1280 Route 46 West, Suite 9, Parsippany NJ, 07054

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

Re: Notice of Exempt Modification Application
21 West Peak Drive, Meriden, CT 06037

January 7, 2019

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 3 existing panel antennae and 6 Remote Radio Heads at the 70' level of the Monopole and proposes to add 3 new panel antennae, also at the 70' level of the Monopole.

There are no documents from the initial approvals by CT Siting Council and City of Meriden, but a recent approval for EM was issued on 12/5/2014 from. The documents enclosed have been modified where necessary to reflect the current reality of the installations on the Monopole.

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

January 8, 2019

Re: Notice of Exempt Modification –
Existing Sprint Telecommunication Facility
21 West Peak Drive, Meriden, CT 06037

Latitude : N41.5628
Longitude: W72.8445

Dear Ms. Bachman:

Sprint currently maintains 3 existing panel antenna and 6 remote radio units at the 70' centerline level of the AT&T owned Monopole. Sprint proposes to add 3 panel antenna and 3 remote radio units also at 70' centerline level of the aforementioned self-supporting tower. 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.

There is no documentation for the original EM approval or the original Building Permit, there is however information on a recent EM approval from December 5, 2014 from CSC. A copy of this approval is attached.

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 Hon. Kevin Scarpati, Mayor of the City of Meriden, Bob Seale, the director of P&Z for the City of Meriden and Mark Gillmore of Thomas Brothers, LLC, the property owners.
.
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 Meriden facility is located at 21 West Peak Drive, Meriden CT, the Site coordinates are: N41. 5628, W – 72.8445. The facility is owned by Thompson Brothers, LLC WATR Radio. The existing facility consists of a 199' Self-supporting Tower and Sprint currently operates wireless communications equipment on a steel platform at the facility and has three antenna and three RRU's mounted on the monopole at a centerline of 130' feet

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:
City of Meriden – Mayor Kevin Scarpati – Via Fed Ex
Thomas Brothers Co. , LLC WATR Radio – Mark Gilmore – Tower Owner - Via Fed Ex
City of Meriden – Planning DirectorBob Seale – Via Fed Ex

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Hon. Kevin Scarpati	Paul Sagristano
City of Meriden	CCC
142 Main Street	4 Davis Road West
Meriden Town Hall	Suite 5
MERIDEN, CT	OLD LYME, CT
06450	06371
US	US
2036304125	9178410247

Shipment Information:
Tracking no.: 774131247198
Ship date: 01/07/2019
Estimated shipping charges: 19.18 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.70 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT58XC962 CSC Submission
P.O. no.:
Invoice no.:
Department no.:

Thank you for shipping online with FedEx ShipManager at fedex.com.

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Mark Gilmore - WATR Radio	Paul Sagristano
Thomas Brothers Co., LLC	CCC
79 Baldwin Ave.	4 Davis Road West Suite 5
WATERBURY, CT	OLD LYME, CT
06706	06371
US	US
203-755-1121	9178410247

Shipment Information:
Tracking no.: 774131313538
Ship date: 01/07/2019
Estimated shipping charges: 19.18 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.70 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT58XC962 - CSC Submission
P.O. no.:
Invoice no.:
Department no.:

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FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Bob Seale P&Z Director	Paul Sagristano
City of Meriden	CCC
142 Main Street	4 Davis Road West
Meriden Town Hall	Suite 5
MERIDEN, CT	OLD LYME, CT
06450	06371
US	US
2036304801	9178410247

Shipment Information:
Tracking no.: 774131283347
Ship date: 01/07/2019
Estimated shipping charges: 19.18 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: FedEx Express Saver
Package type: FedEx Envelope
Number of packages: 1
Total weight: 0.70 LBS
Declared Value: 0.00 USD
Special Services: Direct signature required
Pickup/Drop-off: Drop off package at FedEx location

Billing Information:
Bill transportation to: My Account - 429-429
Your reference: CT58XC962 CSC Submission
P.O. no.:
Invoice no.:
Department no.:

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Please Note

City of Meriden, CT GIS

Contact Us City Home Page

Home | Map Search | Data Search | Documents

21 west

Scale: 1" = 50 ft

BASEMAP
Default
Aerial
Relief

Layers

LOADING MAP

TOOLS

Active Tool:Map ID

Scale: 1" = 50 ft

Layers

TOOLS

Active Tool:Map ID

CITY OF MERIDEN
GIS Services

Property Information: Address: 21 WEST PEAK DR Map/Lot: 1213-0352-0011-0016

Owner Information: THOMAS BROTHERS CO LLC Owner Address: 79 BALDWIN AVE
WATERBURY, CT 06706

Building Information:

Card	Units	Rooms	Bed rooms	Year Built	Full Bath	Half Bath	Other Fixtures	Fire Places	Heat Type	Heat Fuel	Roof Mat	Grade	Type	Ext Wall	Finished Area
1	1			1978					Forced Air		Rubber	C	Comm Grge	Concrete Blo	704
2	1			1952					BB Hot Wtr		Rubber	C	Comm Grge	Concrete Blo	1,738

Sub Area Summary:

SubArea	Description	SketchedArea	Perimeter	AdjArea	Rate	AreaValue
FFL	1st FLOOR	704	108	704	78.00000	$54,912.00

Special Features:

Description	Condition	Year	Assessed Value
FENCE-4 CHAIN	AV	1978	$700

Appraisal Information: **Tax District:** 1 **District Name:** OUTER DISTRICT **District Mill Rate:** 41.04

Current Values by Card Number

Card	Building Value	Yard Items	Land Value	Total	Assessed
1	$34,000	$700	$600,000	$634,700	$444,290
2	$71,800	$0	$0	$71,800	$50,260
TOTAL PARCEL:					
	$105,800	**$700**	**$600,000**	**$706,500**	**$494,550**

Previous Year Totals

Year	Building Value	Yard Items	Land Value
2017	$105,800	$700	$600,000

Special Land Value: $0

Land Information:

Type	Lot Size	Lot Unit	Zoning*
Commercial Building	27,000.00	SF	R-R
Commercial Building	0.00	SF	R-R

Total Acreage:0.62
*Confirm zoning with Planning Office.
Zoning map is the official document to determine zone.

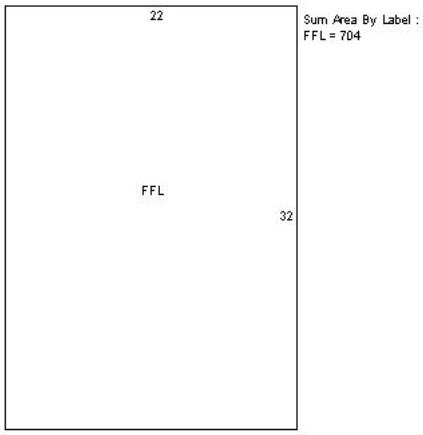
Sales Information:

Book	Page	Grantor	Sale Date	Sale Price	Deed Type
2539	223		1/25/2000	$0	

Assessor's Permit History:

Date	Permit Number	Notes	Type
1/5/2015	B-14-269	NEW ANTENNAE/FIBEER OPTIC CABLE/UPON 135FT TOWER	
11/26/2013	3810	ADD 3 ANTENNAS AND CABLES	
3/8/2013	612	METRO PCS - REPLACE RADIO & BATTERY CABINET & RELOCATE EXISTING PPC. ALL WORK TO BE DONE ON EXISTING CONCRETE PAD. INSTALL FENCE WITH GATE.	
7/17/2012	2259	INSTALL GENERATOR PAD AND 8` HIGH CHAINLINK FENCE FOR NEW GENERATOR PER CODE	C
7/16/2012	2229	WZMX RADIO; INSTALL A 130KW GENERAC GENERATOR WITH AND ATS PER CODES	C
10/19/2010	3179	CLEARWIRE - ADD 3 PANEL & 4 DISH ANTEANNA`S TO EXISTING TELECOMMUNICATIONS TOWER PER PLANS AND TO CODE.	
6/24/2009	1915	CHANGE EXISTING 1PH TO 3PH SERVICE W/ NEW FUTURE TENANT USE	
5/11/2009	1354	POCKET WIRELESS REPLACE EXISTING AT&T EQUIPMENT	
3/19/2009	775	POCKET COMMUNICATIONS; INSTALLATION OF ANTENNAS AND RADIO CABINET PER PLANS AND APPLICABLE CODES AND STANDARDS	
8/2/2005	2800	ADD SPRINT WIRELESS TO EX	CA
7/22/2005	2693	NEXTEL EXPANSION, INTER W	CA
7/22/2005	2693	WIRE ALARMS,LIGHTS, CELL	CA
7/15/2005	2596	GROUND UNIT FOR ASS'D ANT	CA
4/13/2005	1190	EQUIP RM EXPANSION	CA
2/14/2003	402	ADD'L 200 AMP MEERED SERV	CA
9/30/2002	3280	INSTALL ANTENNAE & CONCRE	CA

Property Images

Building photo	Property Sketch
	

195581213-0352-0011-0016 1

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

December 5, 2014

Eric Dahl
HPC Wireless Services
22 Shelter Rock Lane, Building C
Danbury, CT 06811

RE: **EM-SPRINT-080-141113** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 21 West Peak Drive, Meriden, Connecticut.

Dear Mr. Dahl:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by Sprint shall be removed within 60 days of the date the antenna ceased to function.
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 4, 2014. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such

notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/RDM/cm

c: The Honorable Manny Santos, Mayor, City of Meriden
Lawrence Kendzior, City Manager, City of Meriden
Dominick Caruso, City Planner, City of Meriden
Thomas Brothers LLC

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: CT58XC962

Hamden Communication Tower
21 West Peak Drive
Meriden, CT 06037

December 31, 2018

EBI Project Number: 6218007618

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	71.34 %

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

EBI Consulting
environmental | engineering | due diligence

December 31, 2018

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

Emissions Analysis for Site: **CT58XC962 – Hamden Communication Tower**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **21 West Peak Drive, Meriden, 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 **21 West Peak Drive, Meriden, 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 for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

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

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

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel, 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 **Powerwave P40-16-XLPP-RR and the Nokia AAHC** 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 for directional panel antennas, 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 panel antennas are **70 feet** above ground level (AGL) for **Sector A**, **70 feet** above ground level (AGL) for **Sector B** and **70 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:	Powerwave P40-16-XLPP-RR	Make / Model:	Powerwave P40-16-XLPP-RR	Make / Model:	Powerwave P40-16-XLPP-RR
Gain:	14.2 / 15.9 dBd	Gain:	14.2 / 15.9 dBd	Gain:	14.2 / 15.9 dBd
Height (AGL):	**70 feet**	Height (AGL):	**70 feet**	Height (AGL):	**70 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	9,381.04	ERP (W):	9,381.04	ERP (W):	9,381.04
Antenna A1 MPE%	**10.35 %**	Antenna B1 MPE%	**10.35 %**	Antenna C1 MPE%	**10.35 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Nokia AAHC	Make / Model:	Nokia AAHC	Make / Model:	Nokia AAHC
Gain:	15.05 dBd	Gain:	15.05 dBd	Gain:	15.05 dBd
Height (AGL):	**70 feet**	Height (AGL):	**70 feet**	Height (AGL):	**70 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):	5,118.23	ERP (W):	5,118.23	ERP (W):	5,118.23
Antenna A2 MPE%	**4.49 %**	Antenna B2 MPE%	**4.49 %**	Antenna C2 MPE%	**4.49 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**14.84 %**
On Site Measurements per CSC Database	56.50 %
Site Total MPE %:	**71.34 %**

SPRINT Sector A Total:	14.84 %
SPRINT Sector B Total:	14.84 %
SPRINT Sector C Total:	14.84 %
Site Total:	71.34 %

SPRINT _ Frequency Band / Technology (Per Sector)	# 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	526.05	70	4.62	850 MHz	567	0.81%
Sprint 850 MHz LTE	2	1,315.13	70	23.09	850 MHz	567	4.08%
Sprint 1900 MHz (PCS) CDMA	5	622.47	70	27.32	1900 MHz (PCS)	1000	2.73%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	70	27.32	1900 MHz (PCS)	1000	2.73%
Sprint 2500 MHz (BRS) LTE	8	639.78	70	44.92	2500 MHz (BRS)	1000	4.49%
						Total:	**14.84%**

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:	14.84 %
Sector B:	14.84 %
Sector C:	14.84 %
SPRINT Maximum MPE % (per sector):	14.84 %
Site Total:	71.34 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **71.34 %** 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.

STRUCTURAL ANALYSIS REPORT - UPGRADE
SELF-SUPPORT

Prepared For:

Com-Ex Consultants, LLC
115 Route 46 - Suite E39
Mountain Lakes, NJ 07046

Structure Rating:

Self-Support Tower: **Pass**

Sincerely,
Destek Engineering, LLC
Firm License No: PEC0001429

10-22-2018

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

Sprint Site ID: CT58XC962
Sprint Site Name: Hamden Communication Tower
21 West Peak Drive
Meriden, CT 06037

Destek Job No: 1829043 October 22, 2018

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066-Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the 195 feet tall self-support tower located at 21 West Peak Drive, Meriden, CT 06037 for the additions and alterations proposed by Sprint.

The structural analysis is based on the following documentation provided to Destek Engineering, LLC (Destek):

- RFDS provided by Sprint, dated 3/29/2018.
- Construction Drawings prepared by Com-Ex, dated 6/25/2018.
- Erection Drawings prepared by Stainless, Inc., dated 10/12/1990.
- Rigorous Structural Analysis prepared by Stainless, Inc., dated 7/26/2018.

1.1 STRUCTURE

The subject structure is a three-sided, 195' tall self-support tower formed by (7) lattice sections of various lengths and (3) 20' pole sections. Solid round legs are braced along the length of the lattice tower with single angle diagonals and horizontals. The tower is 13'-0" wide at the base and 4'-0" wide at 134.5'. Please refer to the software output in Appendix A for tower geometry, member sizes, and other details.

2.0 EXISTING AND PROPOSED APPURTENANCES

Proposed and Final Configuration of Sprint Appurtenances:

Rad Center (ft.)	Antennas & Equipment	Coax	Mounts
70	(3) Nokia AAHC (3) P40-16XLPP-RR-A (3) ALU RRH 1900 (3) ALU RRH 800	(3) 1-1/4" (3) 1-5/8"	(3) Sector Mounts

Appurtenances by Others:

Rad Center (ft.)	Antennas & Equipment	Coax	Mounts
185	(1) 3-bay ERI FM Antenna	(1) 3"	Pole Mounted
162	(1) 1-bay ERI FM Antenna	(1) 1-5/8"	Pole Mounted
135	(1) Whip Antenna	(1) 1/2"	Pole Mounted
60	(1) Ice Shield	--	--
53.5	(1) Yagi Antenna with Radome	(1) 1/2"	Leg Mounted
48	(1) 6' Grid Dish	(2) 7/8"	Leg Mounted
43	(1) 4' Scala Paraflector Antenna	(1) 7/8"	Leg Mounted
40	(1) Scala Yagi Antenna	(1) 1/2"	Leg Mounted

DESTEK ENGINEERING, LLC
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3.0 CODES AND LOADING

The tower was analyzed per ANSI/TIA-222-G and 2016 Connecticut State Building Code. The following wind loading was used in compliance with the standard for Meriden, CT:

- Basic wind speed 97 mph without ice (V)
- Basic wind speed 50 mph with 0.75" escalating ice (V_i)
- Exposure Category: B
- Topographic Category: 5 with Crest Height of 692'
- Structure Class: II

The following load combinations were used with wind blowing at 0°, 30°, 60°, and 90°, measured from a line normal to the face of the tower:

- 1.2 D + 1.0 D_g + 1.6 W_0
- 0.9 D + 1.0 D_g + 1.6 W_0
- 1.2 D + 1.0 D_g + 1.0 D_i + 1.0 W_i + 1.0 T_i

D: Dead load of structures and appurtenances, excluding guy assemblies
D_g: Dead load of guy assemblies
D_i: Weight of ice due to factored ice thickness (based upon t_i)
T_i: Load effects due to temperature
W_0: Wind load without ice (based upon V)
W_i: Wind load with ice (based upon V_i)

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure and the foundation system are assumed to be in good condition, free of defects and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed additions and alterations. Any deviation of the proposed equipment and placement, etc., will require Destek to generate an additional structural analysis.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066-Tel: (770) 693-0835

5.0 ANALYSIS AND ASSUMPTIONS

The tower was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix A of this report.

The tower and foundation were constructed in accordance with their original design and maintained per the manufacturer's specifications. Tower is plumb and free of twist.

6.0 RESULTS AND CONCLUSION

Based on a structural analysis per ANSI/TIA-222-G, the existing self-support tower **will have adequate** structural capacity for the proposed changes by Sprint once the tower is upgraded according to the attached Destek drawings dated 10/22/2018. For the code specified load combinations and as a maximum, the tower legs from 0' to 7.5' are stressed to **96.8%** of their structural capacity. The tower diagonals, horizontals, and pole extension are stressed to **82.5%**, **40.3%**, and **61.3%** of capacity, respectively.

Information regarding the tower soils was not available at the time of this analysis, thus a qualification of the foundation could not be completed.

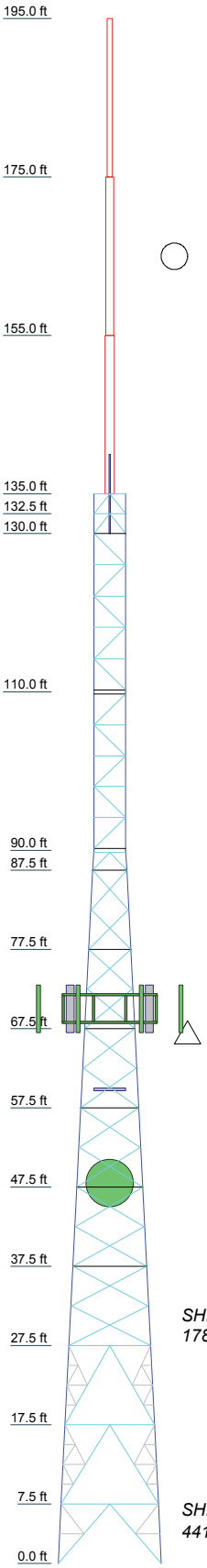
Therefore, the proposed additions and alterations by Sprint **can** be implemented as intended and with the conditions outlined in this report.

Should you need any clarifications or have any questions about this report, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066-Tel: (770) 693-0835

APPENDIX A
SOFTWARE OUTPUT

Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L3	L2	L1
Legs		3.25" SR + HSS4x0.313 Split Pipe				3" SR + 4" XXS (4.5 x 0.674) Split Pipe		A36		E	D	C	SR 2		P14x.593	B	A
Leg Grade																A53-B-35	
Diagonals	H	L3x3x3/8				L2 1/2x2 1/2x3/16					L2 1/2x2 1/2x3/8	L2x2x3/8		G F		N.A.	
Diagonal Grade								A36								N.A.	
Top Girts		N.A.				L2 1/2x2 1/2x3/16				I		L2x2x1/4				N.A.	
Bottom Girts					N.A.							L2x2x1/4				N.A.	
Horizontals		L3x3x1/4		11.25	10.25	N.A.	7.25	6.25	5.25	K	L2x2x1/4			J H		N.A.	
Red. Horizontals		L2x2x3/16									N.A.						
Red. Diagonals		L2 1/2x2 1/2x3/16									N.A.						
Red. Sub-Horizs	N.A.	L2x2x1/4									N.A.						
Red. Sub-Diags	N.A.	L2x2x1/4									N.A.						
Inner Bracing		L2 1/2x2 1/2x3/16									N.A.						
Face Width (ft)	13	12.25	11.25	9.25	8.25	7.25	6.25	5.25	4.25					4	1.16667	1.0625	0.71875
# Panels @ (ft)		1 @ 7.5	2 @ 10			12 @ 5				L	5 @ 3.9	5 @ 3.95	2 @ 2.5		N.A.	N.A.	N.A.
Weight (lb)	23670.7	1503.7	2200.2	2155.1	1631.0	1587.3	1608.4	1566.9	1527.1	1489.5	268.5	2424.4	1761.3	239.2	261.2	1784.8	1041.8	600.2



ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 291146 lb
SHEAR: 26356 lb

UPLIFT: -254655 lb
SHEAR: 23709 lb

AXIAL 95535 lb
SHEAR 17858 lb *MOMENT 1338 kip-ft*
TORQUE 11 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 36538 lb
SHEAR 44118 lb *MOMENT 3141 kip-ft*
TORQUE 16 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3-Bay ERI FM Antenna	185	1900MHz RRH	70
1-Bay ERI FM Antenna	162	1900MHz RRH	70
10'x3" Omni/Whip	135	1900MHz RRH	70
AAHC w/ Mount Pipe	70	10.5'-P2x0.154 H	70
AAHC w/ Mount Pipe	70	10.5'-P2x0.154 H	70
AAHC w/ Mount Pipe	70	10.5'-P2x0.154 H	70
P40-16-XLPP-RR-A w/ Mount Pipe	70	Sector Mount [SM 1302-3]	70
P40-16-XLPP-RR-A w/ Mount Pipe	70	7' Ice Shield	60
P40-16-XLPP-RR-A w/ Mount Pipe	70	4'6" Flat Yagi w/ (9) 1' Elements	53.5
RRH 800	70	6' Grid Dish	48
RRH 800	70	AP18-1900/063D w/ Mount Pipe	43
RRH 800	70	4'6" Flat Yagi w/ (9) 1' Elements	40

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pipe 8.625" x 0.322" (8 STD)	G	L2x2x1/4
B	Pipe 12.75" x 0.375" (12 STD)	H	L3x2 1/2x1/4
C	2.25" SR + HSS2.875x0.25 Split Pipe	I	N.A.
D	2.75" SR + HSS3.5x0.313 Split Pipe	J	2L3x2 1/2x1/4
E	SR 3	K	L2 1/2x2 1/2x3/16
F	L3x3x1/4	L	1 @ 2.25

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 New Haven 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 0.75 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 5 with Crest Height of 692.00 ft
8. TOWER RATING: 96.8%

Destek Engineering, LLC
1281 Kennestone Circle, Ste. 100
Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: **CT58XC962**			
Project: ***1829043***			
Client: Com-Ex	Drawn by: Ahmet Colakoglu		App'd:
Code: TIA-222-G	Date: 10/22/18		Scale: NTS
Path: C:\Users\destek40\Destek Dropbox\rserver\Comex\2018\1829043 - CT58XC962\TNXTower\Upgrade\CT58XC962 - Upgrade.eri			Dwg No. E-1

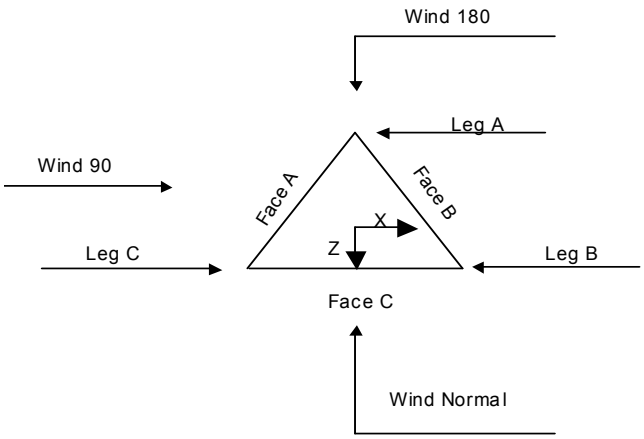
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 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 4.00 ft at the top and 13.00 ft at the base.
An index plate is provided at the 3x free standing -tower connection.
There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 5.
Crest Height 692.00 ft.
SEAW RSM-03 procedures for wind speed-up calculations are used.
Topographic Feature: Flat Topped Ridge.
Slope Distance L: 1334.00 ft.
Distance from Crest x: 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 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 pole design is 1.
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.

Options

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



Triangular Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	195.00-175.00	20.00	Pipe 8.625" x 0.322" (8 STD)	A53-B-35 (35 ksi)	
L2	175.00-155.00	20.00	Pipe 12.75" x 0.375" (12 STD)	A53-B-35 (35 ksi)	
L3	155.00-135.00	20.00	P14x.593	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 195.00-175.00				1.03	1	1.05			
L2 175.00-155.00				1.03	1	1.05			
L3 155.00-135.00				1.03	1	1.05			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	135.00-132.50			4.00	1	2.50
T2	132.50-130.00			4.00	1	2.50
T3	130.00-110.00			4.00	1	20.00
T4	110.00-90.00			4.00	1	20.00
T5	90.00-87.50			4.00	1	2.50
T6	87.50-77.50			4.25	1	10.00
T7	77.50-67.50			5.25	1	10.00
T8	67.50-57.50			6.25	1	10.00
T9	57.50-47.50			7.25	1	10.00
T10	47.50-37.50			8.25	1	10.00
T11	37.50-27.50			9.25	1	10.00
T12	27.50-17.50			10.25	1	10.00
T13	17.50-7.50			11.25	1	10.00
T14	7.50-0.00			12.25	1	7.50

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	135.00-132.50	2.50	K Brace Down	No	Yes	0.0000	0.0000
T2	132.50-130.00	2.50	K Brace Down	No	Yes	0.0000	0.0000
T3	130.00-110.00	3.95	K Brace Right	No	Yes	0.0000	3.0000
T4	110.00-90.00	3.90	K Brace Left	No	Yes	3.0000	3.0000
T5	90.00-87.50	2.25	K Brace Down	No	Yes	3.0000	0.0000
T6	87.50-77.50	5.00	X Brace	No	Yes	0.0000	0.0000
T7	77.50-67.50	5.00	X Brace	No	Yes	0.0000	0.0000
T8	67.50-57.50	5.00	X Brace	No	Yes	0.0000	0.0000
T9	57.50-47.50	5.00	X Brace	No	Yes	0.0000	0.0000
T10	47.50-37.50	5.00	X Brace	No	Yes	0.0000	0.0000
T11	37.50-27.50	5.00	X Brace	No	Yes	0.0000	0.0000
T12	27.50-17.50	10.00	K1B Down	No	Yes	0.0000	0.0000
T13	17.50-7.50	10.00	K1B Down	No	Yes	0.0000	0.0000
T14	7.50-0.00	7.50	K1 Down	No	Yes	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 135.00-132.50	Solid Round	2	A36 (36 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T2 132.50-130.00	Solid Round	2	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 130.00-110.00	Arbitrary Shape	2.25" SR + HSS2.875x0.25 Split Pipe	A36 (36 ksi)	Equal Angle	L2x2x3/8	A36 (36 ksi)
T4 110.00-90.00	Arbitrary Shape	2.75" SR + HSS3.5x0.313	A36	Equal Angle	L2 1/2x2 1/2x3/8	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
		Split Pipe	(36 ksi)			(36 ksi)
T5 90.00-87.50	Solid Round	3	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 87.50-77.50	Arbitrary Shape	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 77.50-67.50	Arbitrary Shape	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 67.50-57.50	Arbitrary Shape	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T9 57.50-47.50	Arbitrary Shape	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 47.50-37.50	Arbitrary Shape	3.25" SR + HSS4x0.313 Split Pipe	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T11 37.50-27.50	Arbitrary Shape	3.25" SR + HSS4x0.313 Split Pipe	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T12 27.50-17.50	Arbitrary Shape	3.25" SR + HSS4x0.313 Split Pipe	A36 (36 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T13 17.50-7.50	Arbitrary Shape	3.25" SR + HSS4x0.313 Split Pipe	A36 (36 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T14 7.50-0.00	Arbitrary Shape	3.25" SR + HSS4x0.313 Split Pipe	A36 (36 ksi)	Single Angle	L3x2 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
T3 130.00-110.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T4 110.00-90.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 87.50-77.50	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 77.50-67.50	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T8 67.50-57.50	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T9 57.50-47.50	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T10 47.50-37.50	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T11 37.50-27.50	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 135.00-132.50	None	Flat Bar		A36	Single Angle	L3x2 1/2x1/4	A36

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 132.50-130.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Double Angle	2L3x2 1/2x1/4	(36 ksi) A36 (36 ksi)
T3 130.00-110.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Equal Angle	L2x2x1/4	(36 ksi) A36 (36 ksi)
T4 110.00-90.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Equal Angle	L2x2x1/4	(36 ksi) A36 (36 ksi)
T5 90.00-87.50	None	Flat Bar		(36 ksi) A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	(36 ksi) A36 (36 ksi)
T12 27.50-17.50	None	Flat Bar		(36 ksi) A36 (36 ksi)	Equal Angle	L3x3x1/4	(36 ksi) A36 (36 ksi)
T13 17.50-7.50	None	Flat Bar		(36 ksi) A36 (36 ksi)	Equal Angle	L3x3x1/4	(36 ksi) A36 (36 ksi)
T14 7.50-0.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Equal Angle	L3x3x1/4	(36 ksi) 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
T3 130.00-110.00	Solid Round	1 1/4" solid	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T4 110.00-90.00	Solid Round	1 1/4" solid	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T12 27.50-17.50	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 17.50-7.50	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T14 7.50-0.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T12 27.50-17.50	A36 (36 ksi)	Horizontal (1)	Equal Angle	L2x2x3/16	1
		Diagonal (1)	Equal Angle	L2 1/2x2 1/2x3/16	1
		Sub-Diagonal	Equal Angle	L2x2x1/4	1
		Sub-Horizontal	Equal Angle	L2x2x1/4	1
T13 17.50-7.50	A36 (36 ksi)	Horizontal (1)	Equal Angle	L2x2x3/16	1
		Diagonal (1)	Equal Angle	L2 1/2x2 1/2x3/16	1
		Sub-Diagonal	Equal Angle	L2x2x1/4	1
		Sub-Horizontal	Equal Angle	L2x2x1/4	1
T14 7.50-0.00	A36 (36 ksi)	Horizontal (1)	Equal Angle	L2x2x3/16	1
		Diagonal (1)	Equal Angle	L2 1/2x2 1/2x3/16	1

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 135.00-132.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T2 132.50-130.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T3 130.00-110.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T4 110.00-90.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T5 90.00-87.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T6 87.50-77.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T7 77.50-67.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T8 67.50-57.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T9 57.50-47.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T10 47.50-37.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T11 37.50-27.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T12 27.50-17.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T13 17.50-7.50	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T14 7.50-0.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	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	Yes	1	1	1	1	1	1	1	1
135.00-132.50				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
132.50-130.00				1	1	1	1	1	1	1
T3	Yes	Yes	1.07309	1	1	1	1	1	1	1
130.00-110.00				1	1	1	1	1	1	1
T4	Yes	Yes	1.07615	1	1	1	1	1	1	1
110.00-90.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
90.00-87.50				1	1	1	1	1	1	1
T6	Yes	Yes	1.04189	1	1	1	1	1	1	1
87.50-77.50				1	1	1	1	1	1	1
T7	Yes	Yes	1.04189	1	1	1	1	1	1	1
77.50-67.50				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
T8	Yes	Yes	1.04189	1	1	1	1	1	1	1
67.50-57.50				1	1	1	1	1	1	1
T9	Yes	Yes	1.04189	1	1	1	1	1	1	1
57.50-47.50				1	1	1	1	1	1	1
T10	Yes	Yes	1.04782	1	1	1	1	1	1	1
47.50-37.50				1	1	1	1	1	1	1
T11	Yes	Yes	1.04782	1	1	1	1	1	1	1
37.50-27.50				1	1	1	1	1	1	1
T12	Yes	Yes	1.18037	1	1	1	1	1	1	1
27.50-17.50				1	1	1	1	1	1	1
T13	Yes	Yes	1.18037	1	1	1	1	1	1	1
17.50-7.50				1	1	1	1	1	1	1
T14 7.50-0.00	Yes	Yes	1.08345	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal 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
135.00-132.50														
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
132.50-130.00														
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
130.00-110.00														
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
110.00-90.00														
T5 90.00-87.50	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
T6 87.50-77.50	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
T7 77.50-67.50	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
T8 67.50-57.50	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
T9 57.50-47.50	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
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
47.50-37.50														
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
37.50-27.50														
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
27.50-17.50														
T13 17.50-7.50	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
T14 7.50-0.00	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 135.00-132.50	Flange	0.7500 A325N	0	0.7500 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T2 132.50-130.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T3 130.00-110.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T4 110.00-90.00	Flange	1.0000 A325N	4	0.7500 A325N	1	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T5 90.00-87.50	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T6 87.50-77.50	Flange	0.7500 A325N	0	0.7500 A325N	1	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 77.50-67.50	Flange	1.0000 A325N	4	0.7500 A325N	1	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 67.50-57.50	Flange	0.7500 A325N	0	0.7500 A325N	1	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 57.50-47.50	Flange	1.0000 A325N	4	0.7500 A325N	1	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 47.50-37.50	Flange	0.7500 A325N	0	0.7500 A325N	1	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 37.50-27.50	Flange	1.0000 A325N	6	0.7500 A325N	1	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 27.50-17.50	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	2	0.6250 A325N	0
T13 17.50-7.50	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	2	0.6250 A325N	0
T14 7.50-0.00	Flange	0.7500 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	2	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Feedline Ladder (Rail)	A	No	No	Af (CaAa)	110.00 - 0.00	0.0000	-0.2	2	2	36.0000 1.7500	1.7500		3.00
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	43.00 - 0.00	0.0000	-0.3	2	2	0.5000	1.0900		0.33
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	48.00 - 43.00	0.0000	-0.3	1	1	0.5000	1.0900		0.33
LDF6-50A(1-1/4")	A	No	No	Ar (CaAa)	70.00 - 0.00	0.0000	-0.1	3	3	0.5000	1.5500		0.66
LDF7-50A(1-5/8") ******	A	No	No	Ar (CaAa)	70.00 - 0.00	0.0000	-0.07	3	3	0.5000	1.9800		0.82
Climbing Ladder (Rail)	A	No	No	Af (CaAa)	135.00 - 0.00	-36.0000	0.2	2	1	0.0000 36.0000	0.2500		3.00
Climbing Ladder (Rungs)	A	No	No	Ar (CaAa)	135.00 - 0.00	-18.0000	0.2	1	1	0.5000	0.6250		2.09
1" Rigid Conduit	A	No	No	Ar (CaAa)	135.00 - 0.00	-3.0000	0.2	1	1	0.5000	1.0000		1.00
3" Flex Line	A	No	No	Ar (CaAa)	135.00 -	-6.0000	0.2	1	1	0.5000	3.0000		1.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
					0.00								
LDF4-50A(1/2")	A	No	No	Ar (CaAa)	135.00 - 0.00	-8.0000	0.2	1	1	0.5000	0.6300		0.15
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	132.00 - 0.00	-9.5000	0.2	1	1	0.5000	1.0900		0.33
LDF2-50A(3/8")	A	No	No	Ar (CaAa)	132.00 - 0.00	-11.0000	0.2	1	1	0.5000	0.4400		0.08
LDF4-50A(1/2") ******	A	No	No	Ar (CaAa)	53.50 - 0.00	-12.0000	0.2	1	1	0.5000	0.6300		0.15
1 1/4" Rigid Conduit	B	No	No	Ar (CaAa)	100.00 - 0.00	-7.0000	-0.2	1	1	0.5000	1.2500		0.70
LDF7-50A(1-5/8")	B	No	No	Ar (CaAa)	135.00 - 0.00	-5.0000	-0.2	1	1	0.5000	1.9800		0.82
LDF5-50A(7/8")	B	No	No	Ar (CaAa)	48.00 - 0.00	-3.0000	-0.2	1	1	0.5000	1.0900		0.33
LDF4-50A(1/2") ******	B	No	No	Ar (CaAa)	40.00 - 0.00	-1.5000	-0.2	1	1	0.5000	0.6300		0.15
Feedline Ladder (Rail)	B	No	No	Af (CaAa)	70.00 - 0.00	0.0000	0.3	2	2	36.0000 1.7500	1.7500		3.00

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
L1	195.00-175.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	175.00-155.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	155.00-135.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	135.00-132.50	A	0.000	0.000	1.438	0.000	25.60
		B	0.000	0.000	0.495	0.000	2.05
		C	0.000	0.000	0.000	0.000	0.00
T2	132.50-130.00	A	0.000	0.000	1.745	0.000	26.42
		B	0.000	0.000	0.495	0.000	2.05
		C	0.000	0.000	0.000	0.000	0.00
T3	130.00-110.00	A	0.000	0.000	14.599	0.000	213.00
		B	0.000	0.000	3.960	0.000	16.40
		C	0.000	0.000	0.000	0.000	0.00
T4	110.00-90.00	A	0.000	0.000	26.333	0.000	333.00
		B	0.000	0.000	5.210	0.000	23.40
		C	0.000	0.000	0.000	0.000	0.00
T5	90.00-87.50	A	0.000	0.000	3.298	0.000	41.63
		B	0.000	0.000	0.808	0.000	3.80
		C	0.000	0.000	0.000	0.000	0.00
T6	87.50-77.50	A	0.000	0.000	13.208	0.000	166.50
		B	0.000	0.000	3.230	0.000	15.20
		C	0.000	0.000	0.000	0.000	0.00
T7	77.50-67.50	A	0.000	0.000	15.887	0.000	177.60
		B	0.000	0.000	4.688	0.000	30.20

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
		C	0.000	0.000	0.000	0.000	0.00
T8	67.50-57.50	A	0.000	0.000	23.869	0.000	210.90
		B	0.000	0.000	9.063	0.000	75.20
		C	0.000	0.000	0.000	0.000	0.00
T9	57.50-47.50	A	0.000	0.000	24.351	0.000	211.97
		B	0.000	0.000	9.118	0.000	75.36
		C	0.000	0.000	0.000	0.000	0.00
T10	47.50-37.50	A	0.000	0.000	26.304	0.000	217.52
		B	0.000	0.000	10.311	0.000	78.88
		C	0.000	0.000	0.000	0.000	0.00
T11	37.50-27.50	A	0.000	0.000	26.852	0.000	219.00
		B	0.000	0.000	10.783	0.000	80.00
		C	0.000	0.000	0.000	0.000	0.00
T12	27.50-17.50	A	0.000	0.000	26.852	0.000	219.00
		B	0.000	0.000	10.783	0.000	80.00
		C	0.000	0.000	0.000	0.000	0.00
T13	17.50-7.50	A	0.000	0.000	26.852	0.000	219.00
		B	0.000	0.000	10.783	0.000	80.00
		C	0.000	0.000	0.000	0.000	0.00
T14	7.50-0.00	A	0.000	0.000	20.139	0.000	164.25
		B	0.000	0.000	8.088	0.000	60.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	195.00-175.00	A	2.242	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	175.00-155.00	A	2.236	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	155.00-135.00	A	2.227	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	135.00-132.50	A	2.221	0.000	0.000	19.720	0.000	177.21
		B		0.000	0.000	1.605	0.000	30.54
		C		0.000	0.000	0.000	0.000	0.00
T2	132.50-130.00	A	2.219	0.000	0.000	21.797	0.000	210.20
		B		0.000	0.000	1.604	0.000	30.51
		C		0.000	0.000	0.000	0.000	0.00
T3	130.00-110.00	A	2.211	0.000	0.000	178.291	0.000	1738.47
		B		0.000	0.000	12.803	0.000	242.76
		C		0.000	0.000	0.000	0.000	0.00
T4	110.00-90.00	A	2.191	0.000	0.000	206.924	0.000	2358.02
		B		0.000	0.000	18.359	0.000	338.91
		C		0.000	0.000	0.000	0.000	0.00
T5	90.00-87.50	A	2.177	0.000	0.000	25.799	0.000	292.11
		B		0.000	0.000	2.985	0.000	54.24
		C		0.000	0.000	0.000	0.000	0.00
T6	87.50-77.50	A	2.168	0.000	0.000	103.026	0.000	1161.59
		B		0.000	0.000	11.903	0.000	215.63
		C		0.000	0.000	0.000	0.000	0.00
T7	77.50-67.50	A	2.151	0.000	0.000	110.337	0.000	1255.38
		B		0.000	0.000	15.444	0.000	291.48
		C		0.000	0.000	0.000	0.000	0.00

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
T8	67.50-57.50	A	2.130	0.000	0.000	132.699	0.000	1554.94
		B		0.000	0.000	26.104	0.000	519.70
		C		0.000	0.000	0.000	0.000	0.00
T9	57.50-47.50	A	2.104	0.000	0.000	135.138	0.000	1577.57
		B		0.000	0.000	26.161	0.000	515.59
		C		0.000	0.000	0.000	0.000	0.00
T10	47.50-37.50	A	2.071	0.000	0.000	143.666	0.000	1669.71
		B		0.000	0.000	32.055	0.000	601.45
		C		0.000	0.000	0.000	0.000	0.00
T11	37.50-27.50	A	2.027	0.000	0.000	145.332	0.000	1637.29
		B		0.000	0.000	35.104	0.000	634.60
		C		0.000	0.000	0.000	0.000	0.00
T12	27.50-17.50	A	1.964	0.000	0.000	143.387	0.000	1572.00
		B		0.000	0.000	34.352	0.000	607.81
		C		0.000	0.000	0.000	0.000	0.00
T13	17.50-7.50	A	1.862	0.000	0.000	140.223	0.000	1468.74
		B		0.000	0.000	33.128	0.000	565.51
		C		0.000	0.000	0.000	0.000	0.00
T14	7.50-0.00	A	1.659	0.000	0.000	100.445	0.000	955.71
		B		0.000	0.000	23.017	0.000	364.59
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	195.00-175.00	0.0000	0.0000	0.0000	0.0000
L2	175.00-155.00	0.0000	0.0000	0.0000	0.0000
L3	155.00-135.00	0.0000	0.0000	0.0000	0.0000
T1	135.00-132.50	0.1648	-2.1188	1.1128	-1.4015
T2	132.50-130.00	0.2228	-2.5561	1.4274	-2.0697
T3	130.00-110.00	0.2901	-3.1701	2.5192	-3.9868
T4	110.00-90.00	-1.8038	-2.6027	0.8231	-3.4543
T5	90.00-87.50	-1.5470	-2.4172	0.4541	-2.3170
T6	87.50-77.50	-1.9623	-2.9669	0.1218	-4.1599
T7	77.50-67.50	-2.2025	-3.3727	-0.6585	-5.3816
T8	67.50-57.50	-2.0858	-3.4048	-1.2022	-5.8370
T9	57.50-47.50	-2.3705	-3.9099	-1.9357	-7.1192
T10	47.50-37.50	-3.0571	-4.4579	-3.1506	-8.4881
T11	37.50-27.50	-3.2018	-4.2896	-3.7897	-9.6891
T12	27.50-17.50	-3.1961	-4.3265	-4.1994	-10.0441
T13	17.50-7.50	-3.4075	-4.6209	-4.8069	-10.9113
T14	7.50-0.00	-3.6360	-4.9308	-5.3208	-11.5827

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	7	Climbing Ladder (Rail)	132.50 - 135.00	0.6000	0.2117
T1	8	Climbing Ladder (Rungs)	132.50 - 135.00	0.6000	0.2117
T1	9	1" Rigid Conduit	132.50 - 135.00	0.6000	0.2117
T1	10	3" Flex Line	132.50 - 135.00	1.0000	0.2117
T1	11	LDF4-50A(1/2")	132.50 - 135.00	0.6000	0.2117
T1	17	LDF7-50A(1-5/8")	132.50 - 135.00	0.6000	0.2117
T2	7	Climbing Ladder (Rail)	130.00 - 132.50	0.6000	0.2585
T2	8	Climbing Ladder (Rungs)	130.00 - 132.50	0.6000	0.2585
T2	9	1" Rigid Conduit	130.00 - 132.50	0.6000	0.2585
T2	10	3" Flex Line	130.00 - 132.50	1.0000	0.2585
T2	11	LDF4-50A(1/2")	130.00 - 132.50	0.6000	0.2585
T2	12	LDF5-50A(7/8")	130.00 - 132.00	0.6000	0.2585
T2	13	LDF2-50A(3/8")	130.00 - 132.00	0.6000	0.2585
T2	17	LDF7-50A(1-5/8")	130.00 - 132.50	0.6000	0.2585
T3	7	Climbing Ladder (Rail)	110.00 - 130.00	0.6000	0.4462
T3	8	Climbing Ladder (Rungs)	110.00 - 130.00	0.6000	0.4462
T3	9	1" Rigid Conduit	110.00 - 130.00	0.6000	0.4462
T3	10	3" Flex Line	110.00 - 130.00	1.0000	0.4462
T3	11	LDF4-50A(1/2")	110.00 - 130.00	0.6000	0.4462
T3	12	LDF5-50A(7/8")	110.00 - 130.00	0.6000	0.4462
T3	13	LDF2-50A(3/8")	110.00 - 130.00	0.6000	0.4462
T3	17	LDF7-50A(1-5/8")	110.00 - 130.00	0.6000	0.4462
T4	1	Feedline Ladder (Rail)	90.00 - 110.00	0.6000	0.4256
T4	7	Climbing Ladder (Rail)	90.00 - 110.00	0.6000	0.4256
T4	8	Climbing Ladder (Rungs)	90.00 - 110.00	0.6000	0.4256
T4	9	1" Rigid Conduit	90.00 - 110.00	0.6000	0.4256
T4	10	3" Flex Line	90.00 - 110.00	1.0000	0.4256
T4	11	LDF4-50A(1/2")	90.00 - 110.00	0.6000	0.4256
T4	12	LDF5-50A(7/8")	90.00 - 110.00	0.6000	0.4256
T4	13	LDF2-50A(3/8")	90.00 - 110.00	0.6000	0.4256
T4	16	1 1/4" Rigid Conduit	90.00 - 100.00	0.6000	0.4256
T4	17	LDF7-50A(1-5/8")	90.00 - 110.00	0.6000	0.4256
T5	1	Feedline Ladder (Rail)	87.50 - 90.00	0.6000	0.2728
T5	7	Climbing Ladder (Rail)	87.50 - 90.00	0.6000	0.2728
T5	8	Climbing Ladder (Rungs)	87.50 - 90.00	0.6000	0.2728
T5	9	1" Rigid Conduit	87.50 - 90.00	0.6000	0.2728
T5	10	3" Flex Line	87.50 - 90.00	1.0000	0.2728
T5	11	LDF4-50A(1/2")	87.50 - 90.00	0.6000	0.2728
T5	12	LDF5-50A(7/8")	87.50 - 90.00	0.6000	0.2728
T5	13	LDF2-50A(3/8")	87.50 - 90.00	0.6000	0.2728

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	16	1 1/4" Rigid Conduit	87.50 - 90.00	0.6000	0.2728
T5	17	LDF7-50A(1-5/8")	87.50 - 90.00	0.6000	0.2728
T6	1	Feedline Ladder (Rail)	77.50 - 87.50	0.6000	0.4173
T6	7	Climbing Ladder (Rail)	77.50 - 87.50	0.6000	0.4173
T6	8	Climbing Ladder (Rungs)	77.50 - 87.50	0.6000	0.4173
T6	9	1" Rigid Conduit	77.50 - 87.50	0.6000	0.4173
T6	10	3" Flex Line	77.50 - 87.50	1.0000	0.4173
T6	11	LDF4-50A(1/2")	77.50 - 87.50	0.6000	0.4173
T6	12	LDF5-50A(7/8")	77.50 - 87.50	0.6000	0.4173
T6	13	LDF2-50A(3/8")	77.50 - 87.50	0.6000	0.4173
T6	16	1 1/4" Rigid Conduit	77.50 - 87.50	0.6000	0.4173
T6	17	LDF7-50A(1-5/8")	77.50 - 87.50	0.6000	0.4173
T7	1	Feedline Ladder (Rail)	67.50 - 77.50	0.6000	0.4746
T7	4	LDF6-50A(1-1/4")	67.50 - 70.00	0.6000	0.4746
T7	5	LDF7-50A(1-5/8")	67.50 - 70.00	0.6000	0.4746
T7	7	Climbing Ladder (Rail)	67.50 - 77.50	0.6000	0.4746
T7	8	Climbing Ladder (Rungs)	67.50 - 77.50	0.6000	0.4746
T7	9	1" Rigid Conduit	67.50 - 77.50	0.6000	0.4746
T7	10	3" Flex Line	67.50 - 77.50	1.0000	0.4746
T7	11	LDF4-50A(1/2")	67.50 - 77.50	0.6000	0.4746
T7	12	LDF5-50A(7/8")	67.50 - 77.50	0.6000	0.4746
T7	13	LDF2-50A(3/8")	67.50 - 77.50	0.6000	0.4746
T7	16	1 1/4" Rigid Conduit	67.50 - 77.50	0.6000	0.4746
T7	17	LDF7-50A(1-5/8")	67.50 - 77.50	0.6000	0.4746
T7	21	Feedline Ladder (Rail)	67.50 - 70.00	0.6000	0.4746
T8	1	Feedline Ladder (Rail)	57.50 - 67.50	0.6000	0.5149
T8	4	LDF6-50A(1-1/4")	57.50 - 67.50	0.6000	0.5149
T8	5	LDF7-50A(1-5/8")	57.50 - 67.50	0.6000	0.5149
T8	7	Climbing Ladder (Rail)	57.50 - 67.50	0.6000	0.5149
T8	8	Climbing Ladder (Rungs)	57.50 - 67.50	0.6000	0.5149
T8	9	1" Rigid Conduit	57.50 - 67.50	0.6000	0.5149
T8	10	3" Flex Line	57.50 - 67.50	1.0000	0.5149
T8	11	LDF4-50A(1/2")	57.50 - 67.50	0.6000	0.5149
T8	12	LDF5-50A(7/8")	57.50 - 67.50	0.6000	0.5149
T8	13	LDF2-50A(3/8")	57.50 - 67.50	0.6000	0.5149
T8	16	1 1/4" Rigid Conduit	57.50 - 67.50	0.6000	0.5149
T8	17	LDF7-50A(1-5/8")	57.50 - 67.50	0.6000	0.5149
T8	21	Feedline Ladder (Rail)	57.50 - 67.50	0.6000	0.5149
T9	1	Feedline Ladder (Rail)	47.50 - 57.50	0.6000	0.5458
T9	3	LDF5-50A(7/8")	47.50 - 48.00	0.6000	0.5458
T9	4	LDF6-50A(1-1/4")	47.50 - 57.50	0.6000	0.5458
T9	5	LDF7-50A(1-5/8")	47.50 - 57.50	0.6000	0.5458
T9	7	Climbing Ladder (Rail)	47.50 - 57.50	0.6000	0.5458
T9	8	Climbing Ladder (Rungs)	47.50 - 57.50	0.6000	0.5458
T9	9	1" Rigid Conduit	47.50 - 57.50	0.6000	0.5458
T9	10	3" Flex Line	47.50 - 57.50	1.0000	0.5458
T9	11	LDF4-50A(1/2")	47.50 - 57.50	0.6000	0.5458
T9	12	LDF5-50A(7/8")	47.50 - 57.50	0.6000	0.5458
T9	13	LDF2-50A(3/8")	47.50 - 57.50	0.6000	0.5458
T9	14	LDF4-50A(1/2")	47.50 - 53.50	0.6000	0.5458
T9	16	1 1/4" Rigid Conduit	47.50 - 57.50	0.6000	0.5458
T9	17	LDF7-50A(1-5/8")	47.50 - 57.50	0.6000	0.5458
T9	18	LDF5-50A(7/8")	47.50 - 48.00	0.6000	0.5458
T9	21	Feedline Ladder (Rail)	47.50 - 57.50	0.6000	0.5458
T10	1	Feedline Ladder (Rail)	37.50 - 47.50	0.6000	0.5775
T10	2	LDF5-50A(7/8")	37.50 - 43.00	0.6000	0.5775
T10	3	LDF5-50A(7/8")	43.00 - 47.50	0.6000	0.5775
T10	4	LDF6-50A(1-1/4")	37.50 - 47.50	0.6000	0.5775
T10	5	LDF7-50A(1-5/8")	37.50 - 47.50	0.6000	0.5775
T10	7	Climbing Ladder (Rail)	37.50 - 47.50	0.6000	0.5775
T10	8	Climbing Ladder (Rungs)	37.50 - 47.50	0.6000	0.5775
T10	9	1" Rigid Conduit	37.50 - 47.50	0.6000	0.5775

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	10	3" Flex Line	37.50 - 47.50	1.0000	0.5775
T10	11	LDF4-50A(1/2")	37.50 - 47.50	0.6000	0.5775
T10	12	LDF5-50A(7/8")	37.50 - 47.50	0.6000	0.5775
T10	13	LDF2-50A(3/8")	37.50 - 47.50	0.6000	0.5775
T10	14	LDF4-50A(1/2")	37.50 - 47.50	0.6000	0.5775
T10	16	1 1/4" Rigid Conduit	37.50 - 47.50	0.6000	0.5775
T10	17	LDF7-50A(1-5/8")	37.50 - 47.50	0.6000	0.5775
T10	18	LDF5-50A(7/8")	37.50 - 47.50	0.6000	0.5775
T10	19	LDF4-50A(1/2")	37.50 - 40.00	0.6000	0.5775
T10	21	Feedline Ladder (Rail)	37.50 - 47.50	0.6000	0.5775
T11	1	Feedline Ladder (Rail)	27.50 - 37.50	0.6000	0.5983
T11	2	LDF5-50A(7/8")	27.50 - 37.50	0.6000	0.5983
T11	4	LDF6-50A(1-1/4")	27.50 - 37.50	0.6000	0.5983
T11	5	LDF7-50A(1-5/8")	27.50 - 37.50	0.6000	0.5983
T11	7	Climbing Ladder (Rail)	27.50 - 37.50	0.6000	0.5983
T11	8	Climbing Ladder (Rungs)	27.50 - 37.50	0.6000	0.5983
T11	9	1" Rigid Conduit	27.50 - 37.50	0.6000	0.5983
T11	10	3" Flex Line	27.50 - 37.50	0.6000	0.5983
T11	11	LDF4-50A(1/2")	27.50 - 37.50	0.6000	0.5983
T11	12	LDF5-50A(7/8")	27.50 - 37.50	0.6000	0.5983
T11	13	LDF2-50A(3/8")	27.50 - 37.50	0.6000	0.5983
T11	14	LDF4-50A(1/2")	27.50 - 37.50	0.6000	0.5983
T11	16	1 1/4" Rigid Conduit	27.50 - 37.50	0.6000	0.5983
T11	17	LDF7-50A(1-5/8")	27.50 - 37.50	0.6000	0.5983
T11	18	LDF5-50A(7/8")	27.50 - 37.50	0.6000	0.5983
T11	19	LDF4-50A(1/2")	27.50 - 37.50	0.6000	0.5983
T11	21	Feedline Ladder (Rail)	27.50 - 37.50	0.6000	0.5983
T12	1	Feedline Ladder (Rail)	17.50 - 27.50	0.6000	0.5851
T12	2	LDF5-50A(7/8")	17.50 - 27.50	0.6000	0.5851
T12	4	LDF6-50A(1-1/4")	17.50 - 27.50	0.6000	0.5851
T12	5	LDF7-50A(1-5/8")	17.50 - 27.50	0.6000	0.5851
T12	7	Climbing Ladder (Rail)	17.50 - 27.50	0.6000	0.5851
T12	8	Climbing Ladder (Rungs)	17.50 - 27.50	0.6000	0.5851
T12	9	1" Rigid Conduit	17.50 - 27.50	0.6000	0.5851
T12	10	3" Flex Line	17.50 - 27.50	0.6000	0.5851
T12	11	LDF4-50A(1/2")	17.50 - 27.50	0.6000	0.5851
T12	12	LDF5-50A(7/8")	17.50 - 27.50	0.6000	0.5851
T12	13	LDF2-50A(3/8")	17.50 - 27.50	0.6000	0.5851
T12	14	LDF4-50A(1/2")	17.50 - 27.50	0.6000	0.5851
T12	16	1 1/4" Rigid Conduit	17.50 - 27.50	0.6000	0.5851
T12	17	LDF7-50A(1-5/8")	17.50 - 27.50	0.6000	0.5851
T12	18	LDF5-50A(7/8")	17.50 - 27.50	0.6000	0.5851
T12	19	LDF4-50A(1/2")	17.50 - 27.50	0.6000	0.5851
T12	21	Feedline Ladder (Rail)	17.50 - 27.50	0.6000	0.5851
T13	1	Feedline Ladder (Rail)	7.50 - 17.50	0.6000	0.6000
T13	2	LDF5-50A(7/8")	7.50 - 17.50	0.6000	0.6000
T13	4	LDF6-50A(1-1/4")	7.50 - 17.50	0.6000	0.6000
T13	5	LDF7-50A(1-5/8")	7.50 - 17.50	0.6000	0.6000
T13	7	Climbing Ladder (Rail)	7.50 - 17.50	0.6000	0.6000
T13	8	Climbing Ladder (Rungs)	7.50 - 17.50	0.6000	0.6000
T13	9	1" Rigid Conduit	7.50 - 17.50	0.6000	0.6000
T13	10	3" Flex Line	7.50 - 17.50	0.6000	0.6000
T13	11	LDF4-50A(1/2")	7.50 - 17.50	0.6000	0.6000
T13	12	LDF5-50A(7/8")	7.50 - 17.50	0.6000	0.6000
T13	13	LDF2-50A(3/8")	7.50 - 17.50	0.6000	0.6000
T13	14	LDF4-50A(1/2")	7.50 - 17.50	0.6000	0.6000
T13	16	1 1/4" Rigid Conduit	7.50 - 17.50	0.6000	0.6000
T13	17	LDF7-50A(1-5/8")	7.50 - 17.50	0.6000	0.6000
T13	18	LDF5-50A(7/8")	7.50 - 17.50	0.6000	0.6000
T13	19	LDF4-50A(1/2")	7.50 - 17.50	0.6000	0.6000
T13	21	Feedline Ladder (Rail)	7.50 - 17.50	0.6000	0.6000
T14	1	Feedline Ladder (Rail)	0.00 - 7.50	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	2	LDF5-50A(7/8")	0.00 - 7.50	0.6000	0.6000
T14	4	LDF6-50A(1-1/4")	0.00 - 7.50	0.6000	0.6000
T14	5	LDF7-50A(1-5/8")	0.00 - 7.50	0.6000	0.6000
T14	7	Climbing Ladder (Rail)	0.00 - 7.50	0.6000	0.6000
T14	8	Climbing Ladder (Rungs)	0.00 - 7.50	0.6000	0.6000
T14	9	1" Rigid Conduit	0.00 - 7.50	0.6000	0.6000
T14	10	3" Flex Line	0.00 - 7.50	0.6000	0.6000
T14	11	LDF4-50A(1/2")	0.00 - 7.50	0.6000	0.6000
T14	12	LDF5-50A(7/8")	0.00 - 7.50	0.6000	0.6000
T14	13	LDF2-50A(3/8")	0.00 - 7.50	0.6000	0.6000
T14	14	LDF4-50A(1/2")	0.00 - 7.50	0.6000	0.6000
T14	16	1 1/4" Rigid Conduit	0.00 - 7.50	0.6000	0.6000
T14	17	LDF7-50A(1-5/8")	0.00 - 7.50	0.6000	0.6000
T14	18	LDF5-50A(7/8")	0.00 - 7.50	0.6000	0.6000
T14	19	LDF4-50A(1/2")	0.00 - 7.50	0.6000	0.6000
T14	21	Feedline Ladder (Rail)	0.00 - 7.50	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
3-Bay ERI FM Antenna	A	From Leg	1.00	0.0000	185.00	No Ice	9.00	9.00	300.00
			0.00			1/2" Ice	10.00	10.00	360.00
			0.00			1" Ice	11.00	11.00	420.00
1-Bay ERI FM Antenna	A	From Leg	1.00	0.0000	162.00	No Ice	9.00	9.00	100.00
			0.00			1/2" Ice	10.00	10.00	120.00
			0.00			1" Ice	11.00	11.00	140.00
****									
10'x3" Omni/Whip	A	From Leg	1.00	0.0000	135.00	No Ice	2.66	2.66	100.00
			0.00			1/2" Ice	4.03	4.03	121.79
			0.00			1" Ice	5.03	5.03	150.14
***									
AAHC w/ Mount Pipe	A	From Leg	4.00	0.0000	70.00	No Ice	4.41	2.69	115.07
			0.00			1/2" Ice	4.73	3.08	155.87
			0.00			1" Ice	5.06	3.49	201.53
AAHC w/ Mount Pipe	B	From Leg	4.00	0.0000	70.00	No Ice	4.41	2.69	115.07
			0.00			1/2" Ice	4.73	3.08	155.87
			0.00			1" Ice	5.06	3.49	201.53
AAHC w/ Mount Pipe	C	From Leg	4.00	0.0000	70.00	No Ice	4.41	2.69	115.07
			0.00			1/2" Ice	4.73	3.08	155.87
			0.00			1" Ice	5.06	3.49	201.53
P40-16-XLPP-RR-A w/ Mount Pipe	A	From Leg	4.00	0.0000	70.00	No Ice	8.24	4.83	73.08
			0.00			1/2" Ice	8.70	5.57	135.71
			0.00			1" Ice	9.16	6.27	205.16
P40-16-XLPP-RR-A w/ Mount Pipe	B	From Leg	4.00	0.0000	70.00	No Ice	8.24	4.83	73.08
			0.00			1/2" Ice	8.70	5.57	135.71
			0.00			1" Ice	9.16	6.27	205.16
P40-16-XLPP-RR-A w/ Mount Pipe	C	From Leg	4.00	0.0000	70.00	No Ice	8.24	4.83	73.08
			0.00			1/2" Ice	8.70	5.57	135.71
			0.00			1" Ice	9.16	6.27	205.16

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
RRH 800	A	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	1.72 1.90 2.07	1.43 1.60 1.76	46.00 62.55 81.83
RRH 800	B	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	1.72 1.90 2.07	1.43 1.60 1.76	46.00 62.55 81.83
RRH 800	C	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	1.72 1.90 2.07	1.43 1.60 1.76	46.00 62.55 81.83
1900MHz RRH	A	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	44.00 75.27 110.18
1900MHz RRH	B	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	44.00 75.27 110.18
1900MHz RRH	C	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	44.00 75.27 110.18
10.5'-P2x0.154 H	A	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	2.49 3.57 4.67	0.01 0.02 0.03	38.00 57.16 82.70
10.5'-P2x0.154 H	B	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	2.49 3.57 4.67	0.01 0.02 0.03	38.00 57.16 82.70
10.5'-P2x0.154 H	C	From Leg	4.00 0.00 0.00	0.0000	70.00	No Ice 1/2" Ice 1" Ice	2.49 3.57 4.67	0.01 0.02 0.03	38.00 57.16 82.70
Sector Mount [SM 1302-3]	C	None		0.0000	70.00	No Ice 1/2" Ice 1" Ice	39.23 56.68 74.13	39.23 56.68 74.13	1420.70 2486.30 3551.90
*****									
7' Ice Shield	A	From Leg	1.00 0.00 0.00	0.0000	60.00	No Ice 1/2" Ice 1" Ice	5.97 6.83 7.71	2.59 3.09 3.61	461.00 563.00 676.00
*****									
4'6" Flat Yagi w/ (9) 1' Elements	A	From Leg	1.00 0.00 0.00	0.0000	53.50	No Ice 1/2" Ice 1" Ice	0.56 0.70 0.84	3.00 3.75 4.50	125.00 157.00 189.00
AP18-1900/063D w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	43.00	No Ice 1/2" Ice 1" Ice	3.40 3.80 4.20	2.26 3.11 3.76	29.41 58.19 92.53
4'6" Flat Yagi w/ (9) 1' Elements	A	From Leg	1.00 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice	0.56 0.70 0.84	3.00 3.75 4.50	125.00 157.00 189.00
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
6' Grid Dish		Grid	None		0.0000		48.00	6.00	No Ice	28.27	100.00
									1/2" Ice	29.07	130.00
									1" Ice	29.87	160.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	1.2D+1.6W (pattern 1) 0 deg - No Ice
4	1.2D+1.6W (pattern 2) 0 deg - No Ice
5	0.9 Dead+1.6 Wind 0 deg - No Ice
6	1.2 Dead+1.6 Wind 30 deg - No Ice
7	1.2D+1.6W (pattern 1) 30 deg - No Ice
8	1.2D+1.6W (pattern 2) 30 deg - No Ice
9	0.9 Dead+1.6 Wind 30 deg - No Ice
10	1.2 Dead+1.6 Wind 60 deg - No Ice
11	1.2D+1.6W (pattern 1) 60 deg - No Ice
12	1.2D+1.6W (pattern 2) 60 deg - No Ice
13	0.9 Dead+1.6 Wind 60 deg - No Ice
14	1.2 Dead+1.6 Wind 90 deg - No Ice
15	1.2D+1.6W (pattern 1) 90 deg - No Ice
16	1.2D+1.6W (pattern 2) 90 deg - No Ice
17	0.9 Dead+1.6 Wind 90 deg - No Ice
18	1.2 Dead+1.6 Wind 120 deg - No Ice
19	1.2D+1.6W (pattern 1) 120 deg - No Ice
20	1.2D+1.6W (pattern 2) 120 deg - No Ice
21	0.9 Dead+1.6 Wind 120 deg - No Ice
22	1.2 Dead+1.6 Wind 150 deg - No Ice
23	1.2D+1.6W (pattern 1) 150 deg - No Ice
24	1.2D+1.6W (pattern 2) 150 deg - No Ice
25	0.9 Dead+1.6 Wind 150 deg - No Ice
26	1.2 Dead+1.6 Wind 180 deg - No Ice
27	1.2D+1.6W (pattern 1) 180 deg - No Ice
28	1.2D+1.6W (pattern 2) 180 deg - No Ice
29	0.9 Dead+1.6 Wind 180 deg - No Ice
30	1.2 Dead+1.6 Wind 210 deg - No Ice
31	1.2D+1.6W (pattern 1) 210 deg - No Ice
32	1.2D+1.6W (pattern 2) 210 deg - No Ice
33	0.9 Dead+1.6 Wind 210 deg - No Ice
34	1.2 Dead+1.6 Wind 240 deg - No Ice
35	1.2D+1.6W (pattern 1) 240 deg - No Ice
36	1.2D+1.6W (pattern 2) 240 deg - No Ice
37	0.9 Dead+1.6 Wind 240 deg - No Ice
38	1.2 Dead+1.6 Wind 270 deg - No Ice
39	1.2D+1.6W (pattern 1) 270 deg - No Ice
40	1.2D+1.6W (pattern 2) 270 deg - No Ice
41	0.9 Dead+1.6 Wind 270 deg - No Ice
42	1.2 Dead+1.6 Wind 300 deg - No Ice
43	1.2D+1.6W (pattern 1) 300 deg - No Ice
44	1.2D+1.6W (pattern 2) 300 deg - No Ice
45	0.9 Dead+1.6 Wind 300 deg - No Ice
46	1.2 Dead+1.6 Wind 330 deg - No Ice
47	1.2D+1.6W (pattern 1) 330 deg - No Ice
48	1.2D+1.6W (pattern 2) 330 deg - No Ice

Comb. No.	Description
49	0.9 Dead+1.6 Wind 330 deg - No Ice
50	1.2 Dead+1.0 Ice+1.0 Temp
51	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
52	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
53	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
54	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
55	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
56	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
57	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
58	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
59	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
60	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
61	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
62	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
63	Dead+Wind 0 deg - Service
64	Dead+Wind 30 deg - Service
65	Dead+Wind 60 deg - Service
66	Dead+Wind 90 deg - Service
67	Dead+Wind 120 deg - Service
68	Dead+Wind 150 deg - Service
69	Dead+Wind 180 deg - Service
70	Dead+Wind 210 deg - Service
71	Dead+Wind 240 deg - Service
72	Dead+Wind 270 deg - Service
73	Dead+Wind 300 deg - Service
74	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	195 - 175	Pole	Max Tension	5	0.03	-0.00	-0.00
			Max. Compression	50	-1944.78	0.00	0.88
			Max. Mx	14	-971.66	-18.35	0.55
			Max. My	2	-969.93	0.01	18.85
			Max. Vy	38	-1832.64	18.35	0.55
			Max. Vx	2	-1832.07	0.01	18.85
			Max. Torque	14			1.26
L2	175 - 155	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	50	-4223.03	0.00	1.23
			Max. Mx	14	-2269.52	-74.48	1.02
			Max. My	2	-2266.62	0.05	75.18
			Max. Vy	38	-4044.49	74.48	1.03
			Max. Vx	2	-4043.02	0.05	75.18
			Max. Torque	14			2.63
L3	155 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	50	-7247.85	0.00	1.27
			Max. Mx	14	-4461.61	-169.33	1.56
			Max. My	2	-4458.45	0.10	170.06
			Max. Vy	38	-5425.41	169.33	1.57
			Max. Vx	2	-5425.58	0.10	170.06
			Max. Torque	14			2.63
T1	135 - 132.5	Leg	Max Tension	10	43513.88	-0.06	0.02
			Max. Compression	2	-45932.29	0.01	0.03
			Max. Mx	54	18505.61	-0.09	0.04
			Max. My	57	20147.42	0.00	-0.10
			Max. Vy	54	-55.00	-0.09	0.04
			Max. Vx	58	-62.83	0.01	-0.10

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	17	6667.90	0.00	0.00
			Max. Compression	38	-7235.57	0.00	0.00
			Max. Mx	52	-2571.78	-0.02	0.00
			Max. My	53	-6126.21	0.00	-0.00
			Max. Vy	52	-24.00	0.00	0.00
			Max. Vx	53	0.26	0.00	0.00
		Horizontal	Max Tension	2	795.57	0.00	0.00
			Max. Compression	2	-795.57	0.00	0.03
			Max. Mx	34	-0.00	0.05	-0.03
			Max. My	34	-789.28	0.03	0.06
			Max. Vy	59	31.26	0.02	-0.00
			Max. Vx	34	-28.06	0.03	0.06
T2	132.5 - 130	Leg	Max Tension	13	51288.19	-0.02	0.03
			Max. Compression	2	-54729.91	0.02	0.02
			Max. Mx	16	-2136.31	-0.06	-0.02
			Max. My	4	24845.90	-0.00	0.07
			Max. Vy	16	-51.83	-0.06	-0.02
			Max. Vx	4	53.39	-0.00	0.07
		Diagonal	Max Tension	46	3606.64	0.00	0.00
			Max. Compression	22	-3705.71	0.00	0.00
			Max. Mx	52	1305.56	-0.01	0.00
			Max. My	53	-319.19	0.00	-0.00
			Max. Vy	52	17.92	0.00	0.00
			Max. Vx	53	0.19	0.00	0.00
		Horizontal	Max Tension	14	4529.28	-0.26	0.01
			Max. Compression	41	-4153.17	0.23	0.00
			Max. Mx	10	-493.89	-0.27	0.00
			Max. My	10	3898.97	-0.27	0.01
			Max. Vy	10	148.65	-0.27	0.00
			Max. Vx	10	3.37	0.00	0.00
T3	130 - 110	Leg	Max Tension	10	99756.60	0.46	-0.43
			Max. Compression	2	-106518.06	0.53	0.09
			Max. Mx	46	-91562.24	0.61	-0.14
			Max. My	46	-84765.73	-0.44	0.54
			Max. Vy	34	-4251.92	0.55	0.04
			Max. Vx	18	-3268.95	-0.54	0.39
		Diagonal	Max Tension	22	9632.77	0.00	0.00
			Max. Compression	46	-9629.64	0.00	0.00
			Max. Mx	52	2717.63	-0.06	0.00
			Max. My	53	-376.72	0.00	-0.00
			Max. Vy	52	39.25	0.00	0.00
			Max. Vx	53	0.30	0.00	0.00
		Horizontal	Max Tension	18	1753.08	0.00	0.00
			Max. Compression	18	-1753.08	0.00	0.00
			Max. Mx	50	85.01	-0.04	0.00
			Max. My	38	1499.92	0.00	0.00
			Max. Vy	50	35.26	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Top Girt	Max Tension	46	2445.83	0.00	0.00
			Max. Compression	22	-2410.07	0.00	0.00
			Max. Mx	50	57.66	-0.04	0.00
			Max. My	38	-1769.43	0.00	0.00
			Max. Vy	50	35.26	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Bottom Girt	Max Tension	34	2190.59	0.00	0.00
			Max. Compression	10	-2041.50	0.00	0.00
			Max. Mx	57	446.39	-0.04	0.00
			Max. My	38	-1067.49	0.00	0.00
			Max. Vy	57	35.26	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
T4	110 - 90	Leg	Max Tension	13	160420.77	-0.11	0.31

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-172496.54	1.95	-0.26
			Max. Mx	2	-172496.54	1.95	-0.26
			Max. My	14	-3406.94	-0.74	1.21
			Max. Vy	18	-7867.83	1.93	-0.28
			Max. Vx	18	-3280.29	-1.38	1.21
		Diagonal	Max Tension	46	12376.27	0.00	0.00
			Max. Compression	22	-12287.20	0.00	0.00
			Max. Mx	58	4581.21	-0.06	0.00
			Max. My	59	583.47	0.00	0.00
			Max. Vy	58	45.83	0.00	0.00
			Max. Vx	59	0.29	0.00	0.00
		Horizontal	Max Tension	34	2870.15	0.00	0.00
			Max. Compression	34	-2870.15	0.00	0.00
			Max. Mx	57	718.18	-0.03	0.00
			Max. My	38	2412.25	0.00	0.00
			Max. Vy	57	34.92	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Top Girt	Max Tension	10	2373.44	0.00	0.00
			Max. Compression	34	-2630.71	0.00	0.00
			Max. Mx	51	447.94	-0.03	0.00
			Max. My	38	1336.98	0.00	0.00
			Max. Vy	51	34.92	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Bottom Girt	Max Tension	13	3241.46	0.00	0.00
			Max. Compression	34	-3718.98	0.00	0.00
			Max. Mx	50	-96.43	-0.03	0.00
			Max. My	38	2074.56	0.00	0.00
			Max. Vy	50	34.92	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
T5	90 - 87.5	Leg	Max Tension	13	160594.27	-1.21	0.12
			Max. Compression	2	-172815.96	-0.05	0.04
			Max. Mx	2	-172654.77	1.95	-0.26
			Max. My	38	-4550.86	-0.52	-1.12
			Max. Vy	32	2946.16	1.42	-0.51
			Max. Vx	34	2161.23	-1.13	-1.02
		Diagonal	Max Tension	35	1676.71	0.00	0.00
			Max. Compression	35	-1742.60	0.00	0.00
			Max. Mx	52	193.58	-0.02	0.00
			Max. My	59	182.07	0.00	0.00
			Max. Vy	52	20.36	0.00	0.00
			Max. Vx	59	-0.95	0.00	0.00
		Horizontal	Max Tension	17	3152.53	-0.05	0.00
			Max. Compression	38	-3412.78	0.00	0.00
			Max. Mx	10	1480.85	0.07	-0.00
			Max. My	59	808.40	-0.01	0.00
			Max. Vy	53	41.37	0.04	0.00
			Max. Vx	59	-2.32	0.00	0.00
T6	87.5 - 77.5	Leg	Max Tension	13	159142.71	0.03	-0.02
			Max. Compression	2	-172770.46	0.41	0.01
			Max. Mx	4	-158077.58	0.41	0.01
			Max. My	38	-4795.32	-0.05	-1.29
			Max. Vy	42	143.45	-0.36	-0.01
			Max. Vx	38	-408.03	-0.05	-1.29
		Diagonal	Max Tension	12	2155.25	0.00	0.00
			Max. Compression	36	-2267.95	0.05	0.00
			Max. Mx	10	-940.74	0.07	-0.00
			Max. My	10	100.51	-0.02	0.02
			Max. Vy	52	-37.45	0.05	0.01
			Max. Vx	10	-6.89	0.00	0.00
		Top Girt	Max Tension	42	1075.26	0.00	0.00
			Max. Compression	21	-1063.86	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	50	49.19	-0.04	0.00
			Max. My	60	29.60	0.00	0.00
			Max. Vy	50	40.31	0.00	0.00
			Max. Vx	60	-1.16	0.00	0.00
T7	77.5 - 67.5	Leg	Max Tension	13	161304.46	-0.70	0.02
			Max. Compression	2	-178174.91	1.01	0.01
			Max. Mx	27	109756.77	1.17	-0.01
			Max. My	38	-5369.03	-0.05	-1.53
			Max. Vy	10	868.16	-1.00	0.01
			Max. Vx	38	-1045.55	-0.05	-1.53
		Diagonal	Max Tension	11	2977.45	0.00	0.00
			Max. Compression	35	-3313.89	0.00	0.00
			Max. Mx	34	789.25	0.05	-0.01
			Max. My	10	-516.06	-0.01	0.01
			Max. Vy	52	40.03	0.04	-0.01
			Max. Vx	10	-4.00	0.00	0.00
		Top Girt	Max Tension	10	1242.00	0.00	0.00
			Max. Compression	5	-1303.70	0.00	0.00
			Max. Mx	50	67.02	-0.06	0.00
			Max. My	60	66.06	0.00	0.00
			Max. Vy	50	49.36	0.00	0.00
			Max. Vx	60	-1.43	0.00	0.00
T8	67.5 - 57.5	Leg	Max Tension	13	172107.30	-0.01	0.04
			Max. Compression	2	-192551.58	0.54	0.01
			Max. Mx	34	-183701.17	1.01	-0.01
			Max. My	38	-6974.42	-0.04	-0.88
			Max. Vy	34	265.72	1.01	-0.01
			Max. Vx	38	-334.11	-0.04	-0.88
		Diagonal	Max Tension	31	3901.76	0.00	0.00
			Max. Compression	35	-4200.65	0.00	0.00
			Max. Mx	52	493.20	0.05	0.01
			Max. My	10	-3033.72	-0.01	0.01
			Max. Vy	52	44.67	0.05	-0.01
			Max. Vx	10	-3.59	0.00	0.00
		Top Girt	Max Tension	12	704.26	0.00	0.00
			Max. Compression	5	-753.11	0.00	0.00
			Max. Mx	50	57.75	-0.09	0.00
			Max. My	59	196.21	0.00	0.00
			Max. Vy	50	-58.14	0.00	0.00
			Max. Vx	59	-1.68	0.00	0.00
T9	57.5 - 47.5	Leg	Max Tension	13	184717.05	-0.15	0.02
			Max. Compression	2	-207868.85	0.50	0.01
			Max. Mx	34	-198480.59	0.54	-0.04
			Max. My	38	-8478.15	-0.04	-0.92
			Max. Vy	2	-398.23	0.50	0.01
			Max. Vx	38	382.96	-0.04	-0.92
		Diagonal	Max Tension	11	4390.88	0.00	0.00
			Max. Compression	35	-4799.81	0.00	0.00
			Max. Mx	52	522.88	0.06	0.01
			Max. My	10	-3402.88	-0.00	0.01
			Max. Vy	52	49.26	0.06	-0.01
			Max. Vx	53	-3.39	0.00	0.00
		Top Girt	Max Tension	10	752.86	0.00	0.00
			Max. Compression	37	-817.21	0.00	0.00
			Max. Mx	50	59.67	-0.12	0.00
			Max. My	59	213.62	0.00	0.00
			Max. Vy	50	66.55	0.00	0.00
			Max. Vx	59	-1.92	0.00	0.00
T10	47.5 - 37.5	Leg	Max Tension	13	198717.96	-0.14	0.03
			Max. Compression	2	-224572.98	0.32	0.01
			Max. Mx	2	-215647.26	0.50	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	38	-9232.26	-0.04	-0.78
			Max. Vy	2	140.65	0.50	0.01
			Max. Vx	38	333.42	-0.04	-0.78
		Diagonal	Max Tension	35	5117.72	0.00	0.00
			Max. Compression	35	-5524.09	0.00	0.00
			Max. Mx	52	664.45	0.07	0.01
			Max. My	10	-4155.91	0.00	0.01
			Max. Vy	52	53.78	0.06	-0.01
			Max. Vx	53	-3.47	0.00	0.00
		Top Girt	Max Tension	10	592.22	0.00	0.00
			Max. Compression	37	-662.88	0.00	0.00
			Max. Mx	50	63.63	-0.15	0.00
			Max. My	59	171.77	0.00	0.00
			Max. Vy	50	74.43	0.00	0.00
			Max. Vx	59	-2.15	0.00	0.00
T11	37.5 - 27.5	Leg	Max Tension	13	213297.70	-0.48	0.00
			Max. Compression	2	-241699.04	-1.59	0.02
			Max. Mx	2	-241699.04	-1.59	0.02
			Max. My	38	-10428.17	-0.10	-0.84
			Max. Vy	2	478.31	0.55	0.00
			Max. Vx	46	-204.85	-0.01	0.54
		Diagonal	Max Tension	35	5623.61	0.00	0.00
			Max. Compression	35	-5843.08	0.00	0.00
			Max. Mx	52	876.51	0.08	0.01
			Max. My	10	-4738.16	0.00	0.01
			Max. Vy	52	57.83	0.07	-0.01
			Max. Vx	53	-3.63	0.00	0.00
		Top Girt	Max Tension	26	343.45	0.00	0.00
			Max. Compression	5	-458.72	0.00	0.00
			Max. Mx	50	29.25	-0.19	0.00
			Max. My	59	98.45	0.00	0.01
			Max. Vy	50	-81.55	0.00	0.00
			Max. Vx	59	-2.35	0.00	0.00
T12	27.5 - 17.5	Leg	Max Tension	45	210766.44	1.14	-0.03
			Max. Compression	2	-241746.40	3.81	0.00
			Max. Mx	2	-239062.49	-6.19	0.05
			Max. My	14	-10677.97	-0.35	1.63
			Max. Vy	2	4240.48	4.36	-0.03
			Max. Vx	14	-894.54	-0.35	1.63
		Diagonal	Max Tension	13	14205.59	0.26	-0.03
			Max. Compression	34	-14762.97	0.00	0.00
			Max. Mx	34	-12014.26	-0.30	-0.01
			Max. My	34	-10778.18	-0.04	-0.08
			Max. Vy	34	-111.37	0.00	0.00
			Max. Vx	34	-23.28	0.00	0.00
		Horizontal	Max Tension	35	5166.33	0.00	0.00
			Max. Compression	35	-5457.65	0.07	0.01
			Max. Mx	53	-1309.41	0.13	0.00
			Max. My	19	432.90	-0.06	-0.02
			Max. Vy	53	-79.98	0.13	0.00
			Max. Vx	19	3.99	-0.06	-0.02
		Redund Horz 1 Bracing	Max Tension	2	4192.40	0.00	0.00
			Max. Compression	2	-4192.40	0.00	0.00
			Max. Mx	53	1214.21	-0.01	0.00
			Max. My	54	1725.71	0.00	0.00
			Max. Vy	53	18.65	0.00	0.00
			Max. Vx	54	-0.54	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	4507.96	0.00	0.00
			Max. Compression	2	-4507.96	0.16	0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	2	-108.40	0.16	0.01
			Max. My	34	-4482.60	0.16	0.01
			Max. Vy	2	-61.45	0.16	0.01
			Max. Vx	51	-2.22	0.00	0.00
		Redund Sub Horz Bracing	Max Tension	34	3656.71	0.00	0.00
			Max. Compression	13	-3470.71	0.00	0.00
			Max. Mx	54	1667.49	-0.00	0.00
			Max. My	53	1358.98	0.00	0.00
			Max. Vy	54	9.94	0.00	0.00
			Max. Vx	53	-0.29	0.00	0.00
		Redund Sub Diagonal Bracing	Max Tension	13	3964.54	0.00	0.00
			Max. Compression	34	-4116.29	0.00	0.00
			Max. Mx	52	634.35	-0.01	0.00
			Max. My	60	640.93	0.00	0.00
			Max. Vy	52	10.93	0.00	0.00
			Max. Vx	60	-0.67	0.00	0.00
		Inner Bracing	Max Tension	19	3.61	0.00	0.00
			Max. Compression	57	-13.60	0.00	0.00
			Max. Mx	50	-9.94	-0.06	0.00
			Max. My	51	-7.32	0.00	-0.00
			Max. Vy	50	43.73	0.00	0.00
			Max. Vx	51	0.07	0.00	0.00
T13	17.5 - 7.5	Leg	Max Tension	45	223755.30	1.52	0.02
			Max. Compression	2	-257698.56	3.90	-0.03
			Max. Mx	2	-255896.52	-6.19	0.05
			Max. My	14	-11073.68	-0.35	1.63
			Max. Vy	2	-4304.74	4.52	0.00
			Max. Vx	14	-736.48	-0.22	1.27
		Diagonal	Max Tension	13	13325.28	0.27	-0.03
			Max. Compression	34	-13729.85	0.00	0.00
			Max. Mx	34	-11072.92	-0.31	-0.01
			Max. My	34	-10869.91	-0.01	-0.08
			Max. Vy	34	-114.22	0.00	0.00
			Max. Vx	34	-23.29	0.00	0.00
		Horizontal	Max Tension	11	5406.81	-0.00	-0.01
			Max. Compression	35	-6189.48	0.07	0.01
			Max. Mx	53	1317.83	0.14	0.00
			Max. My	19	1225.67	-0.04	-0.02
			Max. Vy	53	-80.82	0.14	0.00
			Max. Vx	19	4.21	-0.04	-0.02
		Redund Horz 1 Bracing	Max Tension	2	4469.04	0.00	0.00
			Max. Compression	2	-4469.04	0.00	0.00
			Max. Mx	53	1419.86	-0.01	0.00
			Max. My	54	1860.21	0.00	0.00
			Max. Vy	53	19.31	0.00	0.00
			Max. Vx	54	-0.56	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	13	4558.05	0.00	0.00
			Max. Compression	2	-4465.27	0.14	0.01
			Max. Mx	2	-322.07	0.14	-0.01
			Max. My	2	-4465.27	0.14	0.01
			Max. Vy	2	-52.87	0.14	-0.01
			Max. Vx	2	-2.51	0.00	0.00
		Redund Sub Horz Bracing	Max Tension	34	3638.51	0.00	0.00
			Max. Compression	13	-3457.48	0.00	0.00
			Max. Mx	52	1129.68	-0.00	0.00
			Max. My	62	1353.28	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	52	10.33	0.00	0.00
			Max. Vx	62	-0.30	0.00	0.00
		Redund Sub Diagonal Bracing	Max Tension	13	3702.70	0.00	0.00
			Max. Compression	34	-3916.94	0.00	0.00
			Max. Mx	52	801.15	-0.01	0.00
			Max. My	60	892.88	0.00	0.00
			Max. Vy	52	11.25	0.00	0.00
			Max. Vx	60	-0.64	0.00	0.00
		Inner Bracing	Max Tension	19	3.52	0.00	0.00
			Max. Compression	57	-13.42	0.00	0.00
			Max. Mx	50	-10.00	-0.06	0.00
			Max. My	51	-7.54	0.00	-0.00
			Max. Vy	50	45.41	0.00	0.00
			Max. Vx	51	0.04	0.00	0.00
T14	7.5 - 0	Leg	Max Tension	45	242855.65	2.84	-0.08
			Max. Compression	2	-278223.66	0.00	0.00
			Max. Mx	2	-277935.00	-3.63	0.05
			Max. My	14	-12323.67	-0.22	1.27
			Max. Vy	2	-1591.67	2.19	-0.04
			Max. Vx	14	544.32	-0.22	1.27
		Diagonal	Max Tension	35	9334.22	0.00	0.00
			Max. Compression	35	-10154.71	0.00	0.00
			Max. Mx	10	5978.71	0.11	0.00
			Max. My	58	-4717.16	-0.01	-0.01
			Max. Vy	53	-40.38	0.06	0.01
			Max. Vx	58	-4.02	0.00	0.00
		Horizontal	Max Tension	11	5904.47	0.01	-0.01
			Max. Compression	35	-6590.12	0.06	0.01
			Max. Mx	42	2405.48	0.09	0.02
			Max. My	19	1141.81	-0.02	-0.02
			Max. Vy	53	70.20	0.09	0.01
			Max. Vx	19	3.99	-0.02	-0.02
		Redund Horz 1 Bracing	Max Tension	2	4824.99	0.00	0.00
			Max. Compression	2	-4824.99	0.00	0.00
			Max. Mx	58	2193.19	-0.01	0.00
			Max. My	53	1535.69	0.00	0.00
			Max. Vy	58	18.61	0.00	0.00
			Max. Vx	53	0.54	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	3723.32	0.00	0.00
			Max. Compression	2	-3723.32	0.00	0.00
			Max. Mx	59	1879.27	-0.02	0.00
			Max. My	59	400.73	0.00	0.00
			Max. Vy	59	20.69	0.00	0.00
			Max. Vx	59	-0.99	0.00	0.00
		Inner Bracing	Max Tension	21	4.65	0.00	0.00
			Max. Compression	57	-10.24	0.00	0.00
			Max. Mx	50	-7.28	-0.07	0.00
			Max. My	58	-10.16	0.00	0.00
			Max. Vy	50	44.08	0.00	0.00
			Max. Vx	58	-0.02	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	34	289988.31	22460.95	-13776.97
	Max. H_x	34	289988.31	22460.95	-13776.97
	Max. H_z	13	-253733.62	-19930.57	12364.44
	Min. Vert	13	-253733.62	-19930.57	12364.44
	Min. H_x	13	-253733.62	-19930.57	12364.44
	Min. H_z	34	289988.31	22460.95	-13776.97
Leg B	Max. Vert	18	290588.41	-22832.25	-13634.92
	Max. H_x	45	-254654.76	20324.99	12206.83
	Max. H_z	45	-254654.76	20324.99	12206.83
	Min. Vert	45	-254654.76	20324.99	12206.83
	Min. H_x	18	290588.41	-22832.25	-13634.92
	Min. H_z	18	290588.41	-22832.25	-13634.92
Leg A	Max. Vert	2	291145.71	-269.03	26354.48
	Max. H_x	39	12936.06	4032.74	812.97
	Max. H_z	2	291145.71	-269.03	26354.48
	Min. Vert	29	-253055.56	288.43	-23428.55
	Min. H_x	15	12939.98	-4035.64	813.30
	Min. H_z	29	-253055.56	288.43	-23428.55

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	30448.14	-0.00	0.19	-7.02	0.99	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	36537.70	-0.01	-43597.50	-3140.70	1.27	-6.29
1.2D+1.6W (pattern 1) 0 deg - No Ice	36537.72	-0.01	-40777.41	-2681.67	1.22	-6.29
1.2D+1.6W (pattern 2) 0 deg - No Ice	36537.57	0.41	-31521.77	-2453.80	1.25	-6.29
0.9 Dead+1.6 Wind 0 deg - No Ice	27403.25	-0.02	-43597.20	-3132.98	0.98	-6.29
1.2 Dead+1.6 Wind 30 deg - No Ice	36537.70	19666.56	-34055.30	-2530.08	-1453.69	-8.42
1.2D+1.6W (pattern 1) 30 deg - No Ice	36537.72	18278.41	-31650.88	-2137.55	-1227.11	-7.78
1.2D+1.6W (pattern 2) 30 deg - No Ice	36537.71	14131.86	-24472.68	-1979.46	-1136.20	-7.70
0.9 Dead+1.6 Wind 30 deg - No Ice	27403.25	19666.40	-34055.09	-2523.33	-1451.32	-8.41
1.2 Dead+1.6 Wind 60 deg - No Ice	36537.73	35059.46	-20236.93	-1490.42	-2563.90	-16.38
1.2D+1.6W (pattern 1) 60 deg - No Ice	36537.74	32667.71	-18855.99	-1264.74	-2173.08	-15.28
1.2D+1.6W (pattern 2) 60 deg - No Ice	36537.73	25764.86	-14872.85	-1181.03	-2028.71	-15.14
0.9 Dead+1.6 Wind 60 deg - No Ice	27403.28	35059.29	-20236.90	-1485.62	-2559.56	-16.36
1.2 Dead+1.6 Wind 90 deg - No Ice	36537.72	42006.85	-0.14	-8.60	-3027.95	-15.73
1.2D+1.6W (pattern 1) 90 deg - No Ice	36537.74	39230.50	-0.08	-8.56	-2574.71	-14.46
1.2D+1.6W (pattern 2) 90 deg - No Ice	36537.73	30937.42	-0.13	-8.58	-2392.92	-14.30
0.9 Dead+1.6 Wind 90 deg - No Ice	27403.28	42006.67	-0.21	-6.48	-3022.83	-15.71

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 120 deg - No Ice	36537.70	38209.12	22055.08	1561.91	-2717.55	-9.11
1.2D+1.6W (pattern 1) 120 deg - No Ice	36537.74	35767.43	20645.48	1332.49	-2320.10	-8.01
1.2D+1.6W (pattern 2) 120 deg - No Ice	36537.58	27747.30	16017.63	1218.48	-2123.34	-7.87
0.9 Dead+1.6 Wind 120 deg - No Ice	27403.28	38209.56	22055.34	1561.33	-2713.15	-9.09
1.2 Dead+1.6 Wind 150 deg - No Ice	36537.70	20620.27	35706.91	2593.24	-1500.15	1.55
1.2D+1.6W (pattern 1) 150 deg - No Ice	36537.72	19232.04	33302.53	2200.75	-1273.50	2.19
1.2D+1.6W (pattern 2) 150 deg - No Ice	36537.71	15085.59	26124.28	2042.64	-1182.63	2.27
0.9 Dead+1.6 Wind 150 deg - No Ice	27403.25	20620.16	35706.66	2590.70	-1497.75	1.56
1.2 Dead+1.6 Wind 180 deg - No Ice	36537.70	-0.02	40472.97	2955.03	1.15	6.29
1.2D+1.6W (pattern 1) 180 deg - No Ice	36537.72	-0.01	37711.21	2503.71	1.24	6.29
1.2D+1.6W (pattern 2) 180 deg - No Ice	36537.71	-0.02	29744.85	2336.28	1.16	6.29
0.9 Dead+1.6 Wind 180 deg - No Ice	27403.25	-0.03	40472.71	2951.82	0.85	6.29
1.2 Dead+1.6 Wind 210 deg - No Ice	36537.70	-19666.71	34055.23	2513.03	1456.10	8.42
1.2D+1.6W (pattern 1) 210 deg - No Ice	36537.72	-18278.48	31650.86	2120.49	1229.52	7.78
1.2D+1.6W (pattern 2) 210 deg - No Ice	36537.71	-14132.02	24472.60	1962.41	1138.60	7.69
0.9 Dead+1.6 Wind 210 deg - No Ice	27403.25	-19666.61	34054.97	2510.56	1453.15	8.40
1.2 Dead+1.6 Wind 240 deg - No Ice	36537.70	-37764.97	21798.61	1557.60	2712.24	16.38
1.2D+1.6W (pattern 1) 240 deg - No Ice	36537.74	-35323.27	20389.03	1328.11	2314.83	15.28
1.2D+1.6W (pattern 2) 240 deg - No Ice	36537.73	-27303.72	15761.05	1214.21	2118.13	15.14
0.9 Dead+1.6 Wind 240 deg - No Ice	27403.28	-37765.41	21798.88	1557.02	2707.23	16.36
1.2 Dead+1.6 Wind 270 deg - No Ice	36537.72	-42006.85	-0.14	-8.47	3030.33	15.73
1.2D+1.6W (pattern 1) 270 deg - No Ice	36537.74	-39230.50	-0.09	-8.52	2577.10	14.46
1.2D+1.6W (pattern 2) 270 deg - No Ice	36537.73	-30937.42	-0.13	-8.48	2395.30	14.30
0.9 Dead+1.6 Wind 270 deg - No Ice	27403.28	-42006.67	-0.21	-6.35	3024.61	15.71
1.2 Dead+1.6 Wind 300 deg - No Ice	36537.70	-35503.01	-20493.07	-1494.67	2573.88	9.11
1.2D+1.6W (pattern 1) 300 deg - No Ice	36537.74	-33111.88	-19112.42	-1269.11	2183.12	8.01
1.2D+1.6W (pattern 2) 300 deg - No Ice	36537.73	-26209.03	-15129.28	-1185.34	2038.78	7.87
0.9 Dead+1.6 Wind 300 deg - No Ice	27403.28	-35503.46	-20493.32	-1489.92	2569.05	9.09
1.2 Dead+1.6 Wind 330 deg - No Ice	36537.70	-20620.16	-35706.96	-2610.28	1502.54	-1.55
1.2D+1.6W (pattern 1) 330 deg - No Ice	36537.72	-19232.00	-33302.52	-2217.79	1275.88	-2.19
1.2D+1.6W (pattern 2) 330 deg	36537.71	-15085.46	-26124.33	-2059.67	1185.01	-2.27

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
- No Ice						
0.9 Dead+1.6 Wind 330 deg - No Ice	27403.25	-20620.01	-35706.73	-2603.45	1499.53	-1.56
1.2 Dead+1.0 Ice+1.0 Temp	95534.65	0.02	0.40	-36.25	10.40	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	95534.63	0.00	-17826.42	-1336.86	10.43	-1.95
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	95534.63	8937.17	-15443.22	-1171.97	-645.91	-6.64
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	95534.63	15130.02	-8714.30	-676.00	-1098.66	-10.64
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	95534.63	16297.94	0.01	-36.38	-1186.72	-9.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	95534.63	13821.97	7959.12	547.24	-1001.67	-5.18
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	95534.63	8039.48	13888.39	992.68	-584.42	-1.39
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	95534.63	0.00	17428.66	1242.84	10.42	1.95
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	95534.63	-8937.18	15443.27	1099.21	666.76	6.64
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	95534.63	-15474.57	8913.24	613.88	1137.91	10.65
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	95534.63	-16297.94	0.01	-36.36	1207.57	9.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	95534.63	-13477.42	-7760.17	-609.36	1004.11	5.18
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	95534.63	-8039.46	-13888.34	-1065.43	605.26	1.38
Dead+Wind 0 deg - Service	30448.13	-0.00	-10425.44	-755.27	1.00	-1.50
Dead+Wind 30 deg - Service	30448.13	4702.86	-8143.60	-609.37	-346.53	-2.02
Dead+Wind 60 deg - Service	30448.13	8383.61	-4839.14	-361.04	-611.68	-3.93
Dead+Wind 90 deg - Service	30448.13	10044.91	-0.01	-7.09	-722.53	-3.77
Dead+Wind 120 deg - Service	30448.13	9136.92	5274.05	368.05	-648.43	-2.19
Dead+Wind 150 deg - Service	30448.13	4930.90	8538.58	614.37	-357.62	0.37
Dead+Wind 180 deg - Service	30448.13	-0.00	9678.28	700.78	0.99	1.50
Dead+Wind 210 deg - Service	30448.13	-4702.87	8143.62	595.19	348.52	2.02
Dead+Wind 240 deg - Service	30448.13	-9030.70	5212.72	366.99	648.57	3.93
Dead+Wind 270 deg - Service	30448.13	-10044.91	-0.01	-7.08	724.51	3.77
Dead+Wind 300 deg - Service	30448.13	-8489.82	-4900.46	-362.08	615.49	2.19
Dead+Wind 330 deg - Service	30448.13	-4930.89	-8538.57	-628.57	359.58	-0.37

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-30448.14	0.00	0.00	30448.14	-0.19	0.001%
2	-0.00	-36537.76	-43599.47	0.01	36537.70	43597.50	0.003%
3	-0.00	-36537.76	-40779.46	0.01	36537.72	40777.41	0.004%
4	-0.00	-36537.76	-31523.41	-0.41	36537.57	31521.77	0.004%
5	-0.00	-27403.32	-43599.47	0.02	27403.25	43597.20	0.004%
6	19667.55	-36537.76	-34056.90	-19666.56	36537.70	34055.30	0.003%
7	18279.40	-36537.76	-31652.55	-18278.41	36537.72	31650.88	0.004%
8	14132.80	-36537.76	-24474.16	-14131.86	36537.71	24472.68	0.004%
9	19667.55	-27403.32	-34056.90	-19666.40	27403.25	34055.09	0.004%
10	35060.54	-36537.76	-20237.42	-35059.46	36537.73	20236.93	0.002%
11	32668.81	-36537.76	-18856.55	-32667.71	36537.74	18855.99	0.002%
12	25765.87	-36537.76	-14873.30	-25764.86	36537.73	14872.85	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
13	35060.54	-27403.32	-20237.42	-35059.29	27403.28	20236.90	0.003%
14	42008.05	-36537.76	-0.00	-42006.85	36537.72	0.14	0.002%
15	39231.75	-36537.76	-0.00	-39230.50	36537.74	0.08	0.002%
16	30938.54	-36537.76	-0.00	-30937.42	36537.73	0.13	0.002%
17	42008.05	-27403.32	-0.00	-42006.67	27403.28	0.21	0.003%
18	38210.71	-36537.76	22056.17	-38209.12	36537.70	-22055.08	0.003%
19	35768.51	-36537.76	20646.17	-35767.43	36537.74	-20645.48	0.002%
20	27748.80	-36537.76	16018.14	-27747.30	36537.58	-16017.63	0.003%
21	38210.71	-27403.32	22056.17	-38209.56	27403.28	-22055.34	0.003%
22	20621.15	-36537.76	35708.57	-20620.27	36537.70	-35706.91	0.003%
23	19232.99	-36537.76	33304.22	-19232.04	36537.72	-33302.53	0.004%
24	15086.39	-36537.76	26125.83	-15085.59	36537.71	-26124.28	0.004%
25	20621.15	-27403.32	35708.57	-20620.16	27403.25	-35706.66	0.004%
26	0.00	-36537.76	40474.84	0.02	36537.70	-40472.97	0.003%
27	0.00	-36537.76	37713.10	0.01	36537.72	-37711.21	0.004%
28	-0.00	-36537.76	29746.60	0.02	36537.71	-29744.85	0.004%
29	-0.00	-27403.32	40474.84	0.03	27403.25	-40472.71	0.004%
30	-19667.55	-36537.76	34056.90	19666.71	36537.70	-34055.23	0.003%
31	-18279.40	-36537.76	31652.55	18278.48	36537.72	-31650.86	0.004%
32	-14132.80	-36537.76	24474.16	14132.02	36537.71	-24472.60	0.004%
33	-19667.55	-27403.32	34056.90	19666.61	27403.25	-34054.97	0.004%
34	-37766.55	-36537.76	21799.73	37764.97	36537.70	-21798.61	0.003%
35	-35324.35	-36537.76	20389.73	35323.27	36537.74	-20389.03	0.002%
36	-27304.64	-36537.76	15761.71	27303.72	36537.73	-15761.05	0.002%
37	-37766.55	-27403.32	21799.73	37765.41	27403.28	-21798.88	0.003%
38	-42008.05	-36537.76	0.00	42006.85	36537.72	0.14	0.002%
39	-39231.75	-36537.76	0.00	39230.50	36537.74	0.09	0.002%
40	-30938.54	-36537.76	0.00	30937.42	36537.73	0.13	0.002%
41	-42008.05	-27403.32	0.00	42006.67	27403.28	0.21	0.003%
42	-35504.70	-36537.76	-20493.86	35503.01	36537.70	20493.07	0.003%
43	-33112.97	-36537.76	-19112.99	33111.88	36537.74	19112.42	0.002%
44	-26210.04	-36537.76	-15129.74	26209.03	36537.73	15129.28	0.002%
45	-35504.70	-27403.32	-20493.86	35503.46	27403.28	20493.32	0.003%
46	-20621.15	-36537.76	-35708.57	20620.16	36537.70	35706.96	0.003%
47	-19232.99	-36537.76	-33304.22	19232.00	36537.72	33302.52	0.004%
48	-15086.39	-36537.76	-26125.83	15085.46	36537.71	26124.33	0.004%
49	-20621.15	-27403.32	-35708.57	20620.01	27403.25	35706.73	0.004%
50	0.00	-95534.65	0.00	-0.02	95534.65	-0.40	0.000%
51	-0.00	-95534.65	-17827.47	-0.00	95534.63	17826.42	0.001%
52	8937.69	-95534.65	-15444.13	-8937.17	95534.63	15443.22	0.001%
53	15130.90	-95534.65	-8714.81	-15130.02	95534.63	8714.30	0.001%
54	16298.91	-95534.65	0.00	-16297.94	95534.63	-0.01	0.001%
55	13822.79	-95534.65	7959.58	-13821.97	95534.63	-7959.12	0.001%
56	8039.95	-95534.65	13889.21	-8039.48	95534.63	-13888.39	0.001%
57	0.00	-95534.65	17429.63	-0.00	95534.63	-17428.66	0.001%
58	-8937.69	-95534.65	15444.13	8937.18	95534.63	-15443.27	0.001%
59	-15475.44	-95534.65	8913.73	15474.57	95534.63	-8913.24	0.001%
60	-16298.91	-95534.65	0.00	16297.94	95534.63	-0.01	0.001%
61	-13478.25	-95534.65	-7760.66	13477.42	95534.63	7760.17	0.001%
62	-8039.95	-95534.65	-13889.21	8039.46	95534.63	13888.34	0.001%
63	-0.00	-30448.14	-10426.06	0.00	30448.13	10425.44	0.002%
64	4703.16	-30448.14	-8144.12	-4702.86	30448.13	8143.60	0.002%
65	8384.12	-30448.14	-4839.43	-8383.61	30448.13	4839.14	0.002%
66	10045.50	-30448.14	0.00	-10044.91	30448.13	0.01	0.002%
67	9137.43	-30448.14	5274.35	-9136.92	30448.13	-5274.05	0.002%
68	4931.19	-30448.14	8539.09	-4930.90	30448.13	-8538.58	0.002%
69	0.00	-30448.14	9678.86	0.00	30448.13	-9678.28	0.002%
70	-4703.16	-30448.14	8144.12	4702.87	30448.13	-8143.62	0.002%
71	-9031.22	-30448.14	5213.03	9030.70	30448.13	-5212.72	0.002%
72	-10045.50	-30448.14	0.00	10044.91	30448.13	0.01	0.002%
73	-8490.34	-30448.14	-4900.75	8489.82	30448.13	4900.46	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
74	-4931.19	-30448.14	-8539.09	4930.89	30448.13	8538.57	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00005337
2	Yes	18	0.00009223	0.00010129
3	Yes	17	0.00013802	0.00013348
4	Yes	18	0.00009387	0.00010985
5	Yes	17	0.00010535	0.00011485
6	Yes	18	0.00009020	0.00011362
7	Yes	17	0.00013615	0.00014293
8	Yes	18	0.00009230	0.00012361
9	Yes	17	0.00010221	0.00012712
10	Yes	19	0.00005688	0.00010201
11	Yes	18	0.00008622	0.00011056
12	Yes	19	0.00005848	0.00010981
13	Yes	18	0.00006466	0.00011396
14	Yes	19	0.00005847	0.00010375
15	Yes	18	0.00008791	0.00011332
16	Yes	19	0.00005975	0.00011129
17	Yes	18	0.00006706	0.00011660
18	Yes	18	0.00009127	0.00013590
19	Yes	18	0.00008858	0.00010159
20	Yes	18	0.00009301	0.00014604
21	Yes	18	0.00006693	0.00010067
22	Yes	18	0.00008990	0.00011543
23	Yes	17	0.00013530	0.00013715
24	Yes	18	0.00009197	0.00012419
25	Yes	17	0.00010192	0.00012890
26	Yes	18	0.00008964	0.00009974
27	Yes	17	0.00013378	0.00013079
28	Yes	18	0.00009207	0.00010884
29	Yes	17	0.00010135	0.00011200
30	Yes	18	0.00009038	0.00012663
31	Yes	17	0.00013605	0.00014712
32	Yes	18	0.00009250	0.00013627
33	Yes	17	0.00010255	0.00014109
34	Yes	18	0.00009141	0.00014743
35	Yes	18	0.00008865	0.00010936
36	Yes	19	0.00005950	0.00010370
37	Yes	18	0.00006710	0.00010940
38	Yes	19	0.00005844	0.00010426
39	Yes	18	0.00008786	0.00011360
40	Yes	19	0.00005973	0.00011180
41	Yes	18	0.00006703	0.00011712
42	Yes	18	0.00008901	0.00014538
43	Yes	18	0.00008621	0.00010325
44	Yes	19	0.00005847	0.00010245
45	Yes	18	0.00006464	0.00010642
46	Yes	18	0.00009012	0.00010653
47	Yes	17	0.00013579	0.00013532
48	Yes	18	0.00009215	0.00011561
49	Yes	17	0.00010218	0.00011948
50	Yes	13	0.00000001	0.00012398

51	Yes	19	0.00011944	0.00012150
52	Yes	19	0.00011869	0.00012191
53	Yes	19	0.00011843	0.00013074
54	Yes	19	0.00011967	0.00013450
55	Yes	19	0.00012012	0.00013033
56	Yes	19	0.00011937	0.00012550
57	Yes	19	0.00011825	0.00011959
58	Yes	19	0.00011840	0.00012164
59	Yes	19	0.00011904	0.00012964
60	Yes	19	0.00011953	0.00013448
61	Yes	19	0.00011948	0.00013153
62	Yes	19	0.00011963	0.00012582
63	Yes	17	0.00000001	0.00012552
64	Yes	17	0.00000001	0.00012895
65	Yes	17	0.00000001	0.00013053
66	Yes	17	0.00000001	0.00013061
67	Yes	17	0.00000001	0.00012718
68	Yes	17	0.00000001	0.00012578
69	Yes	17	0.00000001	0.00012505
70	Yes	17	0.00000001	0.00012778
71	Yes	17	0.00000001	0.00012821
72	Yes	17	0.00000001	0.00013057
73	Yes	17	0.00000001	0.00012947
74	Yes	17	0.00000001	0.00012711

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	195 - 175	13.24	63	0.9569	0.1118
L2	175 - 155	9.34	63	0.8408	0.0968
L3	155 - 135	6.17	63	0.6267	0.0859
T1	135 - 132.5	4.08	63	0.3326	0.0777
T2	132.5 - 130	3.91	63	0.3252	0.0767
T3	130 - 110	3.74	63	0.3165	0.0751
T4	110 - 90	2.51	63	0.2533	0.0580
T5	90 - 87.5	1.56	63	0.1819	0.0367
T6	87.5 - 77.5	1.47	63	0.1697	0.0333
T7	77.5 - 67.5	1.14	63	0.1431	0.0267
T8	67.5 - 57.5	0.86	63	0.1211	0.0222
T9	57.5 - 47.5	0.62	63	0.1014	0.0185
T10	47.5 - 37.5	0.42	63	0.0829	0.0149
T11	37.5 - 27.5	0.26	63	0.0643	0.0113
T12	27.5 - 17.5	0.13	67	0.0463	0.0077
T13	17.5 - 7.5	0.05	67	0.0292	0.0048
T14	7.5 - 0	0.01	67	0.0124	0.0022

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	3-Bay ERI FM Antenna	63	11.23	0.9034	0.1039	11449
162.00	1-Bay ERI FM Antenna	63	7.17	0.7239	0.0893	4929
135.00	10'x3" Omni/Whip	63	4.08	0.3326	0.0777	4752

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
70.00	AAHC w/ Mount Pipe	63	0.93	0.1266	0.0233	30822
60.00	7' Ice Shield	63	0.68	0.1061	0.0194	31308
53.50	4'6" Flat Yagi w/ (9) 1' Elements	63	0.54	0.0940	0.0171	31022
48.00	6' Grid Dish	63	0.43	0.0838	0.0151	32343
43.00	AP18-1900/063D w/ Mount Pipe	63	0.34	0.0745	0.0133	35991
40.00	4'6" Flat Yagi w/ (9) 1' Elements	63	0.30	0.0689	0.0122	38557

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	195 - 175	54.74	2	3.9119	0.4640
L2	175 - 155	38.76	2	3.4725	0.4013
L3	155 - 135	25.65	2	2.6015	0.3561
T1	135 - 132.5	16.97	2	1.3838	0.3222
T2	132.5 - 130	16.26	2	1.3533	0.3183
T3	130 - 110	15.56	2	1.3171	0.3115
T4	110 - 90	10.44	2	1.0545	0.2349
T5	90 - 87.5	6.48	2	0.7569	0.1524
T6	87.5 - 77.5	6.11	2	0.7059	0.1384
T7	77.5 - 67.5	4.75	2	0.5949	0.1113
T8	67.5 - 57.5	3.60	2	0.5030	0.0924
T9	57.5 - 47.5	2.60	2	0.4211	0.0772
T10	47.5 - 37.5	1.76	2	0.3444	0.0621
T11	37.5 - 27.5	1.07	18	0.2672	0.0472
T12	27.5 - 17.5	0.54	18	0.1928	0.0322
T13	17.5 - 7.5	0.22	21	0.1214	0.0198
T14	7.5 - 0	0.06	19	0.0517	0.0092

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	3-Bay ERI FM Antenna	2	46.55	3.7132	0.4311	2999
162.00	1-Bay ERI FM Antenna	2	29.80	3.0013	0.3703	1222
135.00	10'x3" Omni/Whip	2	16.97	1.3838	0.3222	1148
70.00	AAHC w/ Mount Pipe	2	3.87	0.5262	0.0970	7389
60.00	7' Ice Shield	2	2.83	0.4405	0.0808	7553
53.50	4'6" Flat Yagi w/ (9) 1' Elements	2	2.24	0.3904	0.0712	7494
48.00	6' Grid Dish	2	1.80	0.3482	0.0629	7804
43.00	AP18-1900/063D w/ Mount Pipe	2	1.43	0.3095	0.0554	8696
40.00	4'6" Flat Yagi w/ (9) 1' Elements	18	1.23	0.2863	0.0510	9327

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	135	Diagonal	A325N	0.7500	2	3333.95	11146.90	0.299	1	Member Block Shear
		Horizontal	A325N	0.6250	1	795.57	10440.00	0.076	1	Member Bearing
T2	132.5	Leg	A325N	0.7500	4	12822.00	29820.60	0.430	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3606.64	9107.81	0.396	1	Member Block Shear
		Horizontal	A325N	0.6250	1	4529.28	20880.00	0.217	1	Member Bearing
T3	130	Leg	A325N	0.7500	4	24939.20	29820.60	0.836	1	Bolt Tension
		Diagonal	A325N	0.6250	1	9632.77	12425.20	0.775	1	Bolt Shear
		Horizontal	A325N	0.6250	1	1753.08	9107.81	0.192	1	Member Block Shear
		Top Girt	A325N	0.6250	1	2445.83	9107.81	0.269	1	Member Block Shear
		Bottom Girt	A325N	0.6250	1	2190.59	9107.81	0.241	1	Member Block Shear
T4	110	Leg	A325N	1.0000	4	40105.20	53014.40	0.756	1	Bolt Tension
		Diagonal	A325N	0.7500	1	12376.30	17892.40	0.692	1	Bolt Shear
		Horizontal	A325N	0.6250	1	2870.15	9107.81	0.315	1	Member Block Shear
		Top Girt	A325N	0.6250	1	2373.44	9107.81	0.261	1	Member Block Shear
		Bottom Girt	A325N	0.6250	1	3241.46	9107.81	0.356	1	Member Block Shear
T5	90	Diagonal	A325N	0.7500	1	1676.71	8971.88	0.187	1	Member Block Shear
		Horizontal	A325N	0.6250	1	3152.53	7830.00	0.403	1	Member Bearing
T6	87.5	Diagonal	A325N	0.7500	1	2155.25	8971.88	0.240	1	Member Block Shear
		Top Girt	A325N	0.7500	1	1075.26	8971.88	0.120	1	Member Block Shear
T7	77.5	Leg	A325N	1.0000	4	40326.10	53014.40	0.761	1	Bolt Tension
		Diagonal	A325N	0.7500	1	2977.45	8971.88	0.332	1	Member Block Shear
		Top Girt	A325N	0.7500	1	1242.00	8971.88	0.138	1	Member Block Shear
T8	67.5	Diagonal	A325N	0.7500	1	3901.76	8971.88	0.435	1	Member Block Shear
		Top Girt	A325N	0.7500	1	704.26	8971.88	0.078	1	Member Block Shear
T9	57.5	Leg	A325N	1.0000	4	46179.30	53014.40	0.871	1	Bolt Tension
		Diagonal	A325N	0.7500	1	4390.88	8971.88	0.489	1	Member Block Shear
		Top Girt	A325N	0.7500	1	752.86	8971.88	0.084	1	Member Block Shear
T10	47.5	Diagonal	A325N	0.7500	1	5117.72	8971.88	0.570	1	Member Block Shear
		Top Girt	A325N	0.7500	1	592.22	8971.88	0.066	1	Member Block Shear
T11	37.5	Leg	A325N	1.0000	6	35549.60	53014.40	0.671	1	Bolt Tension
		Diagonal	A325N	0.7500	1	5623.61	8971.88	0.627	1	Member Block Shear
		Top Girt	A325N	0.7500	1	343.45	8971.88	0.038	1	Member Block Shear
T12	27.5	Diagonal	A325N	0.7500	1	14763.00	17892.40	0.825	1	Bolt Shear
		Horizontal	A325N	0.7500	2	2583.17	11146.90	0.232	1	Member Block Shear
T13	17.5	Diagonal	A325N	0.7500	1	13729.80	17892.40	0.767	1	Bolt Shear
		Horizontal	A325N	0.7500	2	2703.40	11146.90	0.243	1	Member Block Shear
T14	7.5	Diagonal	A325N	0.7500	1	9334.22	12615.00	0.740	1	Member Bearing

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
		Horizontal	A325N	0.7500	2	2952.23	11146.90	0.265	1	Member Block Shear

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio P_u / ϕP_n
L1	195 - 175 (1)	Pipe 8.625" x 0.322" (8 STD)	20.00	0.00	0.0	8.3993	-969.93	264577.00	0.004
L2	175 - 155 (2)	Pipe 12.75" x 0.375" (12 STD)	20.00	0.00	0.0	14.5790	-2266.62	459237.00	0.005
L3	155 - 135 (3)	P14x.593	20.00	0.00	0.0	24.9768	-4458.45	786768.00	0.006

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio M_{ux} / ϕM_{nx}	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio M_{uy} / ϕM_{ny}
L1	195 - 175 (1)	Pipe 8.625" x 0.322" (8 STD)	18.85	58.30	0.323	0.00	58.30	0.000
L2	175 - 155 (2)	Pipe 12.75" x 0.375" (12 STD)	75.18	150.79	0.499	0.00	150.79	0.000
L3	155 - 135 (3)	P14x.593	170.06	279.98	0.607	0.00	279.98	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio V_u / ϕV_n	Actual T_u kip-ft	ϕT_n kip-ft	Ratio T_u / ϕT_n
L1	195 - 175 (1)	Pipe 8.625" x 0.322" (8 STD)	1832.07	132288.00	0.014	0.00	88.25	0.000
L2	175 - 155 (2)	Pipe 12.75" x 0.375" (12 STD)	4043.03	229619.00	0.018	0.00	230.04	0.000
L3	155 - 135 (3)	P14x.593	5425.58	393384.00	0.014	0.00	421.72	0.000

Pole Interaction Design Data

Section No.	Elevation	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft								
L1	195 - 175 (1)	0.004	0.323	0.000	0.014	0.000	0.327	1.000	4.8.2
L2	175 - 155 (2)	0.005	0.499	0.000	0.018	0.000	0.504	1.000	4.8.2
L3	155 - 135 (3)	0.006	0.607	0.000	0.014	0.000	0.613	1.000	4.8.2

Leg Design Data (Compression)

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	135 - 132.5	2	2.50	2.50	60.0 K=1.00	3.1416	-45932.30	84214.60	0.545 [1]
T2	132.5 - 130	2	2.50	2.50	60.0 K=1.00	3.1416	-54729.90	84214.60	0.650 [1]
T3	130 - 110	2.25" SR + HSS2.875x0.25 Split Pipe	20.00	3.95	82.1 K=1.07	5.1790	-101214.00	117703.00	0.860 [1]
T4	110 - 90	2.75" SR + HSS3.5x0.313 Split Pipe	20.00	3.90	66.3 K=1.08	7.7674	-165708.00	199611.00	0.830 [1]
T5	90 - 87.5	3	2.50	2.25	36.1 K=1.00	7.0686	-172816.00	213869.00	0.808 [1]
T6	87.5 - 77.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	69.8 K=1.04	11.0045	-172770.00	275906.00	0.626 [1]
T7	77.5 - 67.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	69.8 K=1.04	11.0045	-178175.00	275906.00	0.646 [1]
T8	67.5 - 57.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	69.8 K=1.04	11.0045	-192552.00	275906.00	0.698 [1]
T9	57.5 - 47.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	69.8 K=1.04	11.0045	-207869.00	275906.00	0.753 [1]
T10	47.5 - 37.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	5.01	71.0 K=1.05	10.4106	-224573.00	258611.00	0.868 [1]
T11	37.5 - 27.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	5.01	71.0 K=1.05	10.4106	-241699.00	258611.00	0.935 [1]
T12	27.5 - 17.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	2.50	40.0 K=1.18	10.4106	-241746.00	310041.00	0.780 [1]
T13	17.5 - 7.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	2.50	40.0 K=1.18	10.4106	-257699.00	310041.00	0.831 [1]
T14	7.5 - 0	3.25" SR + HSS4x0.313 Split Pipe	7.51	3.76	55.1 K=1.08	10.4106	-278224.00	287498.00	0.968 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
T1	135 - 132.5	2	0.00	3.60	0.000	0.00	3.60	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T2	132.5 - 130	2	0.00	3.60	0.000	0.00	3.60	0.000
T3	130 - 110	2.25" SR + HSS2.875x0.25 Split Pipe	0.00	5.60	0.000	0.00	7.36	0.000
T4	110 - 90	2.75" SR + HSS3.5x0.313 Split Pipe	0.00	10.36	0.000	0.00	13.42	0.000
T5	90 - 87.5	3	0.00	12.15	0.000	0.00	12.15	0.000
T6	87.5 - 77.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T7	77.5 - 67.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T8	67.5 - 57.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T9	57.5 - 47.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T10	47.5 - 37.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T11	37.5 - 27.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T12	27.5 - 17.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T13	17.5 - 7.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T14	7.5 - 0	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	135 - 132.5	2	0.545	0.000	0.000	0.545 [1]	1.000	4.8.1
T2	132.5 - 130	2	0.650	0.000	0.000	0.650 [1]	1.000	4.8.1
T3	130 - 110	2.25" SR + HSS2.875x0.25 Split Pipe	0.860	0.000	0.000	0.860 [1]	1.000	4.8.1
T4	110 - 90	2.75" SR + HSS3.5x0.313 Split Pipe	0.830	0.000	0.000	0.830 [1]	1.000	4.8.1
T5	90 - 87.5	3	0.808	0.000	0.000	0.808 [1]	1.000	4.8.1
T6	87.5 - 77.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.626	0.000	0.000	0.626 [1]	1.000	4.8.1
T7	77.5 - 67.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.646	0.000	0.000	0.646 [1]	1.000	4.8.1
T8	67.5 - 57.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.698	0.000	0.000	0.698 [1]	1.000	4.8.1
T9	57.5 - 47.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.753	0.000	0.000	0.753 [1]	1.000	4.8.1
T10	47.5 - 37.5	3.25" SR + HSS4x0.313 Split Pipe	0.868	0.000	0.000	0.868 [1]	1.000	4.8.1
T11	37.5 - 27.5	3.25" SR + HSS4x0.313 Split Pipe	0.935	0.000	0.000	0.935 [1]	1.000	4.8.1
T12	27.5 - 17.5	3.25" SR + HSS4x0.313 Split Pipe	0.780	0.000	0.000	0.780 [1]	1.000	4.8.1
T13	17.5 - 7.5	3.25" SR + HSS4x0.313 Split Pipe	0.831	0.000	0.000	0.831 [1]	1.000	4.8.1
T14	7.5 - 0	3.25" SR + HSS4x0.313 Split Pipe	0.968	0.000	0.000	0.968 [1]	1.000	4.8.1

[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	135 - 132.5	L3x3x1/4	3.20	2.61	86.5 K=1.63	1.4400	-7235.57	31479.90	0.230 [1]
T2	132.5 - 130	L2x2x1/4	3.20	2.83	103.4 K=1.19	0.9380	-3705.71	17309.30	0.214 [1]
T3	130 - 110	L2x2x3/8	5.62	5.09	157.0 K=1.00	1.3600	-9629.64	12465.50	0.773 [1]
T4	110 - 90	L2 1/2x2 1/2x3/8	5.59	4.96	122.2 K=1.00	1.7300	-12287.20	25537.70	0.481 [1]
T5	90 - 87.5	L2 1/2x2 1/2x3/16	3.10	2.64	92.0 K=1.44	0.9020	-1742.60	18711.10	0.093 [1]
T6	87.5 - 77.5	L2 1/2x2 1/2x3/16	6.73	3.20	88.2 K=1.14	0.9020	-2267.95	19409.90	0.117 [1]
T7	77.5 - 67.5	L2 1/2x2 1/2x3/16	7.81	3.73	97.9 K=1.08	0.9020	-3313.89	17647.10	0.188 [1]
T8	67.5 - 57.5	L2 1/2x2 1/2x3/16	8.60	4.13	105.1 K=1.05	0.9020	-4200.65	16333.70	0.257 [1]
T9	57.5 - 47.5	L2 1/2x2 1/2x3/16	9.44	4.55	112.7 K=1.02	0.9020	-4799.81	14973.00	0.321 [1]
T10	47.5 - 37.5	L2 1/2x2 1/2x3/16	10.30	4.99	120.9 K=1.00	0.9020	-5524.09	13542.70	0.408 [1]
T11	37.5 - 27.5	L2 1/2x2 1/2x3/16	11.18	5.43	131.6 K=1.00	0.9020	-5843.08	11741.40	0.498 [1]
T12	27.5 - 17.5	L3x3x3/8	11.48	10.90	143.3 K=1.00	2.1100	-14763.00	23208.60	0.636 [1]
T13	17.5 - 7.5	L3x3x3/8	11.73	11.18	146.9 K=1.00	2.1100	-13729.80	22094.00	0.621 [1]
T14	7.5 - 0	L3x2 1/2x1/4	9.93	9.43	150.6 K=1.00	1.3100	-10154.70	13056.30	0.778 [1]

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
T1	135 - 132.5	L3x2 1/2x1/4	4.00	2.76	82.0 K=1.86	1.3100	-795.57	29792.20	0.027 [1]
T2	132.5 - 130	2L3x2 1/2x1/4	4.00	2.76	33.1 K=1.00	2.6300	-4153.17	80446.70	0.052 [1]
T3	130 - 110	L2x2x1/4	4.00	3.55	114.5 K=1.05	0.9380	-1753.08	15239.30	0.115 [1]
T4	110 - 90	L2x2x1/4	4.00	3.51	113.8 K=1.06	0.9380	-2870.15	15371.80	0.187 [1]
T5	90 - 87.5	L2 1/2x2 1/2x3/16	4.02	1.77	81.4 K=1.90	0.9020	-3412.78	20614.00	0.166 [1]
T12	27.5 - 17.5	L3x3x1/4	10.25	4.75	108.1 K=1.12	1.4400	-5457.65	25215.20	0.216 [1]

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	
T13	17.5 - 7.5	L3x3x1/4	11.25	5.25	113.2 K=1.06	1.4400	-6189.48	23769.60	0.260 [1]
T14	7.5 - 0	L3x3x1/4	12.25	5.75	118.3 K=1.02	1.4400	-6590.12	22346.40	0.295 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

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	
T3	130 - 110	L2x2x1/4	4.00	3.59	115.1 K=1.04	0.9380	-2410.07	15122.00	0.159 [1]
T4	110 - 90	L2x2x1/4	4.00	3.51	113.8 K=1.06	0.9380	-2630.71	15371.80	0.171 [1]
T6	87.5 - 77.5	L2 1/2x2 1/2x3/16	4.25	3.73	105.2 K=1.16	0.9020	-1063.86	16319.80	0.065 [1]
T7	77.5 - 67.5	L2 1/2x2 1/2x3/16	5.25	4.67	116.6 K=1.03	0.9020	-1303.70	14278.70	0.091 [1]
T8	67.5 - 57.5	L2 1/2x2 1/2x3/16	6.25	5.67	137.5 K=1.00	0.9020	-753.11	10773.80	0.070 [1]
T9	57.5 - 47.5	L2 1/2x2 1/2x3/16	7.25	6.67	161.8 K=1.00	0.9020	-817.21	7786.67	0.105 [1]
T10	47.5 - 37.5	L2 1/2x2 1/2x3/16	8.25	7.67	186.0 K=1.00	0.9020	-662.88	5889.30	0.113 [1]
T11	37.5 - 27.5	L2 1/2x2 1/2x3/16	9.25	8.68	210.5 K=1.00	0.9020	-458.72	4599.70	0.100 [1]
		KL/R > 200 (C) - 205							

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

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	
T3	130 - 110	L2x2x1/4	4.00	3.55	114.5 K=1.05	0.9380	-2041.50	15239.30	0.134 [1]
T4	110 - 90	L2x2x1/4	4.00	3.51	113.8 K=1.06	0.9380	-3718.98	15371.80	0.242 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2x2x3/16	2.56	2.41	96.8 K=1.32	0.7150	-4192.40	14150.90	0.296 [1]
T13	17.5 - 7.5	L2x2x3/16	2.81	2.66	100.6 K=1.24	0.7150	-4469.04	13602.20	0.329 [1]
T14	7.5 - 0	L2x2x3/16	3.06	2.91	104.4 K=1.18	0.7150	-4824.99	13054.80	0.370 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2 1/2x2 1/2x3/16	5.51	5.16	99.8 K=1.25	0.9020	-4507.96	17303.80	0.261 [1]
T13	17.5 - 7.5	L2 1/2x2 1/2x3/16	5.62	5.30	100.8 K=1.23	0.9020	-4465.27	17111.10	0.261 [1]
T14	7.5 - 0	L2 1/2x2 1/2x3/16	4.73	4.48	114.3 K=1.05	0.9020	-3723.32	14685.00	0.254 [1]

[1] P_u / ϕP_n controls

Redundant Sub-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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2x2x1/4	1.28	1.13	77.4 K=2.23	0.9380	-3470.71	22173.80	0.157 [1]
T13	17.5 - 7.5	L2x2x1/4	1.41	1.26	79.3 K=2.05	0.9380	-3457.48	21825.70	0.158 [1]

[1] P_u / ϕP_n controls

Redundant Sub 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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2x2x1/4	2.76	2.45	97.6 K=1.30	0.9380	-4116.29	18398.40	0.224 [1]
T13	17.5 - 7.5	L2x2x1/4	2.93	2.65	100.6 K=1.24	0.9380	-3916.94	17830.60	0.220 [1]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

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	
T12	27.5 - 17.5	L2 1/2x2 1/2x3/16	5.13	5.13	124.2 K=1.00	0.9020	-13.60	12966.80	0.001 [1]
T13	17.5 - 7.5	L2 1/2x2 1/2x3/16	5.63	5.63	136.4 K=1.00	0.9020	-13.42	10958.50	0.001 [1]
T14	7.5 - 0	L2 1/2x2 1/2x3/16	6.13	6.13	148.5 K=1.00	0.9020	-10.24	9242.34	0.001 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg 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	135 - 132.5	2	2.50	2.50	60.0	3.1416	43515.10	101788.00	0.428 [1]
T2	132.5 - 130	2	2.50	2.50	60.0	3.1416	51288.20	101788.00	0.504 [1]
T3	130 - 110	2.25" SR + HSS2.875x0.25 Split Pipe	20.00	0.25	4.8	5.1790	99756.60	167800.00	0.594 [1]
T4	110 - 90	2.75" SR + HSS3.5x0.313 Split Pipe	20.00	0.25	4.0	7.7674	160421.00	251664.00	0.637 [1]
T5	90 - 87.5	3	2.50	2.25	36.1	7.0686	160594.00	229022.00	0.701 [1]
T6	87.5 - 77.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	67.0	11.0045	159143.00	356546.00	0.446 [1]
T7	77.5 - 67.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	67.0	11.0045	161304.00	356546.00	0.452 [1]
T8	67.5 - 57.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	67.0	11.0045	172107.00	356546.00	0.483 [1]
T9	57.5 - 47.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	10.02	5.01	67.0	11.0045	184717.00	356546.00	0.518 [1]
T10	47.5 - 37.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	5.01	67.8	10.4106	198718.00	337303.00	0.589 [1]
T11	37.5 - 27.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	5.01	67.8	10.4106	213298.00	337303.00	0.632 [1]
T12	27.5 - 17.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	2.50	33.9	10.4106	210766.00	337303.00	0.625 [1]
T13	17.5 - 7.5	3.25" SR + HSS4x0.313 Split Pipe	10.02	2.50	33.9	10.4106	223755.00	337303.00	0.663 [1]
T14	7.5 - 0	3.25" SR + HSS4x0.313 Split Pipe	7.51	3.76	50.8	10.4106	242856.00	337303.00	0.720 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	135 - 132.5	2	0.00	3.60	0.000	0.00	3.60	0.000
T2	132.5 - 130	2	0.00	3.60	0.000	0.00	3.60	0.000
T3	130 - 110	2.25" SR + HSS2.875x0.25 Split Pipe	0.00	5.60	0.000	0.00	7.36	0.000
T4	110 - 90	2.75" SR + HSS3.5x0.313 Split Pipe	0.00	10.36	0.000	0.00	13.42	0.000
T5	90 - 87.5	3	0.00	12.15	0.000	0.00	12.15	0.000
T6	87.5 - 77.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T7	77.5 - 67.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T8	67.5 - 57.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T9	57.5 - 47.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.00	15.95	0.000	0.00	25.30	0.000
T10	47.5 - 37.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T11	37.5 - 27.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T12	27.5 - 17.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T13	17.5 - 7.5	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000
T14	7.5 - 0	3.25" SR + HSS4x0.313 Split Pipe	0.00	16.57	0.000	0.00	20.45	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	135 - 132.5	2	0.428	0.000	0.000	0.428 [1]	1.000	4.8.1
T2	132.5 - 130	2	0.504	0.000	0.000	0.504 [1]	1.000	4.8.1
T3	130 - 110	2.25" SR + HSS2.875x0.25 Split Pipe	0.594	0.000	0.000	0.594 [1]	1.000	4.8.1
T4	110 - 90	2.75" SR + HSS3.5x0.313 Split Pipe	0.637	0.000	0.000	0.637 [1]	1.000	4.8.1
T5	90 - 87.5	3	0.701	0.000	0.000	0.701 [1]	1.000	4.8.1
T6	87.5 - 77.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.446	0.000	0.000	0.446 [1]	1.000	4.8.1
T7	77.5 - 67.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.452	0.000	0.000	0.452 [1]	1.000	4.8.1
T8	67.5 - 57.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.483	0.000	0.000	0.483 [1]	1.000	4.8.1
T9	57.5 - 47.5	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	0.518	0.000	0.000	0.518 [1]	1.000	4.8.1
T10	47.5 - 37.5	3.25" SR + HSS4x0.313 Split Pipe	0.589	0.000	0.000	0.589 [1]	1.000	4.8.1
T11	37.5 - 27.5	3.25" SR + HSS4x0.313 Split Pipe	0.632	0.000	0.000	0.632 [1]	1.000	4.8.1
T12	27.5 - 17.5	3.25" SR + HSS4x0.313 Split Pipe	0.625	0.000	0.000	0.625 [1]	1.000	4.8.1
T13	17.5 - 7.5	3.25" SR + HSS4x0.313	0.663	0.000	0.000	0.663 [1]	1.000	4.8.1

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T14	7.5 - 0	Split Pipe 3.25" SR + HSS4x0.313 Split Pipe	0.720	0.000	0.000	0.720 [1]	1.000	4.8.1

[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	135 - 132.5	L3x3x1/4	3.20	2.61	39.6	0.9159	6667.90	39843.30	0.167 [1]
T2	132.5 - 130	L2x2x1/4	3.20	2.83	60.5	0.5629	3606.64	24485.10	0.147 [1]
T3	130 - 110	L2x2x3/8	5.62	5.09	107.7	0.8091	9632.77	35194.20	0.274 [1]
T4	110 - 90	L2 1/2x2 1/2x3/8	5.59	4.96	83.3	1.0514	12376.30	45736.20	0.271 [1]
T5	90 - 87.5	L2 1/2x2 1/2x3/16	3.10	2.64	44.9	0.5535	1676.71	24075.20	0.070 [1]
T6	87.5 - 77.5	L2 1/2x2 1/2x3/16	6.73	3.20	51.4	0.5535	2155.25	24075.20	0.090 [1]
T7	77.5 - 67.5	L2 1/2x2 1/2x3/16	7.81	3.73	59.7	0.5535	2977.45	24075.20	0.124 [1]
T8	67.5 - 57.5	L2 1/2x2 1/2x3/16	8.60	4.13	65.8	0.5535	3901.76	24075.20	0.162 [1]
T9	57.5 - 47.5	L2 1/2x2 1/2x3/16	9.44	4.55	72.3	0.5535	4390.88	24075.20	0.182 [1]
T10	47.5 - 37.5	L2 1/2x2 1/2x3/16	10.30	4.99	79.0	0.5535	5117.72	24075.20	0.213 [1]
T11	37.5 - 27.5	L2 1/2x2 1/2x3/16	11.18	5.43	85.8	0.5535	5623.61	24075.20	0.234 [1]
T12	27.5 - 17.5	L3x3x3/8	11.48	10.90	146.9	1.3364	14205.60	58133.70	0.244 [1]
T13	17.5 - 7.5	L3x3x3/8	11.73	11.18	150.4	1.3364	13325.30	58133.70	0.229 [1]
T14	7.5 - 0	L3x2 1/2x1/4	9.93	9.43	154.9	0.8184	9334.22	35602.00	0.262 [1]

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
T1	135 - 132.5	L3x2 1/2x1/4	4.00	2.76	45.9	0.8419	795.57	36621.60	0.022 [1]
T2	132.5 - 130	2L3x2 1/2x1/4	4.00	2.76	34.5	1.6912	4529.28	73569.40	0.062 [1]
T3	130 - 110	L2x2x1/4	4.00	3.55	74.7	0.5629	1753.08	24485.10	0.072 [1]
T4	110 - 90	L2x2x1/4	4.00	3.51	73.8	0.5629	2870.15	24485.10	0.117 [1]
T5	90 - 87.5	L2 1/2x2 1/2x3/16	4.02	1.77	43.7	0.5710	3152.53	24839.90	0.127 [1]
T12	27.5 - 17.5	L3x3x1/4	10.25	4.75	64.2	0.9159	5166.33	39843.30	0.130 [1]
T13	17.5 - 7.5	L3x3x1/4	11.25	5.25	70.7	0.9159	5406.81	39843.30	0.136 [1]
T14	7.5 - 0	L3x3x1/4	12.25	5.75	77.1	0.9159	5904.47	39843.30	0.148 [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	
T3	130 - 110	L2x2x1/4	4.00	3.59	75.5	0.5629	2445.83	24485.10	0.100 [1]
T4	110 - 90	L2x2x1/4	4.00	3.51	73.8	0.5629	2373.44	24485.10	0.097 [1]
T6	87.5 - 77.5	L2 1/2x2 1/2x3/16	4.25	3.73	61.7	0.5535	1075.26	24075.20	0.045 [1]
T7	77.5 - 67.5	L2 1/2x2 1/2x3/16	5.25	4.67	76.3	0.5535	1242.00	24075.20	0.052 [1]
T8	67.5 - 57.5	L2 1/2x2 1/2x3/16	6.25	5.67	91.7	0.5535	704.26	24075.20	0.029 [1]
T9	57.5 - 47.5	L2 1/2x2 1/2x3/16	7.25	6.67	107.1	0.5535	752.86	24075.20	0.031 [1]
T10	47.5 - 37.5	L2 1/2x2 1/2x3/16	8.25	7.67	122.5	0.5535	592.22	24075.20	0.025 [1]
T11	37.5 - 27.5	L2 1/2x2 1/2x3/16	9.25	8.68	138.1	0.5535	343.45	24075.20	0.014 [1]

[1] P_u / ϕP_n controls

Bottom 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	
T3	130 - 110	L2x2x1/4	4.00	3.55	74.7	0.5629	2190.59	24485.10	0.089 [1]
T4	110 - 90	L2x2x1/4	4.00	3.51	73.8	0.5629	3241.46	24485.10	0.132 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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	
T12	27.5 - 17.5	L2x2x3/16	2.56	2.41	47.0	0.7150	4192.40	23166.00	0.181 [1]
T13	17.5 - 7.5	L2x2x3/16	2.81	2.66	51.8	0.7150	4469.04	23166.00	0.193 [1]
T14	7.5 - 0	L2x2x3/16	3.06	2.91	56.7	0.7150	4824.99	23166.00	0.208 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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	
T12	27.5 - 17.5	L2 1/2x2 1/2x3/16	5.51	5.16	79.6	0.9020	4507.96	29224.80	0.154 [1]
T13	17.5 - 7.5	L2 1/2x2 1/2x3/16	5.62	5.30	81.7	0.9020	4558.05	29224.80	0.156 [1]
T14	7.5 - 0	L2 1/2x2 1/2x3/16	4.73	4.48	69.1	0.9020	3723.32	29224.80	0.127 [1]

[1] P_u / ϕP_n controls

Redundant Sub-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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2x2x1/4	1.28	1.13	22.3	0.9380	3656.71	30391.20	0.120 [1]
T13	17.5 - 7.5	L2x2x1/4	1.41	1.26	24.8	0.9380	3638.51	30391.20	0.120 [1]

[1] P_u / ϕP_n controls

Redundant Sub 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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2x2x1/4	2.76	2.45	48.3	0.9380	3964.54	30391.20	0.130 [1]
T13	17.5 - 7.5	L2x2x1/4	2.93	2.65	52.2	0.9380	3702.70	30391.20	0.122 [1]

[1] P_u / ϕP_n controls

Inner Bracing 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 $\frac{P_u}{\phi P_n}$
T12	27.5 - 17.5	L2 1/2x2 1/2x3/16	5.13	5.13	79.0	0.9020	3.61	29224.80	0.000 [1]
T13	17.5 - 7.5	L2 1/2x2 1/2x3/16	5.63	5.63	86.8	0.9020	3.52	29224.80	0.000 [1]
T14	7.5 - 0	L2 1/2x2 1/2x3/16	6.13	6.13	94.5	0.9020	4.65	29224.80	0.000 [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
L1	195 - 175	Pole	Pipe 8.625" x 0.322" (8 STD)	1	-969.93	264577.00	32.7	Pass
L2	175 - 155	Pole	Pipe 12.75" x 0.375" (12 STD)	2	-2266.62	459237.00	50.4	Pass
L3	155 - 135	Pole	P14x.593	3	-4458.45	786768.00	61.3	Pass
T1	135 - 132.5	Leg	2	6	-45932.30	84214.60	54.5	Pass
T2	132.5 - 130	Leg	2	18	-54729.90	84214.60	65.0	Pass
T3	130 - 110	Leg	2.25" SR + HSS2.875x0.25 Split Pipe	29	-101214.00	117703.00	86.0	Pass
T4	110 - 90	Leg	2.75" SR + HSS3.5x0.313 Split Pipe	64	-165708.00	199611.00	83.0	Pass
T5	90 - 87.5	Leg	3	102	-172816.00	213869.00	80.8	Pass
T6	87.5 - 77.5	Leg	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	114	-172770.00	275906.00	62.6	Pass
T7	77.5 - 67.5	Leg	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	132	-178175.00	275906.00	64.6 76.1 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T8	67.5 - 57.5	Leg	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	150	-192552.00	275906.00	69.8	Pass
T9	57.5 - 47.5	Leg	3" SR + 4" XXS (4.5 x 0.674) Split Pipe	168	-207869.00	275906.00	75.3 87.1 (b)	Pass
T10	47.5 - 37.5	Leg	3.25" SR + HSS4x0.313 Split Pipe	186	-224573.00	258611.00	86.8	Pass
T11	37.5 - 27.5	Leg	3.25" SR + HSS4x0.313 Split Pipe	204	-241699.00	258611.00	93.5	Pass
T12	27.5 - 17.5	Leg	3.25" SR + HSS4x0.313 Split Pipe	222	-241746.00	310041.00	78.0	Pass
T13	17.5 - 7.5	Leg	3.25" SR + HSS4x0.313 Split Pipe	273	-257699.00	310041.00	83.1	Pass
T14	7.5 - 0	Leg	3.25" SR + HSS4x0.313 Split Pipe	324	-278224.00	287498.00	96.8	Pass
T1	135 - 132.5	Diagonal	L3x3x1/4	15	-7235.57	31479.90	23.0 29.9 (b)	Pass
T2	132.5 - 130	Diagonal	L2x2x1/4	23	-3705.71	17309.30	21.4 39.6 (b)	Pass
T3	130 - 110	Diagonal	L2x2x3/8	38	-9629.64	12465.50	77.3 77.5 (b)	Pass
T4	110 - 90	Diagonal	L2 1/2x2 1/2x3/8	74	-12287.20	25537.70	48.1 69.2 (b)	Pass
T5	90 - 87.5	Diagonal	L2 1/2x2 1/2x3/16	111	-1742.60	18711.10	9.3 18.7 (b)	Pass
T6	87.5 - 77.5	Diagonal	L2 1/2x2 1/2x3/16	125	-2267.95	19409.90	11.7 24.0 (b)	Pass
T7	77.5 - 67.5	Diagonal	L2 1/2x2 1/2x3/16	141	-3313.89	17647.10	18.8 33.2 (b)	Pass
T8	67.5 - 57.5	Diagonal	L2 1/2x2 1/2x3/16	159	-4200.65	16333.70	25.7 43.5 (b)	Pass
T9	57.5 - 47.5	Diagonal	L2 1/2x2 1/2x3/16	177	-4799.81	14973.00	32.1 48.9 (b)	Pass
T10	47.5 - 37.5	Diagonal	L2 1/2x2 1/2x3/16	195	-5524.09	13542.70	40.8 57.0 (b)	Pass
T11	37.5 - 27.5	Diagonal	L2 1/2x2 1/2x3/16	213	-5843.08	11741.40	49.8 62.7 (b)	Pass
T12	27.5 - 17.5	Diagonal	L3x3x3/8	257	-14763.00	23208.60	63.6 82.5 (b)	Pass
T13	17.5 - 7.5	Diagonal	L3x3x3/8	308	-13729.80	22094.00	62.1 76.7 (b)	Pass
T14	7.5 - 0	Diagonal	L3x2 1/2x1/4	343	-10154.70	13056.30	77.8	Pass
T1	135 - 132.5	Horizontal	L3x2 1/2x1/4	10	-795.57	29792.20	2.7 7.6 (b)	Pass
T2	132.5 - 130	Horizontal	2L3x2 1/2x1/4	22	4529.28	73569.40	6.2 21.7 (b)	Pass
T3	130 - 110	Horizontal	L2x2x1/4	40	-1753.08	15239.30	11.5 19.2 (b)	Pass
T4	110 - 90	Horizontal	L2x2x1/4	76	-2870.15	15371.80	18.7 31.5 (b)	Pass
T5	90 - 87.5	Horizontal	L2 1/2x2 1/2x3/16	109	-3412.78	20614.00	16.6 40.3 (b)	Pass
T12	27.5 - 17.5	Horizontal	L3x3x1/4	253	-5457.65	25215.20	21.6 23.2 (b)	Pass
T13	17.5 - 7.5	Horizontal	L3x3x1/4	304	-6189.48	23769.60	26.0	Pass
T14	7.5 - 0	Horizontal	L3x3x1/4	339	-6590.12	22346.40	29.5	Pass
T3	130 - 110	Top Girt	L2x2x1/4	32	-2410.07	15122.00	15.9 26.9 (b)	Pass
T4	110 - 90	Top Girt	L2x2x1/4	69	-2630.71	15371.80	17.1 26.1 (b)	Pass
T6	87.5 - 77.5	Top Girt	L2 1/2x2 1/2x3/16	117	-1063.86	16319.80	6.5 12.0 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T7	77.5 - 67.5	Top Girt	L2 1/2x2 1/2x3/16	133	-1303.70	14278.70	9.1 13.8 (b)	Pass
T8	67.5 - 57.5	Top Girt	L2 1/2x2 1/2x3/16	151	-753.11	10773.80	7.0 7.8 (b)	Pass
T9	57.5 - 47.5	Top Girt	L2 1/2x2 1/2x3/16	170	-817.21	7786.67	10.5	Pass
T10	47.5 - 37.5	Top Girt	L2 1/2x2 1/2x3/16	188	-662.88	5889.30	11.3	Pass
T11	37.5 - 27.5	Top Girt	L2 1/2x2 1/2x3/16	205	-458.72	4599.70	10.0	Pass
T3	130 - 110	Bottom Girt	L2x2x1/4	36	-2041.50	15239.30	13.4 24.1 (b)	Pass
T4	110 - 90	Bottom Girt	L2x2x1/4	72	-3718.98	15371.80	24.2 35.6 (b)	Pass
T12	27.5 - 17.5	Redund Horz 1 Bracing	L2x2x3/16	243	-4192.40	14150.90	29.6	Pass
T13	17.5 - 7.5	Redund Horz 1 Bracing	L2x2x3/16	294	-4469.04	13602.20	32.9	Pass
T14	7.5 - 0	Redund Horz 1 Bracing	L2x2x3/16	341	-4824.99	13054.80	37.0	Pass
T12	27.5 - 17.5	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	244	-4507.96	17303.80	26.1	Pass
T13	17.5 - 7.5	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	295	-4465.27	17111.10	26.1	Pass
T14	7.5 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	338	-3723.32	14685.00	25.4	Pass
T12	27.5 - 17.5	Redund Sub Horz Bracing	L2x2x1/4	235	-3470.71	22173.80	15.7	Pass
T13	17.5 - 7.5	Redund Sub Horz Bracing	L2x2x1/4	282	-3457.48	21825.70	15.8	Pass
T12	27.5 - 17.5	Redund Sub Diagonal Bracing	L2x2x1/4	234	-4116.29	18398.40	22.4	Pass
T13	17.5 - 7.5	Redund Sub Diagonal Bracing	L2x2x1/4	281	-3916.94	17830.60	22.0	Pass
T12	27.5 - 17.5	Inner Bracing	L2 1/2x2 1/2x3/16	269	-13.60	12966.80	0.5	Pass
T13	17.5 - 7.5	Inner Bracing	L2 1/2x2 1/2x3/16	319	-12.85	10958.50	0.5	Pass
T14	7.5 - 0	Inner Bracing	L2 1/2x2 1/2x3/16	346	-9.75	9242.34	0.5	Pass
							Summary	
							Pole (L3) 61.3	Pass
							Leg (T14) 96.8	Pass
							Diagonal (T12) 82.5	Pass
							Horizontal (T5) 40.3	Pass
							Top Girt (T3) 26.9	Pass
							Bottom Girt (T4) 35.6	Pass
							Redund Horz 1 Bracing (T14) 37.0	Pass
							Redund Diag 1 Bracing (T13) 26.1	Pass
							Redund Sub Horz Bracing (T13) 15.8	Pass
							Redund Sub Diagonal Bracing (T12) 22.4	Pass

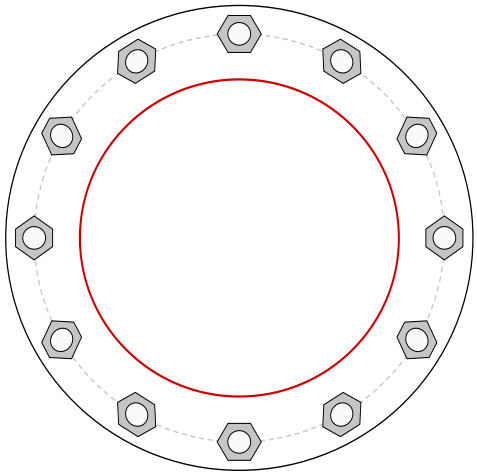
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Inner Bracing (T13)	0.5	Pass
						Bolt Checks	87.1	Pass
						RATING =	**96.8**	**Pass**

Monopole Base Plate Connection

Site Info	
BU # :	
Site Name:	
Order # :	

Analysis Considerations	
TIA-222 Revision:	G
Grout Considered:	No
l_{ar} (in):	0
Eta Factor, η:	0.5

Applied Loads	
Moment (kip-ft):	170.06
Axial Force (kips):	4.46
Shear Force (kips):	5.43



Connection Properties

Anchor Rod Data

(12) 1" ø bolts (A325; Fy=92 ksi, Fu=120 ksi) on 18" BC

Base Plate Data

20.5" OD x 2.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

14" x 0.593" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Analysis Results

Anchor Rod Summary

Pu = 38.12	ϕPn = 58.18	**Stress Rating**
Vu = 0.45	ϕVn = n/a	**67.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	7.28	
Allowable Stress (ksi):	32.4	
Stress Ratio:	**22.5%**	**Pass**

Horizontal Weld:	**N/A**
Vertical Weld:	**N/A**
Plate Flexure+Shear:	**N/A**
Plate Tension+Shear:	**N/A**
Plate Compression:	**N/A**
Punching Shear:	**N/A**

Monopole Flange Plate Connection

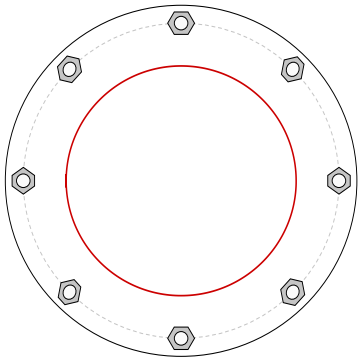
Elevation = 20 ft.

BU #	
Site Name	
Order #	

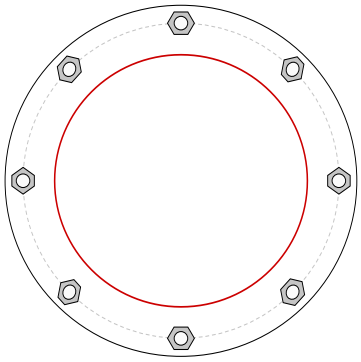
TIA-222 Revision:	G

Applied Loads	
Moment (kip-ft):	75.18
Axial Force (kips):	2.27
Shear Force (kips):	4.04

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 3/4" ø bolts (A325; Fy=92 ksi, Fu=120 ksi) on 17.5" BC

Top Plate Data

19.5" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

19.5" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

12.75" x 0.375" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

14" x 0.593" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	25.47	
Allowable (kips)	30.05	
Stress Ratio:	84.8%	Pass

Top Plate Capacity

Max Stress (ksi):	6.87	
Allowable Stress (ksi):	32.40	
Stress Ratio:	21.2%	Pass
Tension Side Stress Ratio:	17.1%	Pass

Bottom Plate Capacity

Max Stress (ksi):	13.94	
Allowable Stress (ksi):	32.40	
Stress Ratio:	43.0%	Pass
Tension Side Stress Ratio:	17.8%	Pass

Top Stiffener Capacity

Horizontal Weld:	N/A
Vertical Weld:	N/A
Plate Flexure+Shear:	N/A
Plate Tension+Shear:	N/A
Plate Compression:	N/A

Bottom Stiffener Capacity

Horizontal Weld:	N/A
Vertical Weld:	N/A
Plate Flexure+Shear:	N/A
Plate Tension+Shear:	N/A
Plate Compression:	N/A

Top Pole Capacity

Punching Shear:	N/A

Bottom Pole Capacity

Punching Shear:	N/A

Monopole Flange Plate Connection

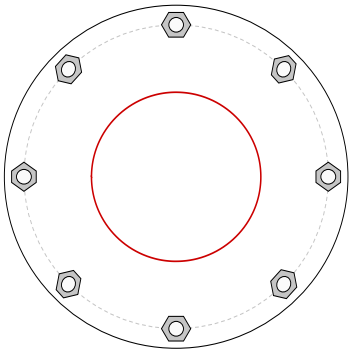
Elevation = 40 ft.

BU #	
Site Name	
Order #	

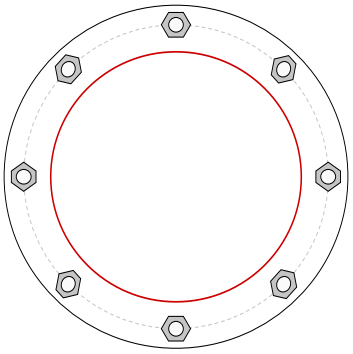
TIA-222 Revision:	G

Applied Loads	
Moment (kip-ft):	18.85
Axial Force (kips):	0.97
Shear Force (kips):	1.83

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 3/4" ø bolts (A325; Fy=92 ksi, Fu=120 ksi) on 15.5" BC

Top Plate Data

17.5" OD x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

17.5" OD x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

8.625" x 0.322" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Bottom Pole Data

12.75" x 0.375" round pole (A53-B-35; Fy=35 ksi, Fu=60 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	7.17	
Allowable (kips)	30.06	
Stress Ratio:	23.9%	Pass

Top Plate Capacity

Max Stress (ksi):	12.13	
Allowable Stress (ksi):	32.40	
Stress Ratio:	37.4%	Pass
Tension Side Stress Ratio:	28.2%	Pass

Bottom Plate Capacity

Max Stress (ksi):	17.72	
Allowable Stress (ksi):	32.40	
Stress Ratio:	54.7%	Pass
Tension Side Stress Ratio:	6.0%	Pass

Top Stiffener Capacity

Horizontal Weld:	N/A
Vertical Weld:	N/A
Plate Flexure+Shear:	N/A
Plate Tension+Shear:	N/A
Plate Compression:	N/A

Bottom Stiffener Capacity

Horizontal Weld:	N/A
Vertical Weld:	N/A
Plate Flexure+Shear:	N/A
Plate Tension+Shear:	N/A
Plate Compression:	N/A

Top Pole Capacity

Punching Shear:	N/A

Bottom Pole Capacity

Punching Shear:	N/A

NOTES:

1. UPGRADE DESIGN VALID FOR APPURTENANCES LISTED IN DESTEK ANALYSIS REPORT DATED 10/22/2018. CONTRACTOR TO REVIEW AND SHOULD ADHERE TO THE REPORT.

2. CONTRACTOR TO REMOVE AND REATTACH EXISTING APPURTENANCES AS NEEDED.

3. ALL DIMENSIONS ARE BASED ON ERECTION DRAWINGS PREPARED BY STAINLESS, INC., DATED 10/12/1990.

4. CONTRACTOR TO FIELD VERIFY EXISTING TOWER MEMBER SIZES AND TOWER DIMENSIONS IN THE VICINITY OF THE UPGRADE, BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. ANY DISCREPANCY SHOULD BE REPORTED TO DESTEK IMMEDIATELY FOR FURTHER EVALUATION.

5. DO NOT PERFORM THE WORK ON THE TOWER WHEN WINDS GUST MORE THAN 15 MPH AT THE GROUND LEVEL.

6. NEW TOWER REACTIONS:

BASE MOMENT:	3141 KIP-FT
LEG UPLIFT:	255 KIPS
LEG COMPRESSION:	291 KIPS
LEG SHEAR:	26 KIPS

7. CONTRACTOR TO HAVE THE SAFETY CLIMB INTACT AND FUNCTIONAL AFTER WORK IS COMPLETE.

8. TOWER WILL BECOME UNSTABLE WHEN MEMBERS ARE DISCONNECTED OR BEING REPLACED. CONTRACTOR IS FULLY RESPONSIBLE TO MAINTAIN STABILITY OF THE TOWER DURING WORK AND SHOULD CONSULT WITH AN ENGINEER.

9. DESTEK DISCLAIMS ANY LIABILITY ARISING FROM THE ORIGINAL MATERIAL, FABRICATION OR ERECTION OF THE TOWER.

10. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

1. DESIGN INFORMATION AND GENERAL REQUIREMENTS

1.1 CODES
a. 2016 CONNECTICUT STATE BUILDING CODE, INTERNATIONAL CODE COUNCIL AND CONNECTICUT DEPARTMENT OF ADMINISTRATIVE SERVICES
b. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-10, AMERICAN SOCIETY OF CIVIL ENGINEERS
c. STEEL CONSTRUCTION MANUAL, 14TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
d. STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, ANSI/TIA-222-G, TELECOMMUNICATIONS INDUSTRY ASSOCIATION

1.2 GENERAL
a. PRIOR TO PURCHASE OR FABRICATION OF MATERIAL, THE CONTRACTOR SHALL PERFORM AN INSPECTION VERIFYING MEMBER DIMENSIONS AND BOLT SIZES. SHOULD THE CONTRACTOR DISCOVER ANY DAMAGED OR MISSING MEMBERS OR THE MEMBER OR BOLT SIZES DO NOT MATCH THOSE LISTED, DESTEK SHALL BE NOTIFIED IMMEDIATELY.
b. CONTRACTOR TO REPLACE ALL BOLTS REMOVED WITH NEW BOLTS OF SAME TYPE, UNLESS NOTED OTHERWISE.

1.3 LOADS & DESIGN CRITERIA
a. WIND LOADING: V=97MPH, EXPOSURE CATEGORY B, STRUCTURE CLASS II, TOPOGRAPHIC CATEGORY 5 WITH CREST HEIGHT=692'.

2. STRUCTURAL STEEL

2.1 MATERIALS
a. STRUCTURAL STEEL . . . . . ASTM A992
ANGLE & PLATE . . . . . ASTM A36 U.N.O.
PIPE . . . . . ASTM A53 GRADE B (OR Fy>35KSI)
HSS ROUND . . . . . ASTM A500 GRADE B (OR Fy>42KSI)
BARS (SOLID RODS) . . . . . ASTM A572 GRADE 50
b. BOLTS . . . . . ASTM A325N U.N.O.
c. WELDING ELECTRODES . . . . . AWS A5.1 (E70XX)
d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360-10"
e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR RE-DRILLING WILL NOT BE PERMITTED.

2.2 CONNECTIONS
a. SHOP CONNECTIONS MAY BE BOLTED OR WELDED
b. FIELD CONNECTIONS BOLTED WITH A325-N BOLTS, (INSTALLED SNUG TIGHT) UNLESS OTHERWISE SPECIFIED OR IF WELDED CONNECTIONS ARE NOTED ON DRAWINGS
c. FIELD CONNECTIONS SHALL BE MADE WITH A325-N BOLTS AND HARDENED WASHERS EXCEPT AS INDICATED ON THE DESIGN DRAWINGS
d. CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
e. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
f. BOLT HOLES SHALL BE CUT, DRILLED OR PUNCHED AT RIGHT ANGLES TO THE SURFACE OF THE METAL AND SHALL NOT BE MADE OR ENLARGED BY BURNING. HOLES SHALL BE CLEAN CUT WITHOUT TORN OR RAGGED EDGES. OUTSIDE BURRS RESULTING FROM DRILLING OR REAMING OPERATION SHALL BE REMOVED WITH A TOOL MAKING A 1/16 INCH BEVEL. BOLT HOLES SHALL BE 1/16 INCH OVERSIZE.

2.3 FINISHES
a. STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
b. BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
c. ALL SURFACES DAMAGED DURING THE WORK SHALL BE PAINTED WITH COLD GALVANIZING COMPOUND TWICE. THE PAINT SHOULD BE AT LEAST 93% PURE ZINC. RUST-OLEUM PROFESSIONAL, (MODEL# 7585838) OR SIMILAR.

2.4 WELDING
a. CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS; INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
b. WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GRIND GALVANIZING BEFORE WELDING.
c. WELDING CERTIFICATE MUST BE PROVIDED PRIOR TO WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.

DRAWINGS PLOTTED TO SCALE ON 11x17 SHEETS

10-22-2018
STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
CT License No: 27057

DESTEK ENGINEERING
DESTEK ENGINEERING, LLC
1281 KENNESTONE CIRCLE
SUITE 100
MARIETTA, GA 30066
TEL NO: 770-693-0835
ADMIN@DESTEKENGINEERING.COM
LICENSE NO: PEC0001429

PREPARED FOR:
Com-Ex Consultants, LLC
115 Route 46 - Suite E39
Mountain Lakes, NJ 07046

NUM	DATE	DESCRIPTION:
A	10/22/18	ISSUED FOR CONSTRUCTION

CT58XC962

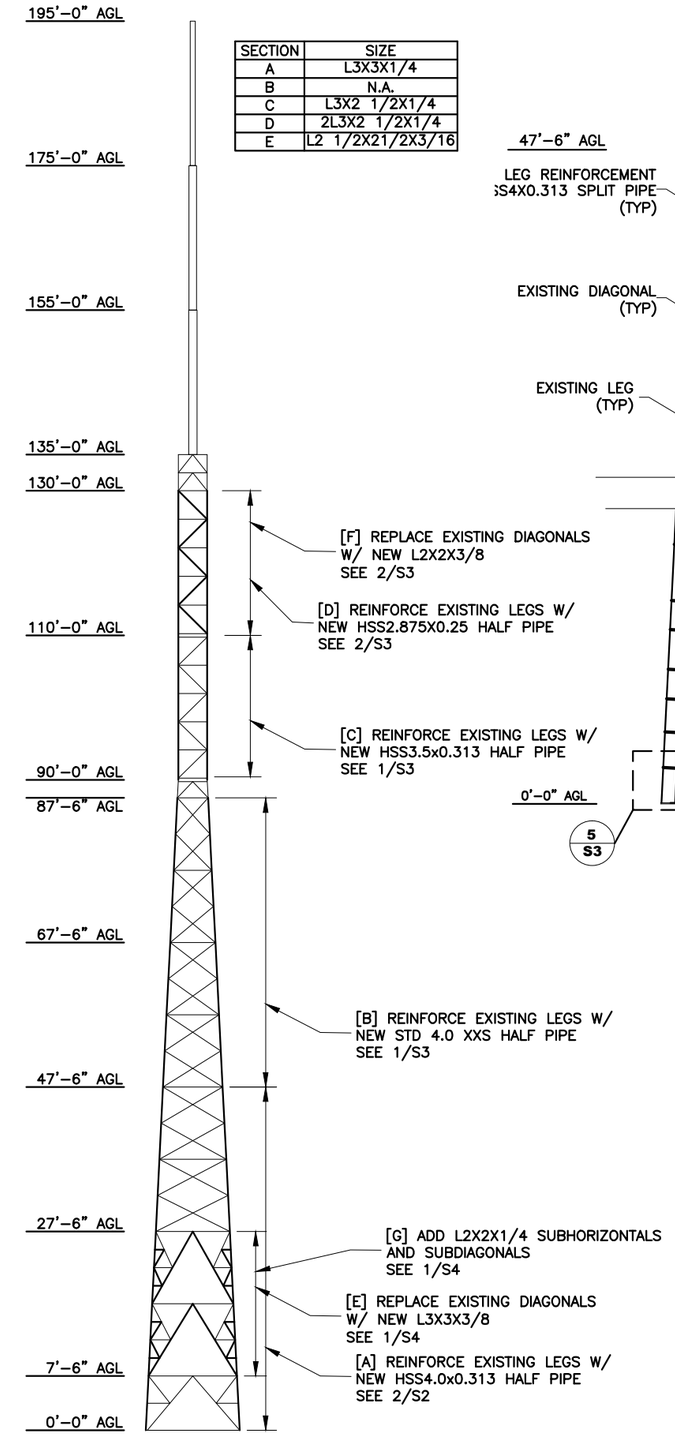
ADDRESS:
21 WEST PEAK DRIVE
MERIDEN, CT 06037

DESIGNED: EM
DRAWN: EM
CHECKED: AC

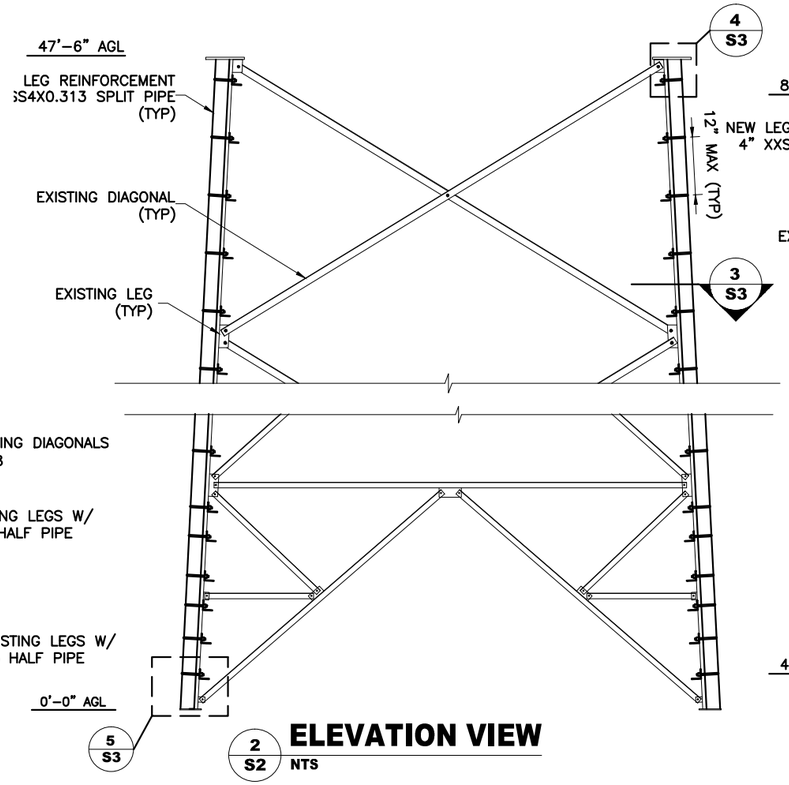
JOB #: 1829043

S1
NOTES

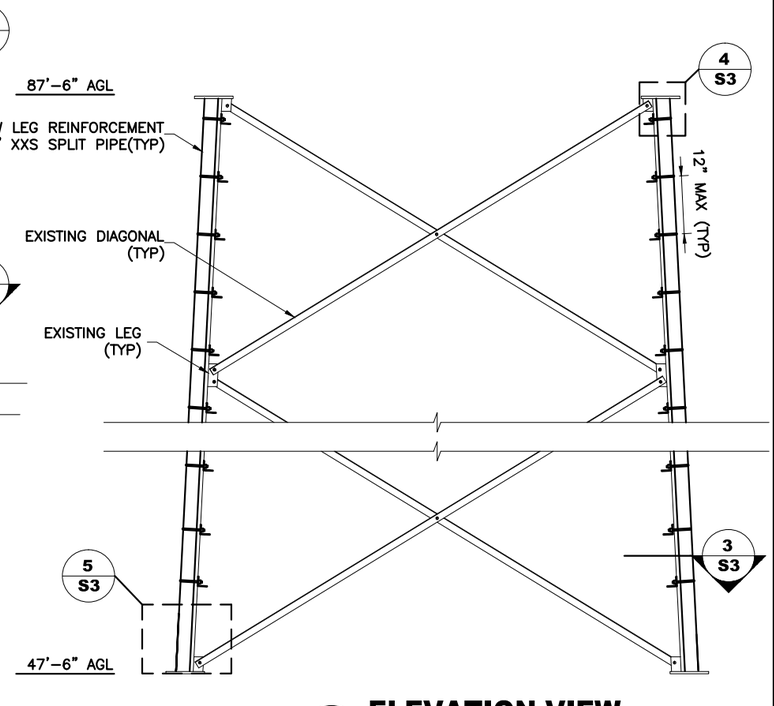
SECTION	SIZE
A	L3X3X1/4
B	N.A.
C	L3X2 1/2X1/4
D	2L3X2 1/2X1/4
E	L2 1/2X21/2X3/16



1 / S2 **TOWER ELEVATION**
3/64" = 1'-0"



2 / S2 **ELEVATION VIEW**
NTS



3 / S2 **ELEVATION VIEW**
N.T.S.

TOWER MODIFICATION SCHEDULE				
	FROM (FT)	TO (FT)	MODIFICATION	REFERENCE SHEET
A	0'-0"	47'-6"	REINFORCE EXISTING LEGS W/ NEW HSS4.0x0.313 HALF PIPE	S2&S3
B	47'-6"	87'-6"	REINFORCE EXISTING LEGS W/ NEW STD 4 XXS HALF PIPE	S2&S3
C	90'-0"	110'-0"	REINFORCE EXISTING LEGS W/ NEW HSS3.5x0.313 HALF PIPE	S3
D	110'-0"	130'-0"	REINFORCE EXISTING LEGS W/ NEW HSS2.875X0.25 HALF PIPE	S3
E	7'-6"	27'-6"	REPLACE EXISTING DIAGONALS W/ NEW L3X3X3/8	S4
F	110'-0"	130'-0"	REPLACE EXISTING DIAGONALS W/ NEW L2X2X3/8	S3
G	7'-6"	27'-6"	ADD L2X2X1/4 SUBHORIZONTALS AND SUBDIAGONALS	S4&S5
NOTE: APPLY MODIFICATIONS TO ALL 3 TOWER FACES				

SELF-SUPPORT TOWER EXISTING MEMBER SIZES																						
SECTION		T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L3	L2	L1				
LEGS		SR 3 1/4						SR 3				SR 2 3/4	SR 2 1/4	SR 2		P14X.593	PIPE 12.75"X0.375"	PIPE 8.625"X0.322				
DIAGONALS		L3X2 1/2X1/4				L2 1/2X2 1/2X3/16						L2 1/2X21/2X3/8	L2X2X1/4		A	N.A.						
TOP GIRTS		N.A.				L2 1/2X2 1/2X3/16					B	L2X2X1/4				N.A.						
BOTTOM GIRTS		N.A.										L2X2X1/4				N.A.						
HORIZONTALS		L3X3X1/4				N.A.					E	L2X2X1/4		D	C	N.A.						
RED. HORIZONTALS		L2X2X3/16										N.A.										
RED. DIAGONALS		L2 1/2X2 1/2X3/16										N.A.										
INNER BRACING		L2 1/2X2 1/2X3/16										N.A.										

DRAWINGS PLOTTED TO SCALE ON 11x17 SHEETS

DESTEK ENGINEERING
DESTEK ENGINEERING, LLC
1281 KENNESTONE CIRCLE
SUITE 100
MARIETTA, GA 30066
TEL NO: 770-693-0835
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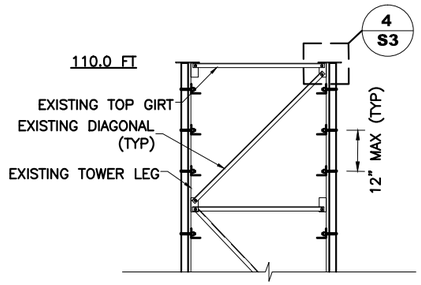
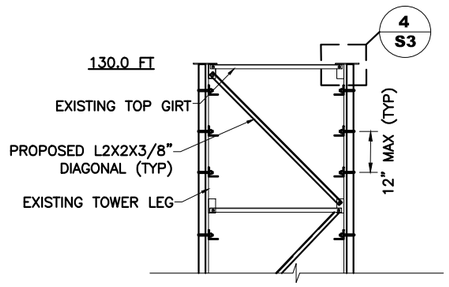
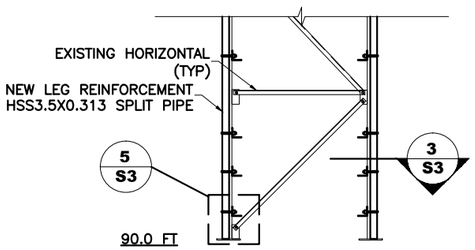
DESIGNED: EM
DRAWN: EM
CHECKED: AC

JOB #: 1829043

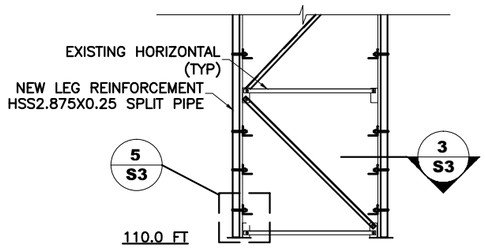
S2
SCOPE OF MODIFICATION



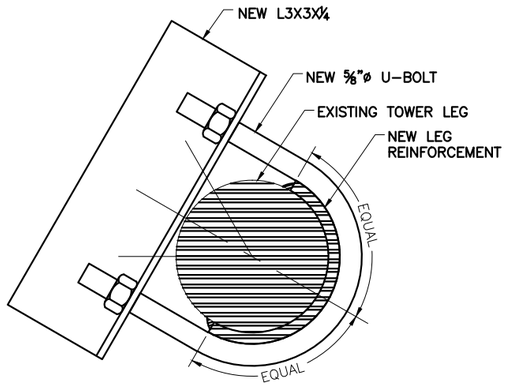




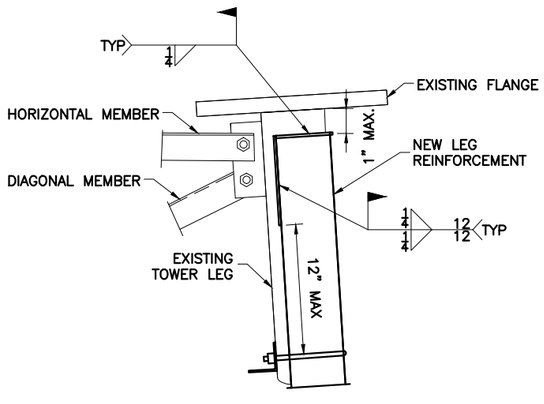
1 S3 ELEVATION VIEW N.T.S



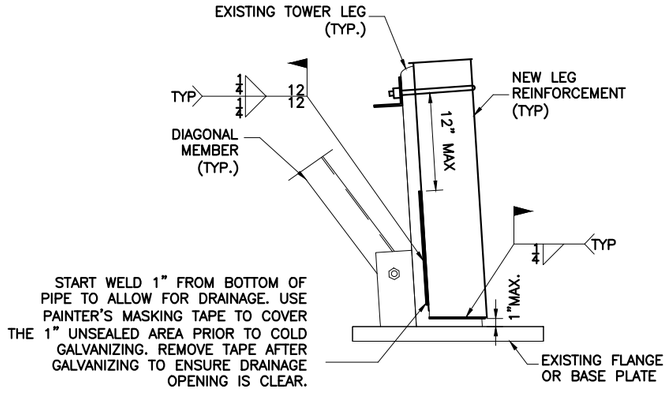
2 S3 ELEVATION VIEW N.T.S



3 S3 LEG REINFORCEMENT N.T.S.



4 S3 TOP OF LEG CONNECTION N.T.S.



START WELD 1" FROM BOTTOM OF PIPE TO ALLOW FOR DRAINAGE. USE PAINTER'S MASKING TAPE TO COVER THE 1" UNSEALED AREA PRIOR TO COLD GALVANIZING. REMOVE TAPE AFTER GALVANIZING TO ENSURE DRAINAGE OPENING IS CLEAR.

5 S3 BASE OF LEG CONNECTION N.T.S.

NOTE: FLANGE BOLTS NOT SHOWN FOR CLARITY

DRAWINGS PLOTTED TO SCALE ON 11x17 SHEETS

DESTEK ENGINEERING
DESTEK ENGINEERING, LLC
1281 KENNESTONE CIRCLE
SUITE 100
MARIETTA, GA 30066
TEL NO: 770-693-0835
ADMIN@DESTEKENGINEERING.COM
LICENSE NO: PEC0001429

PREPARED FOR:
Com-Ex Consultants, LLC
115 Route 46 - Suite E39
Mountain Lakes, NJ 07046

NUM	DATE	DESCRIPTION:
A	10/22/18	ISSUED FOR CONSTRUCTION

CT58XC962

ADDRESS:
21 WEST PEAK DRIVE
MERIDEN, CT 06037

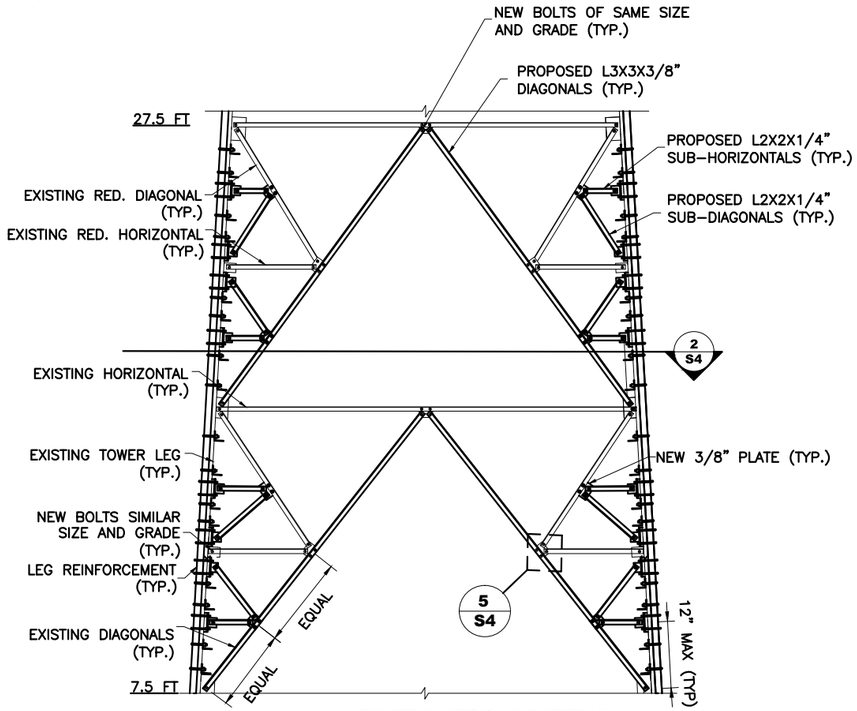
10-22-2018
STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
CT License No: 27057

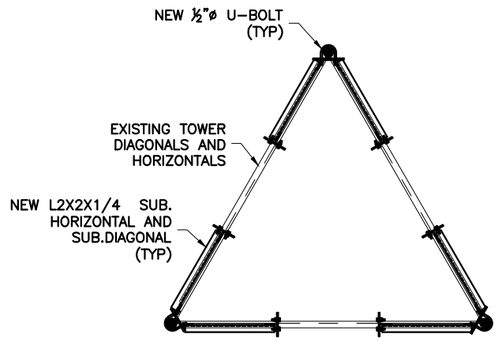
DESIGNED: EM
DRAWN: EM
CHECKED: AC

JOB #: 1829043

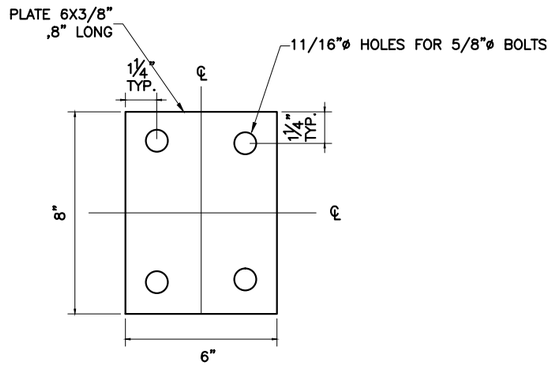
S3 STRUCTURAL DETAILS



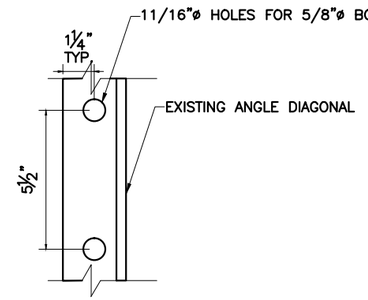
1 S3 ELEVATION VIEW N.T.S



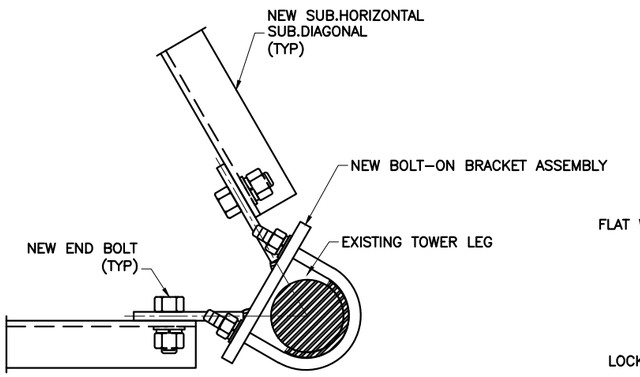
2 S4 BRACING PLAN DETAIL N.T.S



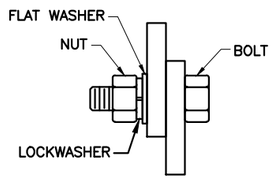
5 S4 PLATE DETAIL 2" = 1'-0"



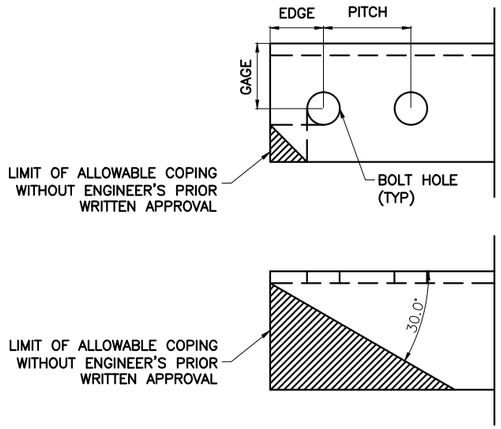
6 S4 DIAGONAL DETAIL 2" = 1'-0"



3 S4 BOLT-ON BRACKET N.T.S.



4 S4 TYPICAL BOLT ASSEMBLY N.T.S.



BOLT SCHEDULE						
MEMBER SIZE	CONNECTION TYPE	BOLT SIZE	MIN EDGE DISTANCE	PITCH DISTANCE	GAGE DISTANCE	BOLT HOLE
L2X2X1/4	END	5/8"ø X 2" LONG	1 1/8"	1 7/8"	1 1/8"	11/16"
L2X2X3/8	END	5/8"ø X 2" LONG	1 1/8"	1 7/8"	1 1/8"	11/16"
L3X3X3/8	END	5/8"ø X 2" LONG	1 1/8"	1 7/8"	1 1/8"	11/16"

10-22-2018

STATE OF CONNECTICUT AHMET COLAKOGLU PEN. 27057 LICENSED PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
CT License No: 27057

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DESTEK ENGINEERING, LLC
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SUITE 100
MARIETTA, GA 30066
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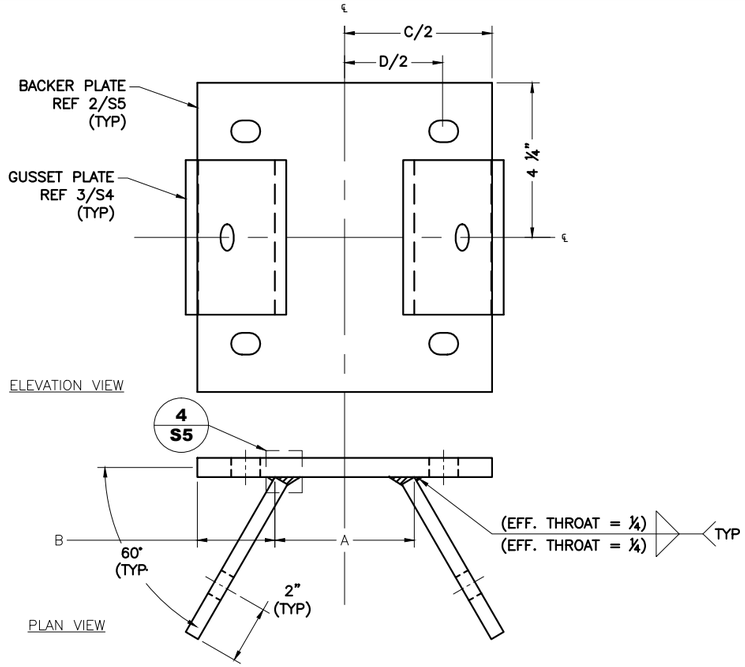
MERIDEN, CT 06037

DESIGNED: EM
DRAWN: EM
CHECKED: AC

JOB #: 1829043

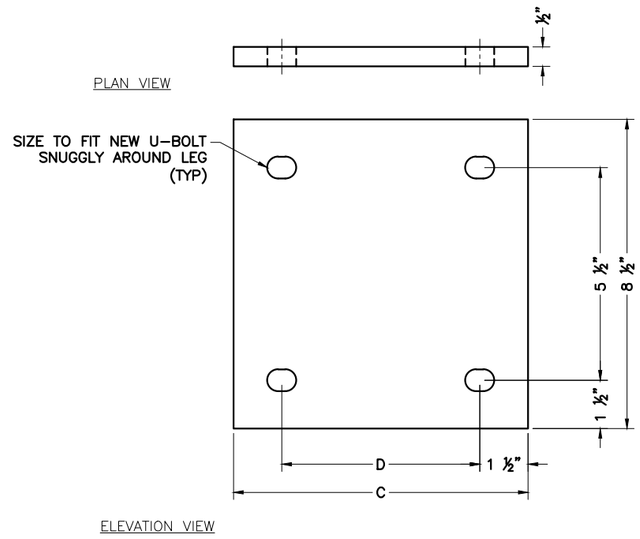
S4 STRUCTURAL DETAILS

DRAWINGS PLOTTED TO SCALE ON 11x17 SHEETS



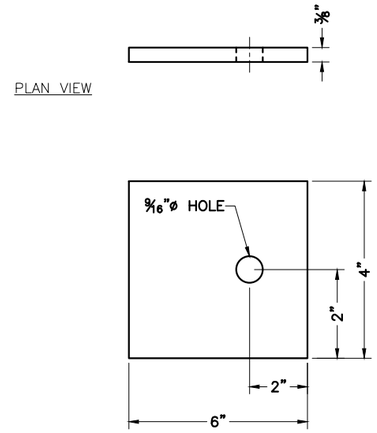
1 S5 BOLT-ON BRACKET ASSEMBLY

N.T.S.



2 S5 BACKER PLATE

N.T.S.

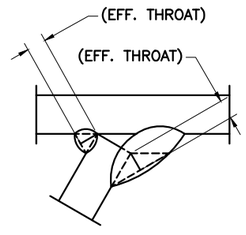


3 S5 GUSSET PLATE

N.T.S.

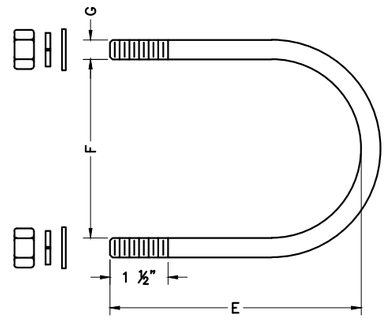
LEG	OUTER DIAMETER	ASSEMBLY		BACKER PLATE		U-BOLT		
		A (in)	B (in)	C (in)	D (in)	E (in)	F (in)	G (in)
3.25"SR+HSS4X0.313 SPLIT PIPE	4"	3 3/16	2 5/32	7 ½	4 ½	6	4 ⅛	½

NOTES:
1. ALL MATERIAL SHALL BE 50 KSI (A572).
2. WELD TO BE E70xx ELECTRODES.
3. USE 2 U-BOLTS PER ASSEMBLY, COMPLETE W/ NUTS, WASHERS AND LOCK WASHERS.
4. ALL HOLES TO BE SHOP FABRICATED, UNLESS NOTED OTHERWISE.



4 S5 WELD DETAIL

N.T.S.



5 S5 U-BOLT

N.T.S.

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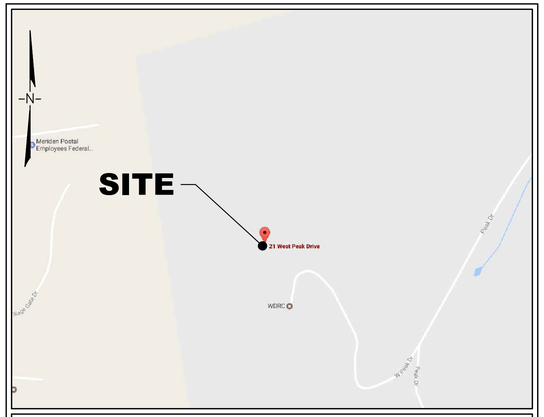
DESIGNED: EM
DRAWN: EM
CHECKED: AC

JOB #: 1829043

S5 STRUCTURAL DETAILS

"SPRINT MiMO UPGRADE"
CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY



KEY MAP

SCALE = N.T.S.

SITE LOCATION INFORMATION

SITE ID NUMBER:	CT58XC962
SITE NAME:	HAMDEN COMMUNICATION TOWER
SITE ADDRESS:	21 WEST PEAK DRIVE MERIDEN, CT 06037
PARCEL ID:	1213-0352-0011-0016
CENSUS TRACT:	343200
CENSUS BLOCK:	3018
PROPERTY OWNER:	THOMAS BROTHERS CO LLC 79 BALDWIN AVE WATERBURY, CT 06706
APPLICANT:	SPRINT CORPORATION 201 ROUTE 17 N, 3RD FLOOR RUTHERFORD, NJ 07070
COUNTY:	NEW HAVEN COUNTY

SITE CHARACTERISTICS

LATITUDE:	41.562890
LONGITUDE:	-72.844535
STRUCTURE TYPE:	SELF-SUPPORT TOWER
LOCATION OF PROPOSED EQUIPMENT:	EXISTING ANTENNA FRAME
STRUCTURE HEIGHT:	±199'-0" AGL
ANTENNA (RAD CENTER):	±70'-0" AGL (ALPHA) ±70'-0" AGL (BETA) ±70'-0" AGL (GAMMA)

SHEET INDEX

SCOPE OF WORK

SPRINT PROPOSED TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- COMPLETE TOWER MODIFICATIONS
- INSTALL (3) NEW SECTOR FRAMES
- INSTALL (3) PANEL ANTENNAS
- RELOCATE EXISTING ANTENNAS AND RRHs
- INSTALL (3) HYBRID CABLES
- INSTALL (1) FIBER MANAGEMENT BOX
- INSTALL (1) EQUIPMENT CABINET WITHIN EXISTING LEASE AREA
- REPLACE (1) EQUIPMENT CABINET WITHIN EXISTING LEASE AREA

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

COM-EX Consultants
115 Route 46
Suite E39
Mountain Lakes, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

Sprint
6100 SPRINT PARKWAY
OVERLAND PARK, KS 66251

Cherundolo Consulting

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
9	01/03/19	REVISED ELEVATION
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2	10/03/17	ISSUED FOR CONSTRUCTION

DRAWN BY:	AM
CHECKED BY:	NDB
SCALE:	AS NOTED
JOB NO:	17058-CHE

INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF A LICENSED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LIC. No. 28643

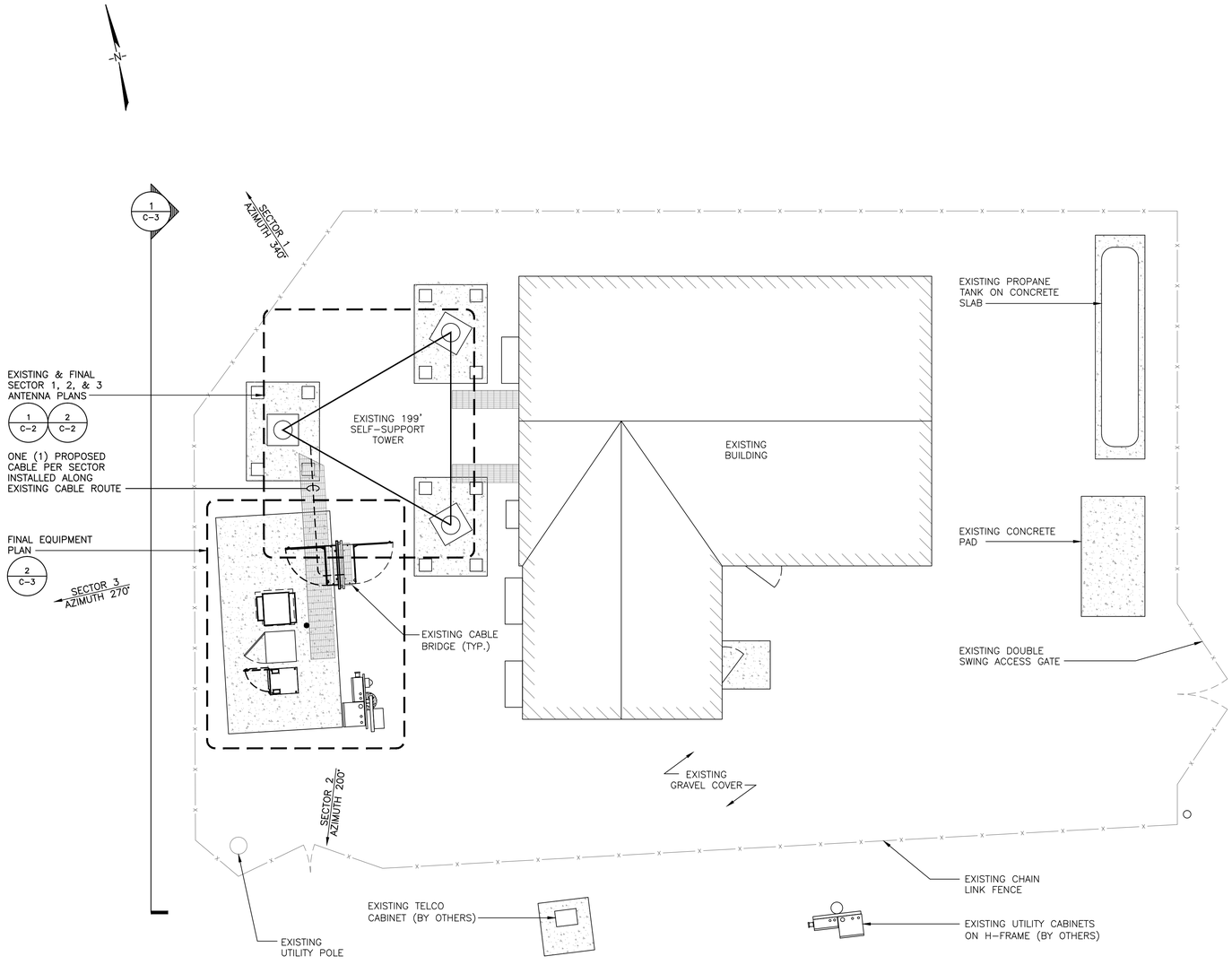
CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

TITLE SHEET

DRAWING SHEET: 1 OF 8

T-1



1 / C-1 COMPOUND PLAN
SCALE: 3/16"=1'
(24"x36" SHEET SIZE)

GENERAL NOTES:

1. SUBJECT PROPERTY IS KNOWN AS TAX PARCEL ID 1213-0352-0011-0016, CENSUS TRACT 343200, CENSUS BLOCK 3018 AS SHOWN THE OFFICIAL TAX MAP OF THE TOWN OF MERIDEN, CT.
2. THE APPLICANT PROPOSES TO RELOCATE THREE (3) ANTENNAS AND INSTALL ONE (1) NEW ANTENNA PER SECTOR ON A PROPOSED ANTENNA FRAME. THE APPLICANT ALSO PROPOSES TO REPLACE ONE (1) EQUIPMENT CABINET AND INSTALL ONE (1) NEW EQUIPMENT CABINET AT GRADE.
3. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY SPRINT, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
4. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION".
5. SITE INFORMATION SHOWN TAKEN FROM PLANS PREPARED BY KMB DESIGN GROUP FOR SPRINT'S INSTALLATION ON THIS FACILITY. DRAWINGS ENTITLED "SPRINT, SITE NAME: HAMDEN COMMUNICATION TOWER, SPRINT NUMBER: CT58XC962" DATED 05/01/12 REVISED 12/05/13. ADDITIONAL SITE INFORMATION WAS SUPPLEMENTED WITH A LIMITED SITE VISIT BY COM-EX CONSULTANTS 05/24/17.
6. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
8. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
10. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
11. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
12. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
13. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
14. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
15. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
16. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND RELATED PARTIES. THE SUBCONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT EFFECTS THEIR WORK.
17. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON THE SITE AT ALL TIMES AND INSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA CONTRACTOR FURNISH 3 SETS OF REDLINE "AS-BUILT" DRAWINGS TO SPRINT UPON COMPLETION OF THE WORK.
18. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAT BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL INCLUDED AS PART OF THE WORK.
19. ALL MATERIAL PROVIDED BY IS TO BE REVIEWED BY THE CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTOR PRIOR TO INSTALLATION. ANY DEFICIENCIES TO PROVIDE MATERIALS SHALL BE BROUGHT TO THE CONSTRUCTION MANAGERS ATTENTION IMMEDIATELY.
20. THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
21. THE CONTRACTOR SHALL COORDINATE ALL CIVIL, STRUCTURAL AND ELECTRICAL DRAWINGS FOR THE LOCATIONS OF ALL OPENINGS, RECESSES, BUILT-IN WORK, ETC..
22. THE CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTACT DOCUMENTS.
23. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
24. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST-ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAND PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
25. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
27. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS MAY TAKE PRECEDENCE.
28. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
29. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
30. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORKS, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
31. DESIGN REQUIREMENTS PER 2016 CONNECTICUT STATE BUILDING CODE AND THE EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

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21 WEST PEAK DRIVE
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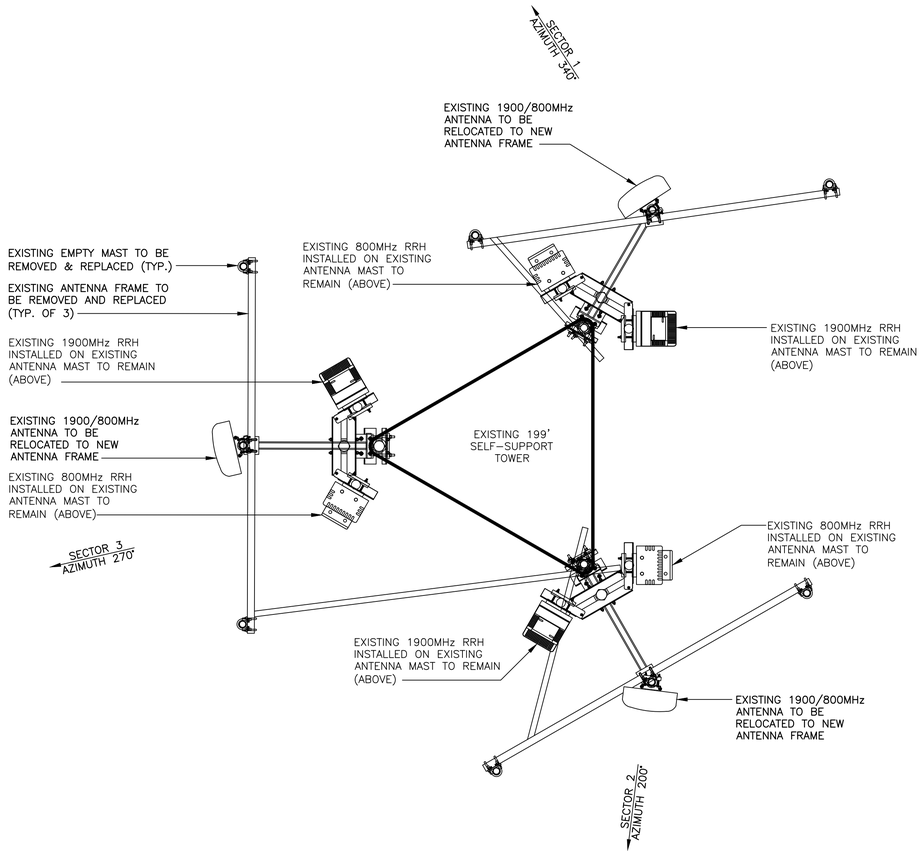
NEW HAVEN COUNTY

DRAWING TITLE:

COMPOUND PLAN & GENERAL NOTES

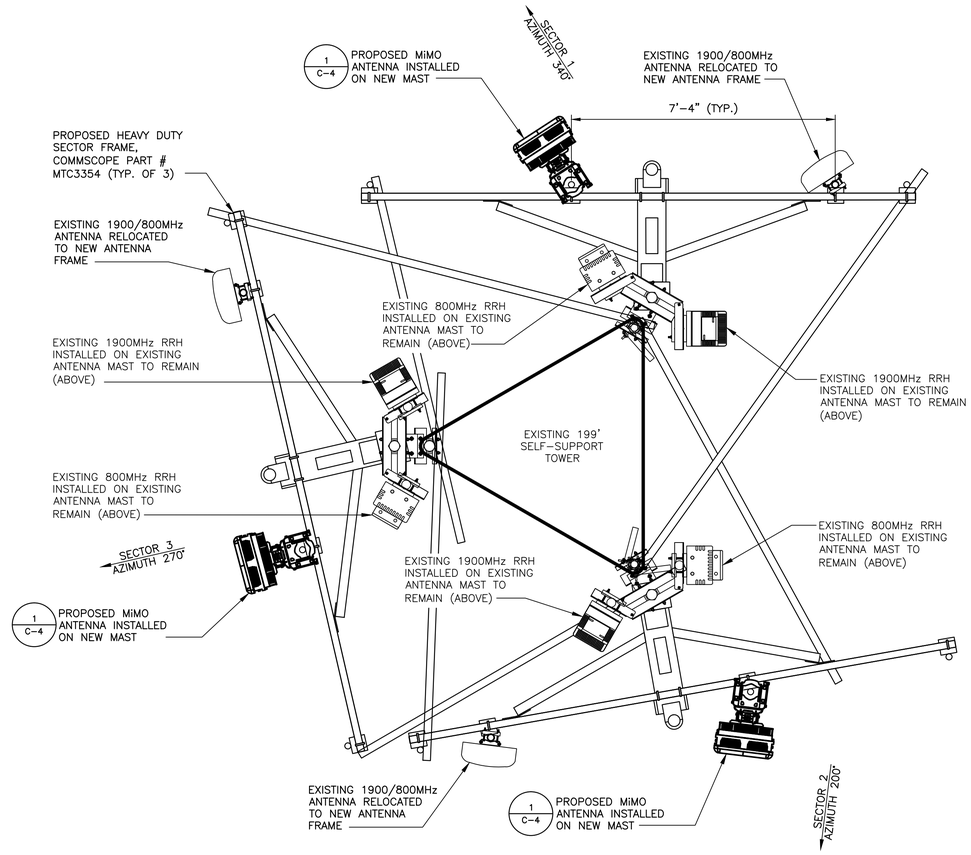
DRAWING SHEET: 2 OF 8

C-1



1 / C-2 EXISTING SECTOR 1, 2, & 3 ANTENNA PLAN
SCALE: 1/2"=1'

STRUCTURAL ANALYSIS AND MODIFICATION DESIGN COMPLETED BY DESTEK ENGINEERING. FOR ADDITIONAL INFORMATION, SEE REPORT TITLED: STRUCTURAL ANALYSIS REPORT – UPGRADE SELF SUPPORT, DATED 10/22/18.



2 / C-2 FINAL SECTOR 1, 2, & 3 ANTENNA PLAN
SCALE: 1/2"=1'

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SCALE:	AS NOTED
JOB NO:	17058-CHE

INFORMATION ON THIS SET OF DRAWINGS IS NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY THE STAMP, SEAL & SIGNATURE OF A PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
No. 28643
PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER Lic. No. 28643

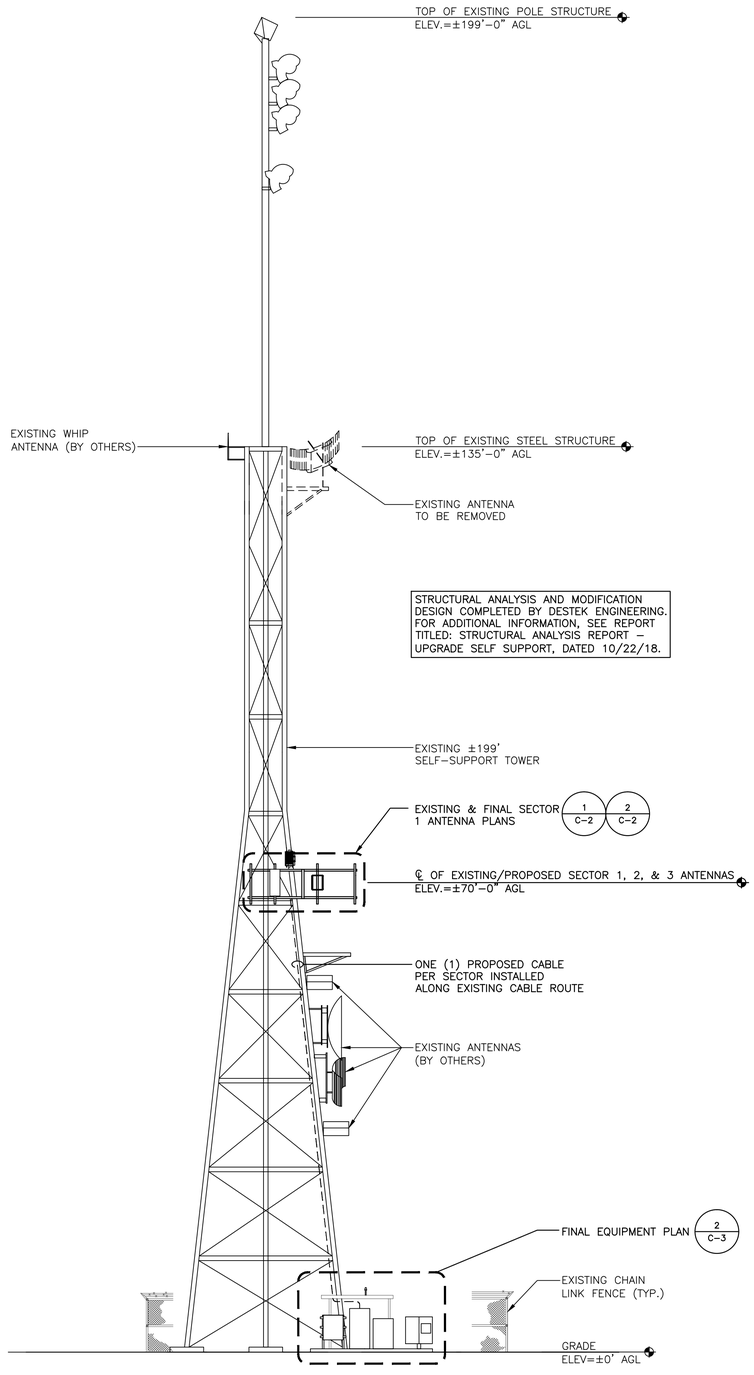
CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

EXISTING & FINAL ANTENNA PLANS

DRAWING SHEET: 3 OF 8

C-2



1 C-3 TOWER ELEVATION
SCALE: 3/32"=1'
(24"x36" SHEET SIZE)

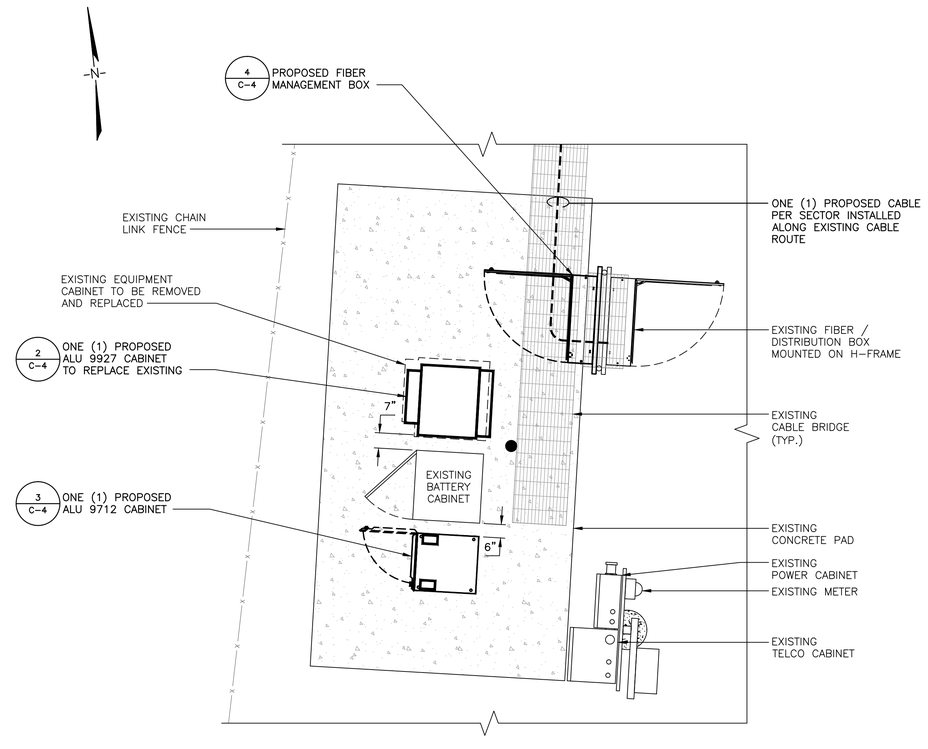
ANTENNA INFORMATION

SECTOR	RAD CENTER	AZIMUTH	POSITION	EXISTING MODEL	EXISTING QTY.	PROPOSED MODEL	PROPOSED QTY.	PROPOSED RRU	CABLE TYPE	CABLE LENGTH
ALPHA	70'-0"	340°	1	N/A	1	NOKIA: 2.5G MAA-AAHC	1	ALCATEL LUCENT: RRH-2X50-800	(1) RFS: HB114-1-08U4-M3J	100'
			2	POWERWAVE P40	1	POWERWAVE P40	1	ALCATEL LUCENT: RRH-4x45-1900		
BETA	70'-0"	200°	1	N/A	1	NOKIA: 2.5G MAA-AAHC	1	ALCATEL LUCENT: RRH-2X50-800	(1) RFS: HB114-1-08U4-M3J	100'
			2	POWERWAVE P40	1	POWERWAVE P40	1	ALCATEL LUCENT: RRH-4x45-1900		
GAMMA	70'-0"	270°	1	N/A	1	NOKIA: 2.5G MAA-AAHC	1	ALCATEL LUCENT: RRH-2X50-800	(1) RFS: HB114-1-08U4-M3J	100'
			2	POWERWAVE P40	1	POWERWAVE P40	1	ALCATEL LUCENT: RRH-4x45-1900		

PROJECT SCOPE:

RELOCATE: (3) PANEL ANTENNAS AND (6) RRHs INSTALL: (3) PANEL ANTENNAS

EQUIP.	BTS CABINET	1	63.5"X31.5"X38.1"	1090 LBS	ALU: 9927
	CABLING KIT	1	41.0"X25.6"X29.5"	560 LBS	ALU: 9712
	FIBER MANAGEMENT BOX	1	39"X39"X13.3"	TBD	ALCATEL LUCENT



2 C-3 FINAL EQUIPMENT PLAN
SCALE: 3/8"=1'

COM-EX Consultants
115 Route 46
Suite E39
Mountain Lakes, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

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OVERLAND PARK, KS 66251

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SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
9	01/03/19	REVISED ELEVATION
8	12/06/18	PER CLIENT COMMENTS
7	12/05/18	PER NEW EQUIPMENT
6	10/23/18	ISSUED AS FINAL
5	06/25/18	REVISED PER CLIENT COMMENTS
4	05/10/18	REVISED PER COMMENTS
3	04/27/18	REVISED PER RFDS
2	10/03/17	ISSUED FOR CONSTRUCTION

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SCALE:	AS NOTED
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STATE OF CONNECTICUT No. 28643 PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER LIC. No. 28643

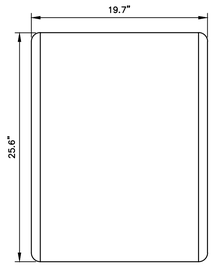
CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

TOWER ELEVATION, B.O.M. & FINAL EQUIPMENT PLAN

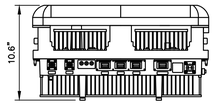
DRAWING SHEET: 4 OF 8

C-3



FRONT VIEW

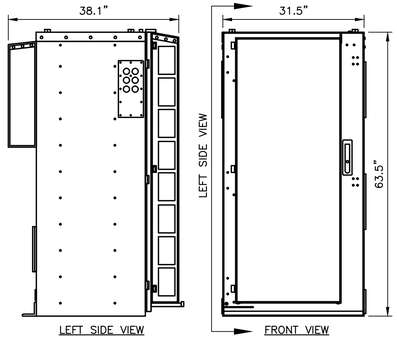
MANUFACTURER	NOKIA
MODEL	2.5G MAA-AAHC(64T64R)
LENGTH	25.6"
WIDTH	19.7"
DEPTH	9.6"
WEIGHT	103.6 LBS
AREA	2.8 SQ. FT.



BOTTOM VIEW

1 C-4 MiMO ANTENNA/RRH NOKIA: 2.5G MAA-AAHC(64T64R)

SCALE: N.T.S.

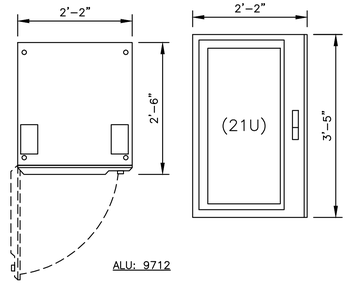


MECHANICAL SPECIFICATIONS
HEIGHT: 63.5 IN.
WIDTH: 31.5 IN.
DEPTH: 38.1 IN.
WEIGHT: 1090 LBS.

EQUIPMENT SHALL BE ANCHORED PER MANUFACTURERS SPECIFICATIONS AND INSTALLATION GUIDELINES.

2 C-4 ALU 9927 CABINET DETAIL

SCALE: N.T.S.

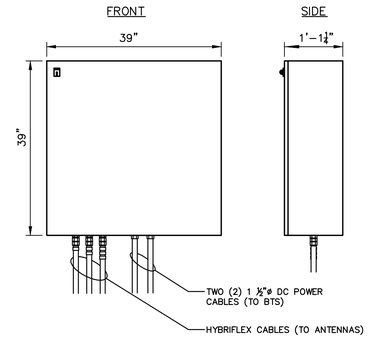


ALU: 9712

MECHANICAL SPECIFICATIONS
HEIGHT: 41.0 IN.
WIDTH: 25.6 IN.
DEPTH: 29.5 IN.
WEIGHT: 560 LBS. (FULLY LOADED)

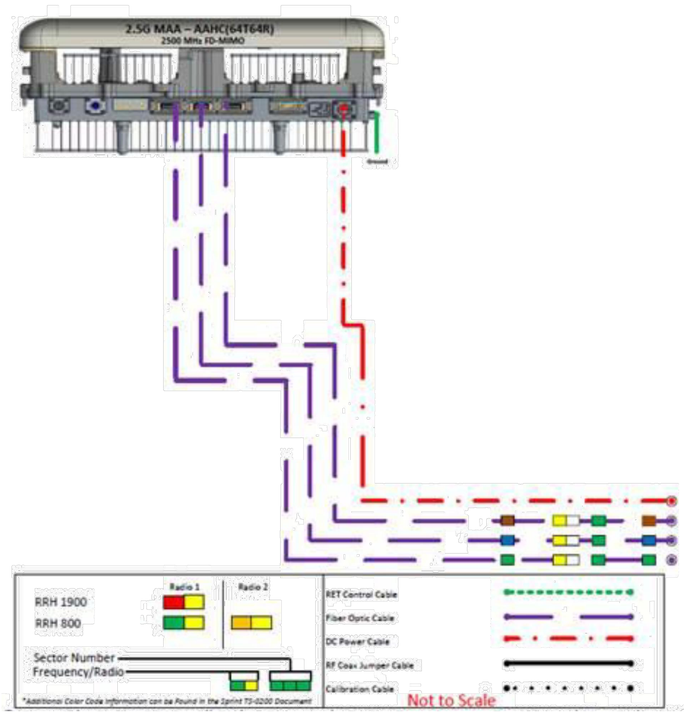
3 C-4 ALU 9712 CABINET DETAIL

SCALE: N.T.S.



4 C-4 FIBER MANAGEMENT BOX DETAIL

SCALE: N.T.S.



5 C-4 MiMO SCHEMATIC

SCALE: N.T.S.

COM-EX Consultants
115 Route 46
Suite E39
Mountain Lakes, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

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STATE OF CONNECTICUT No. 28643 REGISTERED PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER LIC. No. 28643

CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

CONSTRUCTION DETAILS

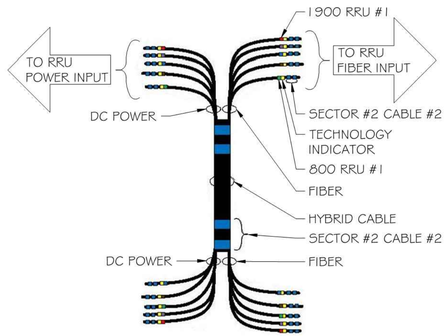
DRAWING SHEET: 5 OF 8

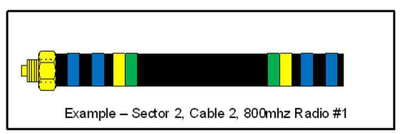
C-4

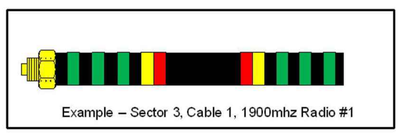
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

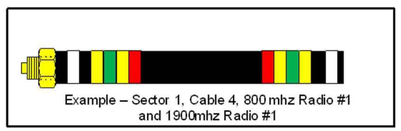
NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

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




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

1 / C-5 COLOR CODING CHARTS
SCALE: NTS

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.

COM-EX Consultants
115 Route 46
Suite E39
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STATE OF CONNECTICUT No. 28643 PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER Lic. No. 28643

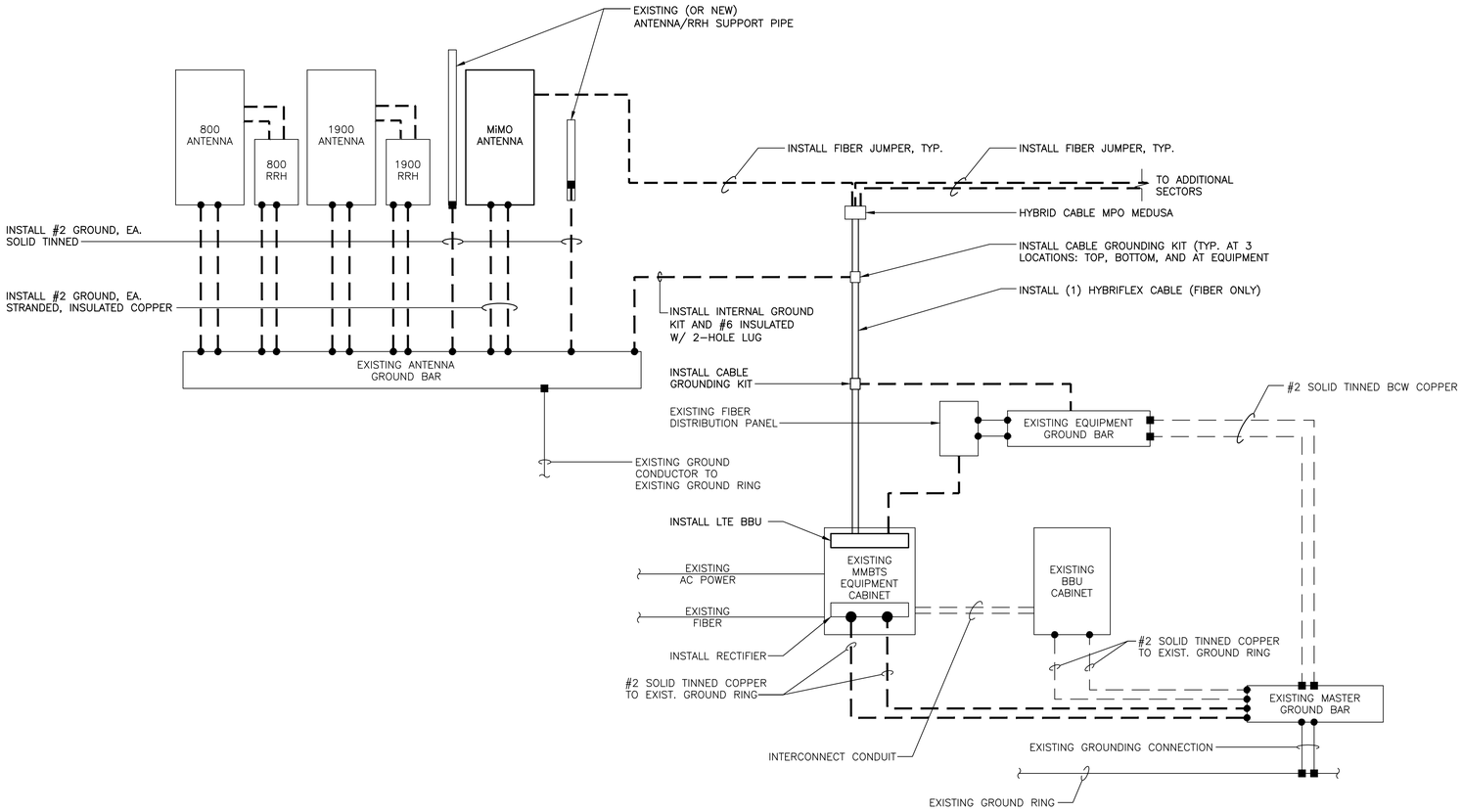
CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

CABLE COLOR CODING

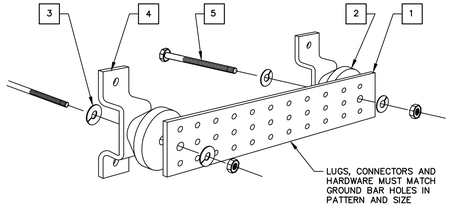
DRAWING SHEET: 6 OF 8

C-5



1 / E-1 TYPICAL POWER & GROUNDING ONE-LINE DIAGRAM

SCALE: N.T.S.



LEGEND

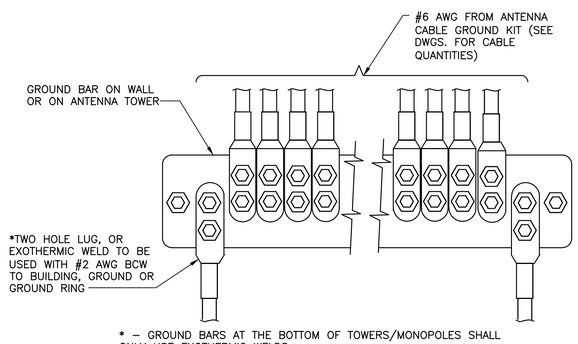
1. COPPER GROUND BAR, 7/16"X 4" X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 X 1" H.H.C.S.BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

GROUND BAR SCHEDULE

TYPE	QTY.	MANUFACTURER	CAT. NO.	REMARKS
MGB	2	HARGER	GB14420TMGB	OR EQUAL
CGB	3	HARGER	GB14412TMGB	OR EQUAL

2 / E-1 TYPICAL GROUND BAR DETAIL

SCALE: NTS



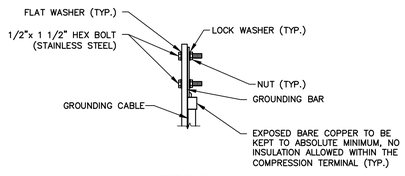
* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRIFLEX GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.

- CONNECT SEQUENCE- BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

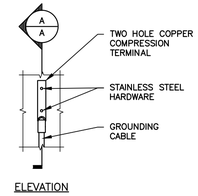
3 / E-1 TYPICAL GROUND BAR CONNECTION PLAN

SCALE: NTS



SECTION "A-A"

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



ELEVATION

4 / E-1 TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: NTS

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THNN INSULATION.
6. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
7. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
10. GROUND HYBRIFLEX CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRIFLEX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
11. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
12. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
16. BOND ANTENNA MOUNTING BRACKETS, HYBRIFLEX CABLE GROUND KITS, AND RRHs TO EGB PLACED NEAR THE ANTENNA LOCATION.
17. BOND ANTENNA EGB'S AND MGB TO GROUND RING.
18. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
19. CONTRACTOR SHALL CONDUCT ANTENNA, HYBRIFLEX CABLES, AND RRH RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
20. CONTRACTOR (CERTIFIED ELECTRICIAN) SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.

COM-EX Consultants
115 Route 46
Suite E39
Mountain Lakes, NJ 07046
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DRAWN BY:	AM
CHECKED BY:	NDB
SCALE:	AS NOTED
JOB NO:	17058-CHE

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STATE OF CONNECTICUT
No. 28643
PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER Lic. No. 28643

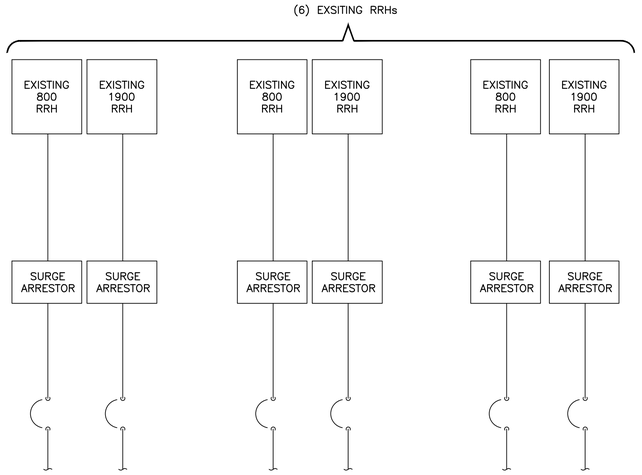
CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

GROUNDING DETAILS

DRAWING SHEET: 7 OF 8

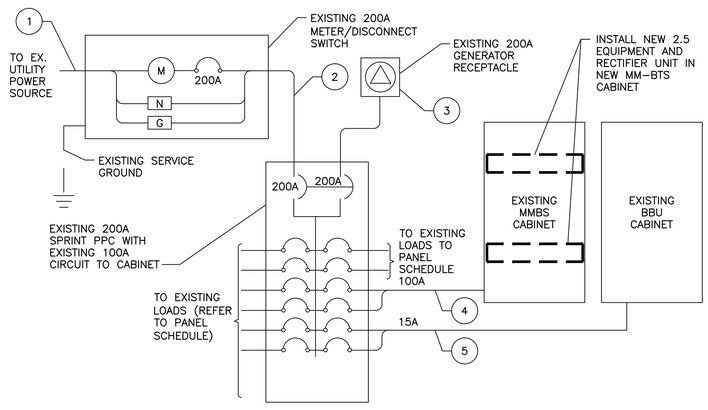
E-1



1 E-2 DC ONE-LINE DIAGRAM
SCALE: NTS

A/C PANEL SCHEDULE							
VOLTAGE:	240V/120		PANEL STATUS:	EXISTING		N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP		MODEL NUMBER:	TBD		INTERNAL TVSS:	YES
MOUNT:	AT GRADE		PHASE:	1		WIRE:	3
ENCLOSURE:	NEMA 3R		BUSS RATING:	200 AMP		GROUND BAR:	YES
			NEUTRAL BAR:	YES			

2 E-2 AC PANEL SCHEDULE
SCALE: NTS



CIRCUIT SCHEDULE			
NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/ DISCONNECT	EXISTING
2	METER/ DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EX. MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1-1/2" CONDUIT
5	TRANSFER & LOAD CENTER	EX. BBU CABINET	(2) #12 AWG, (1) #12 GND IN 3/4" CONDUIT

3 E-2 ELECTRICAL ONE-LINE DIAGRAM
SCALE: NTS

COM-EX Consultants
115 Route 46
Suite E39
Mountain Lakes, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

Sprint
6100 SPRINT PARKWAY
OVERLAND PARK, KS 66251

Cherundolo Consulting

SCHEDULE OF REVISIONS

REV. NO.	DATE	DESCRIPTION OF CHANGES
9	01/03/19	REVISED ELEVATION
8	12/06/18	PER CLIENT COMMENTS
7	12/05/18	PER NEW EQUIPMENT
6	10/23/18	ISSUED AS FINAL
5	06/25/18	REVISED PER CLIENT COMMENTS
4	05/10/18	REVISED PER COMMENTS
3	04/27/18	REVISED PER RFDS
2	10/03/17	ISSUED FOR CONSTRUCTION

DRAWN BY:	AM
CHECKED BY:	NDB
SCALE:	AS NOTED
JOB NO:	17058-CHE

INFORMATION ON THIS SHEET OF DRAWINGS IS NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY THE STAMPED SEAL & SIGNATURE OF THE PROFESSIONAL ENGINEER

NICHOLAS D. BARILE
PROFESSIONAL ENGINEER
CT LIC. No. 28643

CT58XC962
21 WEST PEAK DRIVE
MERIDEN, CT 06037
NEW HAVEN COUNTY

DRAWING TITLE:

DC POWER DETAILS & PANEL SCHEDULES

DRAWING SHEET: 8 OF 8

E-2