.2D + 1.6 (240-Wind)	Yes	Y		1	1.2	13	1.6	46	1.6														
30	1.2D + 1.6 (270-Wind)	Yes	Y		1	1.2	14	1.6	47	1.6														
31	1.2D + 1.6 (300-Wind)	Yes	Y		1	1.2	15	1.6	48	1.6														
32	1.2D + 1.6 (315-Wind)	Yes	Y		1	1.2	16	1.6	49	1.6														
33	1.2D + 1.6 (330-Wind)	Yes	Y		1	1.2	17	1.6	50	1.6														
34	1.2D + 1.0Di + 1.0 (0...	Yes	Y		1	1.2	18	1	51	1	19	1	52	1										

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
35	1.2D + 1.0Di + 1.0 (3..	Yes	Y		1	1.2	18	1	51	1	20	1	53	1												
36	1.2D + 1.0Di + 1.0 (4..	Yes	Y		1	1.2	18	1	51	1	21	1	54	1												
37	1.2D + 1.0Di + 1.0 (6..	Yes	Y		1	1.2	18	1	51	1	22	1	55	1												
38	1.2D + 1.0Di + 1.0 (9..	Yes	Y		1	1.2	18	1	51	1	23	1	56	1												
39	1.2D + 1.0Di + 1.0 (1..	Yes	Y		1	1.2	18	1	51	1	24	1	57	1												
40	1.2D + 1.0Di + 1.0 (1..	Yes	Y		1	1.2	18	1	51	1	25	1	58	1												
41	1.2D + 1.0Di + 1.0 (1..	Yes	Y		1	1.2	18	1	51	1	26	1	59	1												
42	1.2D + 1.0Di + 1.0 (1..	Yes	Y		1	1.2	18	1	51	1	27	1	60	1												
43	1.2D + 1.0Di + 1.0 (2..	Yes	Y		1	1.2	18	1	51	1	28	1	61	1												
44	1.2D + 1.0Di + 1.0 (2..	Yes	Y		1	1.2	18	1	51	1	29	1	62	1												
45	1.2D + 1.0Di + 1.0 (2..	Yes	Y		1	1.2	18	1	51	1	30	1	63	1												
46	1.2D + 1.0Di + 1.0 (2..	Yes	Y		1	1.2	18	1	51	1	31	1	64	1												
47	1.2D + 1.0Di + 1.0 (3..	Yes	Y		1	1.2	18	1	51	1	32	1	65	1												
48	1.2D + 1.0Di + 1.0 (3..	Yes	Y		1	1.2	18	1	51	1	33	1	66	1												
49	1.2D + 1.0Di + 1.0 (3..	Yes	Y		1	1.2	18	1	51	1	34	1	67	1												
50	1.2D + 1.5LV-1	Yes	Y		1	1.2	68	1.5																		
51	1.2D + 1.5LV-2	Yes	Y		1	1.2	69	1.5																		
52	1.2D + 1.5LV-3	Yes	Y		1	1.2	70	1.5																		
53	1.2D + 1.5LV-4	Yes	Y		1	1.2	71	1.5																		
54	1.2D + 1.5LV-5	Yes	Y		1	1.2	72	1.5																		
55	1.2D + 1.5LV-6	Yes	Y		1	1.2	73	1.5																		
56	1.2D + 1.5LV-7	Yes	Y		1	1.2	74	1.5																		
57	1.2D + 1.5LV-8	Yes	Y		1	1.2	75	1.5																		
58	1.2D + 1.5LV-9	Yes	Y		1	1.2	76	1.5																		
59	1.2D + 1.5LV-10	Yes	Y		1	1.2	77	1.5																		
60	1.2D + 1.5LV-11	Yes	Y		1	1.2	78	1.5																		
61	1.2D + 1.5LV-12	Yes	Y		1	1.2	79	1.5																		
62	1.2D + 1.5LV-13	Yes	Y		1	1.2	80	1.5																		
63	1.2D + 1.5LV-14	Yes	Y		1	1.2	81	1.5																		
64	1.2D + 1.5LV-15	Yes	Y		1	1.2	82	1.5																		
65	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	2	.096	35	.096														
66	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	3	.096	36	.096														
67	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	4	.096	37	.096														
68	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	5	.096	38	.096														
69	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	6	.096	39	.096														
70	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	7	.096	40	.096														
71	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	8	.096	41	.096														
72	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	9	.096	42	.096														
73	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	10	.096	43	.096														
74	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	11	.096	44	.096														
75	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	12	.096	45	.096														
76	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	13	.096	46	.096														
77	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	14	.096	47	.096														
78	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	15	.096	48	.096														
79	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	16	.096	49	.096														
80	1.2D + 1.5LM-1 + Ma..	Yes	Y		1	1.2	83	1.5	17	.096	50	.096														
81	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	2	.096	35	.096														
82	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	3	.096	36	.096														
83	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	4	.096	37	.096														
84	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	5	.096	38	.096														
85	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	6	.096	39	.096														
86	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	7	.096	40	.096														
87	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	8	.096	41	.096														
88	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	9	.096	42	.096														
89	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	10	.096	43	.096														
90	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	11	.096	44	.096														
91	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	12	.096	45	.096														

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
92	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	13	.096	46	.096														
93	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	14	.096	47	.096														
94	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	15	.096	48	.096														
95	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	16	.096	49	.096														
96	1.2D + 1.5LM-2 + Ma..	Yes	Y		1	1.2	84	1.5	17	.096	50	.096														
97	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	2	.096	35	.096														
98	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	3	.096	36	.096														
99	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	4	.096	37	.096														
100	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	5	.096	38	.096														
101	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	6	.096	39	.096														
102	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	7	.096	40	.096														
103	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	8	.096	41	.096														
104	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	9	.096	42	.096														
105	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	10	.096	43	.096														
106	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	11	.096	44	.096														
107	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	12	.096	45	.096														
108	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	13	.096	46	.096														
109	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	14	.096	47	.096														
110	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	15	.096	48	.096														
111	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	16	.096	49	.096														
112	1.2D + 1.5LM-3 + Ma..	Yes	Y		1	1.2	85	1.5	17	.096	50	.096														
113	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	2	.096	35	.096														
114	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	3	.096	36	.096														
115	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	4	.096	37	.096														
116	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	5	.096	38	.096														
117	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	6	.096	39	.096														
118	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	7	.096	40	.096														
119	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	8	.096	41	.096														
120	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	9	.096	42	.096														
121	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	10	.096	43	.096														
122	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	11	.096	44	.096														
123	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	12	.096	45	.096														
124	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	13	.096	46	.096														
125	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	14	.096	47	.096														
126	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	15	.096	48	.096														
127	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	16	.096	49	.096														
128	1.2D + 1.5LM-4 + Ma..	Yes	Y		1	1.2	86	1.5	17	.096	50	.096														
129	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	2	.096	35	.096														
130	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	3	.096	36	.096														
131	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	4	.096	37	.096														
132	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	5	.096	38	.096														
133	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	6	.096	39	.096														
134	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	7	.096	40	.096														
135	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	8	.096	41	.096														
136	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	9	.096	42	.096														
137	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	10	.096	43	.096														
138	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	11	.096	44	.096														
139	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	12	.096	45	.096														
140	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	13	.096	46	.096														
141	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	14	.096	47	.096														
142	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	15	.096	48	.096														
143	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	16	.096	49	.096														
144	1.2D + 1.5LM-5 + Ma..	Yes	Y		1	1.2	87	1.5	17	.096	50	.096														
145	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	2	.096	35	.096														
146	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	3	.096	36	.096														
147	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	4	.096	37	.096														
148	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	5	.096	38	.096														

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
149	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	6	.096	39	.096												
150	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	7	.096	40	.096												
151	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	8	.096	41	.096												
152	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	9	.096	42	.096												
153	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	10	.096	43	.096												
154	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	11	.096	44	.096												
155	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	12	.096	45	.096												
156	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	13	.096	46	.096												
157	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	14	.096	47	.096												
158	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	15	.096	48	.096												
159	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	16	.096	49	.096												
160	1.2D + 1.5LM-6 + Ma..	Yes	Y		1	1.2	88	1.5	17	.096	50	.096												
161	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	2	.096	35	.096												
162	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	3	.096	36	.096												
163	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	4	.096	37	.096												
164	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	5	.096	38	.096												
165	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	6	.096	39	.096												
166	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	7	.096	40	.096												
167	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	8	.096	41	.096												
168	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	9	.096	42	.096												
169	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	10	.096	43	.096												
170	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	11	.096	44	.096												
171	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	12	.096	45	.096												
172	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	13	.096	46	.096												
173	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	14	.096	47	.096												
174	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	15	.096	48	.096												
175	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	16	.096	49	.096												
176	1.2D + 1.5LM-7 + Ma..	Yes	Y		1	1.2	89	1.5	17	.096	50	.096												
177	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	2	.096	35	.096												
178	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	3	.096	36	.096												
179	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	4	.096	37	.096												
180	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	5	.096	38	.096												
181	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	6	.096	39	.096												
182	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	7	.096	40	.096												
183	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	8	.096	41	.096												
184	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	9	.096	42	.096												
185	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	10	.096	43	.096												
186	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	11	.096	44	.096												
187	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	12	.096	45	.096												
188	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	13	.096	46	.096												
189	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	14	.096	47	.096												
190	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	15	.096	48	.096												
191	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	16	.096	49	.096												
192	1.2D + 1.5LM-8 + Ma..	Yes	Y		1	1.2	90	1.5	17	.096	50	.096												
193	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	2	.096	35	.096												
194	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	3	.096	36	.096												
195	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	4	.096	37	.096												
196	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	5	.096	38	.096												
197	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	6	.096	39	.096												
198	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	7	.096	40	.096												
199	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	8	.096	41	.096												
200	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	9	.096	42	.096												
201	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	10	.096	43	.096												
202	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	11	.096	44	.096												
203	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	12	.096	45	.096												
204	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	13	.096	46	.096												
205	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	14	.096	47	.096												

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
206	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	15	.096	48	.096												
207	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	16	.096	49	.096												
208	1.2D + 1.5LM-9 + Ma..	Yes	Y		1	1.2	91	1.5	17	.096	50	.096												
209	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	2	.096	35	.096												
210	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	3	.096	36	.096												
211	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	4	.096	37	.096												
212	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	5	.096	38	.096												
213	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	6	.096	39	.096												
214	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	7	.096	40	.096												
215	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	8	.096	41	.096												
216	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	9	.096	42	.096												
217	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	10	.096	43	.096												
218	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	11	.096	44	.096												
219	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	12	.096	45	.096												
220	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	13	.096	46	.096												
221	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	14	.096	47	.096												
222	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	15	.096	48	.096												
223	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	16	.096	49	.096												
224	1.2D + 1.5LM-10 + M..	Yes	Y		1	1.2	92	1.5	17	.096	50	.096												
225	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	2	.096	35	.096												
226	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	3	.096	36	.096												
227	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	4	.096	37	.096												
228	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	5	.096	38	.096												
229	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	6	.096	39	.096												
230	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	7	.096	40	.096												
231	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	8	.096	41	.096												
232	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	9	.096	42	.096												
233	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	10	.096	43	.096												
234	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	11	.096	44	.096												
235	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	12	.096	45	.096												
236	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	13	.096	46	.096												
237	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	14	.096	47	.096												
238	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	15	.096	48	.096												
239	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	16	.096	49	.096												
240	1.2D + 1.5LM-11 + M..	Yes	Y		1	1.2	93	1.5	17	.096	50	.096												
241	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	2	.096	35	.096												
242	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	3	.096	36	.096												
243	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	4	.096	37	.096												
244	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	5	.096	38	.096												
245	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	6	.096	39	.096												
246	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	7	.096	40	.096												
247	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	8	.096	41	.096												
248	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	9	.096	42	.096												
249	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	10	.096	43	.096												
250	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	11	.096	44	.096												
251	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	12	.096	45	.096												
252	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	13	.096	46	.096												
253	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	14	.096	47	.096												
254	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	15	.096	48	.096												
255	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	16	.096	49	.096												
256	1.2D + 1.5LM-12 + M..	Yes	Y		1	1.2	94	1.5	17	.096	50	.096												
257	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	2	.096	35	.096												
258	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	3	.096	36	.096												
259	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	4	.096	37	.096												
260	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	5	.096	38	.096												
261	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	6	.096	39	.096												
262	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	7	.096	40	.096												

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
263	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	8	.096	41	.096												
264	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	9	.096	42	.096												
265	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	10	.096	43	.096												
266	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	11	.096	44	.096												
267	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	12	.096	45	.096												
268	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	13	.096	46	.096												
269	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	14	.096	47	.096												
270	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	15	.096	48	.096												
271	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	16	.096	49	.096												
272	1.2D + 1.5LM-13 + M..	Yes	Y		1	1.2	95	1.5	17	.096	50	.096												
273	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	2	.096	35	.096												
274	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	3	.096	36	.096												
275	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	4	.096	37	.096												
276	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	5	.096	38	.096												
277	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	6	.096	39	.096												
278	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	7	.096	40	.096												
279	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	8	.096	41	.096												
280	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	9	.096	42	.096												
281	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	10	.096	43	.096												
282	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	11	.096	44	.096												
283	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	12	.096	45	.096												
284	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	13	.096	46	.096												
285	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	14	.096	47	.096												
286	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	15	.096	48	.096												
287	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	16	.096	49	.096												
288	1.2D + 1.5LM-14 + M..	Yes	Y		1	1.2	96	1.5	17	.096	50	.096												
289	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	2	.096	35	.096												
290	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	3	.096	36	.096												
291	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	4	.096	37	.096												
292	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	5	.096	38	.096												
293	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	6	.096	39	.096												
294	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	7	.096	40	.096												
295	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	8	.096	41	.096												
296	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	9	.096	42	.096												
297	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	10	.096	43	.096												
298	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	11	.096	44	.096												
299	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	12	.096	45	.096												
300	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	13	.096	46	.096												
301	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	14	.096	47	.096												
302	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	15	.096	48	.096												
303	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	16	.096	49	.096												
304	1.2D + 1.5LM-15 + M..	Yes	Y		1	1.2	97	1.5	17	.096	50	.096												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N1	max	1094.98	78	1282.308	37	592.782	18	0	1	0	1	0	1
2		min	-944.666	116	227.522	16	-519.915	10	0	1	0	1	0	1
3	N2	max	963.918	124	1277.668	45	1102.668	2	0	1	0	1	0	1
4		min	-1114.2	68	226.767	8	-1173.758	26	0	1	0	1	0	1
5	N28	max	13.121	14	41.54	45	93.382	21	0	1	0	1	0	1
6		min	-13.055	6	5.704	5	-98.31	29	0	1	0	1	0	1
7	N29	max	0	1	0	1	0	1	0	1	0	1	0	1
8		min	0	1	0	1	0	1	0	1	0	1	0	1
9	Totals:	max	982.448	29	2570.489	39	1666.666	18						
10		min	-982.448	5	571.232	10	-1666.666	10						

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

	Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	BH	PIPE_2.5	.369	6.25	34	.098	6.25		43	14558.792	50715	3596.25	3596.25	1....	H1-1b
2	TH	PIPE_2.5	.512	6.25	26	.103	6.25		34	14558.792	50715	3596.25	3596.25	1....	H1-1b
3	MP4	PIPE_2.0	.519	1.417	117	.055	5.917		26	14916.096	32130	1871.625	1871.625	2....	H1-1b
4	MP3	PIPE_2.0	.599	.172	117	.059	.172		113	22356.067	32130	1871.625	1871.625	1....	H1-1b
5	MP2	PIPE_2.0	.653	5.917	71	.065	1.417		80	14916.096	32130	1871.625	1871.625	2....	H1-1b
6	MP1	PIPE_2.0	.557	.172	77	.052	4.641		72	22356.067	32130	1871.625	1871.625	1....	H1-1b
7	TB1	PIPE_1.25	.082	3.04	38	.007	6.079		38	7805.39	19687.5	800.625	800.625	1....	H1-1b

RAMAKER & ASSOCIATES, INC.
855 Community Drive, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999

Job	CT33XC572
Project	22977
By	TJS
Date	4/17/18

Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V :	97	mph	Basic Wind Speed (Annex B)
z :	130.3	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	24.3	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
NNVV-65B-R4	72.0	19.6	3.7	Flat	1.252	9.80	298.2	
APXVTM14-ALU-I20	56.3	12.6	4.5	Flat	1.287	4.93	154.1	
TD-RRH8x20	26.1	18.6	1.4	Flat	1.200	3.37	98.3	
1900MHz 4x45W RRH	25.1	11.1	2.3	Flat	1.200	1.93	56.4	
800MHz 2x50W RRH	19.0	13.0	1.5	Flat	1.200	1.72	50.0	
Pipe2-1/2STD x 12.5 ft	150.0	2.9	52.2	Round	1.200	2.99	87.3	7.0
Pipe2STD x 8 ft	96.0	2.4	40.4	Round	1.200	1.58	46.2	5.8
Pipe2STD x 5.5 ft	66.0	2.4	27.8	Round	1.200	1.09	31.7	5.8
Pipe1-1/4STD x 6.079 ft	72.9	1.7	43.9	Round	1.200	0.84	24.5	4.0

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Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V :	97	mph	Basic Wind Speed (Annex B)
z :	130.3	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	24.3	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
NNVV-65B-R4	72.0	7.8	9.2	Flat	1.474	3.90	139.7	
APXVTM14-ALU-I20	56.3	6.3	8.9	Flat	1.465	2.46	87.7	
TD-RRH8x20	26.1	6.7	3.9	Flat	1.262	1.21	37.2	
1900MHz 4x45W RRH	25.1	10.7	2.3	Flat	1.200	1.86	54.3	
800MHz 2x50W RRH	19.0	12.2	1.6	Flat	1.200	1.61	46.9	
Pipe2-1/2STD x 12.5 ft	150.0	2.9	52.2	Round	1.200	2.99	87.3	7.0
Pipe2STD x 8 ft	96.0	2.4	40.4	Round	1.200	1.58	46.2	5.8
Pipe2STD x 5.5 ft	66.0	2.4	27.8	Round	1.200	1.09	31.7	5.8
Pipe1-1/4STD x 6.079 ft	72.9	1.7	43.9	Round	1.200	0.84	24.5	4.0

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Date	4/17/18

Ice Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V_i :	50	mph	Basic Wind Speed (Annex B)
z :	130.3	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	6.48	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections
t_{iz} :	2.29	in	Design Thickness of Radial Ice at Height z (2.6.8)

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
NNVV-65B-R4	76.6	24.2	3.2	Flat	1.230	12.87	102.5	
APXVTM14-ALU-I20	60.9	17.2	3.5	Flat	1.246	7.27	58.7	
TD-RRH8x20	30.7	23.2	1.3	Flat	1.200	4.94	38.4	
1900MHz 4x45W RRH	29.7	15.7	1.9	Flat	1.200	3.23	25.2	
800MHz 2x50W RRH	23.6	17.6	1.3	Flat	1.200	2.88	22.4	
Pipe2-1/2STD x 12.5 ft	154.6	7.5	20.7	Round	1.105	8.01	57.4	4.5
Pipe2STD x 8 ft	100.6	7.0	14.4	Round	0.965	4.86	30.4	3.6
Pipe2STD x 5.5 ft	70.6	7.0	10.1	Round	0.870	3.41	19.2	3.3
Pipe1-1/4STD x 6.079 ft	77.5	6.2	12.4	Round	0.920	3.36	20.1	3.1

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Ice Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V_i :	50	mph	Basic Wind Speed (Annex B)
z :	130.3	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_z :	1.07		Velocity Pressure Coefficient (2.6.5.2)
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
K_d :	0.95		Wind Direction Probability Factor (Table 2-2)
q_z :	6.48	psf	Velocity Pressure at Height z
G_h :	1.00		Strength Design of Appurtenances and their Connections
t_{iz} :	2.29	in	Design Thickness of Radial Ice at Height z (2.6.8)

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_a	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
NNVV-65B-R4	76.6	12.4	6.2	Flat	1.364	6.59	58.2	
APXVTM14-ALU-I20	60.9	10.9	5.6	Flat	1.337	4.60	39.9	
TD-RRH8x20	30.7	11.3	2.7	Flat	1.210	2.41	18.9	
1900MHz 4x45W RRH	29.7	15.3	1.9	Flat	1.200	3.15	24.5	
800MHz 2x50W RRH	23.6	16.8	1.4	Flat	1.200	2.75	21.4	
Pipe2-1/2STD x 12.5 ft	154.6	7.5	20.7	Round	1.105	8.01	57.4	4.5
Pipe2STD x 8 ft	100.6	7.0	14.4	Round	0.965	4.86	30.4	3.6
Pipe2STD x 5.5 ft	70.6	7.0	10.1	Round	0.870	3.41	19.2	3.3
Pipe1-1/4STD x 6.079 ft	77.5	6.2	12.4	Round	0.920	3.36	20.1	3.1

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Ice Load on Antennas TIA-222-G

Ice Weight :	56	pcf	Ice Density
t_i :	1.00		Design Ice Thickness
Occupancy :	II		Classification of Structures (Table 2-1)
Exposure :	B		Exposure Category
V_i :	50	mph	Basic Wind Speed (Annex B)
z :	130.3	ft	Height above ground level to the center of the antenna
I :	1.00		Importance Factor (Table 2-3)
K_{iz} :	1.15		Height Escalation Factor for Ice Thickness
K_{zt} :	1.00		Topographic Factor (2.6.6.4)
t_{iz} :	2.29	in	Design Thickness of Radial Ice at Height z (2.6.8)

Platform Grating :	None
Ice Load :	psf

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Width	Depth	Diam.	Area	Perim.	Ice Weight	
	in	*in*	*in*	*in*	*sq in*	*in*	*lb*	*plf*
NNVV-65B-R4	76.6	24.2	12.4	21.10	168.59	63.98	393.4	
APXVTM14-ALU-I20	60.9	17.2	10.9	14.09	118.08	46.98	215.4	
TD-RRH8x20	30.7	23.2	11.3	19.77	159.04	59.78	134.5	
1900MHz 4x45W RRH	29.7	15.7	15.3	15.41	127.62	52.76	103.8	
800MHz 2x50W RRH	23.6	17.6	16.8	17.83	145.05	59.58	89.3	
Pipe2-1/2STD x 12.5 ft	154.6	7.5	7.5	2.88	37.26	16.24	181.1	14.5
Pipe2STD x 8 ft	100.6	7.0	7.0	2.38	33.66	14.67	104.7	13.1
Pipe2STD x 5.5 ft	70.6	7.0	7.0	2.38	33.66	14.67	72.0	13.1
Pipe1-1/4STD x 6.079 ft	77.5	6.2	6.2	1.66	28.50	12.42	67.4	11.1

RAMAKER & ASSOCIATES, INC.

April 23, 2018

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Rt. 46 West
Parsippany, NJ 07054

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

SUBJECT: **STRUCTURAL ASSESSMENT**
168-FOOT SELF-SUPPORT TOWER

CARRIER: **SPRINT**

SITE: **CT33XC572**
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, TOLLAND COUNTY, CONNECTICUT 06076
RAMAKER & ASSOCIATES PROJECT NUMBER: 22977

RESULTS:	**TOWER:**	**88.1%**	**PASS**
	FOUNDATION:		**NOT ANALYZED**

Dear Tom Jupin:

Ramaker & Associates, Inc. (RAMAKER) respectfully submits this structural assessment for the above mentioned site. The purpose of this report is to determine the structural integrity of the existing structure with the existing and proposed loading. Engineering recommendations regarding the analysis results are provided in the following pages.

RAMAKER developed a finite element model of the tower using tnxTower analysis software. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the tower loading occur.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

James M. Alvin
Structural Designer

James R. Skowronski, P.E.
Supervising Engineer

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
No. 26266
LICENSED
PROFESSIONAL ENGINEER

ANALYSIS CRITERIA

State Building Code	2016 CT State Building Code
Adopted Building Code	2012 IBC
Referenced Standard	TIA-222-G
Risk Category	II
Ultimate Design Wind Speed, V_{ult}	125 mph (3 sec. gust)
Nominal Design Wind Speed, V_{asd}	97 mph (3 sec. gust)
Design Wind Speed w/ Ice	50 mph (3 sec. gust)
Ice Thickness	1 inch
Exposure Category	B
Topographic Category	1
Crest Height	N/A

SUPPORTING DOCUMENTATION

- Structural analysis by EBI Consulting, reference number 81150092, dated February 27, 2015
- Structural analysis by All-Points Technology, job number CT231261, dated October 5, 2016
- Construction drawings by RAMAKER, project number 22977
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

TOWER LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antenna equipment, mount, and cable configurations as shown in the following chart:

Elevation	Appurtenance	Mount	Coax	Owner	Status
168	(1) 20' 4-Bay Dipole	Leg Mount	(1) 1-5/8	Unknown	Existing
	(1) 6' Dipole	Pipe Mount	(1) 7/8		
	(1) 8' Omni	Pipe Mount	(1) 1-1/4		
	(1) 6' Yagi	Pipe Mount	(1) 7/8		
152	(3) Empty Mount	(3) 3' Standoff	--		
150	(6) Andrew SBNHH-1D65B	(3) Sector Frame	(12) 1-5/8 (2) 1-1/4 Hybrid	Verizon	Existing
	(4) Amphenol WPA-80063-4CF				
	(2) Amphenol WPA-80080-4CF				
	(3) ALU B13 RRH4x30-4R				
	(3) ALU B66A RRH4x45				
	(2) Raycap RCMDC-3315-PF-48				
140	(3) Andrew LNX-6515DS-T4M	(3) 4' Standoff	(12) 1-1/4	T-Mobile	Existing
	(3) EMS RR90-17-DP				
	(3) TMA				
130.3	**(6) Decibel DB980H90E-M**	(3) Sector Frame	**(6) 1-5/8** **(4) Hybrid**	Sprint	**Remove**
	(3) ALU 1900MHz 4x45W RRH				**Relocated**
	(3) Commscope NNVV-65B-R4				**Proposed**
	(3) RFS APXVTM14-ALU-I20				
	(6) ALU 800MHz 2x50W RRH				
	(3) ALU TD-RRH8x20-25				
120	(2) Powerwave P65-17-XL-R	(3) Sector Frame	(6) 1-1/4 (2) 3/4 Power (1) 5/16 fiber (1) 1/4	AT&T	Existing
	(1) KMW AM-X-CD-16-65				
	(3) Powerwave 7770.00				
	(3) Ericsson RRUS-11				
	(1) Raycap DC6-48-60-18-8F				
	(3) RETs				
	(6) TMAs				
91	(1) 2' Dipole	Leg Mount	(1) 1/2	Unknown	Existing
86	(1) Vacant Mount	(1) 3' Standoff	--		
82	(1) GPS	Leg Mount	(1) 1/2		
71	(1) 13' Dipole	(1) 6' Standoff	(1) 3/8		
68	(1) 10"x8" Flood Light	Leg Mount	(1) 1/2		
62	(1) 10"x8" Flood Light	Leg Mount	(1) 1/2		
23	(1) Camera	Leg Mount	(1) 1/4		

TOWER RESULTS

The maximum tower member stress capacities under the loading conditions previously described are as follows:

Component Type	Percent Capacity	Pass/Fail
Leg	88.1	Pass
Diagonal	63.3	Pass
Horizontal	57.7	Pass
Bolt	86.9	Pass
Anchor Rods	62.3	Pass
RATING	**88.1**	**PASS**

Note: A rating of 105% or less is within engineering tolerances and considered acceptable.

Results of the analysis show that the existing tower will be stressed to a maximum of 88.1 percent of capacity. Therefore, the existing tower will pass the TIA-222-G analysis requirements under proposed loading conditions.

FOUNDATION REACTIONS

The maximum tower reactions correlated to maximum moment are as follows:

Load Type	EBI Consulting ASD Reactions	Modified ASD	Proposed Model
Axial (k)	42.6	57.5	37.2
Shear (k)	38.3	51.7	37.2
Moment (k-ft)	3639.0	4912.7	3548.8

The TIA-222-G code in Section 15.5.1 allows the original ASD design reactions to be multiplied by 1.35 when comparing them with reactions determined using the TIA-222-G code.

Although all proposed model foundation reactions are less than the modified ASD reactions from the referenced structural analysis, due to lack of information the foundations were not analyzed.

LIMITATIONS

The recommendations contained within this report were developed using the supporting documentation as previously described. All recommendations pertain only to the proposed antenna installation activities as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

- Missing, corroding, and/or deteriorating members
- Improper manufacturing and/or construction
- Improper maintenance

RAMAKER assumes no responsibility for modifications completed prior to or hereafter in which RAMAKER was not directly involved. These modifications include but are not limited to the following:

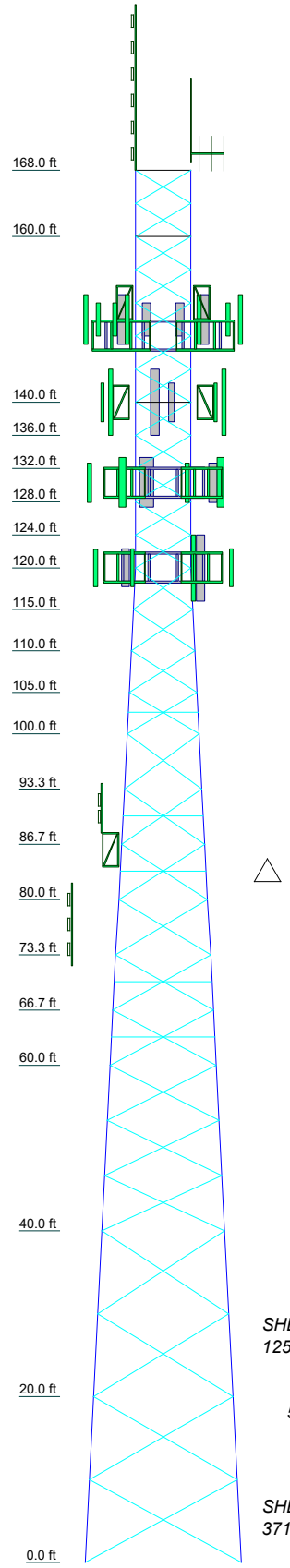
- Replacing or strengthening bracing members
- Reinforcing or extending vertical members
- Installing or removing antenna mounting gates or side arms
- Changing loading configurations

The tower owner is responsible for verifying that the existing loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication and erection deficiencies, this report should be disregarded and RAMAKER should be contacted immediately. RAMAKER is not liable for any representation, recommendation, or conclusion not expressly stated herein.

ATTACHMENTS

- Analysis Figures
- Analysis Calculations

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
Legs	379.3	ROHN 2.5 STD				A		P3STD + Half P3.5STD				ROHN 3.5 EH				ROHN 4 EH		ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH
Leg Grade		875.2	201.5	168.4	168.4	206.9	206.9	297.5	303.6	309.8	410.2	457.9	538.9	554.2	614.7	759.6	733.9	2600.7	2664.2	3130.3
Diagonals		L1 3/4x1 3/4x3/16						L2x2x3/16				L2 1/2x2 1/2x3/16		L2 1/2x2 1/2x1/4				L3x3x1/4		L3 1/2x3 1/2x1/4
Diagonal Grade		A572-50						A36												
Top Girts			B													N.A.				
Sec. Horizontals			L2x2x1/8								C	N.A.	L2x2x3/16	N.A.	N.A.	C	D			
Face Width (ft)	6.69			N.A.					19667	70333	8.27	8.71667	9.39222	10.0678	10.7433	11.4189	12.0944	12.77	14.7967	16.8233
# Panels @ (ft)		12 @ 4					4 @ 5									9 @ 6.66667			4 @ 10	
Weight (lb)	15582.0																			



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 4-Bay Dipole	168	Side Arm Mount [SO 203-1] (T-Mobile)	140
6' Dipole	168	NNVV-65B-R4 w/ Mount Pipe (Sprint)	130.3
2" Dia 8' Omni	168	NNVV-65B-R4 w/ Mount Pipe (Sprint)	130.3
6' Yagi	168	NNVV-65B-R4 w/ Mount Pipe (Sprint)	130.3
2' x 2" Pipe Mount	168	APXVTM14-ALU-120 w/Mount Pipe (Sprint)	130.3
2' x 2" Pipe Mount	168		
10'x2" Pipe Mount	165	APXVTM14-ALU-120 w/Mount Pipe (Sprint)	130.3
Side Arm Mount [SO 311-1]	152	APXVTM14-ALU-120 w/Mount Pipe (Sprint)	130.3
Side Arm Mount [SO 311-1]	152		
Side Arm Mount [SO 311-1]	152	TD-RRH8x20-25 (Sprint)	130.3
(2) SBNHH-1D65B w/Mount Pipe (Verizon)	150	TD-RRH8x20-25 (Sprint)	130.3
(2) SBNHH-1D65B w/Mount Pipe (Verizon)	150	TD-RRH8x20-25 (Sprint)	130.3
		1900MHz 4x45W RRH (Sprint)	130.3
(2) SBNHH-1D65B w/Mount Pipe (Verizon)	150	1900MHz 4x45W RRH (Sprint)	130.3
		1900MHz 4x45W RRH (Sprint)	130.3
WPA-80063/4CF w/Mount Pipe (Verizon)	150	800MHz 2x50W RRH (Sprint)	130.3
		800MHz 2x50W RRH (Sprint)	130.3
WPA-80063/4CF w/Mount Pipe (Verizon)	150	800MHz 2x50W RRH (Sprint)	130.3
		800MHz 2x50W RRH (Sprint)	130.3
WPA-80063/4CF w/Mount Pipe (Verizon)	150	800MHz 2x50W RRH (Sprint)	130.3
		800MHz 2x50W RRH (Sprint)	130.3
WPA-80063/4CF w/Mount Pipe (Verizon)	150	Sector Mount [SM 701-1] (Sprint)	130.3
WPA-80080/4CF w/Mount Pipe (Verizon)	150	Sector Mount [SM 701-1] (Sprint)	130.3
		Sector Mount [SM 701-1] (Sprint)	130.3
WPA-80080/4CF w/Mount Pipe (Verizon)	150	7770.00 w/Mount Pipe (ATI)	120
		7770.00 w/Mount Pipe (ATI)	120
B13 RRH4x30-4R (Verizon)	150	7770.00 w/Mount Pipe (ATI)	120
B13 RRH4x30-4R (Verizon)	150	P65-17-XL-R w/Mount Pipe (ATI)	120
B13 RRH4x30-4R (Verizon)	150	P65-17-XL-R w/Mount Pipe (ATI)	120
B66A RRH4x45 (Verizon)	150	AM-X-CD-16-65-00T w/Mount Pipe (ATI)	120
B66A RRH4x45 (Verizon)	150		
B66A RRH4x45 (Verizon)	150	RET Module (ATI)	120
RCMDC-3315-PF-48 (Verizon)	150	RET Module (ATI)	120
RCMDC-3315-PF-48 (Verizon)	150	RET Module (ATI)	120
Sector Mount [SM 506-1] (Verizon)	150	(2) LGP214nn (ATI)	120
Sector Mount [SM 506-1] (Verizon)	150	(2) LGP214nn (ATI)	120
Sector Mount [SM 506-1] (Verizon)	150	(2) LGP214nn (ATI)	120
LNX-6515DS-T4M w/Mount Pipe (T-Mobile)	140	RRUS-11 (ATI)	120
		RRUS-11 (ATI)	120
LNX-6515DS-T4M w/Mount Pipe (T-Mobile)	140	RRUS-11 (ATI)	120
		DC6-48-60-18-8F (ATI)	120
LNX-6515DS-T4M w/Mount Pipe (T-Mobile)	140	Sector Mount [SM 401-1] (ATI)	120
		Sector Mount [SM 401-1] (ATI)	120
RR90-17-DP w/Mount Pipe (T-Mobile)	140	Sector Mount [SM 401-1] (ATI)	120
RR90-17-DP w/Mount Pipe (T-Mobile)	140	2' Omni	91
RR90-17-DP w/Mount Pipe (T-Mobile)	140	Side Arm Mount [SO 305-1]	86
LGP214nn (T-Mobile)	140	GPS	82
LGP214nn (T-Mobile)	140	12' Dipole	71
LGP214nn (T-Mobile)	140	6' x 2" Pipe Mount	71
Side Arm Mount [SO 203-1] (T-Mobile)	140	Flood Light	68
Side Arm Mount [SO 203-1] (T-Mobile)	140	Camera2	68
		Flood Light	62

ALL REAC
ARE FAC

MAX. COF
DOWN
SHEAR

UPLIFT
SHEAR

AXI
1409

SHEAR
12513 lb

TORQUE
50 mph WIND -

AXIAL
3717

SHEAR
37157 lb

TORQUE 2
REACTIONS -

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2.5STD + Half P3STD	C	L3x3x3/16
B	L1 3/4x1 3/4x3/16	D	L2x2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

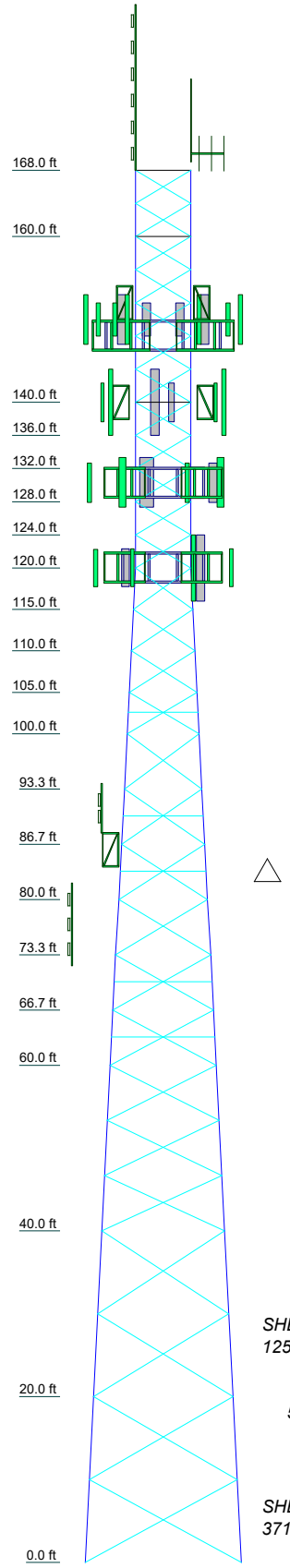
TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 88.1%

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643 7999

Job: CT33XC572			
Project: 22977			
Client: Sprint	Drawn by: JMA	App'd:	
Code: TIA-222-G	Date: 04/17/18	Scale: NTS	
Path: I:\22900\22977\Structural\tnx\22977 rev2.eri		Dwg No. E-1	

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
Legs		ROHN 2.5 STD					A	P3STD + Half P3.5STD					ROHN 3.5 EH				ROHN 4 EH		ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH
Leg Grade		A572-50																			
Diagonals		L1 3/4x1 3/4x3/16						L2x2x3/16					L2 1/2x2 1/2x3/16				L2 1/2x2 1/2x1/4		L3x3x1/4		L3 1/2x3 1/2x1/4
Diagonal Grade		A36																			
Top Girts		L2x2x1/8						N.A.													
Sec. Horizontals	B	N.A.										C	N.A.	L2x2x3/16	N.A.	N.A.	C	D		N.A.	
Face Width (ft)	6.69										19667	8.27	8.71667	9.39222	10.0678	10.7433	11.4189	12.0944	12.77	14.7967	16.8233
# Panels @ (ft)	12 @ 4								4 @ 5								9 @ 6.66667			4 @ 10	
Weight (lb)	15582.0	379.3	875.2	201.5	168.4	168.4	206.9	206.9	297.5	303.6	309.8	410.2	457.9	538.9	554.2	614.7	759.6	733.9	2600.7	2664.2	3130.3



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2.5STD + Half P3STD	C	L3x3x3/16
B	L1 3/4x1 3/4x3/16	D	L2x2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 88.1%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 229779 lb
SHEAR: 23427 lb

UPLIFT: -197134 lb
SHEAR: 20622 lb

AXIAL 140948 lb
SHEAR 12513 lb *MOMENT 1264621 lb-ft*
TORQUE 6080 lb-ft
50 mph WIND - 1.0000 in ICE

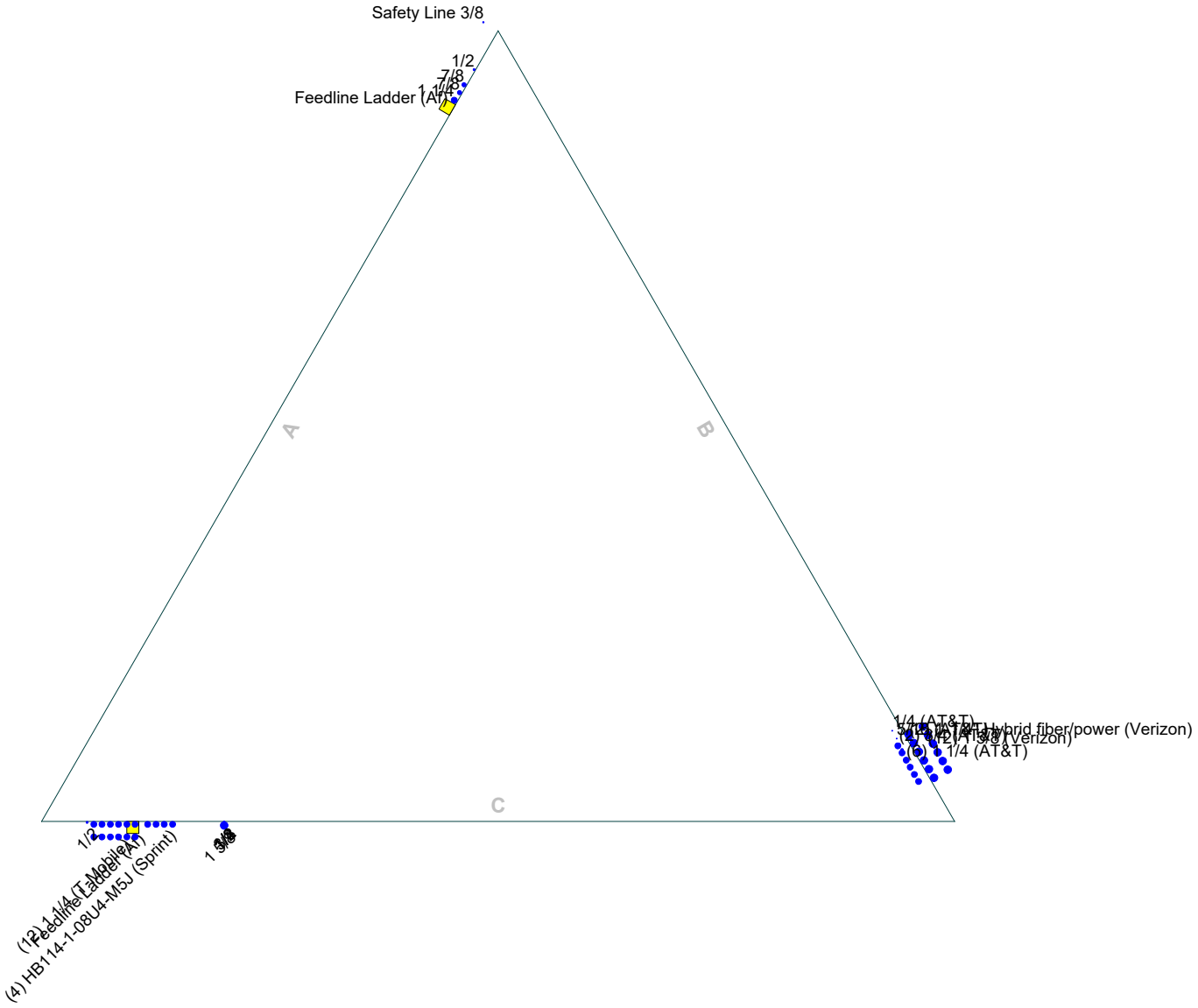
AXIAL 37170 lb
SHEAR 37157 lb *MOMENT 3548806 lb-ft*
TORQUE 25254 lb-ft
REACTIONS - 97 mph WIND

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643 7999

Job: CT33XC572			
Project: 22977			
Client: Sprint	Drawn by: JMA	App'd:	
Code: TIA-222-G	Date: 04/17/18	Scale: NTS	
Path: I:\22900\22977\Structural\tnx\22977 rev2.eri		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face

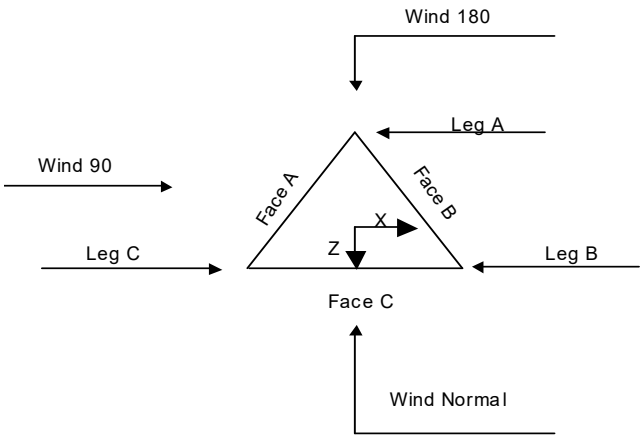


Ramaker & Associates, Inc.	Job: **CT33XC572**		
855 Community Drive Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643 7999	Project: **22977**		
	Client: Sprint	Drawn by: JMA	App'd:
	Code: TIA-222-G	Date: 04/17/18	Scale: NTS
	Path: I:\22900\22977\Structural\tnx\22977 rev2.eri		Dwg No. E-7

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 168.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.69 ft at the top and 18.85 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	168.00-160.00			6.69	1	8.00
T2	160.00-140.00			6.69	1	20.00
T3	140.00-136.00			6.69	1	4.00
T4	136.00-132.00			6.69	1	4.00
T5	132.00-128.00			6.69	1	4.00
T6	128.00-124.00			6.69	1	4.00
T7	124.00-120.00			6.69	1	4.00
T8	120.00-115.00			6.69	1	5.00
T9	115.00-110.00			7.20	1	5.00
T10	110.00-105.00			7.70	1	5.00
T11	105.00-100.00			8.21	1	5.00
T12	100.00-93.33			8.72	1	6.67
T13	93.33-86.67			9.39	1	6.67
T14	86.67-80.00			10.07	1	6.67
T15	80.00-73.33			10.74	1	6.67
T16	73.33-66.67			11.42	1	6.67
T17	66.67-60.00			12.09	1	6.67
T18	60.00-40.00			12.77	1	20.00
T19	40.00-20.00			14.80	1	20.00
T20	20.00-0.00			16.82	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	168.00-160.00	4.00	X Brace	No	No	0.0000	0.0000
T2	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T3	140.00-136.00	4.00	X Brace	No	No	0.0000	0.0000
T4	136.00-132.00	4.00	X Brace	No	No	0.0000	0.0000
T5	132.00-128.00	4.00	X Brace	No	No	0.0000	0.0000
T6	128.00-124.00	4.00	X Brace	No	No	0.0000	0.0000
T7	124.00-120.00	4.00	X Brace	No	No	0.0000	0.0000
T8	120.00-115.00	5.00	X Brace	No	No	0.0000	0.0000
T9	115.00-110.00	5.00	X Brace	No	No	0.0000	0.0000
T10	110.00-105.00	5.00	X Brace	No	No	0.0000	0.0000
T11	105.00-100.00	5.00	X Brace	No	Yes	0.0000	0.0000
T12	100.00-93.33	6.67	X Brace	No	No	0.0000	0.0000
T13	93.33-86.67	6.67	X Brace	No	Yes	0.0000	0.0000
T14	86.67-80.00	6.67	X Brace	No	Yes	0.0000	0.0000
T15	80.00-73.33	6.67	X Brace	No	No	0.0000	0.0000
T16	73.33-66.67	6.67	X Brace	No	Yes	0.0000	0.0000
T17	66.67-60.00	6.67	X Brace	No	Yes	0.0000	0.0000
T18	60.00-40.00	6.67	X Brace	No	No	0.0000	0.0000
T19	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T20	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 168.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 140.00-136.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 136.00-132.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 132.00-128.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T6 128.00-124.00	Arbitrary Shape	P2.5STD + Half P3STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T7 124.00-120.00	Arbitrary Shape	P2.5STD + Half P3STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 120.00-115.00	Arbitrary Shape	P3STD + Half P3.5STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T9 115.00-110.00	Arbitrary Shape	P3STD + Half P3.5STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T10 110.00-105.00	Arbitrary Shape	P3STD + Half P3.5STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T11 105.00-100.00	Arbitrary Shape	P3STD + Half P3.5STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T12 100.00-93.33	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 93.33-86.67	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T14 86.67-80.00	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T15 80.00-73.33	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T16 73.33-66.67	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T17 66.67-60.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T18 60.00-40.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T19 40.00-20.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T20 20.00-0.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 168.00-160.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T3 140.00-136.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T11 105.00-100.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T13 93.33-86.67	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T14 86.67-80.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T16 73.33-66.67	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T17 66.67-60.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 168.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 140.00-136.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 136.00-132.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 132.00-128.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 128.00-124.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 124.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 120.00-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 115.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 110.00-105.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 105.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 100.00-93.33	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 93.33-86.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T14 86.67-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T15 80.00-73.33	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
T16 73.33-66.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T17 66.67-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T18 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T19 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T20 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1
168.00-160.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
140.00-136.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
136.00-132.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
132.00-128.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
128.00-124.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
124.00-120.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
120.00-115.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
115.00-110.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
110.00-105.00				1	1	1	1	1	1	1
T11	Yes	No	2	1	1	1	1	1	1	1
105.00-100.00				1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1
100.00-93.33				1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1
93.33-86.67				1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1
86.67-80.00				1	1	1	1	1	1	1
T15	Yes	No	1	1	1	1	1	1	1	1
80.00-73.33				1	1	1	1	1	1	1
T16	Yes	No	2	1	1	1	1	1	1	1
73.33-66.67				1	1	1	1	1	1	1
T17	Yes	No	1	1	1	1	1	1	1	1
66.67-60.00				1	1	1	1	1	1	1
T18	Yes	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T19	Yes	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T20 20.00-0.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
168.00-160.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-140.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
140.00-136.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
136.00-132.00														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
132.00-128.00														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
128.00-124.00														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
124.00-120.00														
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
120.00-115.00														
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
115.00-110.00														
T10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
110.00-105.00														
T11	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
105.00-100.00														
T12	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
100.00-93.33														
T13	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
93.33-86.67														
T14	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
86.67-80.00														
T15	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
80.00-73.33														
T16	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
73.33-66.67														
T17	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
66.67-60.00														
T18	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
60.00-40.00														
T19	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
40.00-20.00														
T20 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1	Flange	0.6250	4	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
168.00-160.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	0.6250	4	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-140.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	0.7500	0	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
140.00-136.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
136.00-132.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
132.00-128.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
128.00-124.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7	Flange	0.7500	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
124.00-120.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
120.00-115.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
115.00-110.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
110.00-105.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T11	Flange	0.8750	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
105.00-100.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T12	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
100.00-93.33		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T13	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
93.33-86.67		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T14	Flange	0.8750	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
86.67-80.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T15	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
80.00-73.33		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T16	Flange	0.7500	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
73.33-66.67		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T17	Flange	1.0000	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.7500	2	0.6250	0
66.67-60.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T18	Flange	1.0000	6	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
60.00-40.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T19	Flange	1.0000	6	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
40.00-20.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T20 20.00-0.00	Flange	0.7500	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Feedline Ladder (Af)	A	No	Af (CaAa)	168.00 - 0.00	0.0000	0.4	1	1	3.0000	3.0000		8.40

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Feedline Ladder (Af)	C	No	Af (CaAa)	168.00 - 0.00	0.0000	0.4	1	1	3.0000	3.0000		8.40
Safety Line 3/8	A	No	Ar (CaAa)	168.00 - 0.00	4.0000	0.5	1	1	0.3750	0.3750		0.22
7/8	A	No	Ar (CaAa)	168.00 - 0.00	0.0000	0.43	1	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	168.00 - 0.00	0.0000	0.42	1	1	1.1100	1.1100		0.54
1 5/8	C	No	Ar (CaAa)	168.00 - 0.00	0.0000	0.3	1	1	0.5000 1.9800	1.9800		1.04
1 1/4	A	No	Ar (CaAa)	168.00 - 0.00	0.0000	0.41	1	1	0.5000 1.5500	1.5500		0.66
**********												
1 5/8 (Verizon)	B	No	Ar (CaAa)	149.00 - 0.00	0.0000	0.42	12	6	0.5000 1.9800	1.9800		1.04
1-1/4" Hybrid fiber/power (Verizon)	B	No	Ar (CaAa)	149.00 - 0.00	0.0000	0.4	2	2	0.5000 1.2500	1.2500		0.66
**********												
1 1/4 (T-Mobile)	C	No	Ar (CaAa)	140.00 - 0.00	0.0000	0.42	12	6	0.5000 1.5500	1.5500		0.66
**********												
HB114-1-08U4-M5J (Sprint)	C	No	Ar (CaAa)	131.00 - 0.00	0.0000	0.37	4	4	0.5000 1.5400	1.5400		1.08
**********												
1 1/4 (AT&T)	B	No	Ar (CaAa)	120.00 - 0.00	-2.0000	0.42	6	6	0.5000 1.5500	1.5500		0.66
3/4 (AT&T)	B	No	Ar (CaAa)	120.00 - 0.00	-2.0000	0.4	2	2	0.7500	0.7500		0.00
5/16 (AT&T)	B	No	Ar (CaAa)	120.00 - 0.00	-2.0000	0.39	1	1	0.3200	0.3200		0.09
1/4 (AT&T)	B	No	Ar (CaAa)	120.00 - 0.00	-2.0000	0.38	1	1	0.2900	0.2900		0.07
**********												
1/2	C	No	Ar (CaAa)	91.00 - 0.00	0.0000	0.3	1	1	0.5800	0.5800		0.25
**********												
1/2	C	No	Ar (CaAa)	82.00 - 0.00	0.0000	0.3	1	1	0.5800	0.5800		0.25
**********												
3/8	C	No	Ar (CaAa)	71.00 - 0.00	0.0000	0.3	1	1	0.4400	0.4400		0.08
**********												
1/2	C	No	Ar (CaAa)	68.00 - 0.00	0.0000	0.45	1	1	0.5800	0.5800		0.25
**********												
1/2	A	No	Ar (CaAa)	23.00 - 0.00	0.0000	0.45	1	1	0.5800	0.5800		0.25
**********												
1/4	C	No	Ar (CaAa)	23.00 - 0.00	0.0000	0.3	1	1	0.2900	0.2900		0.07

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 lb
T1	168.00-160.00	A	0.000	0.000	7.316	0.000	82.88
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.584	0.000	75.52
T2	160.00-140.00	A	0.000	0.000	18.290	0.000	207.20
		B	0.000	0.000	23.634	0.000	124.20
		C	0.000	0.000	13.960	0.000	188.80
T3	140.00-136.00	A	0.000	0.000	3.658	0.000	41.44
		B	0.000	0.000	10.504	0.000	55.20
		C	0.000	0.000	10.232	0.000	69.44

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 lb
T4	136.00-132.00	A	0.000	0.000	3.658	0.000	41.44
		B	0.000	0.000	10.504	0.000	55.20
		C	0.000	0.000	10.232	0.000	69.44
T5	132.00-128.00	A	0.000	0.000	3.658	0.000	41.44
		B	0.000	0.000	10.504	0.000	55.20
		C	0.000	0.000	12.080	0.000	82.40
T6	128.00-124.00	A	0.000	0.000	3.658	0.000	41.44
		B	0.000	0.000	10.504	0.000	55.20
		C	0.000	0.000	12.696	0.000	86.72
T7	124.00-120.00	A	0.000	0.000	3.658	0.000	41.44
		B	0.000	0.000	10.504	0.000	55.20
		C	0.000	0.000	12.696	0.000	86.72
T8	120.00-115.00	A	0.000	0.000	4.572	0.000	51.80
		B	0.000	0.000	18.835	0.000	89.60
		C	0.000	0.000	15.870	0.000	108.40
T9	115.00-110.00	A	0.000	0.000	4.572	0.000	51.80
		B	0.000	0.000	18.835	0.000	89.60
		C	0.000	0.000	15.870	0.000	108.40
T10	110.00-105.00	A	0.000	0.000	4.572	0.000	51.80
		B	0.000	0.000	18.835	0.000	89.60
		C	0.000	0.000	15.870	0.000	108.40
T11	105.00-100.00	A	0.000	0.000	4.572	0.000	51.80
		B	0.000	0.000	18.835	0.000	89.60
		C	0.000	0.000	15.870	0.000	108.40
T12	100.00-93.33	A	0.000	0.000	6.097	0.000	69.07
		B	0.000	0.000	25.113	0.000	119.47
		C	0.000	0.000	21.160	0.000	144.53
T13	93.33-86.67	A	0.000	0.000	6.097	0.000	69.07
		B	0.000	0.000	25.113	0.000	119.47
		C	0.000	0.000	21.411	0.000	145.62
T14	86.67-80.00	A	0.000	0.000	6.097	0.000	69.07
		B	0.000	0.000	25.113	0.000	119.47
		C	0.000	0.000	21.663	0.000	146.70
T15	80.00-73.33	A	0.000	0.000	6.097	0.000	69.07
		B	0.000	0.000	25.113	0.000	119.47
		C	0.000	0.000	21.933	0.000	147.87
T16	73.33-66.67	A	0.000	0.000	6.097	0.000	69.07
		B	0.000	0.000	25.113	0.000	119.47
		C	0.000	0.000	22.201	0.000	148.55
T17	66.67-60.00	A	0.000	0.000	6.097	0.000	69.07
		B	0.000	0.000	25.113	0.000	119.47
		C	0.000	0.000	22.613	0.000	150.07
T18	60.00-40.00	A	0.000	0.000	18.290	0.000	207.20
		B	0.000	0.000	75.340	0.000	358.40
		C	0.000	0.000	67.840	0.000	450.20
T19	40.00-20.00	A	0.000	0.000	18.464	0.000	207.95
		B	0.000	0.000	75.340	0.000	358.40
		C	0.000	0.000	67.927	0.000	450.41
T20	20.00-0.00	A	0.000	0.000	19.450	0.000	212.20
		B	0.000	0.000	75.340	0.000	358.40
		C	0.000	0.000	68.420	0.000	451.60

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 lb
T1	168.00-160.00	A	2.348	0.000	0.000	26.098	0.000	546.07

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 lb
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	13.097	0.000	327.40
T2	160.00-140.00	A	2.327	0.000	0.000	64.829	0.000	1348.71
		B		0.000	0.000	35.381	0.000	790.96
		C		0.000	0.000	32.576	0.000	810.29
T3	140.00-136.00	A	2.308	0.000	0.000	12.889	0.000	266.71
		B		0.000	0.000	15.672	0.000	349.27
		C		0.000	0.000	15.909	0.000	380.90
T4	136.00-132.00	A	2.301	0.000	0.000	12.861	0.000	265.65
		B		0.000	0.000	15.653	0.000	348.48
		C		0.000	0.000	15.889	0.000	379.89
T5	132.00-128.00	A	2.294	0.000	0.000	12.834	0.000	264.57
		B		0.000	0.000	15.634	0.000	347.66
		C		0.000	0.000	21.004	0.000	461.27
T6	128.00-124.00	A	2.287	0.000	0.000	12.805	0.000	263.46
		B		0.000	0.000	15.614	0.000	346.82
		C		0.000	0.000	22.685	0.000	487.33
T7	124.00-120.00	A	2.279	0.000	0.000	12.775	0.000	262.31
		B		0.000	0.000	15.593	0.000	345.96
		C		0.000	0.000	22.653	0.000	485.87
T8	120.00-115.00	A	2.271	0.000	0.000	15.927	0.000	326.24
		B		0.000	0.000	40.590	0.000	735.82
		C		0.000	0.000	28.271	0.000	605.23
T9	115.00-110.00	A	2.261	0.000	0.000	15.877	0.000	324.34
		B		0.000	0.000	40.503	0.000	732.66
		C		0.000	0.000	28.218	0.000	602.80
T10	110.00-105.00	A	2.251	0.000	0.000	15.826	0.000	322.37
		B		0.000	0.000	40.413	0.000	729.39
		C		0.000	0.000	28.163	0.000	600.28
T11	105.00-100.00	A	2.240	0.000	0.000	15.773	0.000	320.32
		B		0.000	0.000	40.319	0.000	725.99
		C		0.000	0.000	28.105	0.000	597.66
T12	100.00-93.33	A	2.227	0.000	0.000	20.943	0.000	423.77
		B		0.000	0.000	53.604	0.000	962.45
		C		0.000	0.000	37.380	0.000	792.60
T13	93.33-86.67	A	2.211	0.000	0.000	20.837	0.000	419.76
		B		0.000	0.000	53.418	0.000	955.76
		C		0.000	0.000	39.434	0.000	821.20
T14	86.67-80.00	A	2.194	0.000	0.000	20.724	0.000	415.49
		B		0.000	0.000	53.219	0.000	948.64
		C		0.000	0.000	41.450	0.000	848.56
T15	80.00-73.33	A	2.176	0.000	0.000	20.603	0.000	410.93
		B		0.000	0.000	53.005	0.000	941.02
		C		0.000	0.000	43.590	0.000	877.08
T16	73.33-66.67	A	2.156	0.000	0.000	20.471	0.000	406.04
		B		0.000	0.000	52.774	0.000	932.81
		C		0.000	0.000	46.108	0.000	909.09
T17	66.67-60.00	A	2.135	0.000	0.000	20.328	0.000	400.74
		B		0.000	0.000	52.522	0.000	923.91
		C		0.000	0.000	49.558	0.000	954.75
T18	60.00-40.00	A	2.085	0.000	0.000	59.987	0.000	1165.75
		B		0.000	0.000	155.810	0.000	2710.23
		C		0.000	0.000	146.804	0.000	2793.47
T19	40.00-20.00	A	1.981	0.000	0.000	59.273	0.000	1111.20
		B		0.000	0.000	152.159	0.000	2584.54
		C		0.000	0.000	144.190	0.000	2666.01
T20	20.00-0.00	A	1.775	0.000	0.000	62.048	0.000	1060.42
		B		0.000	0.000	144.923	0.000	2344.39
		C		0.000	0.000	142.883	0.000	2466.89

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	168.00-160.00	-14.9564	-13.4328	-12.4169	-19.7951
T2	160.00-140.00	0.5177	-2.4853	-3.2042	-11.9430
T3	140.00-136.00	-5.5810	6.7695	-4.0791	-1.9460
T4	136.00-132.00	-5.5810	6.7695	-4.0810	-1.9349
T5	132.00-128.00	-8.0484	7.4099	-6.9215	-0.3648
T6	128.00-124.00	-8.7624	7.6129	-7.7364	0.1237
T7	124.00-120.00	-8.7624	7.6129	-7.7401	0.1338
T8	120.00-115.00	-3.1488	10.4755	0.8892	5.0241
T9	115.00-110.00	-3.3817	11.2262	0.9718	5.3800
T10	110.00-105.00	-3.6146	11.9768	1.0521	5.7382
T11	105.00-100.00	-3.8475	12.7274	1.1301	6.0987
T12	100.00-93.33	-4.1192	13.6032	1.2177	6.5225
T13	93.33-86.67	-4.6454	14.7505	0.4322	7.6820
T14	86.67-80.00	-5.1947	15.9120	-0.4208	8.8897
T15	80.00-73.33	-5.7853	17.1003	-1.4061	10.1953
T16	73.33-66.67	-6.4525	18.3115	-2.8095	11.7096
T17	66.67-60.00	-7.4237	19.6289	-5.0897	13.5503
T18	60.00-40.00	-8.2350	21.7413	-5.6598	15.0611
T19	40.00-20.00	-9.4845	24.7201	-6.8084	16.9910
T20	20.00-0.00	-10.8899	26.7207	-9.1796	17.2014

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.4928
T1	2	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.4928
T1	3	Safety Line 3/8	160.00 - 168.00	0.6000	0.4928
T1	4	7/8	160.00 - 168.00	0.6000	0.4928
T1	5	7/8	160.00 - 168.00	0.6000	0.4928
T1	6	1 5/8	160.00 - 168.00	0.6000	0.4928
T1	7	1 1/4	160.00 - 168.00	0.6000	0.4928
T2	1	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.5300
T2	2	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.5300
T2	3	Safety Line 3/8	140.00 - 160.00	0.6000	0.5300
T2	4	7/8	140.00 - 160.00	0.6000	0.5300
T2	5	7/8	140.00 - 160.00	0.6000	0.5300
T2	6	1 5/8	140.00 - 160.00	0.6000	0.5300
T2	7	1 1/4	140.00 - 160.00	0.6000	0.5300
T2	9	1 5/8	140.00 - 149.00	0.6000	0.5300
T2	10	1-1/4" Hybrid fiber/power	140.00 - 149.00	0.6000	0.5300
T3	1	Feedline Ladder (Af)	136.00 - 140.00	0.6000	0.4353
T3	2	Feedline Ladder (Af)	136.00 - 140.00	0.6000	0.4353
T3	3	Safety Line 3/8	136.00 - 140.00	0.6000	0.4353
T3	4	7/8	136.00 - 140.00	0.6000	0.4353
T3	5	7/8	136.00 - 140.00	0.6000	0.4353
T3	6	1 5/8	136.00 - 140.00	0.6000	0.4353
T3	7	1 1/4	136.00 - 140.00	0.6000	0.4353
T3	9	1 5/8	136.00 - 140.00	0.6000	0.4353
T3	10	1-1/4" Hybrid fiber/power	136.00 - 140.00	0.6000	0.4353

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	12	1 1/4	136.00 - 140.00	0.6000	0.4353
T4	1	Feedline Ladder (Af)	132.00 - 136.00	0.6000	0.5576
T4	2	Feedline Ladder (Af)	132.00 - 136.00	0.6000	0.5576
T4	3	Safety Line 3/8	132.00 - 136.00	0.6000	0.5576
T4	4	7/8	132.00 - 136.00	0.6000	0.5576
T4	5	7/8	132.00 - 136.00	0.6000	0.5576
T4	6	1 5/8	132.00 - 136.00	0.6000	0.5576
T4	7	1 1/4	132.00 - 136.00	0.6000	0.5576
T4	9	1 5/8	132.00 - 136.00	0.6000	0.5576
T4	10	1-1/4" Hybrid fiber/power	132.00 - 136.00	0.6000	0.5576
T4	12	1 1/4	132.00 - 136.00	0.6000	0.5576
T5	1	Feedline Ladder (Af)	128.00 - 132.00	0.6000	0.5585
T5	2	Feedline Ladder (Af)	128.00 - 132.00	0.6000	0.5585
T5	3	Safety Line 3/8	128.00 - 132.00	0.6000	0.5585
T5	4	7/8	128.00 - 132.00	0.6000	0.5585
T5	5	7/8	128.00 - 132.00	0.6000	0.5585
T5	6	1 5/8	128.00 - 132.00	0.6000	0.5585
T5	7	1 1/4	128.00 - 132.00	0.6000	0.5585
T5	9	1 5/8	128.00 - 132.00	0.6000	0.5585
T5	10	1-1/4" Hybrid fiber/power	128.00 - 132.00	0.6000	0.5585
T5	12	1 1/4	128.00 - 132.00	0.6000	0.5585
T5	14	HB114-1-08U4-M5J	128.00 - 131.00	0.6000	0.5585
T6	1	Feedline Ladder (Af)	124.00 - 128.00	0.6000	0.5450
T6	2	Feedline Ladder (Af)	124.00 - 128.00	0.6000	0.5450
T6	3	Safety Line 3/8	124.00 - 128.00	0.6000	0.5450
T6	4	7/8	124.00 - 128.00	0.6000	0.5450
T6	5	7/8	124.00 - 128.00	0.6000	0.5450
T6	6	1 5/8	124.00 - 128.00	0.6000	0.5450
T6	7	1 1/4	124.00 - 128.00	0.6000	0.5450
T6	9	1 5/8	124.00 - 128.00	0.6000	0.5450
T6	10	1-1/4" Hybrid fiber/power	124.00 - 128.00	0.6000	0.5450
T6	12	1 1/4	124.00 - 128.00	0.6000	0.5450
T6	14	HB114-1-08U4-M5J	124.00 - 128.00	0.6000	0.5450
T7	1	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5470
T7	2	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5470
T7	3	Safety Line 3/8	120.00 - 124.00	0.6000	0.5470
T7	4	7/8	120.00 - 124.00	0.6000	0.5470
T7	5	7/8	120.00 - 124.00	0.6000	0.5470
T7	6	1 5/8	120.00 - 124.00	0.6000	0.5470
T7	7	1 1/4	120.00 - 124.00	0.6000	0.5470
T7	9	1 5/8	120.00 - 124.00	0.6000	0.5470
T7	10	1-1/4" Hybrid fiber/power	120.00 - 124.00	0.6000	0.5470
T7	12	1 1/4	120.00 - 124.00	0.6000	0.5470
T7	14	HB114-1-08U4-M5J	120.00 - 124.00	0.6000	0.5470
T8	1	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.5767
T8	2	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.5767
T8	3	Safety Line 3/8	115.00 - 120.00	0.6000	0.5767
T8	4	7/8	115.00 - 120.00	0.6000	0.5767
T8	5	7/8	115.00 - 120.00	0.6000	0.5767
T8	6	1 5/8	115.00 - 120.00	0.6000	0.5767
T8	7	1 1/4	115.00 - 120.00	0.6000	0.5767
T8	9	1 5/8	115.00 - 120.00	0.6000	0.5767
T8	10	1-1/4" Hybrid fiber/power	115.00 - 120.00	0.6000	0.5767
T8	12	1 1/4	115.00 - 120.00	0.6000	0.5767
T8	14	HB114-1-08U4-M5J	115.00 - 120.00	0.6000	0.5767
T8	16	1 1/4	115.00 - 120.00	0.6000	0.5767
T8	17	3/4	115.00 - 120.00	0.6000	0.5767
T8	18	5/16	115.00 - 120.00	0.6000	0.5767
T8	19	1/4	115.00 - 120.00	0.6000	0.5767
T9	1	Feedline Ladder (Af)	110.00 - 115.00	0.6000	0.5934
T9	2	Feedline Ladder (Af)	110.00 - 115.00	0.6000	0.5934
T9	3	Safety Line 3/8	110.00 - 115.00	0.6000	0.5934

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	4	7/8	110.00 - 115.00	0.6000	0.5934
T9	5	7/8	110.00 - 115.00	0.6000	0.5934
T9	6	1 5/8	110.00 - 115.00	0.6000	0.5934
T9	7	1 1/4	110.00 - 115.00	0.6000	0.5934
T9	9	1 5/8	110.00 - 115.00	0.6000	0.5934
T9	10	1-1/4" Hybrid fiber/power	110.00 - 115.00	0.6000	0.5934
T9	12	1 1/4	110.00 - 115.00	0.6000	0.5934
T9	14	HB114-1-08U4-M5J	110.00 - 115.00	0.6000	0.5934
T9	16	1 1/4	110.00 - 115.00	0.6000	0.5934
T9	17	3/4	110.00 - 115.00	0.6000	0.5934
T9	18	5/16	110.00 - 115.00	0.6000	0.5934
T9	19	1/4	110.00 - 115.00	0.6000	0.5934
T10	1	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.6000
T10	2	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.6000
T10	3	Safety Line 3/8	105.00 - 110.00	0.6000	0.6000
T10	4	7/8	105.00 - 110.00	0.6000	0.6000
T10	5	7/8	105.00 - 110.00	0.6000	0.6000
T10	6	1 5/8	105.00 - 110.00	0.6000	0.6000
T10	7	1 1/4	105.00 - 110.00	0.6000	0.6000
T10	9	1 5/8	105.00 - 110.00	0.6000	0.6000
T10	10	1-1/4" Hybrid fiber/power	105.00 - 110.00	0.6000	0.6000
T10	12	1 1/4	105.00 - 110.00	0.6000	0.6000
T10	14	HB114-1-08U4-M5J	105.00 - 110.00	0.6000	0.6000
T10	16	1 1/4	105.00 - 110.00	0.6000	0.6000
T10	17	3/4	105.00 - 110.00	0.6000	0.6000
T10	18	5/16	105.00 - 110.00	0.6000	0.6000
T10	19	1/4	105.00 - 110.00	0.6000	0.6000
T11	1	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.5086
T11	2	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.5086
T11	3	Safety Line 3/8	100.00 - 105.00	0.6000	0.5086
T11	4	7/8	100.00 - 105.00	0.6000	0.5086
T11	5	7/8	100.00 - 105.00	0.6000	0.5086
T11	6	1 5/8	100.00 - 105.00	0.6000	0.5086
T11	7	1 1/4	100.00 - 105.00	0.6000	0.5086
T11	9	1 5/8	100.00 - 105.00	0.6000	0.5086
T11	10	1-1/4" Hybrid fiber/power	100.00 - 105.00	0.6000	0.5086
T11	12	1 1/4	100.00 - 105.00	0.6000	0.5086
T11	14	HB114-1-08U4-M5J	100.00 - 105.00	0.6000	0.5086
T11	16	1 1/4	100.00 - 105.00	0.6000	0.5086
T11	17	3/4	100.00 - 105.00	0.6000	0.5086
T11	18	5/16	100.00 - 105.00	0.6000	0.5086
T11	19	1/4	100.00 - 105.00	0.6000	0.5086
T12	1	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T12	2	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T12	3	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T12	4	7/8	93.33 - 100.00	0.6000	0.6000
T12	5	7/8	93.33 - 100.00	0.6000	0.6000
T12	6	1 5/8	93.33 - 100.00	0.6000	0.6000
T12	7	1 1/4	93.33 - 100.00	0.6000	0.6000
T12	9	1 5/8	93.33 - 100.00	0.6000	0.6000
T12	10	1-1/4" Hybrid fiber/power	93.33 - 100.00	0.6000	0.6000
T12	12	1 1/4	93.33 - 100.00	0.6000	0.6000
T12	14	HB114-1-08U4-M5J	93.33 - 100.00	0.6000	0.6000
T12	16	1 1/4	93.33 - 100.00	0.6000	0.6000
T12	17	3/4	93.33 - 100.00	0.6000	0.6000
T12	18	5/16	93.33 - 100.00	0.6000	0.6000
T12	19	1/4	93.33 - 100.00	0.6000	0.6000
T13	1	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T13	2	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T13	3	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T13	4	7/8	86.67 - 93.33	0.6000	0.6000
T13	5	7/8	86.67 - 93.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	6	1 5/8	86.67 - 93.33	0.6000	0.6000
T13	7	1 1/4	86.67 - 93.33	0.6000	0.6000
T13	9	1 5/8	86.67 - 93.33	0.6000	0.6000
T13	10	1-1/4" Hybrid fiber/power	86.67 - 93.33	0.6000	0.6000
T13	12	1 1/4	86.67 - 93.33	0.6000	0.6000
T13	14	HB114-1-08U4-M5J	86.67 - 93.33	0.6000	0.6000
T13	16	1 1/4	86.67 - 93.33	0.6000	0.6000
T13	17	3/4	86.67 - 93.33	0.6000	0.6000
T13	18	5/16	86.67 - 93.33	0.6000	0.6000
T13	19	1/4	86.67 - 93.33	0.6000	0.6000
T13	21	1/2	86.67 - 91.00	0.6000	0.6000
T14	1	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T14	2	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T14	3	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T14	4	7/8	80.00 - 86.67	0.6000	0.6000
T14	5	7/8	80.00 - 86.67	0.6000	0.6000
T14	6	1 5/8	80.00 - 86.67	0.6000	0.6000
T14	7	1 1/4	80.00 - 86.67	0.6000	0.6000
T14	9	1 5/8	80.00 - 86.67	0.6000	0.6000
T14	10	1-1/4" Hybrid fiber/power	80.00 - 86.67	0.6000	0.6000
T14	12	1 1/4	80.00 - 86.67	0.6000	0.6000
T14	14	HB114-1-08U4-M5J	80.00 - 86.67	0.6000	0.6000
T14	16	1 1/4	80.00 - 86.67	0.6000	0.6000
T14	17	3/4	80.00 - 86.67	0.6000	0.6000
T14	18	5/16	80.00 - 86.67	0.6000	0.6000
T14	19	1/4	80.00 - 86.67	0.6000	0.6000
T14	21	1/2	80.00 - 86.67	0.6000	0.6000
T14	23	1/2	80.00 - 82.00	0.6000	0.6000
T15	1	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T15	2	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T15	3	Safety Line 3/8	73.33 - 80.00	0.6000	0.6000
T15	4	7/8	73.33 - 80.00	0.6000	0.6000
T15	5	7/8	73.33 - 80.00	0.6000	0.6000
T15	6	1 5/8	73.33 - 80.00	0.6000	0.6000
T15	7	1 1/4	73.33 - 80.00	0.6000	0.6000
T15	9	1 5/8	73.33 - 80.00	0.6000	0.6000
T15	10	1-1/4" Hybrid fiber/power	73.33 - 80.00	0.6000	0.6000
T15	12	1 1/4	73.33 - 80.00	0.6000	0.6000
T15	14	HB114-1-08U4-M5J	73.33 - 80.00	0.6000	0.6000
T15	16	1 1/4	73.33 - 80.00	0.6000	0.6000
T15	17	3/4	73.33 - 80.00	0.6000	0.6000
T15	18	5/16	73.33 - 80.00	0.6000	0.6000
T15	19	1/4	73.33 - 80.00	0.6000	0.6000
T15	21	1/2	73.33 - 80.00	0.6000	0.6000
T15	23	1/2	73.33 - 80.00	0.6000	0.6000
T16	1	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T16	2	Feedline Ladder (Af)	66.67 - 73.33	0.6000	0.6000
T16	3	Safety Line 3/8	66.67 - 73.33	0.6000	0.6000
T16	4	7/8	66.67 - 73.33	0.6000	0.6000
T16	5	7/8	66.67 - 73.33	0.6000	0.6000
T16	6	1 5/8	66.67 - 73.33	0.6000	0.6000
T16	7	1 1/4	66.67 - 73.33	0.6000	0.6000
T16	9	1 5/8	66.67 - 73.33	0.6000	0.6000
T16	10	1-1/4" Hybrid fiber/power	66.67 - 73.33	0.6000	0.6000
T16	12	1 1/4	66.67 - 73.33	0.6000	0.6000
T16	14	HB114-1-08U4-M5J	66.67 - 73.33	0.6000	0.6000
T16	16	1 1/4	66.67 - 73.33	0.6000	0.6000
T16	17	3/4	66.67 - 73.33	0.6000	0.6000
T16	18	5/16	66.67 - 73.33	0.6000	0.6000
T16	19	1/4	66.67 - 73.33	0.6000	0.6000
T16	21	1/2	66.67 - 73.33	0.6000	0.6000
T16	23	1/2	66.67 - 73.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T16	25	3/8	66.67 - 71.00	0.6000	0.6000
T16	27	1/2	66.67 - 68.00	0.6000	0.6000
T17	1	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T17	2	Feedline Ladder (Af)	60.00 - 66.67	0.6000	0.6000
T17	3	Safety Line 3/8	60.00 - 66.67	0.6000	0.6000
T17	4	7/8	60.00 - 66.67	0.6000	0.6000
T17	5	7/8	60.00 - 66.67	0.6000	0.6000
T17	6	1 5/8	60.00 - 66.67	0.6000	0.6000
T17	7	1 1/4	60.00 - 66.67	0.6000	0.6000
T17	9	1 5/8	60.00 - 66.67	0.6000	0.6000
T17	10	1-1/4" Hybrid fiber/power	60.00 - 66.67	0.6000	0.6000
T17	12	1 1/4	60.00 - 66.67	0.6000	0.6000
T17	14	HB114-1-08U4-M5J	60.00 - 66.67	0.6000	0.6000
T17	16	1 1/4	60.00 - 66.67	0.6000	0.6000
T17	17	3/4	60.00 - 66.67	0.6000	0.6000
T17	18	5/16	60.00 - 66.67	0.6000	0.6000
T17	19	1/4	60.00 - 66.67	0.6000	0.6000
T17	21	1/2	60.00 - 66.67	0.6000	0.6000
T17	23	1/2	60.00 - 66.67	0.6000	0.6000
T17	25	3/8	60.00 - 66.67	0.6000	0.6000
T17	27	1/2	60.00 - 66.67	0.6000	0.6000
T18	1	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T18	2	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T18	3	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T18	4	7/8	40.00 - 60.00	0.6000	0.6000
T18	5	7/8	40.00 - 60.00	0.6000	0.6000
T18	6	1 5/8	40.00 - 60.00	0.6000	0.6000
T18	7	1 1/4	40.00 - 60.00	0.6000	0.6000
T18	9	1 5/8	40.00 - 60.00	0.6000	0.6000
T18	10	1-1/4" Hybrid fiber/power	40.00 - 60.00	0.6000	0.6000
T18	12	1 1/4	40.00 - 60.00	0.6000	0.6000
T18	14	HB114-1-08U4-M5J	40.00 - 60.00	0.6000	0.6000
T18	16	1 1/4	40.00 - 60.00	0.6000	0.6000
T18	17	3/4	40.00 - 60.00	0.6000	0.6000
T18	18	5/16	40.00 - 60.00	0.6000	0.6000
T18	19	1/4	40.00 - 60.00	0.6000	0.6000
T18	21	1/2	40.00 - 60.00	0.6000	0.6000
T18	23	1/2	40.00 - 60.00	0.6000	0.6000
T18	25	3/8	40.00 - 60.00	0.6000	0.6000
T18	27	1/2	40.00 - 60.00	0.6000	0.6000
T19	1	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T19	2	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T19	3	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T19	4	7/8	20.00 - 40.00	0.6000	0.6000
T19	5	7/8	20.00 - 40.00	0.6000	0.6000
T19	6	1 5/8	20.00 - 40.00	0.6000	0.6000
T19	7	1 1/4	20.00 - 40.00	0.6000	0.6000
T19	9	1 5/8	20.00 - 40.00	0.6000	0.6000
T19	10	1-1/4" Hybrid fiber/power	20.00 - 40.00	0.6000	0.6000
T19	12	1 1/4	20.00 - 40.00	0.6000	0.6000
T19	14	HB114-1-08U4-M5J	20.00 - 40.00	0.6000	0.6000
T19	16	1 1/4	20.00 - 40.00	0.6000	0.6000
T19	17	3/4	20.00 - 40.00	0.6000	0.6000
T19	18	5/16	20.00 - 40.00	0.6000	0.6000
T19	19	1/4	20.00 - 40.00	0.6000	0.6000
T19	21	1/2	20.00 - 40.00	0.6000	0.6000
T19	23	1/2	20.00 - 40.00	0.6000	0.6000
T19	25	3/8	20.00 - 40.00	0.6000	0.6000
T19	27	1/2	20.00 - 40.00	0.6000	0.6000
T19	29	1/2	20.00 - 23.00	0.6000	0.6000
T19	31	1/4	20.00 - 23.00	0.6000	0.6000
T20	1	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T20	2	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T20	3	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T20	4	7/8	0.00 - 20.00	0.6000	0.6000
T20	5	7/8	0.00 - 20.00	0.6000	0.6000
T20	6	1 5/8	0.00 - 20.00	0.6000	0.6000
T20	7	1 1/4	0.00 - 20.00	0.6000	0.6000
T20	9	1 5/8	0.00 - 20.00	0.6000	0.6000
T20	10	1-1/4" Hybrid fiber/power	0.00 - 20.00	0.6000	0.6000
T20	12	1 1/4	0.00 - 20.00	0.6000	0.6000
T20	14	HB114-1-08U4-M5J	0.00 - 20.00	0.6000	0.6000
T20	16	1 1/4	0.00 - 20.00	0.6000	0.6000
T20	17	3/4	0.00 - 20.00	0.6000	0.6000
T20	18	5/16	0.00 - 20.00	0.6000	0.6000
T20	19	1/4	0.00 - 20.00	0.6000	0.6000
T20	21	1/2	0.00 - 20.00	0.6000	0.6000
T20	23	1/2	0.00 - 20.00	0.6000	0.6000
T20	25	3/8	0.00 - 20.00	0.6000	0.6000
T20	27	1/2	0.00 - 20.00	0.6000	0.6000
T20	29	1/2	0.00 - 20.00	0.6000	0.6000
T20	31	1/4	0.00 - 20.00	0.6000	0.6000

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 lb
20' 4-Bay Dipole	C	From Leg	0.00	0.0000	168.00	No Ice	4.00	4.00	55.00
			0.00			1/2" Ice	6.00	6.00	100.00
			10.00			1" Ice	8.00	8.00	145.00
6' Dipole	A	From Leg	0.00	0.0000	168.00	No Ice	2.25	2.25	30.00
			0.00			1/2" Ice	3.00	3.00	40.00
			5.00			1" Ice	3.75	3.75	50.00
2" Dia 8' Omni	B	From Leg	0.00	0.0000	168.00	No Ice	2.00	2.00	5.00
			0.00			1/2" Ice	3.03	3.03	18.00
			6.00			1" Ice	4.06	4.06	31.00
6' Yagi	B	From Leg	0.00	0.0000	168.00	No Ice	3.00	3.00	10.00
			0.00			1/2" Ice	4.00	4.00	20.00
			2.00			1" Ice	5.00	5.00	30.00
2' x 2" Pipe Mount	A	From Leg	0.00	0.0000	168.00	No Ice	0.34	0.34	7.32
			0.00			1/2" Ice	0.47	0.47	11.12
			1.00			1" Ice	0.61	0.61	16.54
2' x 2" Pipe Mount	B	From Leg	0.00	0.0000	168.00	No Ice	0.34	0.34	7.32
			0.00			1/2" Ice	0.47	0.47	11.12
			1.00			1" Ice	0.61	0.61	16.54
**********									
10'x2" Pipe Mount	B	None		0.0000	165.00	No Ice	2.38	2.38	36.50
						1/2" Ice	3.41	3.41	62.84
						1" Ice	4.47	4.47	91.81
**********									
Side Arm Mount [SO 311-1]	A	From Leg	1.50	0.0000	152.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	5.81	7.15	126.70
Side Arm Mount [SO 311-1]	B	From Leg	1.50	0.0000	152.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
Side Arm Mount [SO 311-1]	C	From Leg	1.50	0.0000	152.00	No Ice	2.97	3.51	62.00
			0.00			1/2" Ice	4.39	5.33	94.35
			0.00			1" Ice	5.81	7.15	126.70
**********									
(2) SBNHH-1D65B w/Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	8.15	6.83	72.61
			0.00			1/2" Ice	8.61	7.79	138.89
(Verizon)			0.00			1" Ice	9.07	8.62	212.98
(2) SBNHH-1D65B w/Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	8.15	6.83	72.61
			0.00			1/2" Ice	8.61	7.79	138.89
(Verizon)			0.00			1" Ice	9.07	8.62	212.98
(2) SBNHH-1D65B w/Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	8.15	6.83	72.61
			0.00			1/2" Ice	8.61	7.79	138.89
(Verizon)			0.00			1" Ice	9.07	8.62	212.98
WPA-80063/4CF w/Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	5.41	3.44	33.90
(Verizon)			-2.00			1/2" Ice	5.90	4.24	77.47
			0.00			1" Ice	6.36	4.91	127.01
WPA-80063/4CF w/Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	5.41	3.44	33.90
(Verizon)			-2.00			1/2" Ice	5.90	4.24	77.47
			0.00			1" Ice	6.36	4.91	127.01
WPA-80063/4CF w/Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	5.41	3.44	33.90
(Verizon)			-2.00			1/2" Ice	5.90	4.24	77.47
			0.00			1" Ice	6.36	4.91	127.01
WPA-80063/4CF w/Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	5.41	3.44	33.90
(Verizon)			2.00			1/2" Ice	5.90	4.24	77.47
			0.00			1" Ice	6.36	4.91	127.01
WPA-80080/4CF w/Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	5.19	3.67	31.80
(Verizon)			2.00			1/2" Ice	5.68	4.47	75.51
			0.00			1" Ice	6.14	5.15	125.19
WPA-80080/4CF w/Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	5.19	3.67	31.80
(Verizon)			2.00			1/2" Ice	5.68	4.47	75.51
			0.00			1" Ice	6.14	5.15	125.19
B13 RRH4x30-4R	A	From Leg	3.50	0.0000	150.00	No Ice	2.16	1.62	57.20
(Verizon)			-2.00			1/2" Ice	2.35	1.79	76.81
			-1.00			1" Ice	2.55	1.97	99.38
B13 RRH4x30-4R	B	From Leg	3.50	0.0000	150.00	No Ice	2.16	1.62	57.20
(Verizon)			-2.00			1/2" Ice	2.35	1.79	76.81
			-1.00			1" Ice	2.55	1.97	99.38
B13 RRH4x30-4R	C	From Leg	3.50	0.0000	150.00	No Ice	2.16	1.62	57.20
(Verizon)			-2.00			1/2" Ice	2.35	1.79	76.81
			-1.00			1" Ice	2.55	1.97	99.38
B66A RRH4x45	A	From Leg	3.50	0.0000	150.00	No Ice	2.54	1.61	56.80
(Verizon)			2.00			1/2" Ice	2.75	1.79	76.92
			-1.00			1" Ice	2.97	1.98	100.15
B66A RRH4x45	B	From Leg	3.50	0.0000	150.00	No Ice	2.54	1.61	56.80
(Verizon)			2.00			1/2" Ice	2.75	1.79	76.92
			-1.00			1" Ice	2.97	1.98	100.15
B66A RRH4x45	C	From Leg	3.50	0.0000	150.00	No Ice	2.54	1.61	56.80
(Verizon)			2.00			1/2" Ice	2.75	1.79	76.92
			-1.00			1" Ice	2.97	1.98	100.15
RCMDC-3315-PF-48	A	From Leg	3.50	0.0000	150.00	No Ice	2.67	1.71	30.00
(Verizon)			4.50			1/2" Ice	2.87	1.88	53.86
			-1.00			1" Ice	3.08	2.06	80.91
RCMDC-3315-PF-48	A	From Leg	3.50	0.0000	150.00	No Ice	2.67	1.71	30.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon)			4.50			1/2" Ice	2.87	1.88	53.86
			-1.00			1" Ice	3.08	2.06	80.91
Sector Mount [SM 506-1]	A	From Leg	2.00	0.0000	150.00	No Ice	17.53	14.00	580.80
(Verizon)			0.00			1/2" Ice	24.17	20.81	782.60
			-2.00			1" Ice	30.81	27.62	984.40
Sector Mount [SM 506-1]	B	From Leg	2.00	0.0000	150.00	No Ice	17.53	14.00	580.80
(Verizon)			0.00			1/2" Ice	24.17	20.81	782.60
			-2.00			1" Ice	30.81	27.62	984.40
Sector Mount [SM 506-1]	C	From Leg	2.00	0.0000	150.00	No Ice	17.53	14.00	580.80
(Verizon)			0.00			1/2" Ice	24.17	20.81	782.60
			-2.00			1" Ice	30.81	27.62	984.40
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LNX-6515DS-T4M w/Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	11.45	9.60	77.70
			-1.00			1/2" Ice	12.06	11.02	164.67
(T-Mobile)			0.00			1" Ice	12.69	12.29	261.39
LNX-6515DS-T4M w/Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	11.45	9.60	77.70
			-1.00			1/2" Ice	12.06	11.02	164.67
(T-Mobile)			0.00			1" Ice	12.69	12.29	261.39
LNX-6515DS-T4M w/Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	11.45	9.60	77.70
			-1.00			1/2" Ice	12.06	11.02	164.67
(T-Mobile)			0.00			1" Ice	12.69	12.29	261.39
RR90-17-DP w/Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	4.67	3.40	39.90
(T-Mobile)			1.00			1/2" Ice	5.13	4.24	78.20
			0.00			1" Ice	5.57	4.95	122.71
RR90-17-DP w/Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	4.67	3.40	39.90
(T-Mobile)			1.00			1/2" Ice	5.13	4.24	78.20
			0.00			1" Ice	5.57	4.95	122.71
RR90-17-DP w/Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	4.67	3.40	39.90
(T-Mobile)			1.00			1/2" Ice	5.13	4.24	78.20
			0.00			1" Ice	5.57	4.95	122.71
LGP214nn	A	From Leg	3.50	0.0000	140.00	No Ice	1.11	0.21	14.10
(T-Mobile)			-1.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
LGP214nn	B	From Leg	3.50	0.0000	140.00	No Ice	1.11	0.21	14.10
(T-Mobile)			-1.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
LGP214nn	C	From Leg	3.50	0.0000	140.00	No Ice	1.11	0.21	14.10
(T-Mobile)			-1.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
Side Arm Mount [SO 203-1]	A	From Leg	2.00	0.0000	140.00	No Ice	2.96	3.36	125.00
(T-Mobile)			0.00			1/2" Ice	4.10	4.68	153.55
			0.00			1" Ice	5.24	6.00	182.10
Side Arm Mount [SO 203-1]	B	From Leg	2.00	0.0000	140.00	No Ice	2.96	3.36	125.00
(T-Mobile)			0.00			1/2" Ice	4.10	4.68	153.55
			0.00			1" Ice	5.24	6.00	182.10
Side Arm Mount [SO 203-1]	C	From Leg	2.00	0.0000	140.00	No Ice	2.96	3.36	125.00
(T-Mobile)			0.00			1/2" Ice	4.10	4.68	153.55
			0.00			1" Ice	5.24	6.00	182.10
**********									
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	3.00	0.0000	130.30	No Ice	12.75	7.65	106.60
(Sprint)			-2.00			1/2" Ice	13.45	8.94	199.84
			0.00			1" Ice	14.12	10.07	301.80
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	3.00	0.0000	130.30	No Ice	12.75	7.65	106.60
(Sprint)			-2.00			1/2" Ice	13.45	8.94	199.84
			0.00			1" Ice	14.12	10.07	301.80
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	3.00	0.0000	130.30	No Ice	12.75	7.65	106.60
(Sprint)			-2.00			1/2" Ice	13.45	8.94	199.84

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	14.12	10.07	301.80
APXVTM14-ALU-120 w/Mount Pipe	A	From Leg	3.00	0.0000	130.30	No Ice	7.13	5.51	85.20
			6.00			1/2" Ice	7.84	6.69	145.82
(Sprint)			0.00			1" Ice	8.50	7.73	213.60
APXVTM14-ALU-120 w/Mount Pipe	B	From Leg	3.00	0.0000	130.30	No Ice	7.13	5.51	85.20
			6.00			1/2" Ice	7.84	6.69	145.82
(Sprint)			0.00			1" Ice	8.50	7.73	213.60
APXVTM14-ALU-120 w/Mount Pipe	C	From Leg	3.00	0.0000	130.30	No Ice	7.13	5.51	85.20
			6.00			1/2" Ice	7.84	6.69	145.82
(Sprint)			0.00			1" Ice	8.50	7.73	213.60
TD-RRH8x20-25	A	From Leg	3.00	0.0000	130.30	No Ice	4.05	1.53	76.20
(Sprint)			2.00			1/2" Ice	4.30	1.71	103.34
			-1.50			1" Ice	4.56	1.90	134.00
TD-RRH8x20-25	B	From Leg	3.00	0.0000	130.30	No Ice	4.05	1.53	76.20
(Sprint)			2.00			1/2" Ice	4.30	1.71	103.34
			-1.50			1" Ice	4.56	1.90	134.00
TD-RRH8x20-25	C	From Leg	3.00	0.0000	130.30	No Ice	4.05	1.53	76.20
(Sprint)			2.00			1/2" Ice	4.30	1.71	103.34
			-1.50			1" Ice	4.56	1.90	134.00
1900MHz 4x45W RRH	A	From Leg	3.00	0.0000	130.30	No Ice	2.32	2.24	60.00
(Sprint)			-6.00			1/2" Ice	2.53	2.44	83.12
			-1.50			1" Ice	2.74	2.65	109.48
1900MHz 4x45W RRH	B	From Leg	3.00	0.0000	130.30	No Ice	2.32	2.24	60.00
(Sprint)			-6.00			1/2" Ice	2.53	2.44	83.12
			-1.50			1" Ice	2.74	2.65	109.48
1900MHz 4x45W RRH	C	From Leg	3.00	0.0000	130.30	No Ice	2.32	2.24	60.00
(Sprint)			-6.00			1/2" Ice	2.53	2.44	83.12
			-1.50			1" Ice	2.74	2.65	109.48
800MHz 2x50W RRH	A	From Leg	3.00	0.0000	130.30	No Ice	2.06	1.93	64.00
(Sprint)			2.00			1/2" Ice	2.24	2.11	86.12
			1.50			1" Ice	2.43	2.29	111.30
800MHz 2x50W RRH	A	From Leg	3.00	0.0000	130.30	No Ice	2.06	1.93	64.00
(Sprint)			2.00			1/2" Ice	2.24	2.11	86.12
			1.50			1" Ice	2.43	2.29	111.30
800MHz 2x50W RRH	B	From Leg	3.00	0.0000	130.30	No Ice	2.06	1.93	64.00
(Sprint)			2.00			1/2" Ice	2.24	2.11	86.12
			1.50			1" Ice	2.43	2.29	111.30
800MHz 2x50W RRH	B	From Leg	3.00	0.0000	130.30	No Ice	2.06	1.93	64.00
(Sprint)			-6.00			1/2" Ice	2.24	2.11	86.12
			1.50			1" Ice	2.43	2.29	111.30
800MHz 2x50W RRH	C	From Leg	3.00	0.0000	130.30	No Ice	2.06	1.93	64.00
(Sprint)			-6.00			1/2" Ice	2.24	2.11	86.12
			1.50			1" Ice	2.43	2.29	111.30
800MHz 2x50W RRH	C	From Leg	3.00	0.0000	130.30	No Ice	2.06	1.93	64.00
(Sprint)			-6.00			1/2" Ice	2.24	2.11	86.12
			1.50			1" Ice	2.43	2.29	111.30
Sector Mount [SM 701-1]	A	From Leg	1.50	0.0000	130.30	No Ice	13.80	3.75	275.00
(Sprint)			0.00			1/2" Ice	18.42	5.95	388.66
			0.00			1" Ice	23.04	8.15	502.32
Sector Mount [SM 701-1]	B	From Leg	1.50	0.0000	130.30	No Ice	13.80	3.75	275.00
(Sprint)			0.00			1/2" Ice	18.42	5.95	388.66
			0.00			1" Ice	23.04	8.15	502.32
Sector Mount [SM 701-1]	C	From Leg	1.50	0.0000	130.30	No Ice	13.80	3.75	275.00
(Sprint)			0.00			1/2" Ice	18.42	5.95	388.66
			0.00			1" Ice	23.04	8.15	502.32
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7770.00 w/Mount Pipe	A	From Leg	3.00	0.0000	120.00	No Ice	5.84	4.35	56.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			-4.50			1/2" Ice	6.32	5.20	105.42
			0.00			1" Ice	6.77	5.92	160.42
7770.00 w/Mount Pipe	B	From Leg	3.00	0.0000	120.00	No Ice	5.84	4.35	56.90
(AT&T)			-4.50			1/2" Ice	6.32	5.20	105.42
			0.00			1" Ice	6.77	5.92	160.42
7770.00 w/Mount Pipe	C	From Leg	3.00	0.0000	120.00	No Ice	5.84	4.35	56.90
(AT&T)			-4.50			1/2" Ice	6.32	5.20	105.42
			0.00			1" Ice	6.77	5.92	160.42
P65-17-XL-R w/Mount Pipe	A	From Leg	3.00	0.0000	120.00	No Ice	11.47	8.70	88.20
(AT&T)			4.50			1/2" Ice	12.08	10.11	171.36
			0.00			1" Ice	12.71	11.38	264.18
P65-17-XL-R w/Mount Pipe	B	From Leg	3.00	0.0000	120.00	No Ice	11.47	8.70	88.20
(AT&T)			4.50			1/2" Ice	12.08	10.11	171.36
			0.00			1" Ice	12.71	11.38	264.18
AM-X-CD-16-65-00T w/Mount Pipe	C	From Leg	3.00	0.0000	120.00	No Ice	6.04	5.14	49.43
			4.50			1/2" Ice	6.41	5.75	102.89
(AT&T)			0.00			1" Ice	6.77	6.38	162.74
RET Module	A	From Leg	3.00	0.0000	120.00	No Ice	0.34	0.18	2.20
(AT&T)			4.50			1/2" Ice	0.42	0.24	5.14
			-4.00			1" Ice	0.51	0.31	9.29
RET Module	B	From Leg	3.00	0.0000	120.00	No Ice	0.34	0.18	2.20
(AT&T)			4.50			1/2" Ice	0.42	0.24	5.14
			-4.00			1" Ice	0.51	0.31	9.29
RET Module	C	From Leg	3.00	0.0000	120.00	No Ice	0.34	0.18	2.20
(AT&T)			4.50			1/2" Ice	0.42	0.24	5.14
			-2.25			1" Ice	0.51	0.31	9.29
(2) LGP214nn	A	From Leg	2.50	0.0000	120.00	No Ice	1.11	0.21	14.10
(AT&T)			0.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
(2) LGP214nn	B	From Leg	2.50	0.0000	120.00	No Ice	1.11	0.21	14.10
(AT&T)			0.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
(2) LGP214nn	C	From Leg	2.50	0.0000	120.00	No Ice	1.11	0.21	14.10
(AT&T)			0.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
RRUS-11	A	From Leg	2.50	0.0000	120.00	No Ice	2.52	1.07	55.00
(AT&T)			4.50			1/2" Ice	2.72	1.21	74.32
			0.00			1" Ice	2.92	1.36	96.56
RRUS-11	B	From Leg	2.50	0.0000	120.00	No Ice	2.52	1.07	55.00
(AT&T)			4.50			1/2" Ice	2.72	1.21	74.32
			0.00			1" Ice	2.92	1.36	96.56
RRUS-11	C	From Leg	2.50	0.0000	120.00	No Ice	2.52	1.07	55.00
(AT&T)			4.50			1/2" Ice	2.72	1.21	74.32
			0.00			1" Ice	2.92	1.36	96.56
DC6-48-60-18-8F	C	From Leg	0.50	0.0000	120.00	No Ice	0.92	0.92	33.00
(AT&T)			0.00			1/2" Ice	1.46	1.46	50.72
			0.00			1" Ice	1.64	1.64	70.92
Sector Mount [SM 401-1]	A	From Leg	1.50	0.0000	120.00	No Ice	8.83	7.05	268.16
(AT&T)			0.00			1/2" Ice	12.37	10.13	388.19
			0.00			1" Ice	15.91	13.21	508.22
Sector Mount [SM 401-1]	B	From Leg	1.50	0.0000	120.00	No Ice	8.83	7.05	268.16
(AT&T)			0.00			1/2" Ice	12.37	10.13	388.19
			0.00			1" Ice	15.91	13.21	508.22
Sector Mount [SM 401-1]	C	From Leg	1.50	0.0000	120.00	No Ice	8.83	7.05	268.16
(AT&T)			0.00			1/2" Ice	12.37	10.13	388.19
			0.00			1" Ice	15.91	13.21	508.22

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
2' Omni	C	From Leg	3.00 0.00 0.00	0.0000	91.00	No Ice 1/2" Ice 1" Ice	0.36 0.49 0.63	0.36 0.49 0.63	10.00 13.98 19.58
**********									
Side Arm Mount [SO 305-1]	C	From Leg	1.50 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.94 1.48 2.02	1.41 2.17 2.93	30.00 43.27 56.54
**********									
GPS	C	From Leg	3.00 0.00 0.00	0.0000	82.00	No Ice 1/2" Ice 1" Ice	1.00 1.50 2.00	1.00 1.50 2.00	10.00 15.00 20.00
**********									
12' Dipole	C	From Leg	6.00 0.00 6.00	0.0000	71.00	No Ice 1/2" Ice 1" Ice	3.25 4.75 6.25	3.25 4.75 6.25	35.00 63.00 91.00
6' x 2" Pipe Mount	C	From Leg	3.00 0.00 0.00	0.0000	71.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	21.90 32.73 47.61
**********									
Flood Light	C	From Leg	0.00 0.00 0.00	0.0000	68.00	No Ice 1/2" Ice 1" Ice	0.18 0.25 0.33	0.18 0.25 0.33	8.00 10.47 13.91
**********									
Flood Light	B	From Leg	0.00 0.00 0.00	0.0000	62.00	No Ice 1/2" Ice 1" Ice	0.18 0.25 0.33	0.18 0.25 0.33	8.00 10.47 13.91
**********									
Camera2	B	From Leg	0.00 0.00 0.00	0.0000	68.00	No Ice 1/2" Ice 1" Ice	0.93 1.07 1.21	0.62 0.73 0.85	75.00 84.24 95.48

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	7597.77					
Bracing Weight	7984.24					
Total Member Self-Weight	15582.01			9258.05	1556.45	
Total Weight	30974.63			9258.05	1556.45	
Wind 0 deg - No Ice		-17.02	-22808.07	-2159732.01	3286.33	-3660.35
Wind 30 deg - No Ice		11365.18	-19746.97	-1865158.94	-1076051.46	10921.47
Wind 60 deg - No Ice		19011.63	-10992.45	-1042769.07	-1816122.41	15748.56
Wind 90 deg - No Ice		21399.74	17.02	10987.94	-2055616.67	9745.81
Wind 120 deg - No Ice		18733.79	10851.70	1052761.84	-1797899.78	6522.82
Wind 150 deg - No Ice		10360.82	17973.32	1751366.35	-1001660.50	10469.72
Wind 180 deg - No Ice		17.02	21546.02	2077954.84	-173.44	3660.35
Wind 210 deg - No Ice		-11365.18	19746.97	1883675.05	1079164.36	-10921.47
Wind 240 deg - No Ice		-20104.60	11623.48	1111431.81	1906091.82	-15748.56
Wind 270 deg - No Ice		-21399.74	-17.02	7528.17	2058729.56	-9745.81

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 300 deg - No Ice		-17640.83	-10220.67	-984099.09	1714156.15	-6522.82
Wind 330 deg - No Ice		-10360.82	-17973.32	-1732850.24	1004773.39	-10469.72
Member Ice	40851.33					
Total Weight Ice	134752.63			58251.07	-13039.71	
Wind 0 deg - Ice		-3.48	-12278.66	-1123964.37	-12780.57	-1874.10
Wind 30 deg - Ice		6179.61	-10718.63	-971170.82	-606293.97	3554.19
Wind 60 deg - Ice		10606.18	-6128.25	-531587.06	-1033312.24	5967.32
Wind 90 deg - Ice		11966.50	3.48	58510.21	-1170991.52	3901.59
Wind 120 deg - Ice		10278.29	5942.97	635080.44	-1010262.11	2853.24
Wind 150 deg - Ice		5862.27	10162.01	1047301.12	-583284.50	3920.30
Wind 180 deg - Ice		3.48	12014.54	1220465.12	-13298.85	1874.10
Wind 210 deg - Ice		-6179.61	10718.63	1087672.96	580214.56	-3554.19
Wind 240 deg - Ice		-10834.91	6260.31	658089.90	1024554.54	-5967.32
Wind 270 deg - Ice		-11966.50	-3.48	57991.93	1144912.11	-3901.59
Wind 300 deg - Ice		-10049.56	-5810.91	-508577.60	966860.98	-2853.24
Wind 330 deg - Ice		-5862.27	-10162.01	-930798.98	557205.09	-3920.30
Total Weight	30974.63			9258.05	1556.45	
Wind 0 deg - Service		-6.51	-8726.65	-828937.62	19.88	-1400.50
Wind 30 deg - Service		4348.46	-7555.44	-716230.31	-412948.14	4178.69
Wind 60 deg - Service		7274.09	-4205.85	-401573.76	-696108.45	6025.59
Wind 90 deg - Service		8187.81	6.51	1606.73	-787741.92	3728.87
Wind 120 deg - Service		7167.78	4151.99	400202.34	-689136.25	2495.71
Wind 150 deg - Service		3964.18	6876.82	667497.08	-384485.23	4005.85
Wind 180 deg - Service		6.51	8243.78	792453.88	-1303.87	1400.50
Wind 210 deg - Service		-4348.46	7555.44	718120.03	411664.14	-4178.69
Wind 240 deg - Service		-7692.27	4447.29	422650.20	728056.84	-6025.59
Wind 270 deg - Service		-8187.81	-6.51	282.98	786457.93	-3728.87
Wind 300 deg - Service		-6749.60	-3910.56	-379125.90	654619.87	-2495.71
Wind 330 deg - Service		-3964.18	-6876.82	-665607.37	383201.24	-4005.85

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice

Comb. No.	Description
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	168 - 160	Leg	Max Tension	23	996.13	30.92	21.35
			Max. Compression	27	-1860.18	-0.73	15.57
			Max. Mx	18	-1431.92	33.43	-21.76
			Max. My	2	-1407.96	-0.22	40.14
			Max. Vy	20	166.82	0.00	-0.00
			Max. Vx	2	160.95	-0.00	-0.00
		Diagonal	Max Tension	20	430.13	0.00	0.00
			Max. Compression	10	-436.03	0.00	0.00
			Max. Mx	34	242.67	27.27	0.05
			Max. My	29	-62.81	26.14	-1.05
			Max. Vy	34	-34.49	27.27	0.05
			Max. Vx	31	-0.33	0.00	0.00
		Top Girt	Max Tension	3	69.20	0.00	0.00
			Max. Compression	37	-107.09	0.00	0.00
			Max. Mx	26	-68.25	-91.58	0.00
			Max. My	18	-45.94	0.00	-0.00
			Max. Vy	26	-54.76	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	7	11502.46	66.21	-40.37
			Max. Compression	2	-15485.41	0.40	94.59
			Max. Mx	8	-554.57	842.57	-0.92
			Max. My	2	2116.73	-7.97	-844.29
			Max. Vy	20	693.57	369.89	-1.90
			Max. Vx	2	696.94	-7.97	373.75
		Diagonal	Max Tension	12	2681.79	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	12	-2695.21	0.00	0.00
			Max. Mx	27	847.65	32.69	-0.19
			Max. My	24	-2650.76	0.71	-2.35
			Max. Vy	27	-35.56	32.69	0.14
			Max. Vx	22	-0.61	0.00	0.00
		Top Girt	Max Tension	10	83.18	0.00	0.00
			Max. Compression	15	-64.94	0.00	0.00
			Max. Mx	26	52.78	-93.06	0.00
			Max. My	18	-26.03	0.00	-0.00
			Max. Vy	26	-55.64	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T3	140 - 136	Leg	Max Tension	7	16628.23	-72.89	36.79
			Max. Compression	18	-21300.89	-25.96	20.95
			Max. Mx	18	-20961.48	83.85	-43.20
			Max. My	2	-20909.46	0.40	94.59
			Max. Vy	20	492.43	72.09	-34.88
			Max. Vx	2	499.57	0.40	94.59
		Diagonal	Max Tension	12	3365.30	0.00	0.00
			Max. Compression	24	-3475.44	0.00	0.00
			Max. Mx	28	1129.03	29.71	0.45
			Max. My	24	-3470.23	-2.29	-2.41
			Max. Vy	28	-34.52	29.71	0.45
			Max. Vx	22	-0.63	0.00	0.00
		Top Girt	Max Tension	34	268.09	0.00	0.00
			Max. Compression	15	-46.54	0.00	0.00
			Max. Mx	26	263.06	-92.07	0.00
			Max. My	18	22.70	0.00	-0.00
			Max. Vy	26	55.05	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T4	136 - 132	Leg	Max Tension	7	22440.38	26.45	-20.17
			Max. Compression	18	-28037.77	267.16	-129.10
			Max. Mx	8	18636.98	-310.74	-16.99
			Max. My	2	10138.52	-10.31	325.62
			Max. Vy	8	105.36	-310.74	-16.99
			Max. Vx	3	-103.54	10.74	296.28
		Diagonal	Max Tension	12	3529.56	0.00	0.00
			Max. Compression	12	-3446.83	0.00	0.00
			Max. Mx	27	1424.58	33.05	0.40
			Max. My	29	360.83	30.82	1.09
			Max. Vy	27	-35.27	33.05	0.40
			Max. Vx	29	-0.33	0.00	0.00
T5	132 - 128	Leg	Max Tension	7	28921.09	-269.49	130.15
			Max. Compression	18	-35635.67	345.03	-168.84
			Max. Mx	20	23276.14	-512.44	21.39
			Max. My	2	13499.35	-10.31	-540.74
			Max. Vy	20	493.81	310.57	-16.72
			Max. Vx	2	515.22	-10.31	325.62
		Diagonal	Max Tension	12	4265.71	0.00	0.00
			Max. Compression	24	-4379.95	0.00	0.00
			Max. Mx	27	1111.00	35.14	0.28
			Max. My	16	-4294.98	-3.79	1.57
			Max. Vy	27	-35.70	35.14	0.28
			Max. Vx	16	-0.41	-3.79	1.57
T6	128 - 124	Leg	Max Tension	7	36881.87	-362.39	-26.05
			Max. Compression	18	-45020.87	-91.89	-3.71
			Max. Mx	18	-44954.72	383.23	26.30
			Max. My	5	-2766.11	8.37	-297.24
			Max. Vy	18	143.54	383.23	26.30
			Max. Vx	19	53.57	-178.57	267.46
		Diagonal	Max Tension	8	5048.64	0.00	0.00
			Max. Compression	20	-4955.59	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	28	2104.54	30.55	0.47
			Max. My	6	-4612.90	0.88	-3.69
			Max. Vy	28	-34.42	30.55	0.47
			Max. Vx	6	-0.96	0.00	0.00
T7	124 - 120	Leg	Max Tension	7	45416.58	59.72	2.50
			Max. Compression	18	-53956.40	328.74	30.88
			Max. Mx	18	-53956.40	328.74	30.88
			Max. My	12	-3804.05	-22.03	-225.92
			Max. Vy	18	-129.69	328.74	30.88
			Max. Vx	12	-103.53	-22.03	-225.92
		Diagonal	Max Tension	20	5042.38	0.00	0.00
			Max. Compression	8	-5222.46	0.00	0.00
			Max. Mx	28	507.49	36.91	-0.32
			Max. My	16	-5143.15	-3.56	6.01
			Max. Vy	27	-35.92	36.85	0.26
			Max. Vx	16	-1.55	-3.56	6.01
T8	120 - 115	Leg	Max Tension	7	54164.11	-266.54	-31.03
			Max. Compression	18	-63924.03	29.04	14.68
			Max. Mx	18	-63242.89	328.74	30.83
			Max. My	16	-4792.34	-34.50	421.19
			Max. Vy	22	-742.71	-255.12	11.65
			Max. Vx	4	-669.97	29.77	35.20
		Diagonal	Max Tension	7	4466.47	0.00	0.00
			Max. Compression	18	-4801.34	0.00	0.00
			Max. Mx	30	1111.79	34.29	3.45
			Max. My	6	-3817.19	-0.58	-8.81
			Max. Vy	29	38.06	32.21	-3.92
			Max. Vx	37	2.81	0.00	0.00
T9	115 - 110	Leg	Max Tension	7	62882.45	-80.33	-16.96
			Max. Compression	18	-74075.35	282.84	20.87
			Max. Mx	18	-74075.35	282.84	20.87
			Max. My	16	-5180.85	-34.49	421.19
			Max. Vy	2	-82.78	282.20	4.74
			Max. Vx	4	-116.46	-34.34	-420.81
		Diagonal	Max Tension	18	4512.88	0.00	0.00
			Max. Compression	20	-4406.52	0.00	0.00
			Max. Mx	31	1743.49	47.84	-4.40
			Max. My	31	128.62	36.06	6.11
			Max. Vy	31	-41.67	47.84	-4.40
			Max. Vx	31	-2.54	0.00	0.00
T10	110 - 105	Leg	Max Tension	7	70540.35	-233.43	-20.50
			Max. Compression	18	-82219.22	-73.44	12.66
			Max. Mx	18	-82124.86	282.84	20.88
			Max. My	16	-5362.62	-33.81	314.30
			Max. Vy	2	103.11	282.20	4.74
			Max. Vx	16	-94.81	-33.81	314.30
		Diagonal	Max Tension	20	4313.95	0.00	0.00
			Max. Compression	18	-4545.00	0.00	0.00
			Max. Mx	31	976.51	47.25	5.24
			Max. My	31	-50.99	37.47	6.77
			Max. Vy	29	43.70	43.47	5.98
			Max. Vx	31	-2.66	0.00	0.00
T11	105 - 100	Leg	Max Tension	7	78191.64	13.08	-15.15
			Max. Compression	18	-90763.29	157.73	35.11
			Max. Mx	18	-90714.63	626.44	-6.74
			Max. My	16	-5713.31	-8.53	325.90
			Max. Vy	18	-303.35	626.44	-6.75
			Max. Vx	16	197.60	-33.80	314.30
		Diagonal	Max Tension	20	4359.23	17.95	3.40
			Max. Compression	20	-4436.01	0.00	0.00
			Max. Mx	31	1414.97	51.29	-3.10

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	18	-4338.88	-7.66	6.56
			Max. Vy	29	45.87	46.67	-1.31
			Max. Vx	32	2.04	0.00	0.00
		Secondary Horizontal	Max Tension	18	1574.08	0.00	0.00
			Max. Compression	18	-1574.08	2.12	-4.60
			Max. Mx	30	-18.16	48.33	15.46
			Max. My	32	-18.13	48.20	15.63
			Max. Vy	30	-58.32	48.33	15.46
			Max. Vx	30	-5.22	0.00	0.00
T12	100 - 93.3333	Leg	Max Tension	7	86538.88	-170.72	-35.59
			Max. Compression	18	-99862.39	-81.54	26.19
			Max. Mx	6	85437.52	-174.47	-35.72
			Max. My	16	-6028.46	-38.26	477.91
			Max. Vy	2	78.52	158.39	3.86
			Max. Vx	18	-91.45	-16.38	428.88
		Diagonal	Max Tension	20	4752.32	0.00	0.00
			Max. Compression	18	-4959.81	0.00	0.00
			Max. Mx	31	1352.32	77.22	-7.36
			Max. My	34	-763.11	53.17	11.21
			Max. Vy	33	57.45	69.36	8.98
			Max. Vx	34	-3.66	0.00	0.00
T13	93.3333 - 86.6667	Leg	Max Tension	7	95636.58	15.70	-29.28
			Max. Compression	18	-110058.58	-644.20	14.26
			Max. Mx	18	-110019.65	1049.13	-3.65
			Max. My	16	-6386.22	-64.47	502.77
			Max. Vy	18	511.48	1049.13	-3.65
			Max. Vx	16	226.34	-38.26	477.91
		Diagonal	Max Tension	21	4944.27	37.52	0.51
			Max. Compression	18	-5149.95	0.00	0.00
			Max. Mx	31	1295.34	90.38	-10.84
			Max. My	29	1385.23	81.16	-11.87
			Max. Vy	33	61.51	79.86	-9.81
			Max. Vx	29	3.71	0.00	0.00
		Secondary Horizontal	Max Tension	18	1908.71	0.00	0.00
			Max. Compression	18	-1908.71	7.75	-5.52
			Max. Mx	28	444.88	52.07	4.52
			Max. My	32	-52.03	49.93	8.59
			Max. Vy	28	50.87	52.07	4.52
			Max. Vx	34	-3.05	0.00	0.00
T14	86.6667 - 80	Leg	Max Tension	7	104291.42	471.28	-17.65
			Max. Compression	18	-119818.95	-23.78	36.61
			Max. Mx	18	-119759.86	1022.86	-6.36
			Max. My	16	-6736.49	-48.80	586.78
			Max. Vy	18	-537.10	1022.86	-6.36
			Max. Vx	16	-236.92	-48.80	586.78
		Diagonal	Max Tension	7	4991.01	43.78	-3.36
			Max. Compression	18	-5338.79	0.00	0.00
			Max. Mx	31	1220.91	89.52	-10.69
			Max. My	29	-1728.22	64.64	-12.86
			Max. Vy	33	64.28	83.32	-9.81
			Max. Vx	29	-3.82	0.00	0.00
		Secondary Horizontal	Max Tension	18	2077.98	0.00	0.00
			Max. Compression	18	-2077.98	6.89	-4.06
			Max. Mx	29	9.38	54.53	8.56
			Max. My	32	-32.38	54.24	8.97
			Max. Vy	29	53.05	54.53	8.56
			Max. Vx	34	-3.07	0.00	0.00
T15	80 - 73.3333	Leg	Max Tension	7	113155.86	-53.94	-38.02
			Max. Compression	18	-129894.02	71.13	23.32
			Max. Mx	32	-65402.22	-230.90	98.79
			Max. My	16	-7070.65	-48.79	586.78

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	2	-59.64	74.47	15.07
			Max. Vx	18	101.63	-59.71	522.67
		Diagonal	Max Tension	8	5004.00	0.00	0.00
			Max. Compression	8	-5131.39	0.00	0.00
			Max. Mx	31	1510.70	112.21	11.76
			Max. My	35	35.42	88.76	14.18
			Max. Vy	33	72.91	104.21	-13.41
			Max. Vx	35	4.14	0.00	0.00
T16	73.3333 - 66.6667	Leg	Max Tension	7	121044.81	-92.50	-25.74
			Max. Compression	18	-139082.36	-912.94	13.90
			Max. Mx	18	-138991.57	1347.49	-4.47
			Max. My	16	-7659.33	-118.46	819.19
			Max. Vy	18	682.82	1347.49	-4.47
			Max. Vx	16	-317.85	-118.46	819.19
		Diagonal	Max Tension	9	5299.31	44.29	-3.30
			Max. Compression	18	-5675.48	0.00	0.00
			Max. Mx	31	1296.23	109.66	-10.58
			Max. My	35	-2213.95	79.82	11.82
			Max. Vy	33	75.10	104.40	-8.22
			Max. Vx	29	-3.70	0.00	0.00
		Secondary Horizontal	Max Tension	18	2412.06	0.00	0.00
			Max. Compression	18	-2412.06	14.24	-4.96
			Max. Mx	29	-29.81	85.99	21.01
			Max. My	32	-75.55	85.34	21.83
			Max. Vy	29	77.19	85.99	21.01
			Max. Vx	34	-5.65	0.00	0.00
T17	66.6667 - 60	Leg	Max Tension	7	129031.53	644.15	-18.46
			Max. Compression	18	-148338.92	-155.47	33.21
			Max. Mx	18	-148301.22	1337.24	-8.54
			Max. My	16	-7990.71	-118.45	819.19
			Max. Vy	18	-713.27	1337.24	-8.54
			Max. Vx	16	310.94	-118.45	819.19
		Diagonal	Max Tension	7	5407.00	51.08	0.41
			Max. Compression	18	-5860.78	0.00	0.00
			Max. Mx	35	1537.67	126.94	-15.60
			Max. My	29	1526.21	118.99	-17.09
			Max. Vy	33	79.56	121.73	-16.09
			Max. Vx	35	4.47	0.00	0.00
		Secondary Horizontal	Max Tension	18	2572.60	0.00	0.00
			Max. Compression	18	-2572.60	13.47	-2.10
			Max. Mx	35	-140.94	79.01	6.56
			Max. My	32	-77.11	78.09	8.43
			Max. Vy	35	-61.97	79.01	6.56
			Max. Vx	34	-2.87	0.00	0.00
T18	60 - 40	Leg	Max Tension	7	152473.99	-411.66	-18.56
			Max. Compression	18	-175863.20	852.55	63.38
			Max. Mx	29	19964.91	-910.18	-21.74
			Max. My	16	-8481.75	-38.18	587.37
			Max. Vy	37	216.38	-900.29	12.11
			Max. Vx	19	-100.25	-397.86	516.48
		Diagonal	Max Tension	18	5653.37	0.00	0.00
			Max. Compression	18	-5829.67	0.00	0.00
			Max. Mx	35	1620.34	172.08	-18.35
			Max. My	29	-1119.18	130.78	-21.90
			Max. Vy	33	100.50	155.74	19.24
			Max. Vx	29	-5.33	0.00	0.00
T19	40 - 20	Leg	Max Tension	7	172137.36	-613.83	-56.95
			Max. Compression	18	-199135.21	1053.02	53.42
			Max. Mx	29	21837.35	-1492.10	-12.95
			Max. My	16	-10793.41	-89.47	1486.55
			Max. Vy	37	240.39	-1479.36	6.61

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	16	246.14	-89.47	1486.55
		Diagonal	Max Tension	8	6448.66	0.00	0.00
			Max. Compression	18	-6904.64	0.00	0.00
			Max. Mx	35	1015.98	248.69	28.61
			Max. My	29	-2478.27	198.35	-35.48
			Max. Vy	33	122.80	229.09	-32.17
			Max. Vx	29	7.07	0.00	0.00
T20	20 - 0	Leg	Max Tension	7	192214.35	-713.43	-66.83
			Max. Compression	18	-223539.19	-0.00	-0.14
			Max. Mx	27	-107888.16	1553.97	12.59
			Max. My	16	-12415.38	-103.17	1772.52
			Max. Vy	37	-294.81	-1479.36	6.61
			Max. Vx	16	-275.54	-103.17	1772.52
		Diagonal	Max Tension	7	6918.02	0.00	0.00
			Max. Compression	18	-7634.56	0.00	0.00
			Max. Mx	33	410.94	294.26	33.57
			Max. My	29	-2937.78	250.68	-39.26
			Max. Vy	33	124.33	294.26	33.57
			Max. Vx	29	7.07	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	229778.88	20661.91	-11040.68
	Max. H_x	18	229778.88	20661.91	-11040.68
	Max. H_z	5	-174514.80	-15653.49	9701.14
	Min. Vert	7	-197134.00	-18235.32	9629.40
	Min. H_x	7	-197134.00	-18235.32	9629.40
	Min. H_z	18	229778.88	20661.91	-11040.68
Leg B	Max. Vert	10	217729.90	-19171.01	-10691.45
	Max. H_x	23	-185446.52	16727.13	9292.94
	Max. H_z	23	-185446.52	16727.13	9292.94
	Min. Vert	23	-185446.52	16727.13	9292.94
	Min. H_x	10	217729.90	-19171.01	-10691.45
	Min. H_z	10	217729.90	-19171.01	-10691.45
Leg A	Max. Vert	2	225553.37	-176.88	23008.33
	Max. H_x	21	8947.83	1576.16	675.30
	Max. H_z	2	225553.37	-176.88	23008.33
	Min. Vert	15	-194880.51	179.36	-20233.24
	Min. H_x	9	8607.51	-1579.27	642.03
	Min. H_z	15	-194880.51	179.36	-20233.24

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	30974.63	-0.00	0.00	9258.02	1556.42	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	37169.56	-27.24	-36492.92	-3479804.63	4668.04	-5865.25
0.9 Dead+1.6 Wind 0 deg - No Ice	27877.17	-27.24	-36492.92	-3477385.54	4193.75	-5861.25
1.2 Dead+1.6 Wind 30 deg - No Ice	37169.56	18184.29	-31595.16	-3005613.68	-1732565.77	17500.43

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.6 Wind 30 deg - No Ice	27877.17	18184.29	-31595.16	-3003922.39	-1730450.11	17500.52
1.2 Dead+1.6 Wind 60 deg - No Ice	37169.56	30418.61	-17587.93	-1682036.74	-2923779.70	25249.11
0.9 Dead+1.6 Wind 60 deg - No Ice	27877.17	30418.61	-17587.93	-1682298.57	-2919861.92	25236.13
1.2 Dead+1.6 Wind 90 deg - No Ice	37169.56	34239.59	27.23	13984.61	-3309300.40	15649.24
0.9 Dead+1.6 Wind 90 deg - No Ice	27877.17	34239.59	27.23	11180.44	-3304784.44	15637.38
1.2 Dead+1.6 Wind 120 deg - No Ice	37169.56	29974.07	17362.72	1690791.10	-2894481.18	10493.01
0.9 Dead+1.6 Wind 120 deg - No Ice	27877.47	29974.40	17362.73	1685452.80	-2890580.48	10477.15
1.2 Dead+1.6 Wind 150 deg - No Ice	37169.39	16577.23	28757.14	2815331.29	-1612884.86	16781.86
0.9 Dead+1.6 Wind 150 deg - No Ice	27877.19	16577.36	28757.29	2808283.40	-1610910.17	16776.59
1.2 Dead+1.6 Wind 180 deg - No Ice	37169.56	27.23	34473.64	3340841.96	-898.52	5862.67
0.9 Dead+1.6 Wind 180 deg - No Ice	27877.17	27.23	34473.64	3333036.56	-1363.82	5861.55
1.2 Dead+1.6 Wind 210 deg - No Ice	37169.56	-18184.29	31595.16	3028014.75	1736186.65	-17499.35
0.9 Dead+1.6 Wind 210 deg - No Ice	27877.17	-18184.29	31595.16	3020718.50	1733135.10	-17499.40
1.2 Dead+1.6 Wind 240 deg - No Ice	37169.56	-32167.36	18597.57	1785161.37	3067119.79	-25253.99
0.9 Dead+1.6 Wind 240 deg - No Ice	27877.17	-32167.36	18597.56	1779710.34	3062076.89	-25237.53
1.2 Dead+1.6 Wind 270 deg - No Ice	37169.56	-34239.59	-27.24	8422.13	3313046.11	-15649.30
0.9 Dead+1.6 Wind 270 deg - No Ice	27877.17	-34239.59	-27.24	5624.84	3307591.79	-15637.49
1.2 Dead+1.6 Wind 300 deg - No Ice	37169.56	-28225.32	-16353.08	-1587768.04	2758562.10	-10490.23
0.9 Dead+1.6 Wind 300 deg - No Ice	27877.17	-28225.32	-16353.08	-1588144.52	2753912.74	-10477.22
1.2 Dead+1.6 Wind 330 deg - No Ice	37169.39	-16577.20	-28757.15	-2792953.11	1616714.91	-16782.64
0.9 Dead+1.6 Wind 330 deg - No Ice	27877.19	-16577.27	-28757.34	-2791509.06	1613801.39	-16777.42
1.2 Dead+1.0 Ice+1.0 Temp	140947.56	-0.00	-0.00	61173.11	-13152.37	-2.92
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	140947.56	-3.48	-12278.66	-1150316.69	-12902.17	-1830.12
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	140947.56	6179.61	-10718.63	-993672.68	-621089.78	3644.21
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	140947.56	10606.18	-6128.25	-543254.39	-1058695.17	6078.30
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	140947.56	11966.50	3.48	61440.27	-1199911.36	4003.39
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	140947.56	10278.29	5942.97	652388.64	-1035247.97	2920.14
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	140947.56	5862.27	10162.01	1074914.73	-597636.90	3933.79
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	140947.56	3.48	12014.54	1252257.29	-13430.87	1831.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	140947.56	-6179.61	10718.63	1116041.06	594741.75	-3643.85
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	140947.56	-10834.91	6260.31	675834.30	1050038.68	-6079.91
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	140947.56	-11966.50	-3.48	60917.43	1173577.53	-4003.42
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	140947.56	-10049.56	-5810.91	-519821.94	991251.38	-2918.89
1.2 Dead+1.0 Wind 330 deg+1.0	140947.56	-5862.27	-10162.01	-952548.01	571314.19	-3934.00

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Ice+1.0 Temp						
Dead+Wind 0 deg - Service	30974.63	-6.51	-8726.65	-824708.29	2225.27	-1401.88
Dead+Wind 30 deg - Service	30974.63	4348.46	-7555.44	-711428.39	-412792.33	4181.31
Dead+Wind 60 deg - Service	30974.63	7274.09	-4205.85	-395224.07	-697374.36	6036.01
Dead+Wind 90 deg - Service	30974.63	8187.81	6.51	9965.68	-789473.92	3742.97
Dead+Wind 120 deg - Service	30974.63	7167.78	4151.99	410566.89	-690392.61	2508.10
Dead+Wind 150 deg - Service	30974.63	3964.18	6876.82	679205.29	-384211.54	4010.43
Dead+Wind 180 deg - Service	30974.63	6.51	8243.78	804758.54	895.86	1401.89
Dead+Wind 210 deg - Service	30974.63	-4348.46	7555.44	730026.49	415904.54	-4181.28
Dead+Wind 240 deg - Service	30974.63	-7692.27	4447.29	433109.59	733879.51	-6037.40
Dead+Wind 270 deg - Service	30974.63	-8187.81	-6.51	8636.54	792593.84	-3742.97
Dead+Wind 300 deg - Service	30974.63	-6749.60	-3910.56	-372688.82	660125.41	-2506.79
Dead+Wind 330 deg - Service	30974.63	-3964.18	-6876.82	-660608.47	387337.00	-4010.45

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	-0.00	-30974.63	0.00	0.00	30974.63	-0.00	0.000%
2	-27.23	-37169.56	-36492.92	27.24	37169.56	36492.92	0.000%
3	-27.23	-27877.17	-36492.92	27.24	27877.17	36492.92	0.000%
4	18184.29	-37169.56	-31595.16	-18184.29	37169.56	31595.16	0.000%
5	18184.29	-27877.17	-31595.16	-18184.29	27877.17	31595.16	0.000%
6	30418.61	-37169.56	-17587.93	-30418.61	37169.56	17587.93	0.000%
7	30418.61	-27877.17	-17587.93	-30418.61	27877.17	17587.93	0.000%
8	34239.59	-37169.56	27.23	-34239.59	37169.56	-27.23	0.000%
9	34239.59	-27877.17	27.23	-34239.59	27877.17	-27.23	0.000%
10	29974.06	-37169.56	17362.71	-29974.07	37169.56	-17362.72	0.000%
11	29974.06	-27877.17	17362.71	-29974.40	27877.47	-17362.73	0.001%
12	16577.31	-37169.56	28757.32	-16577.23	37169.39	-28757.14	0.001%
13	16577.31	-27877.17	28757.32	-16577.36	27877.19	-28757.29	0.000%
14	27.23	-37169.56	34473.64	-27.23	37169.56	-34473.64	0.000%
15	27.23	-27877.17	34473.64	-27.23	27877.17	-34473.64	0.000%
16	-18184.29	-37169.56	31595.16	18184.29	37169.56	-31595.16	0.000%
17	-18184.29	-27877.17	31595.16	18184.29	27877.17	-31595.16	0.000%
18	-32167.36	-37169.56	18597.56	32167.36	37169.56	-18597.57	0.000%
19	-32167.36	-27877.17	18597.56	32167.36	27877.17	-18597.56	0.000%
20	-34239.59	-37169.56	-27.23	34239.59	37169.56	27.24	0.000%
21	-34239.59	-27877.17	-27.23	34239.59	27877.17	27.24	0.000%
22	-28225.32	-37169.56	-16353.08	28225.32	37169.56	16353.08	0.000%
23	-28225.32	-27877.17	-16353.08	28225.32	27877.17	16353.08	0.000%
24	-16577.31	-37169.56	-28757.32	16577.20	37169.39	28757.15	0.001%
25	-16577.31	-27877.17	-28757.32	16577.27	27877.19	28757.34	0.000%
26	0.00	-140947.56	0.00	0.00	140947.56	0.00	0.000%
27	-3.48	-140947.56	-12278.66	3.48	140947.56	12278.66	0.000%
28	6179.61	-140947.56	-10718.63	-6179.61	140947.56	10718.63	0.000%
29	10606.18	-140947.56	-6128.25	-10606.18	140947.56	6128.25	0.000%
30	11966.50	-140947.56	3.48	-11966.50	140947.56	-3.48	0.000%
31	10278.29	-140947.56	5942.97	-10278.29	140947.56	-5942.97	0.000%
32	5862.27	-140947.56	10162.01	-5862.27	140947.56	-10162.01	0.000%
33	3.48	-140947.56	12014.54	-3.48	140947.56	-12014.54	0.000%
34	-6179.61	-140947.56	10718.63	6179.61	140947.56	-10718.63	0.000%
35	-10834.91	-140947.56	6260.31	10834.91	140947.56	-6260.31	0.000%
36	-11966.50	-140947.56	-3.48	11966.50	140947.56	3.48	0.000%
37	-10049.56	-140947.56	-5810.91	10049.56	140947.56	5810.91	0.000%
38	-5862.27	-140947.56	-10162.01	5862.27	140947.56	10162.01	0.000%
39	-6.51	-30974.63	-8726.65	6.51	30974.63	8726.65	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
40	4348.46	-30974.63	-7555.44	-4348.46	30974.63	7555.44	0.000%
41	7274.09	-30974.63	-4205.85	-7274.09	30974.63	4205.85	0.000%
42	8187.81	-30974.63	6.51	-8187.81	30974.63	-6.51	0.000%
43	7167.78	-30974.63	4151.99	-7167.78	30974.63	-4151.99	0.000%
44	3964.18	-30974.63	6876.82	-3964.18	30974.63	-6876.82	0.000%
45	6.51	-30974.63	8243.78	-6.51	30974.63	-8243.78	0.000%
46	-4348.46	-30974.63	7555.44	4348.46	30974.63	-7555.44	0.000%
47	-7692.27	-30974.63	4447.29	7692.27	30974.63	-4447.29	0.000%
48	-8187.81	-30974.63	-6.51	8187.81	30974.63	6.51	0.000%
49	-6749.60	-30974.63	-3910.56	6749.60	30974.63	3910.56	0.000%
50	-3964.18	-30974.63	-6876.82	3964.18	30974.63	6876.82	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000154
5	Yes	4	0.00000001	0.00000132
6	Yes	4	0.00000001	0.00000163
7	Yes	4	0.00000001	0.00000132
8	Yes	4	0.00000001	0.00000136
9	Yes	4	0.00000001	0.00000112
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000102
12	Yes	4	0.00000001	0.00000150
13	Yes	4	0.00000001	0.00000128
14	Yes	4	0.00000001	0.00000159
15	Yes	4	0.00000001	0.00000127
16	Yes	4	0.00000001	0.00000156
17	Yes	4	0.00000001	0.00000133
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000136
21	Yes	4	0.00000001	0.00000113
22	Yes	4	0.00000001	0.00000149
23	Yes	4	0.00000001	0.00000116
24	Yes	4	0.00000001	0.00000149
25	Yes	4	0.00000001	0.00000128
26	Yes	4	0.00000001	0.00000315
27	Yes	4	0.00000001	0.00004973
28	Yes	4	0.00000001	0.00005050
29	Yes	4	0.00000001	0.00005113
30	Yes	4	0.00000001	0.00005083
31	Yes	4	0.00000001	0.00005067
32	Yes	4	0.00000001	0.00005094
33	Yes	4	0.00000001	0.00005141
34	Yes	4	0.00000001	0.00005108
35	Yes	4	0.00000001	0.00005047
36	Yes	4	0.00000001	0.00004995
37	Yes	4	0.00000001	0.00004974
38	Yes	4	0.00000001	0.00004942
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001

41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	168 - 160	4.958	47	0.2609	0.0203
T2	160 - 140	4.520	47	0.2604	0.0202
T3	140 - 136	3.431	47	0.2509	0.0205
T4	136 - 132	3.217	47	0.2455	0.0205
T5	132 - 128	3.009	47	0.2382	0.0204
T6	128 - 124	2.807	47	0.2290	0.0201
T7	124 - 120	2.610	47	0.2214	0.0196
T8	120 - 115	2.422	47	0.2122	0.0190
T9	115 - 110	2.197	47	0.2021	0.0180
T10	110 - 105	1.985	47	0.1913	0.0169
T11	105 - 100	1.784	47	0.1800	0.0158
T12	100 - 93.3333	1.595	47	0.1681	0.0146
T13	93.3333 - 86.6667	1.363	47	0.1529	0.0132
T14	86.6667 - 80	1.153	47	0.1374	0.0119
T15	80 - 73.3333	0.964	47	0.1214	0.0105
T16	73.3333 - 66.6667	0.798	47	0.1079	0.0095
T17	66.6667 - 60	0.651	47	0.0942	0.0084
T18	60 - 40	0.522	47	0.0804	0.0073
T19	40 - 20	0.230	47	0.0500	0.0044
T20	20 - 0	0.063	47	0.0222	0.0022

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	20' 4-Bay Dipole	47	4.958	0.2609	0.0203	Inf
165.00	10'x2" Pipe Mount	47	4.794	0.2608	0.0203	Inf
152.00	Side Arm Mount [SO 311-1]	47	4.082	0.2590	0.0203	322572
150.00	(2) SBNHH-1D65B w/Mount Pipe	47	3.973	0.2583	0.0203	241283
140.00	LNX-6515DS-T4M w/Mount Pipe	47	3.431	0.2509	0.0205	69600
130.30	NNVV-65B-R4 w/ Mount Pipe	47	2.923	0.2343	0.0203	37810
120.00	7770.00 w/Mount Pipe	47	2.422	0.2122	0.0190	26450
91.00	2' Omni	47	1.287	0.1476	0.0128	24805
86.00	Side Arm Mount [SO 305-1]	47	1.133	0.1358	0.0118	26468
82.00	GPS	47	1.019	0.1260	0.0109	22700
71.00	12' Dipole	47	0.745	0.1032	0.0091	30363
68.00	Flood Light	47	0.679	0.0970	0.0086	27114
62.00	Flood Light	47	0.559	0.0843	0.0076	30726

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	168 - 160	20.692	18	1.0900	0.0851
T2	160 - 140	18.863	18	1.0878	0.0847
T3	140 - 136	14.310	18	1.0484	0.0857
T4	136 - 132	13.418	18	1.0256	0.0858
T5	132 - 128	12.550	18	0.9951	0.0855
T6	128 - 124	11.707	18	0.9563	0.0843
T7	124 - 120	10.884	18	0.9244	0.0821
T8	120 - 115	10.099	18	0.8856	0.0797
T9	115 - 110	9.160	18	0.8434	0.0754
T10	110 - 105	8.275	18	0.7982	0.0708
T11	105 - 100	7.436	18	0.7505	0.0660
T12	100 - 93.3333	6.646	18	0.7007	0.0609
T13	93.3333 - 86.6667	5.678	18	0.6374	0.0554
T14	86.6667 - 80	4.805	18	0.5725	0.0498
T15	80 - 73.3333	4.018	18	0.5060	0.0441
T16	73.3333 - 66.6667	3.327	18	0.4495	0.0396
T17	66.6667 - 60	2.712	18	0.3923	0.0350
T18	60 - 40	2.177	18	0.3346	0.0304
T19	40 - 20	0.957	18	0.2084	0.0183
T20	20 - 0	0.262	18	0.0922	0.0091

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	20' 4-Bay Dipole	18	20.692	1.0900	0.0851	325270
165.00	10'x2" Pipe Mount	18	20.006	1.0893	0.0849	325270
152.00	Side Arm Mount [SO 311-1]	18	17.034	1.0823	0.0849	82782
150.00	(2) SBNHH-1D65B w/Mount Pipe	18	16.577	1.0794	0.0850	61388
140.00	LNX-6515DS-T4M w/Mount Pipe	18	14.310	1.0484	0.0857	17139
130.30	NNVV-65B-R4 w/ Mount Pipe	18	12.189	0.9785	0.0851	8971
120.00	7770.00 w/Mount Pipe	18	10.099	0.8856	0.0797	6274
91.00	2' Omni	18	5.363	0.6151	0.0535	5945
86.00	Side Arm Mount [SO 305-1]	18	4.723	0.5657	0.0492	6301
82.00	GPS	18	4.244	0.5251	0.0457	5453
71.00	12' Dipole	18	3.103	0.4299	0.0380	7262
68.00	Flood Light	18	2.828	0.4040	0.0360	6516
62.00	Flood Light	18	2.329	0.3513	0.0317	7380

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	168	Leg	A325N	0.6250	4	249.03	20708.70	0.012 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	430.13	5811.33	0.074 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	69.20	5811.33	0.012 ✔	1	Member Block Shear
T2	160	Leg	A325N	0.6250	4	2875.61	20708.70	0.139 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2681.79	5811.33	0.461 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	83.18	4553.91	0.018 ✔	1	Member Block Shear
T3	140	Diagonal	A325N	0.6250	1	3365.30	5811.33	0.579 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	268.09	4553.91	0.059 ✔	1	Member Block Shear
T4	136	Diagonal	A325N	0.6250	1	3529.56	5811.33	0.607 ✔	1	Member Block Shear
T5	132	Diagonal	A325N	0.6250	1	4265.71	5811.33	0.734 ✔	1	Member Block Shear
T6	128	Diagonal	A325N	0.6250	1	5048.64	5811.33	0.869 ✔	1	Member Block Shear
T7	124	Leg	A325N	0.7500	4	11354.10	29820.60	0.381 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5042.38	5811.33	0.868 ✔	1	Member Block Shear
T8	120	Diagonal	A325N	0.6250	1	4466.47	6830.86	0.654 ✔	1	Member Block Shear
T9	115	Diagonal	A325N	0.6250	1	4512.88	6830.86	0.661 ✔	1	Member Block Shear
T10	110	Diagonal	A325N	0.6250	1	4313.95	6830.86	0.632 ✔	1	Member Block Shear
T11	105	Leg	A325N	0.8750	4	19531.60	40589.10	0.481 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4359.23	6830.86	0.638 ✔	1	Member Block Shear
T12	100	Diagonal	A325N	0.6250	1	4752.32	7830.00	0.607 ✔	1	Member Bearing
T13	93.3333	Diagonal	A325N	0.6250	1	4944.27	7830.00	0.631 ✔	1	Member Bearing
T14	86.6667	Leg	A325N	0.8750	4	26039.90	40589.10	0.642 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4991.01	7830.00	0.637 ✔	1	Member Bearing
T15	80	Diagonal	A325N	0.6250	1	5004.00	10440.00	0.479 ✔	1	Member Bearing
T16	73.3333	Diagonal	A325N	0.6250	1	5299.31	10440.00	0.508 ✔	1	Member Bearing
T17	66.6667	Leg	A325N	1.0000	4	32226.60	53014.40	0.608 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5407.00	10440.00	0.518 ✔	1	Member Bearing
T18	60	Leg	A325N	1.0000	6	25412.30	53014.40	0.479 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5653.37	10440.00	0.542 ✔	1	Member Bearing
T19	40	Leg	A325N	1.0000	6	28689.60	53014.40	0.541 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6448.66	10440.00	0.618 ✔	1	Member Bearing
T20	20	Diagonal	A325N	0.7500	1	6918.02	12615.00	0.548 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	ROHN 2.5 STD	8.00	4.00	50.7 K=1.00	1.7040	-1860.18	63560.30	0.029 [1] ✓
T2	160 - 140	ROHN 2.5 STD	20.00	4.00	50.7 K=1.00	1.7040	-15485.40	63560.30	0.244 [1] ✓
T3	140 - 136	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-21300.90	63560.30	0.335 [1] ✓
T4	136 - 132	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-28037.80	63560.30	0.441 [1] ✓
T5	132 - 128	ROHN 2.5 STD	4.00	4.00	50.7 K=1.00	1.7040	-35635.70	63560.30	0.561 [1] ✓
T6	128 - 124	P2.5STD + Half P3STD	4.00	4.00	50.5 K=1.00	2.6460	-45020.90	98795.30	0.456 [1] ✓
T7	124 - 120	P2.5STD + Half P3STD	4.00	4.00	50.5 K=1.00	2.6460	-53956.40	98795.30	0.546 [1] ✓
T8	120 - 115	P3STD + Half P3.5STD	5.01	5.01	52.4 K=1.00	3.3750	-63924.00	124294.00	0.514 [1] ✓
T9	115 - 110	P3STD + Half P3.5STD	5.01	5.01	52.4 K=1.00	3.3750	-74075.40	124294.00	0.596 [1] ✓
T10	110 - 105	P3STD + Half P3.5STD	5.01	5.01	52.4 K=1.00	3.3750	-82219.20	124294.00	0.661 [1] ✓
T11	105 - 100	P3STD + Half P3.5STD	5.01	2.58	53.9 K=2.00	3.3750	-90763.30	122789.00	0.739 [1] ✓
T12	100 - 93.3333	ROHN 3.5 EH	6.68	6.68	61.3 K=1.00	3.6784	-99862.40	125727.00	0.794 [1] ✓
T13	93.3333 - 86.6667	ROHN 3.5 EH	6.68	3.45	31.7 K=1.00	3.6784	-110059.00	153781.00	0.716 [1] ✓
T14	86.6667 - 80	ROHN 3.5 EH	6.68	3.45	31.7 K=1.00	3.6784	-119819.00	153830.00	0.779 [1] ✓
T15	80 - 73.3333	ROHN 4 EH	6.68	6.68	54.3 K=1.00	4.4074	-129894.00	159911.00	0.812 [1] ✓
T16	73.3333 - 66.6667	ROHN 4 EH	6.68	3.43	55.8 K=2.00	4.4074	-139082.00	157916.00	0.881 [1] ✓
T17	66.6667 - 60	ROHN 4 EH	6.68	3.43	27.9 K=1.00	4.4074	-148339.00	187383.00	0.792 [1] ✓
T18	60 - 40	ROHN 5 EH	20.03	6.68	43.6 K=1.00	6.1120	-175863.00	239385.00	0.735 [1] ✓
T19	40 - 20	ROHN 6 EHS	20.03	10.02	54.0 K=1.00	6.7133	-199135.00	244058.00	0.816 [1] ✓
T20	20 - 0	ROHN 6 EH	20.03	10.02	54.8 K=1.00	8.4049	-223539.00	303742.00	0.736 [1] ✓

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L1 3/4x1 3/4x3/16	7.79	3.64	127.1 K=1.00	0.6211	-436.03	8596.26	0.051 [1] ✔
T2	160 - 140	L1 3/4x1 3/4x3/16	7.79	3.64	127.1 K=1.00	0.6211	-2695.21	8596.26	0.314 [1] ✔
T3	140 - 136	L1 3/4x1 3/4x3/16	7.79	3.64	127.1 K=1.00	0.6211	-3475.44	8596.26	0.404 [1] ✔
T4	136 - 132	L1 3/4x1 3/4x3/16	7.79	3.64	127.1 K=1.00	0.6211	-3446.83	8596.26	0.401 [1] ✔
T5	132 - 128	L1 3/4x1 3/4x3/16	7.79	3.64	127.1 K=1.00	0.6211	-4379.95	8596.26	0.510 [1] ✔
T6	128 - 124	L1 3/4x1 3/4x3/16	7.79	3.64	127.1 K=1.00	0.6211	-4955.59	8596.26	0.576 [1] ✔
T7	124 - 120	L1 3/4x1 3/4x3/16	7.79	3.61	126.0 K=1.00	0.6211	-5222.46	8718.58	0.599 [1] ✔
T8	120 - 115	L2x2x3/16	8.56	4.11	125.2 K=1.00	0.7150	-4801.34	10154.20	0.473 [1] ✔
T9	115 - 110	L2x2x3/16	8.97	4.32	131.5 K=1.00	0.7150	-4406.52	9316.83	0.473 [1] ✔
T10	110 - 105	L2x2x3/16	9.40	4.53	138.0 K=1.00	0.7150	-4545.00	8477.33	0.536 [1] ✔
T11	105 - 100	L2x2x3/16	9.83	4.75	144.6 K=1.00	0.7150	-4436.01	7720.01	0.575 [1] ✔
T12	100 - 93.3333	L2 1/2x2 1/2x3/16	11.25	5.51	133.5 K=1.00	0.9020	-4959.81	11440.10	0.434 [1] ✔
T13	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.80	5.78	140.1 K=1.00	0.9020	-5149.95	10374.50	0.496 [1] ✔
T14	86.6667 - 80	L2 1/2x2 1/2x3/16	12.36	6.06	147.0 K=1.00	0.9020	-5338.79	9433.42	0.566 [1] ✔
T15	80 - 73.3333	L2 1/2x2 1/2x1/4	12.93	6.33	154.6 K=1.00	1.1900	-5131.39	11249.50	0.456 [1] ✔
T16	73.3333 - 66.6667	L2 1/2x2 1/2x1/4	13.52	6.62	161.7 K=1.00	1.1900	-5675.48	10278.70	0.552 [1] ✔
T17	66.6667 - 60	L2 1/2x2 1/2x1/4	14.11	6.91	169.0 K=1.00	1.1900	-5860.78	9417.25	0.622 [1] ✔
T18	60 - 40	L3x3x1/4	15.92	7.77	157.6 K=1.00	1.4400	-5750.06	13105.90	0.439 [1] ✔
T19	40 - 20	L3 1/2x3 1/2x1/4	19.14	9.42	162.9 K=1.00	1.6900	-6904.64	14380.40	0.480 [1] ✔
T20	20 - 0	L3 1/2x3 1/2x1/4	20.89	10.29	177.9 K=1.00	1.6900	-7634.56	12070.00	0.633 [1] ✔

[1] $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T11	105 - 100	L3x3x3/16	8.46	8.12	111.9 K=1.08	1.0900	-1574.08	18047.70	0.087 [1] ✓
T13	93.3333 - 86.6667	L2x2x3/16	9.72	9.38	158.5 K=0.87	0.7150	-1908.71	6433.37	0.297 [1] ✓
T14	86.6667 - 80	L2x2x3/16	10.39	10.06	166.5 K=0.85	0.7150	-2077.98	5823.57	0.357 [1] ✓
T16	73.3333 - 66.6667	L3x3x3/16	11.75	11.37	135.6 K=0.93	1.0900	-2412.06	13396.50	0.180 [1] ✓
T17	66.6667 - 60	L2x2x3/16	12.42	12.05	190.3 K=0.81	0.7150	-2572.60	4459.97	0.577 [1] ✓

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L1 3/4x1 3/4x3/16	6.69	6.21	217.0 K=1.00	0.6211	-107.09	2979.61	0.036 [1] ✓
T2	160 - 140	KL/R > 200 (C) - 6 L2x2x1/8	6.69	6.21	187.5 K=1.00	0.4844	-64.94	3113.34	0.021 [1] ✓
T3	140 - 136	L2x2x1/8	6.69	6.21	187.5 K=1.00	0.4844	-46.54	3113.34	0.015 [1] ✓

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	ROHN 2.5 STD	8.00	4.00	50.7	1.7040	996.13	76682.30	0.013 [1] ✓
T2	160 - 140	ROHN 2.5 STD	20.00	4.00	50.7	1.7040	11502.50	76682.30	0.150 [1] ✓
T3	140 - 136	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	16628.20	76682.30	0.217 [1] ✓
T4	136 - 132	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	22440.40	76682.30	0.293 [1] ✓
T5	132 - 128	ROHN 2.5 STD	4.00	4.00	50.7	1.7040	28921.10	76682.30	0.377 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	128 - 124	P2.5STD + Half P3STD	4.00	4.00	50.5	2.6460	36881.90	119070.00	0.310 [1]
T7	124 - 120	P2.5STD + Half P3STD	4.00	4.00	50.5	2.6460	45416.60	119070.00	0.381 [1]
T8	120 - 115	P3STD + Half P3.5STD	5.01	5.01	52.4	3.3750	54164.10	151875.00	0.357 [1]
T9	115 - 110	P3STD + Half P3.5STD	5.01	5.01	52.4	3.3750	62882.40	151875.00	0.414 [1]
T10	110 - 105	P3STD + Half P3.5STD	5.01	5.01	52.4	3.3750	70540.30	151875.00	0.464 [1]
T11	105 - 100	P3STD + Half P3.5STD	5.01	2.58	27.0	3.3750	78191.60	151875.00	0.515 [1]
T12	100 - 93.3333	ROHN 3.5 EH	6.68	6.68	61.3	3.6784	86538.90	165529.00	0.523 [1]
T13	93.3333 - 86.6667	ROHN 3.5 EH	6.68	3.45	31.7	3.6784	95636.60	165529.00	0.578 [1]
T14	86.6667 - 80	ROHN 3.5 EH	6.68	3.45	31.7	3.6784	104291.00	165529.00	0.630 [1]
T15	80 - 73.3333	ROHN 4 EH	6.68	6.68	54.3	4.4074	113156.00	198335.00	0.571 [1]
T16	73.3333 - 66.6667	ROHN 4 EH	6.68	3.43	27.9	4.4074	121045.00	198335.00	0.610 [1]
T17	66.6667 - 60	ROHN 4 EH	6.68	3.43	27.9	4.4074	129032.00	198335.00	0.651 [1]
T18	60 - 40	ROHN 5 EH	20.03	6.68	43.6	6.1120	152474.00	275039.00	0.554 [1]
T19	40 - 20	ROHN 6 EHS	20.03	10.02	54.0	6.7133	172137.00	302097.00	0.570 [1]
T20	20 - 0	ROHN 6 EH	20.03	10.02	54.8	8.4049	192214.00	378222.00	0.508 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	168 - 160	L1 3/4x1 3/4x3/16	7.79	3.64	84.0	0.3604	430.13	15675.30	0.027 [1]
T2	160 - 140	L1 3/4x1 3/4x3/16	7.79	3.64	84.0	0.3604	2681.79	15675.30	0.171 [1]
T3	140 - 136	L1 3/4x1 3/4x3/16	7.79	3.64	84.0	0.3604	3365.30	15675.30	0.215 [1]
T4	136 - 132	L1 3/4x1 3/4x3/16	7.79	3.64	84.0	0.3604	3529.56	15675.30	0.225 [1]
T5	132 - 128	L1 3/4x1 3/4x3/16	7.79	3.64	84.0	0.3604	4265.71	15675.30	0.272 [1]
T6	128 - 124	L1 3/4x1 3/4x3/16	7.79	3.64	84.0	0.3604	5048.64	15675.30	0.322 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	124 - 120	L1 3/4x1 3/4x3/16	7.79	3.61	83.3	0.3604	5042.38	15675.30	0.322 [1]
T8	120 - 115	L2x2x3/16	8.56	4.11	82.3	0.4308	4466.47	18739.00	0.238 [1]
T9	115 - 110	L2x2x3/16	8.97	4.32	86.3	0.4308	4512.88	18739.00	0.241 [1]
T10	110 - 105	L2x2x3/16	9.40	4.53	90.5	0.4308	4313.95	18739.00	0.230 [1]
T11	105 - 100	L2x2x3/16	9.83	4.75	94.7	0.4308	4359.23	18739.00	0.233 [1]
T12	100 - 93.3333	L2 1/2x2 1/2x3/16	11.25	5.51	86.8	0.5710	4752.32	24839.90	0.191 [1]
T13	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	11.80	5.78	91.0	0.5710	4944.27	24839.90	0.199 [1]
T14	86.6667 - 80	L2 1/2x2 1/2x3/16	12.36	6.06	95.4	0.5710	4991.01	24839.90	0.201 [1]
T15	80 - 73.3333	L2 1/2x2 1/2x1/4	12.93	6.33	100.6	0.7519	5004.00	32706.60	0.153 [1]
T16	73.3333 - 66.6667	L2 1/2x2 1/2x1/4	13.52	6.62	105.1	0.7519	5299.31	32706.60	0.162 [1]
T17	66.6667 - 60	L2 1/2x2 1/2x1/4	14.11	6.91	109.7	0.7519	5407.00	32706.60	0.165 [1]
T18	60 - 40	L3x3x1/4	15.92	7.77	101.8	0.9394	5653.37	40862.80	0.138 [1]
T19	40 - 20	L3 1/2x3 1/2x1/4	19.14	9.42	105.1	1.1269	6448.66	49019.10	0.132 [1]
T20	20 - 0	L3 1/2x3 1/2x1/4	20.89	10.29	114.7	1.1034	6918.02	47999.50	0.144 [1]

[1] $P_u / \phi P_n$ controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T11	105 - 100	L3x3x3/16	8.46	8.12	103.8	1.0900	1574.08	35316.00	0.045 [1]
T13	93.3333 - 86.6667	L2x2x3/16	9.72	9.38	182.5	0.7150	1908.71	23166.00	0.082 [1]
T14	86.6667 - 80	L2x2x3/16	10.39	10.06	195.7	0.7150	2077.98	23166.00	0.090 [1]
T16	73.3333 - 66.6667	L3x3x3/16	11.75	11.37	145.3	1.0900	2412.06	35316.00	0.068 [1]
T17	66.6667 - 60	L2x2x3/16	12.42	12.05	234.3	0.7150	2572.60	23166.00	0.111 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	168 - 160	L1 3/4x1 3/4x3/16	6.69	6.21	144.2	0.3604	69.20	15675.30	0.004 [1] ✓
T2	160 - 140	L2x2x1/8	6.69	6.21	123.6	0.2930	83.18	12744.10	0.007 [1] ✓
T3	140 - 136	L2x2x1/8	6.69	6.21	123.6	0.2930	268.09	12744.10	0.021 [1] ✓

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	168 - 160	Leg	ROHN 2.5 STD	3	-1860.18	63560.30	2.9	Pass
		Diagonal	L1 3/4x1 3/4x3/16	8	-436.03	8596.26	5.1	Pass
		Top Girt	L1 3/4x1 3/4x3/16	6	-107.09	2979.61	3.6	Pass
T2	160 - 140	Leg	ROHN 2.5 STD	21	-15485.40	63560.30	24.4	Pass
		Diagonal	L1 3/4x1 3/4x3/16	27	-2695.21	8596.26	31.4	Pass
		Top Girt	L2x2x1/8	22	-64.94	3113.34	2.1	Pass
T3	140 - 136	Leg	ROHN 2.5 STD	55	-21300.90	63560.30	33.5	Pass
		Diagonal	L1 3/4x1 3/4x3/16	64	-3475.44	8596.26	40.4	Pass
		Top Girt	L2x2x1/8	59	268.09	12744.10	2.1	Pass
T4	136 - 132	Leg	ROHN 2.5 STD	67	-28037.80	63560.30	44.1	Pass
		Diagonal	L1 3/4x1 3/4x3/16	72	-3446.83	8596.26	40.1	Pass
T5	132 - 128	Leg	ROHN 2.5 STD	76	-35635.70	63560.30	56.1	Pass
		Diagonal	L1 3/4x1 3/4x3/16	82	-4379.95	8596.26	51.0	Pass
T6	128 - 124	Leg	P2.5STD + Half P3STD	85	-45020.90	98795.30	45.6	Pass
		Diagonal	L1 3/4x1 3/4x3/16	88	-4955.59	8596.26	57.6	Pass
T7	124 - 120	Leg	P2.5STD + Half P3STD	94	-53956.40	98795.30	54.6	Pass
		Diagonal	L1 3/4x1 3/4x3/16	98	-5222.46	8718.58	59.9	Pass
T8	120 - 115	Leg	P3STD + Half P3.5STD	103	-63924.00	124294.00	51.4	Pass
		Diagonal	L2x2x3/16	106	-4801.34	10154.20	47.3	Pass
T9	115 - 110	Leg	P3STD + Half P3.5STD	112	-74075.40	124294.00	59.6	Pass
		Diagonal	L2x2x3/16	115	-4406.52	9316.83	47.3	Pass
T10	110 - 105	Leg	P3STD + Half P3.5STD	121	-82219.20	124294.00	66.1	Pass
		Diagonal	L2x2x3/16	124	-4545.00	8477.33	53.6	Pass
T11	105 - 100	Leg	P3STD + Half P3.5STD	130	-90763.30	122789.00	73.9	Pass
		Diagonal	L2x2x3/16	133	-4436.01	7720.01	57.5	Pass
		Secondary Horizontal	L3x3x3/16	139	-1574.08	18047.70	8.7	Pass
T12	100 - 93.3333	Leg	ROHN 3.5 EH	142	-99862.40	125727.00	79.4	Pass
		Diagonal	L2 1/2x2 1/2x3/16	145	-4959.81	11440.10	43.4	Pass
T13	93.3333 - 86.6667	Leg	ROHN 3.5 EH	151	-110059.00	153781.00	71.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	154	-5149.95	10374.50	49.6	Pass
		Secondary Horizontal	L2x2x3/16	160	-1908.71	6433.37	29.7	Pass
T14	86.6667 - 80	Leg	ROHN 3.5 EH	163	-119819.00	153830.00	77.9	Pass
		Diagonal	L2 1/2x2 1/2x3/16	166	-5338.79	9433.42	56.6	Pass
		Secondary Horizontal	L2x2x3/16	174	-2077.98	5823.57	35.7	Pass
T15	80 - 73.3333	Leg	ROHN 4 EH	175	-129894.00	159911.00	81.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	L2 1/2x2 1/2x1/4	179	-5131.39	11249.50	45.6	Pass
T16	73.3333 - 66.6667	Leg	ROHN 4 EH	184	-139082.00	157916.00	88.1	Pass
		Diagonal	L2 1/2x2 1/2x1/4	187	-5675.48	10278.70	55.2	Pass
		Secondary Horizontal	L3x3x3/16	195	-2412.06	13396.50	18.0	Pass
T17	66.6667 - 60	Leg	ROHN 4 EH	196	-148339.00	187383.00	79.2	Pass
		Diagonal	L2 1/2x2 1/2x1/4	199	-5860.78	9417.25	62.2	Pass
		Secondary Horizontal	L2x2x3/16	207	-2572.60	4459.97	57.7	Pass
T18	60 - 40	Leg	ROHN 5 EH	208	-175863.00	239385.00	73.5	Pass
		Diagonal	L3x3x1/4	212	-5750.06	13105.90	43.9	Pass
T19	40 - 20	Leg	ROHN 6 EHS	229	-199135.00	244058.00	81.6	Pass
		Diagonal	L3 1/2x3 1/2x1/4	232	-6904.64	14380.40	48.0	Pass
T20	20 - 0	Leg	ROHN 6 EH	244	-223539.00	303742.00	73.6	Pass
		Diagonal	L3 1/2x3 1/2x1/4	247	-7634.56	12070.00	63.3	Pass
							Summary	
						Leg (T16)	88.1	Pass
						Diagonal (T20)	63.3	Pass
						Secondary Horizontal (T17)	57.7	Pass
						Top Girt (T1)	3.6	Pass
						Bolt Checks	86.9	Pass
						RATING =	**88.1**	**Pass**

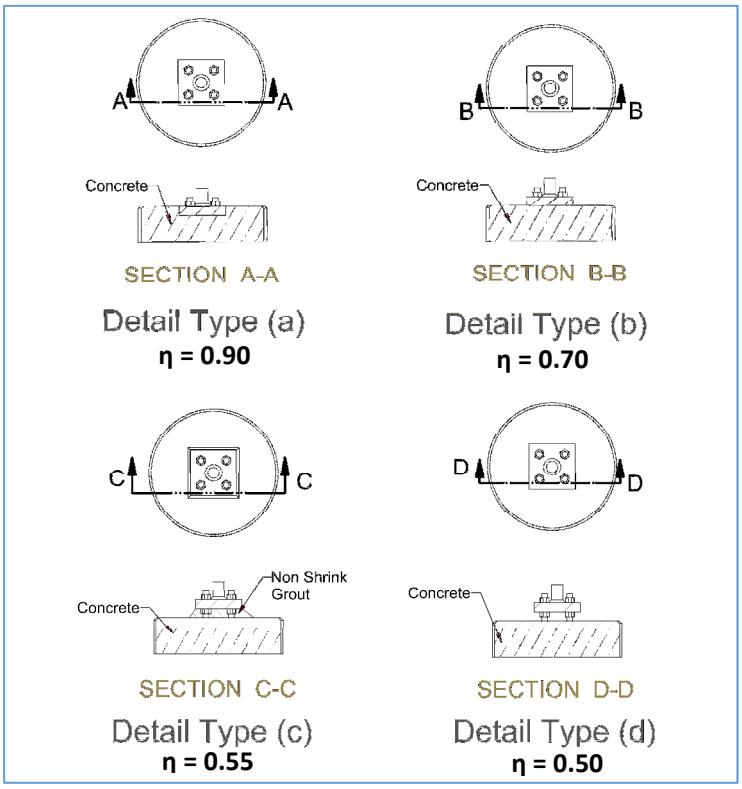
Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

Site:	CT33XC572
Project:	22977
Date:	4/17/18

Self Support Tower Anchor Rod Check - TIA-222-G

Eta, η:	0.70	
Tension, Pu:	197.1	kip
Shear, Vu:	20.6	kip
Quantity:	6	
Diameter:	1	in
Grade:	A354 Gr. BC (1/4 to 2-1/2)	
Fy:	109	ksi
Fu:	125	ksi
Anchor Force:	37.8	kip
Design Capacity:	60.6	kip
Stress Ratio:	62.3%	
Length, lar:		in
Moment, Mu:		kip-in
Stress Ratio:		
Maximum Acceptable:	105%	
Governing Stress Ratio:	**62.3%**	Pass

Anchor Rod Detail Types



PROJECT INFORMATION:

TOWER INFORMATION

LAT: 41.999167°

LONG: -72.152369°

SITE TYPE: 150' SELF-SUPPORT TOWER

COUNTY: TOLLAND

LANDLORD

NAVIGATOR PROPERTIES, LLC
NANCY AUMEN, DIR. OF ADMIN
PO BOX 1160
KENNEBUNKPORT, ME 04046
(207) 967-8094
NANCY@MARINETOWER.COM

APPLICANT

SPRINT
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
CONTACT: TBD
PHONE: TBD
EMAIL: TBD

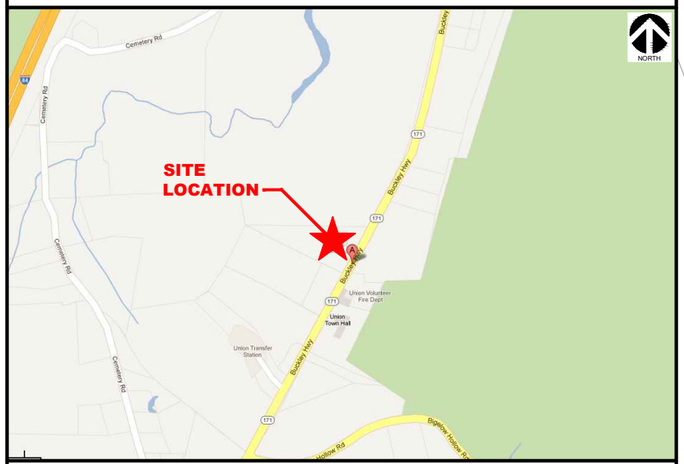
A&E FIRM

RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK
PROJECT MANAGER
PHONE: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

SCOPE OF WORK:

- REPLACE (6) EXISTING ANTENNAS WITH (3) NEW 2500 PANEL ANTENNAS AND (3) NEW 800/1900 PANEL ANTENNAS ON EXISTING MOUNTS
- ADD (3) NEW 2500 RRHS
- ADD (6) NEW 800 RRHS
- ADD (4) HYBRID CABLES
- RELOCATE (3) EXISTING 1900 RRHS

VICINITY MAP:



AERIAL MAP:

SHEET INDEX:

SHEET #	SHEET DESCRIPTION	REVISION
T-1	COVER SHEET & SITE PLAN	1
A-1	PROPOSED ANTENNA LAYOUT & EQUIPMENT LAYOUT	-
A-2	TOWER ELEVATION	-
A-3	ANTENNA DETAILS	-
A-4	ANTENNA SCHEDULE & DETAILS	-
A-5	FIBER PLUMBING DIAGRAM	-
A-6	CABLE COLOR CODING	-
E-1	DC POWER & FIBER DISTRIBUTION DETAIL	-

CODE COMPLIANCE:

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

1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

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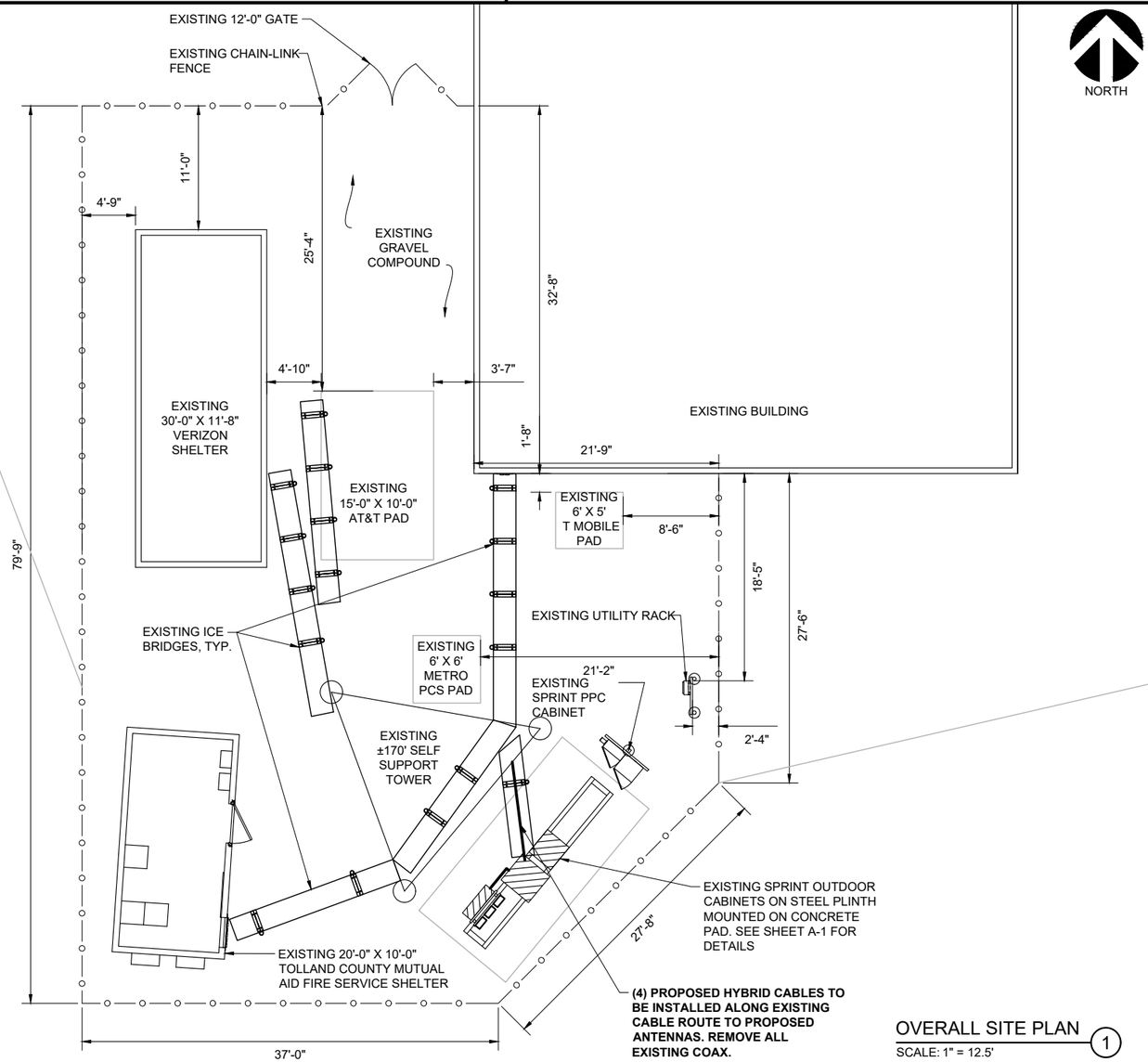
DO MACRO UPGRADE

SITE CASCADE:

CT33XC572



OVERALL SITE PLAN (1)
SCALE: 1" = 12.5'

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Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R Skowronski Date: 6/11/2018

MARK	DATE	DESCRIPTION
1	06/11/18	REVISED PER CLIENT COMMENTS

ISSUE PHASE: FINAL
DATE ISSUED: 04/23/2018

PROJECT TITLE:
CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:
COVER SHEET & SITE PLAN

0 6.25' 12.5' 25'
11" x 17" - 1" = 12.5'
22" x 34" - 1" = 6.25'

PROJECT NUMBER: 22977
SHEET NUMBER: T-1

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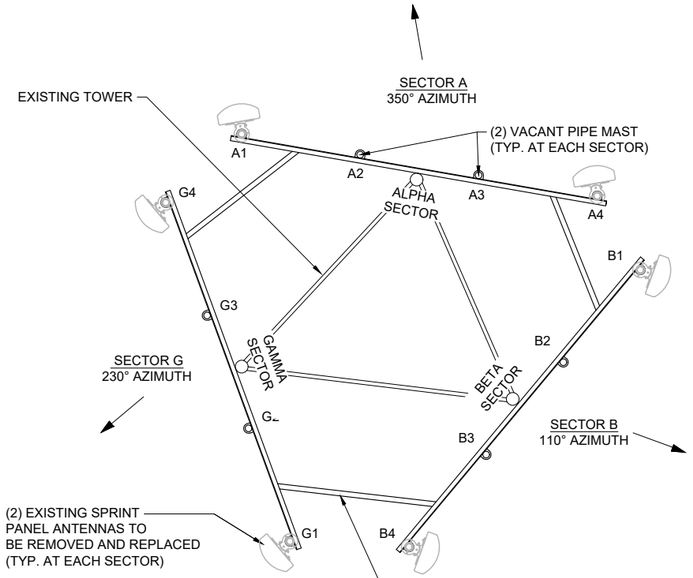
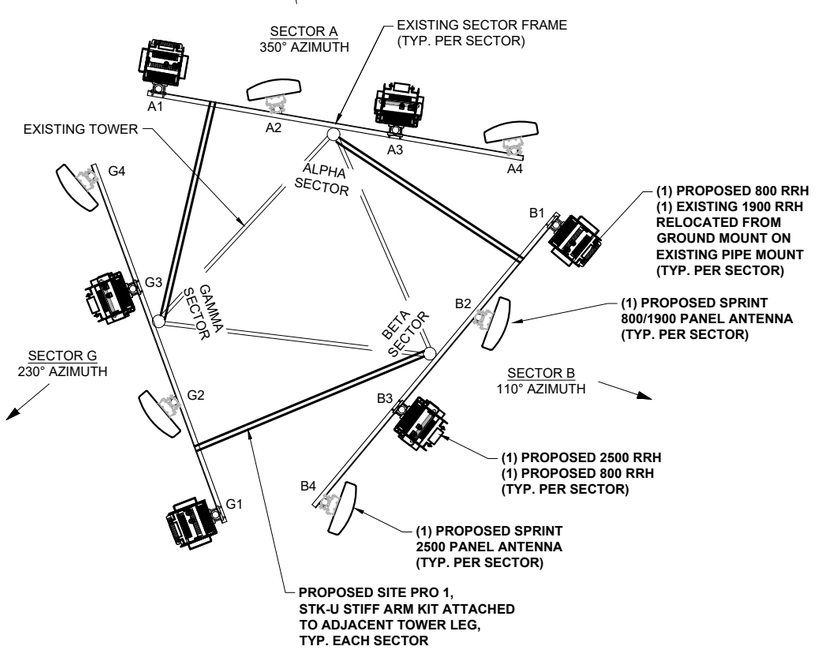
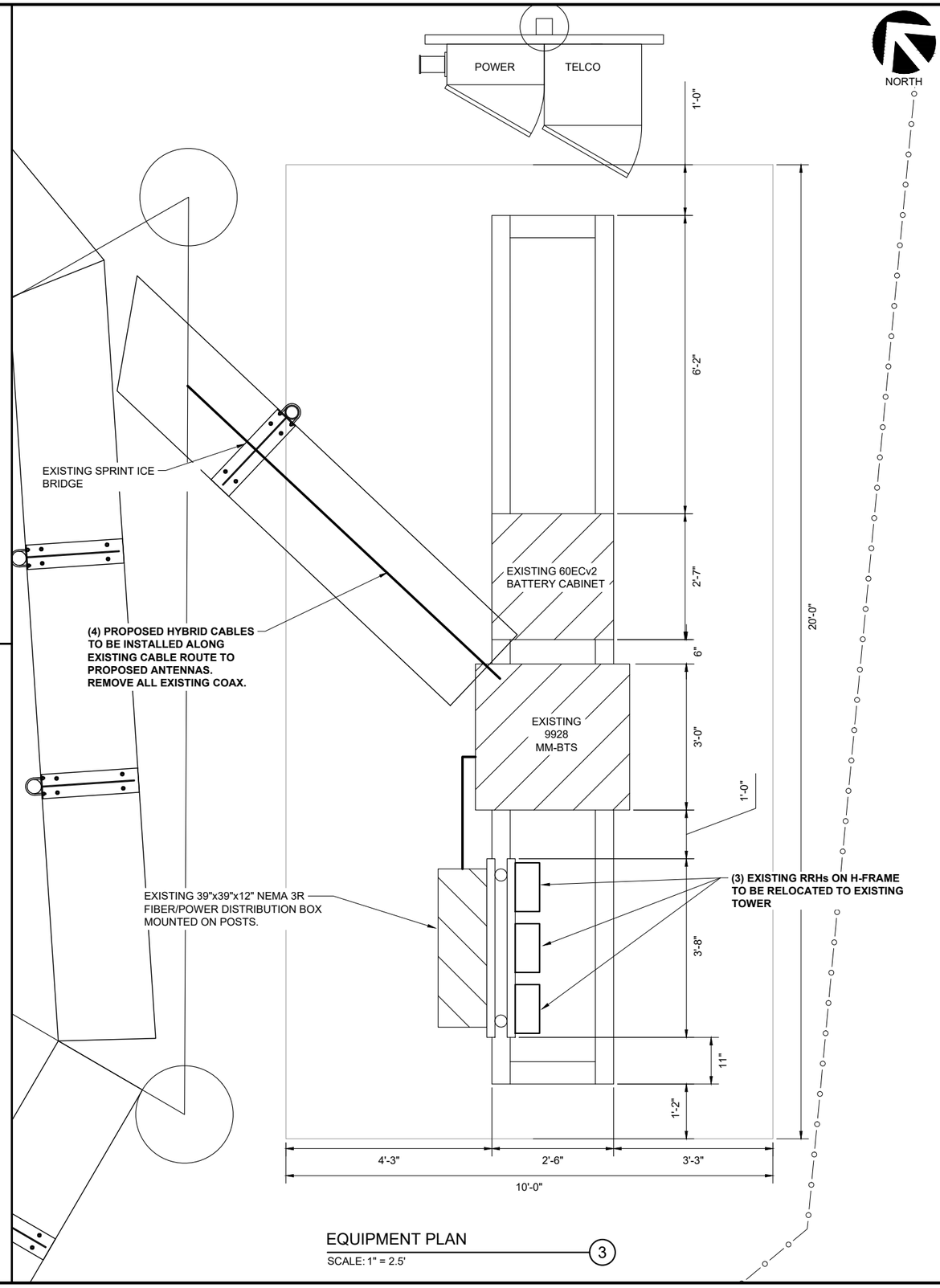


EXISTING ANTENNA PLAN
SCALE: NTS (1)



PROPOSED ANTENNA PLAN
SCALE: NTS (2)



EQUIPMENT PLAN
SCALE: 1" = 2.5' (3)

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JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL ENGINEER

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DATE ISSUED: 04/23/2018

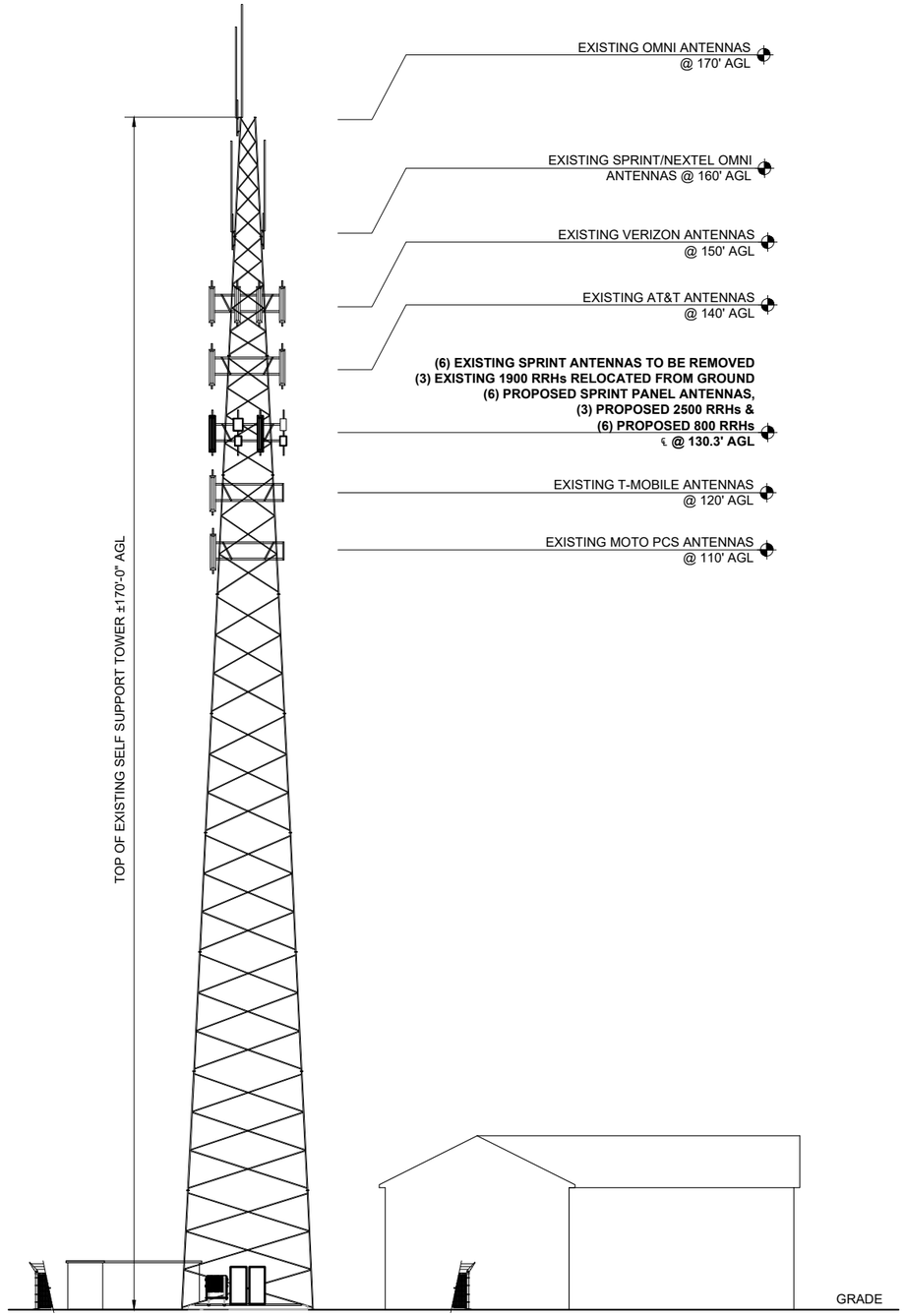
PROJECT TITLE:
CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:
PROPOSED ANTENNA LAYOUT & EQUIPMENT LAYOUT

0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

PROJECT NUMBER: 22977
SHEET NUMBER: A-1



TOWER ELEVATION (EAST) 1

SCALE: 1" = 25'

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PROJECT TITLE:

CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:

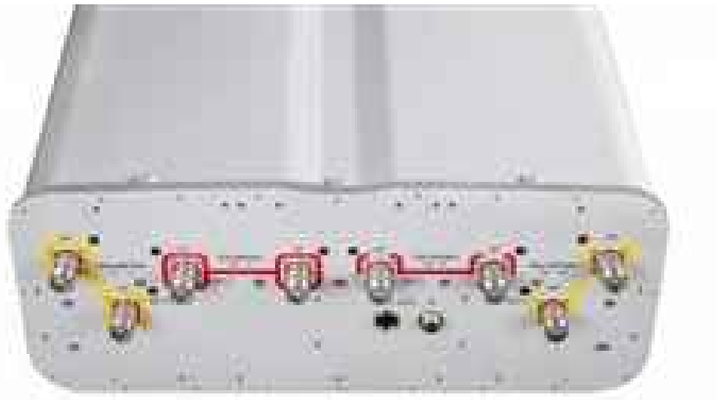
TOWER ELEVATION

0 12.5' 25' 50'

11" x 17" - 1" = 25'
22" x 34" - 1" = 12.5'

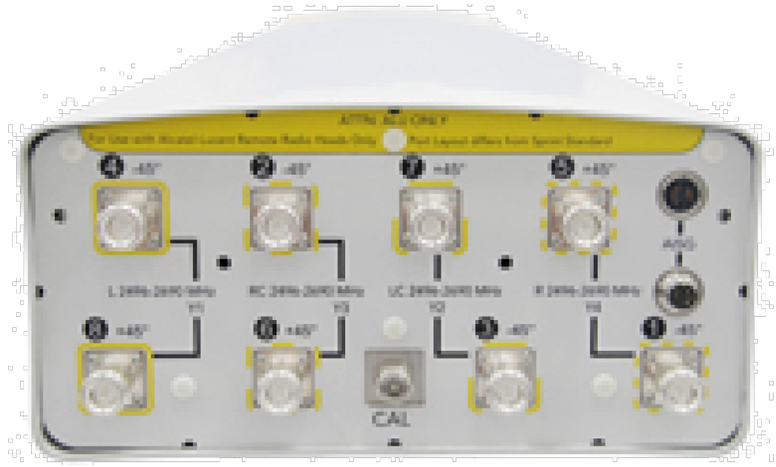
PROJECT NUMBER: 22977

SHEET NUMBER: A-2



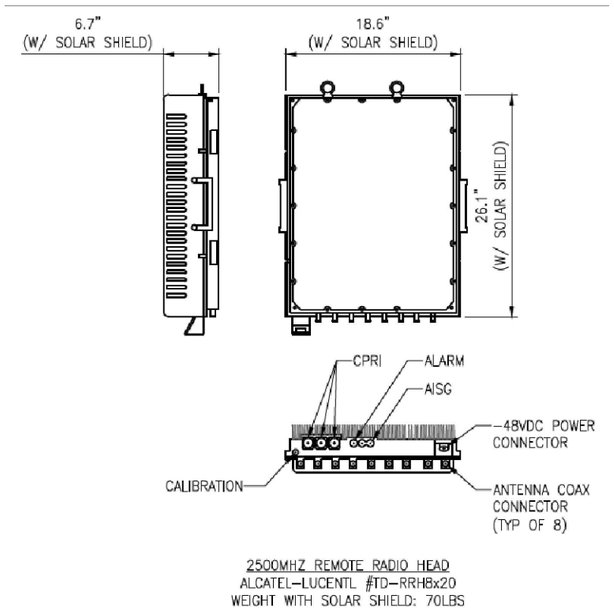
MECHANICAL	
DIMENSION (HxWxD)	72.0" x 19.6" x 7.8"
WEIGHT	77.4 lbs

ANTENNA MODEL: COMMSCOPE #NNVV-65B-R4 - ANTENNA SPECS



MECHANICAL	
DIMENSION (HxWxD)	56.3"x12.6"x6.3"
WEIGHT	56.2 lbs

ANTENNA MODEL: RFS #APXVTM14-ALU-I20 - ANTENNA SPECS



2500MHZ REMOTE RADIO HEAD
ALCATEL-LUCENTL #TD-RRH8x20
WEIGHT WITH SOLAR SHIELD: 70LBS

MECHANICAL	
DIMENSION (HxWxD)	26.1"x18.6"x6.7"
WEIGHT	70 lbs

RRH MODEL: ALU #TD-RRH8X20-25 - RADIO SPECS

800MHz 2X50W Remote Radio Head (RRH)

Simultaneous CDMA & LTE Multi technology RRH 862-869 MHz
- Any combination of CDMA and LTE carriers supported by 100W RF Power

2 CPRI-like Optical Connections for daisy chaining
Software Switchable External Filter for use before Public Safety is cleared

Dimensions:	w/o Filter	w/ Filter
Height:	480 mm (19")	480 mm (19")
Width:	330 mm (13")	330 mm (13")
Depth:	218 mm (8.6")	310 (12.2")
Weight:	24 kg (53 lbs)	29 kg (64 lbs)
	49 liters, <29kg	

Power Supply: -48 VDC
Power Consumption: <400W Typical
Operating Temp range -40° C to +55° C
Option to mount on Ground at tower base

Front/Top View

Bottom View

Alcatel-Lucent's 800 RRH satisfies Sprint's requirements.

MECHANICAL	
DIMENSION (HxWxD)	19" x 13" x 12.2"
WEIGHT	64 lbs

RRH MODEL: ALU #800 MHz 2x50W - RADIO SPECS

Sprint

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JAMES R. SKOWRONSKI
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ISSUE PHASE: FINAL
DATE ISSUED: 04/23/2018

PROJECT TITLE:
CT33XC572

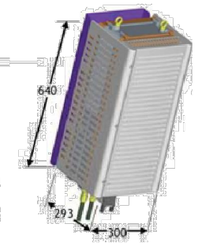
PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:
ANTENNA DETAILS

SCALE: NONE

PROJECT NUMBER: 22977
SHEET NUMBER: A-3

1900MHz Remote Radio Head (RRH)



Capacity & Features

CDMA / LTE Multi technology RRH 65MHz bandwidth (PCS A-G Band)

- Sprint is free to deploy any combination of CDMA (1XRTT or EVDO) and LTE carriers in Sprint's spectrum up to 160 Watts of RF power.
- E.g. "A block" and "G block" both with 4 branch MIMO (4Tx & 4Rx)

2 CPRI Optical Connections for multi-carrier LTE and CDMA (1X & DO)

Power Supply: -48 VDC

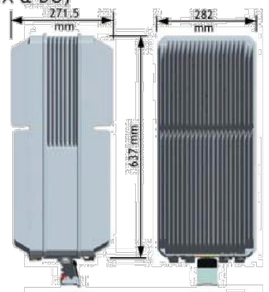
Power Consumption: 700W Typical

Dimensions:

- Size: 282 x 271.5 x 637mm (11.1" x 10.69" x 25.1")
- Volume: 49 Liter
  56 liters with solar shield & mounting OD

Weight: 27 kg (59.5 lbs)

Operating Temp range -40°C/+55°C



Alcatel-Lucent's 65MHz RRH satisfies Sprint's requirements.

MECHANICAL	
DIMENSION (HxWxD)	25.2"x11.8"x11.5"
WEIGHT	59.5 lbs

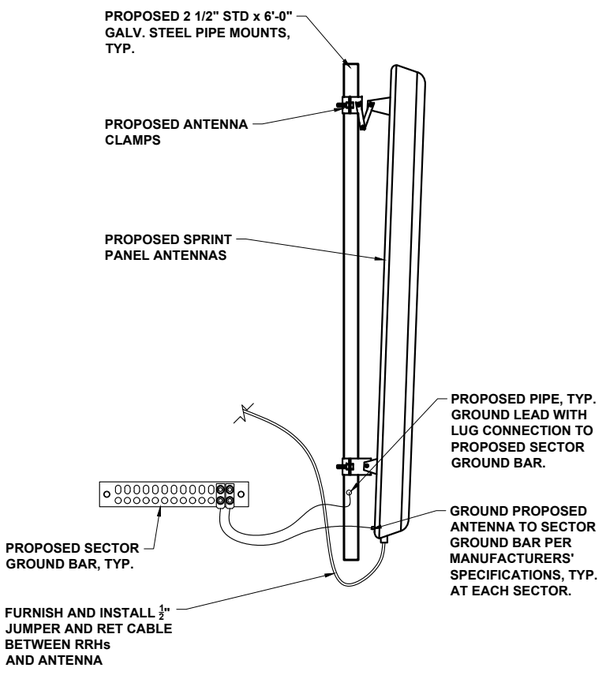
RRH MODEL: ALU #1900 MHZ 4X45W - RADIO SPECS

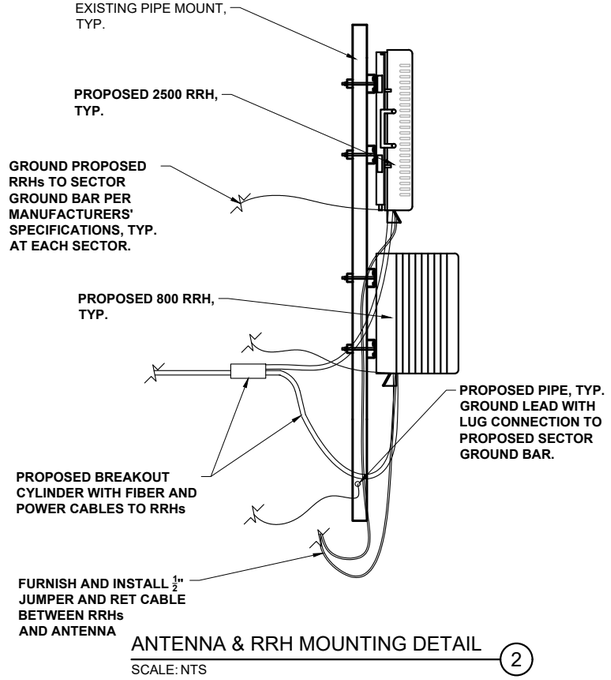
800/1900/2500 EQUIPMENT SCHEDULE

SECTOR	POSITION	ANTENNA MAKE/MODEL	AZIMUTH	CENTER LINE	RRH	CABLE TYPE	CABLE LENGTH	JUMPER TYPE
ALPHA	1	-	-	130.3'	(1) EXISTING RRH 1900 4X45 65 MHz (RELOCATED FROM THE GROUND) (1) PROPOSED RRH 800 MHz 2x50W	(1) PROPOSED HYBRIFLEX	160'	8' HYBRID
	2	PROPOSED 800/1900 PANEL ANTENNA (COMMSCOPE NNVV-65B-R4)	350°	130.3'	-	-	-	-
	3	-	-	130.3'	(1) PROPOSED RRH 800 MHz 2x50W (1) PROPOSED 2500 (TD-RRH8x20-25)	(1) PROPOSED HYBRIFLEX	160'	8' HYBRID
	4	PROPOSED 2500 PANEL ANTENNA (RFS APXVTM14-ALU-120)	350°	130.3'	-	-	-	-
BETA	1	-	-	130.3'	(1) EXISTING RRH 1900 4X45 65 MHz (RELOCATED FROM THE GROUND) (1) PROPOSED RRH 800 MHz 2x50W	(1) PROPOSED HYBRIFLEX	160'	8' HYBRID
	2	PROPOSED 800/1900 PANEL ANTENNA (COMMSCOPE NNVV-65B-R4)	110°	130.3'	-	-	-	-
	3	-	-	130.3'	(1) PROPOSED RRH 800 MHz 2x50W (1) PROPOSED 2500 (TD-RRH8x20-25)	SHARED WITH ALPHA	160'	8' HYBRID
	4	PROPOSED 2500 PANEL ANTENNA (RFS APXVTM14-ALU-120)	110°	130.3'	-	-	-	-
GAMMA	1	-	-	130.3'	(1) EXISTING RRH 1900 4X45 65 MHz (RELOCATED FROM THE GROUND) (1) PROPOSED RRH 800 MHz 2x50W	(1) PROPOSED HYBRIFLEX	160'	8' HYBRID
	2	PROPOSED 800/1900 PANEL ANTENNA (COMMSCOPE NNVV-65B-R4)	230°	130.3'	-	-	-	-
	3	-	-	130.3'	(1) PROPOSED RRH 800 MHz 2x50W (1) PROPOSED 2500 (TD-RRH8x20-25)	SHARED WITH ALPHA	160'	8' HYBRID
	4	PROPOSED 2500 PANEL ANTENNA (RFS APXVTM14-ALU-120)	230°	130.3'	-	-	-	-

EQUIPMENT & CABLE SCHEDULE (1)

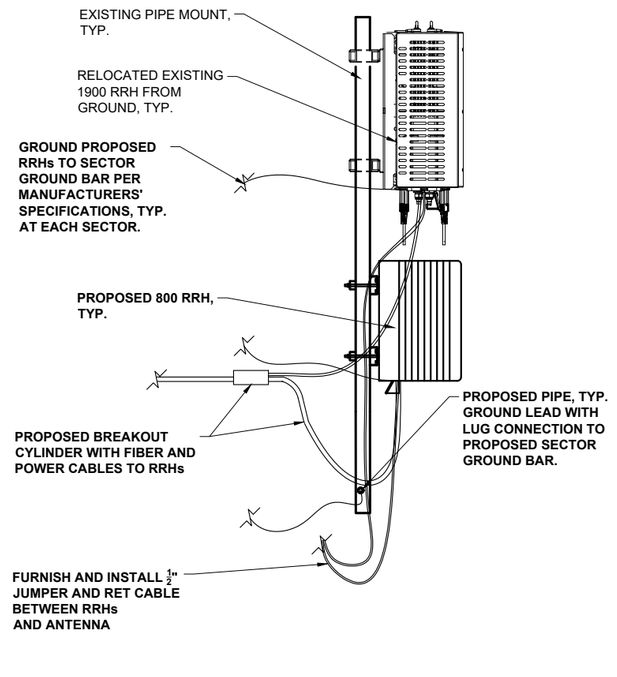
SCALE: NTS





ANTENNA & RRH MOUNTING DETAIL (2)

SCALE: NTS



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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 6/11/2018

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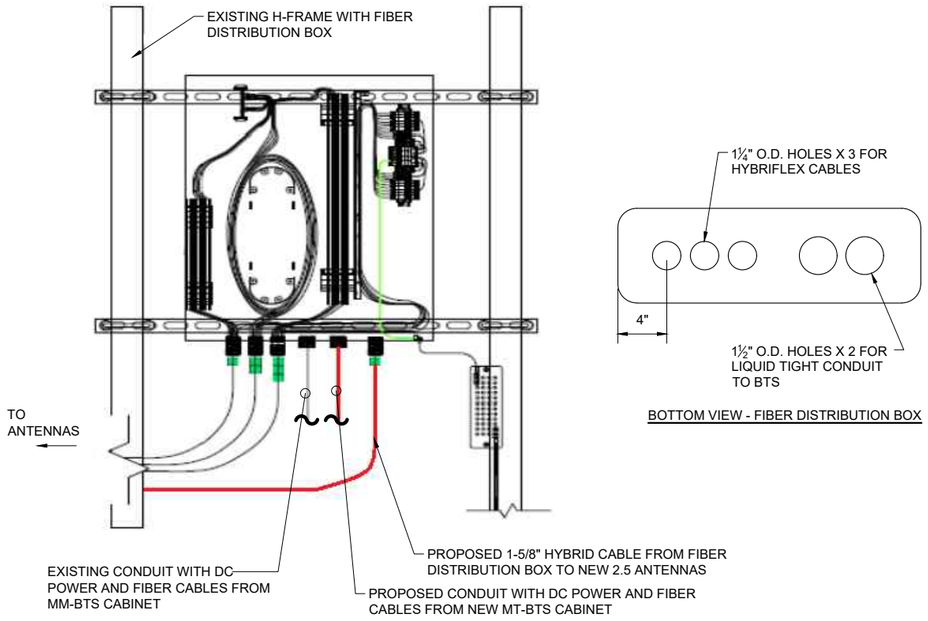
PROJECT TITLE:
CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:
ANTENNA SCHEDULE & DETAIL

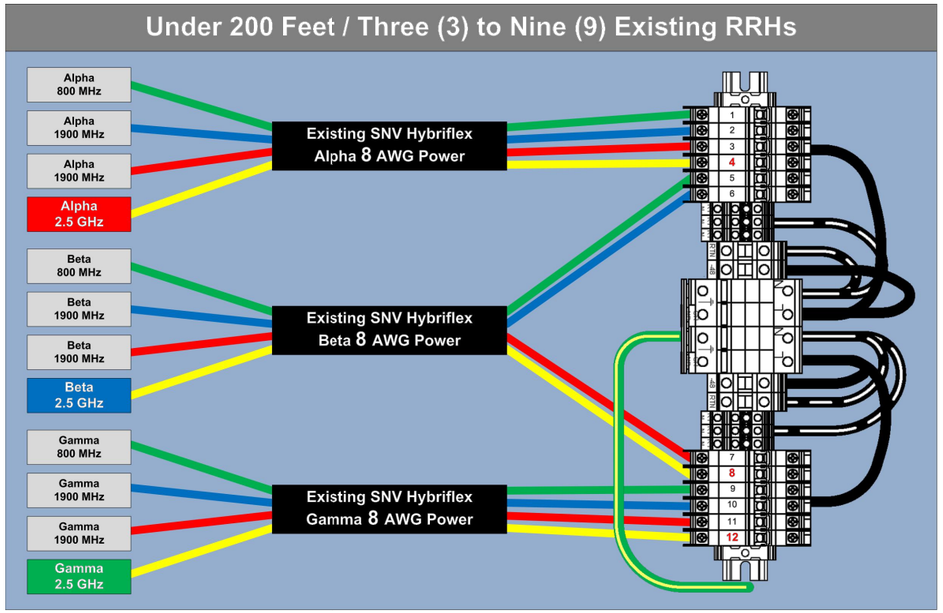
SCALE: NONE

PROJECT NUMBER: 22977
SHEET NUMBER: A-4

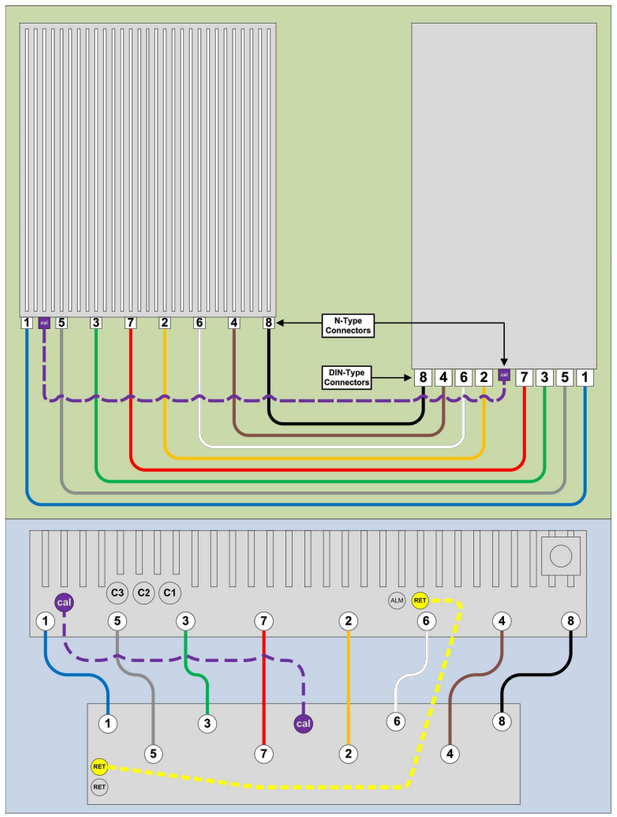


TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)
SCALE: NTS

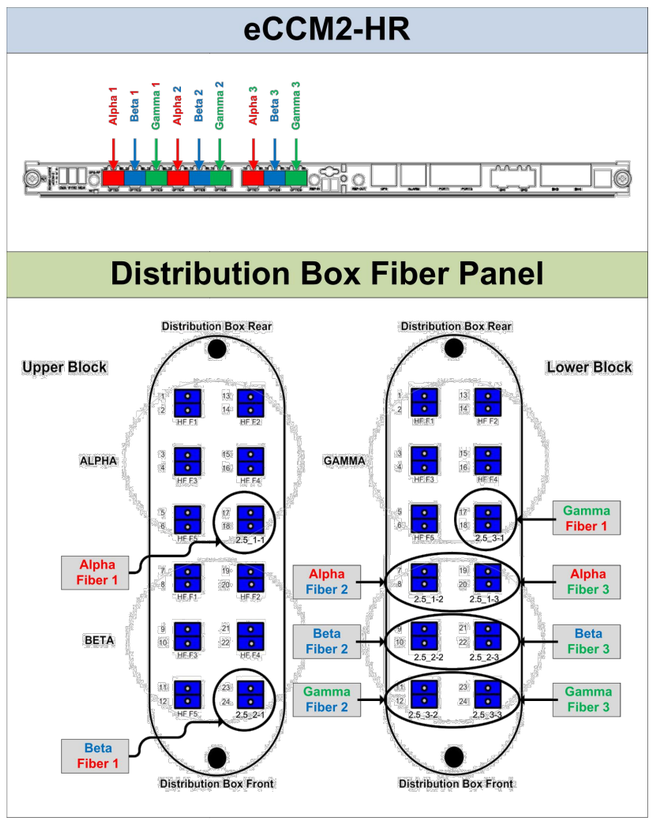
BOTTOM VIEW - FIBER DISTRIBUTION BOX



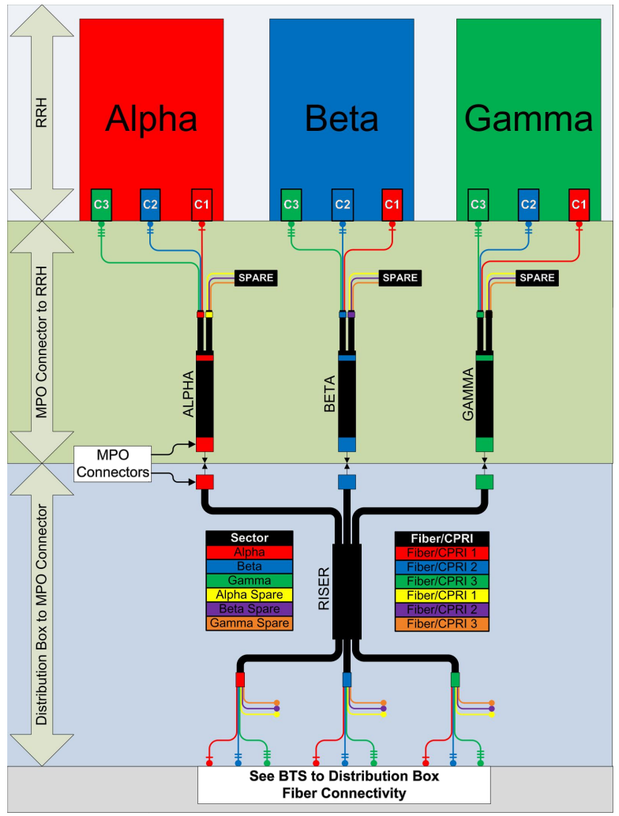
RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL (2)
SCALE: NTS



8T8R DETAIL (3)
SCALE: NTS



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)
SCALE: NTS



RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)
SCALE: NTS

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1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

RAMAKER & ASSOCIATES, INC.
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123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
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Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 6/11/2018

MARK	DATE	DESCRIPTION
1	06/11/18	REVISED PER CLIENT COMMENTS

ISSUE PHASE: FINAL
DATE ISSUED: 04/23/2018

PROJECT TITLE:
CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:
FIBER PLUMBING DIAGRAM

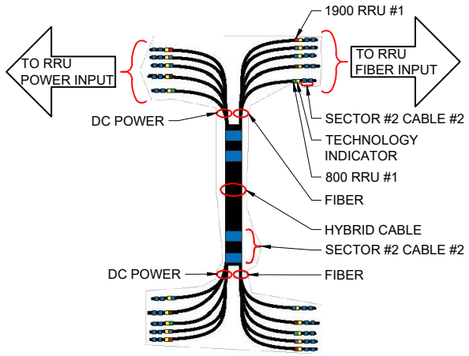
SCALE: NONE

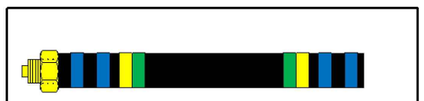
PROJECT NUMBER: 22977
SHEET NUMBER: A-5

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL




Example – Sector 2, Cable 2, 800mhz Radio #1


Example – Sector 3, Cable 1, 1900mhz Radio #1


Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

COLOR CODING CHARTS

SCALE: NTS

1

CABLE MARKING NOTES

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 6/11/2018

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1	06/11/18	REVISED PER CLIENT COMMENTS

ISSUE PHASE: FINAL
DATE ISSUED: 04/23/2018

PROJECT TITLE:

CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

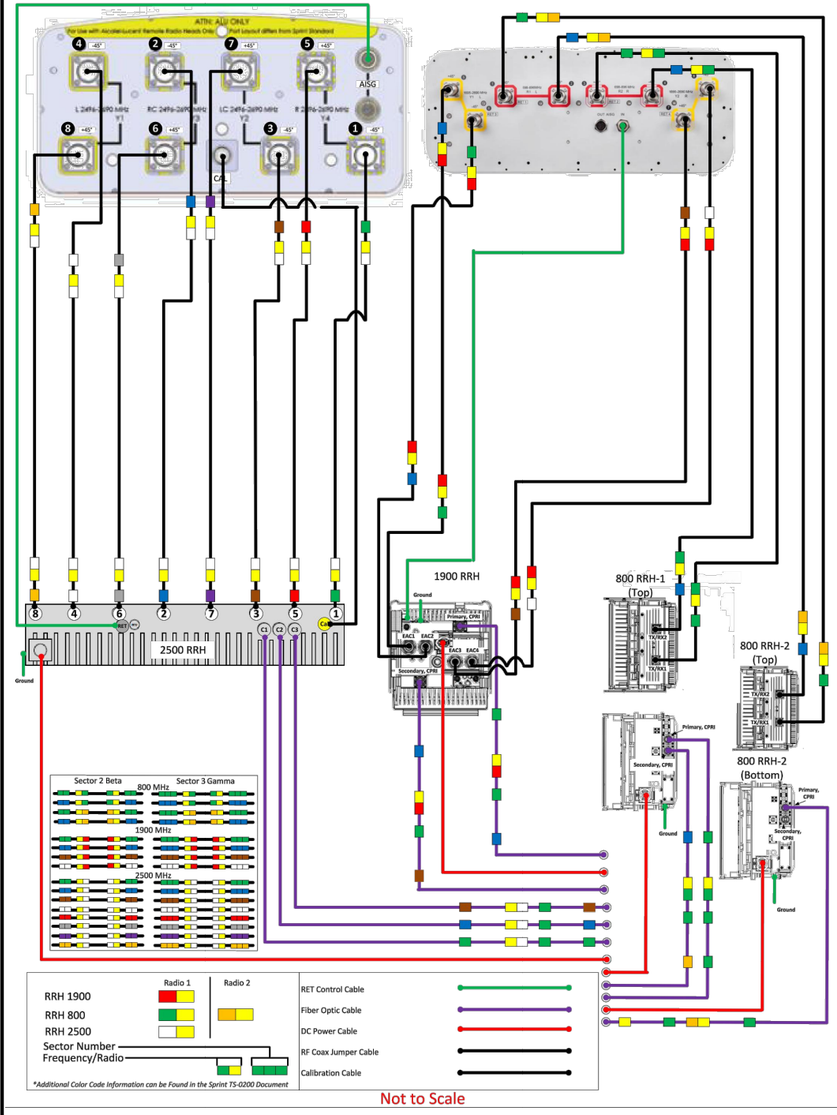
SHEET TITLE:

CABLE COLOR CODING

SCALE: NONE

PROJECT NUMBER: 22977
SHEET NUMBER: A-6

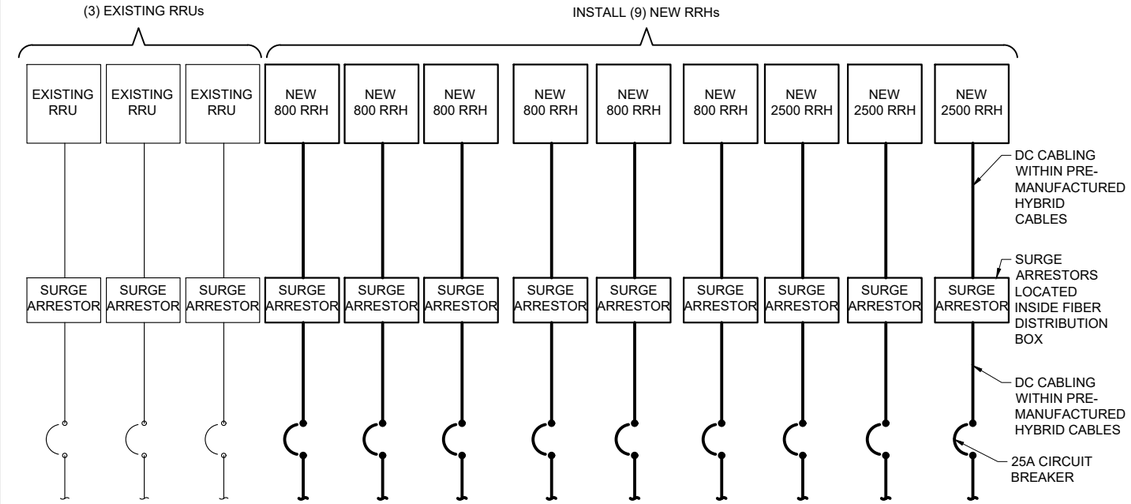
ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



Not to Scale

ANTENNA COLOR CODING CHART (1)

SCALE: NTS



DC ONE-LINE DIAGRAM (2)

SCALE: NTS

FREQ BAND (1900,800) + RADIO NUMBER

HYBRID SHEATH COLOR CODE

RFS (OEM)COLOR CODE

HF11-FIBER PAIR 1-(F1)
HF11-FIBER PAIR 2-(F2)
HF11-FIBER PAIR 3-(F3)
HF11-FIBER PAIR 4-(F4)
HF11-FIBER PAIR 5-(F5)
HF12-FIBER PAIR 1-(F1) 2.5 ALPHA 1
HF21-FIBER PAIR 1-(F1)
HF21-FIBER PAIR 2-(F2)
HF21-FIBER PAIR 3-(F3)
HF21-FIBER PAIR 4-(F4)
HF21-FIBER PAIR 5-(F5)
HF12-FIBER PAIR 2-(F2) 2.5 BETA 1

HF31-FIBER PAIR 1-(F1)
HF31-FIBER PAIR 2-(F2)
HF31-FIBER PAIR 3-(F3)
HF31-FIBER PAIR 4-(F4)
HF31-FIBER PAIR 5-(F5)
HF12-FIBER PAIR 3-(F3) 2.5 GAMMA 1
HF12-FIBER PAIR 4-(F4) 2.5 ALPHA 2
HF12-FIBER PAIR 5-(F5) 2.5 BETA 2
HF12-FIBER PAIR 6-(F6) 2.5 GAMMA 2
HF12-FIBER PAIR 7-(F7) 2.5 ALPHA 3
HF12-FIBER PAIR 8-(F8) 2.5 BETA 3
HF12-FIBER PAIR 9-(F9) 2.5 GAMMA 3

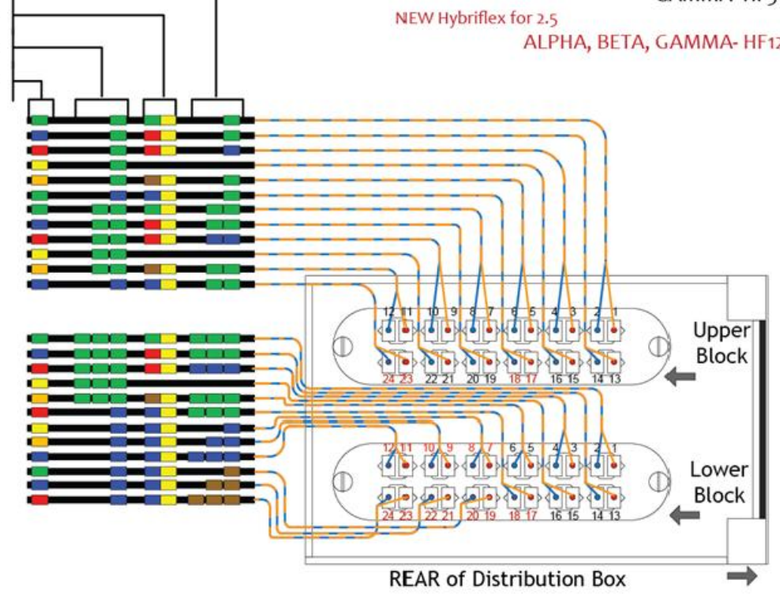
NOTES:

1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

Each sector has separate Hybriflex cable .
Hybriflex cable naming as follows:

ALPHA – HF11
BETA - HF21
GAMMA- HF31

NEW Hybriflex for 2.5
ALPHA, BETA, GAMMA- HF12



TYPICAL FIBER DISTRIBUTION (3)

SCALE: NTS

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CT33XC572

PROJECT INFORMATION:
1050 BUCKLEY HIGHWAY (CT ROUTE 171)
UNION, CT 06076, TOLLAND COUNTY

SHEET TITLE:
DC POWER & FIBER DISTRIBUTION DETAIL

SCALE: NONE

PROJECT NUMBER: 22977
SHEET NUMBER: E-1